

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

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

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

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

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

 **SAFETY PRECAUTIONS**

Please see the Technical Document for details.

**Air-cooled Inverter Modular Chiller
for Diverse Customer Needs**

UNIVERSAL SMART X Series 4



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A Carrier Company



Better Air Solutions

Made-in-Japan
All-new innovative chiller system

UNIVERSAL SMART X Series 4

30HP model / 40HP model / 50HP model

Welcome to the world of Toshiba's chillers and reversible heat pump products. Toshiba are world renowned for producing high quality / high efficiency products with excellent customer support. This ethos has now been continuously applied to a new range of air-cooled chillers and reversible heat pump products - the Universal Smart X Series 4. The Universal Smart X Series 4 have been designed for high efficiency, low running costs, excellent risk diversification capabilities, lower noise levels and ease of installation and maintenance. With capacity range 30HP, 40HP, 50HP each module and possible to operate up to 128 modules as one system, the Universal Smart X is the perfect solution for a wide range of applications including data centers, hospitals, clean rooms, offices and manufacturing facilities, etc...

The flexible design options, wide operating / capacity range and system configurations mean there is a Universal Smart X option to suit your required application. Since 2011, over 40,000 modules of the Universal Smart X air-cooled chillers have been installed around the world with customer's satisfactions on running cost reductions and easy control over the whole system.



UNIVERSAL SMART X Series 4 line-up

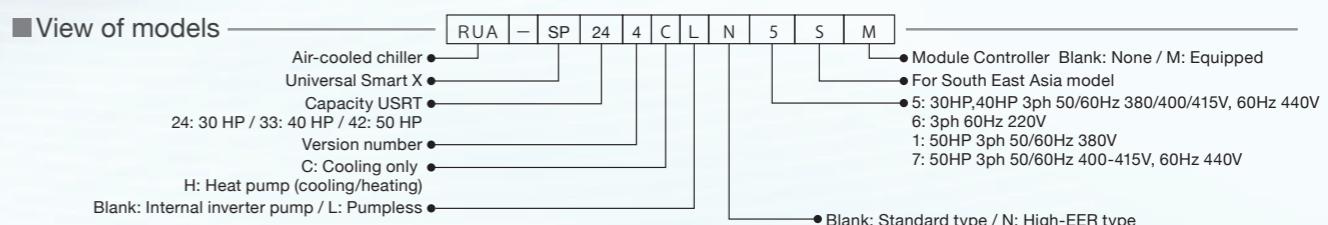
Internal inverter pump

Model	Use	Type	Power supply	Page
30HP	Cooling-only	Standard	3-phase 3-wire 50/60Hz 380V/400V/415V	11
		High-EER	3-phase 3-wire 60Hz 440V	13
	Heat pump	Standard	3-phase 3-wire 60Hz 220V	15
		High-EER	3-phase 3-wire 60Hz 220V	17
40HP	Cooling-only	Standard	3-phase 3-wire 50/60Hz 380V/400V/415V	11
		High-EER	3-phase 3-wire 60Hz 440V	13
	Heat pump	Standard	3-phase 3-wire 60Hz 220V	15
		High-EER	3-phase 3-wire 60Hz 220V	17
50HP	Cooling-only	Standard	3-phase 3-wire 50/60Hz 380V/400V/415V	11
		High-EER	3-phase 3-wire 60Hz 440V	13
	Heat pump	Standard	3-phase 3-wire 60Hz 220V	15
		High-EER	3-phase 3-wire 60Hz 220V	17

Pumpless

Model	Use	Type	Power supply	Page
30HP	Cooling-only	Standard	3-phase 3-wire 50/60Hz 380V/400V/415V	19
		High-EER	3-phase 3-wire 60Hz 440V	21
	Heat pump	Standard	3-phase 3-wire 60Hz 220V	23
		High-EER	3-phase 3-wire 60Hz 220V	25
40HP	Cooling-only	Standard	3-phase 3-wire 50/60Hz 380V/400V/415V	19
		High-EER	3-phase 3-wire 60Hz 440V	21
	Heat pump	Standard	3-phase 3-wire 60Hz 220V	23
		High-EER	3-phase 3-wire 60Hz 220V	25
50HP	Cooling-only	Standard	3-phase 3-wire 50/60Hz 380V/400V/415V	19
		High-EER	3-phase 3-wire 60Hz 440V	21
	Heat pump	Standard	3-phase 3-wire 60Hz 220V	23
		High-EER	3-phase 3-wire 60Hz 220V	25

View of models



7 Smart features



UNIVERSAL SMART X Series 4

30HPmodel / 40HPmodel / 50HPmodel

Energy-efficient and High Redundancy Air-cooled Modular Chillers

1

Highest operating efficiency in the industry

New generation of DC inverter twin rotary compressor

- ✓ Top class efficiency IPLV 7.1*¹
- ✓ Exquisite twin rotary design for excellent part load efficiency

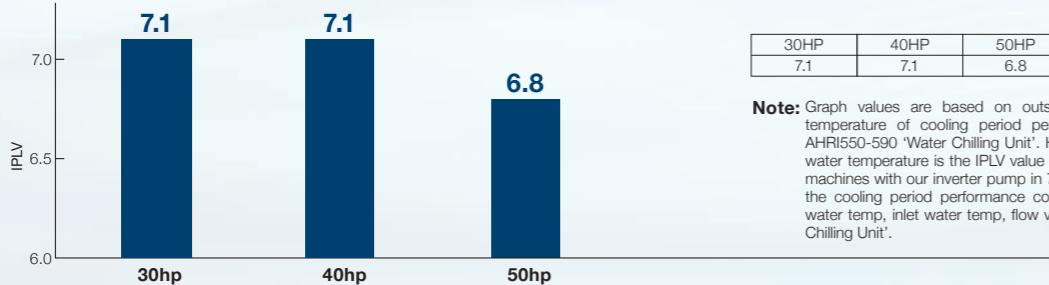
*1 For high EER type 30hp module unit, internal pump power is not included.
See the graphs on next page for the values of each unit and IPLV values based on ARI550-590.



High-efficiency compressor

- ① More coils on motors with varnish coating ② Less pressure loss

Top class IPLV level

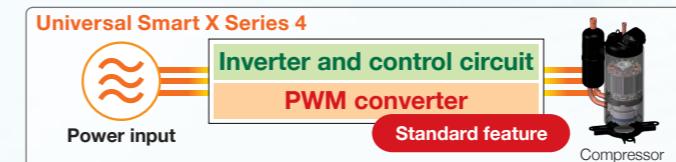


2

Harmonic suppression improvement

Harmonic current suppression function as standard feature

- ✓ Cost reduction for harmonic current suppression devices

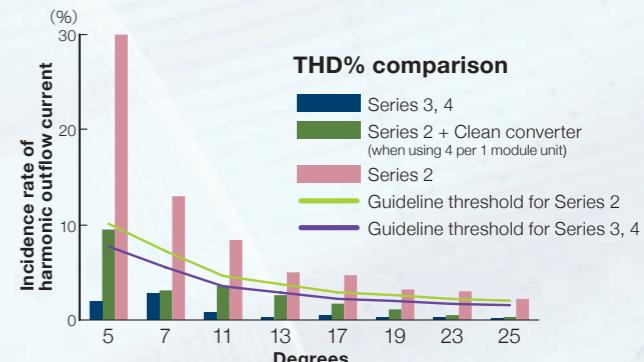


Harmonic current could damage electrical equipment significantly*². Leave it to Toshiba with its exclusive technology of the PWM converter to design chillers with the minimum impact of harmonic current level. By making the voltage and current wave closer to a pure sine wave form, the PWM converter can reduce harmonic current which would not require an additional installation of harmonic filter. As a standard feature on all of the Universal Smart X series, the cost reduction is absolutely over the top.

*2 Flickering on TVs, radio noise, mistaken tripping of an electrical leakage breaker, burnout of a reactor or phase-advanced condenser.

Benefits at a glance

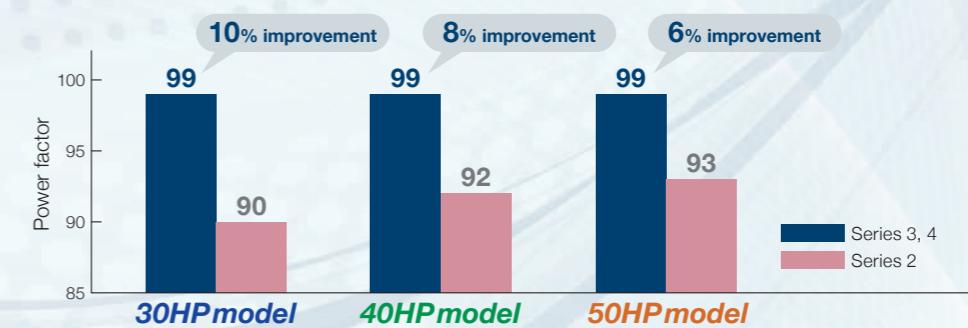
- 1 Eliminate problems caused by harmonic current
- 2 Reduce power consumption of electrical equipment
- 3 Reduce additional cost for harmonic filter because THD% is already low



3

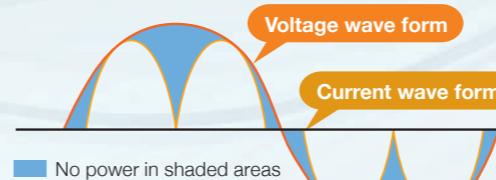
Top class power factor

Exclusive PWM converter technology for power factor 99% at rated conditions



All about efficiency

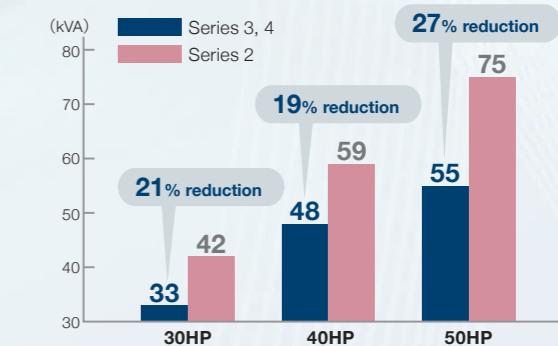
Low power factor is not only inefficient, but can be expensive over the life of an electrical system. By dividing the power into ON/OFF areas, the Universal Smart X Series 4 achieved power factor at 99% which increases the distribution system's efficiency and reduces power loss as well as energy costs associated with low power factor penalties.



Benefits at a glance

Significant energy saving over original series by reducing power cable, switches, fuses, etc... in size!³

Comparison of power transformer volume



³ Some models (combined with module unit) do not allow a reduction in size.



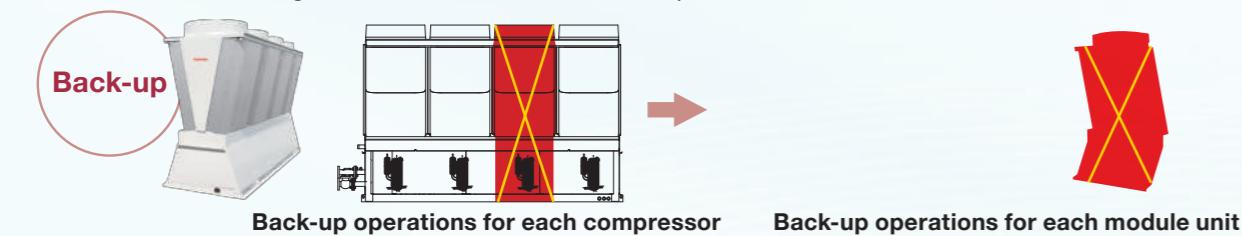
UNIVERSAL SMART X Series 4

30HPmodel / 40HPmodel / 50HPmodel

7 Smart features

4 Highly-reliable module unit system

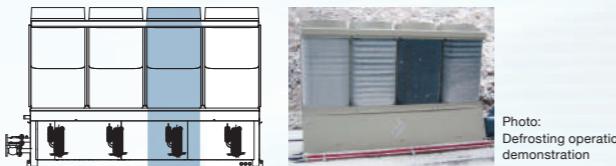
Each module unit has four independent refrigerant cycles. Furthermore, modular design of the Universal Smart X series 4 provides excellent risk-diversification.



And also...

Defrosting operation for a single module is performed by only one compressor at a time

Utilizing the redundancy of four compressors to carry out distributed defrost operation in a module unit, the Universal Smart X can manage to maintain leaving hot water during defrost operation.

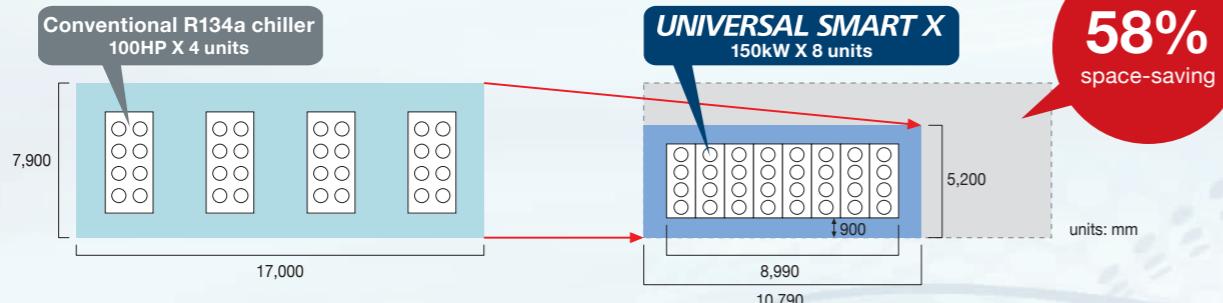


Space-saving installation

Optimum air flow with advanced X frame. Easy installation in small spaces.

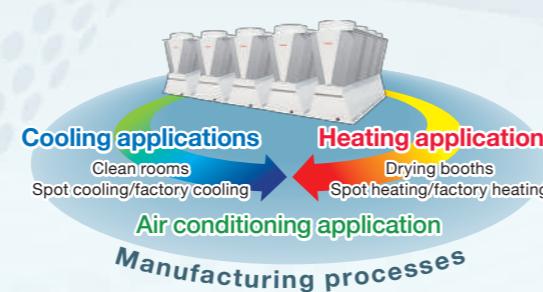
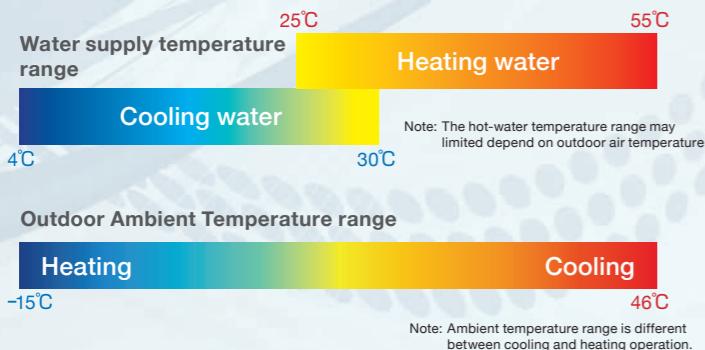
- Installation space has decreased by 58% compared with the R134a model*1 from 15 years ago, providing enough capacity increase in the same space.
- Compact modular design makes it an excellent solution for replacing system using a cooling tower.

*1 Compared with the space needed to install a system for a 1200kW cooling load.
Comparison of four RUA-SA30001H units and eight 150kW module units.



5 Wide range of operating temperatures

The Universal Smart X Series 4 can be widely used for both commercial and industrial applications with its wide range of leaving water temperature from 4°C ~ 55°C and outdoor temperature range can be from -15°C to 46°C depending on model.



6 Flexible control of up to 6400 horsepower

Up to 128 UNIVERSAL SMART X module units can be combined and operated together.

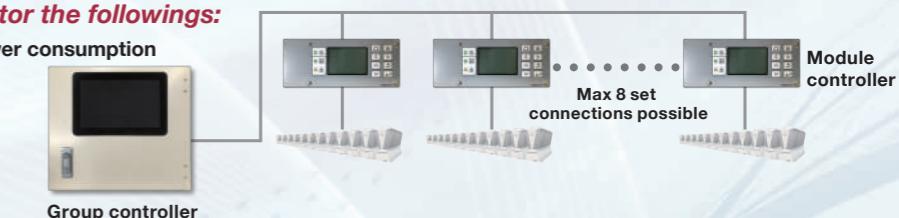


Superior system management

Module controller, simple group controller, group controller, and PC monitor app are now ready for users to manage and save energy.

It has never been easier to motor the followings:

- Instantaneous heat production, power consumption
- Operating capacity
- Water supply temperature
- Error history

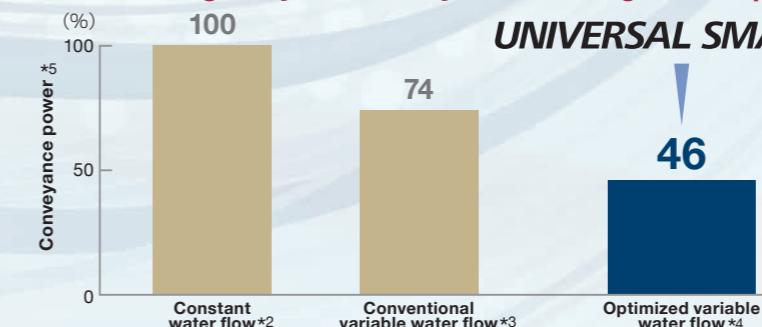


7 Optimized variable flow control (With variable pressure /“Bypass zero”)

Passing on from previous series, the Universal Smart X series 4 can be able to control system with added flow rate detection in order to make the bypass flow rate approaching zero. This feature significantly contributes to energy savings for both heat pump and entire system. Furthermore, the Series 4 is now equipped with a feature which allows normal operation without any sensors. This increases the Universal Smart X series 4 liability as well as risk diversification.

Contribute to energy-savings for both heat source machine and entire system.

Power loss is greatly reduced by coordinating chiller operation with the load continuously.



UNIVERSAL SMART X

*2 Constant water flow with constant differential pressure
*3 Variable water flow with constant differential pressure
*4 Variable water flow with variable differential pressure
*5 Comparison at systems with single pump
Reduced volume differs by piping system.



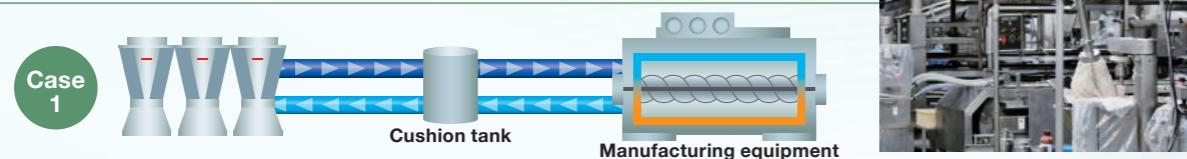
UNIVERSAL SMART X Series 4

30HPmodel / 40HPmodel / 50HPmodel

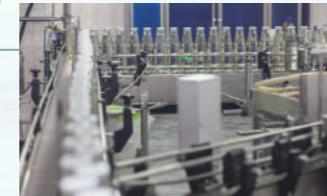
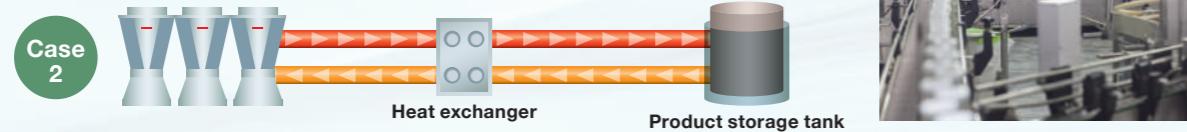
Application Type

Provide appropriate solutions with superior function for every application, from air conditioning to industrial processes!

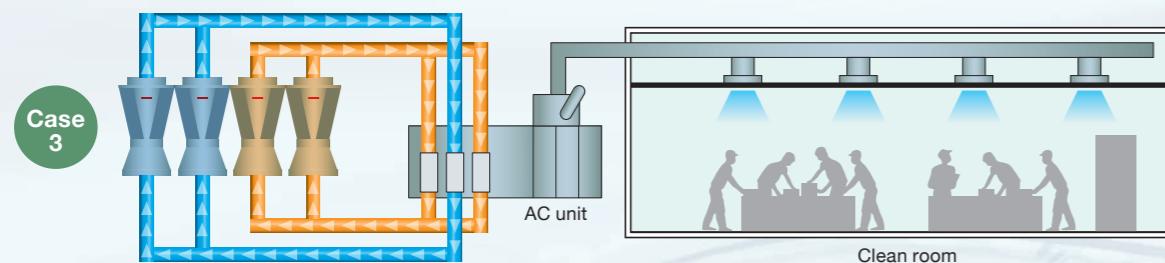
1 For machinery cooling!



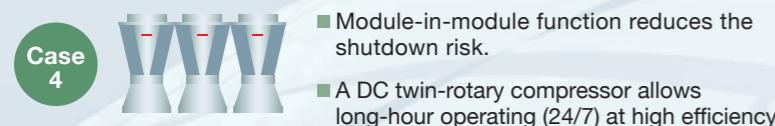
2 Year-round hot-water supply with heat machine option!



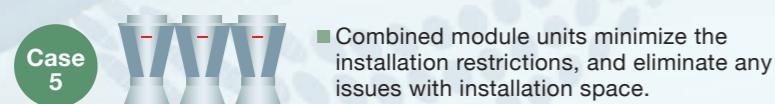
3 For clean rooms!



4 For server rooms!



5 For large commercial facilities!



And also...

Maximize the function of Universal Smart X with optimal operation in various applications.

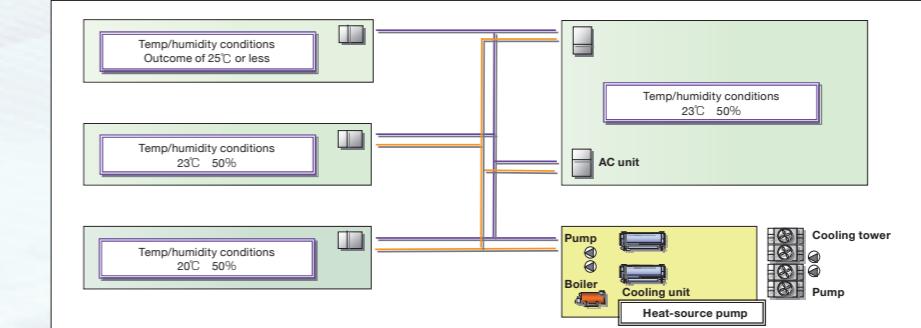
Operation Type

1 For heat loss reduction during transfer

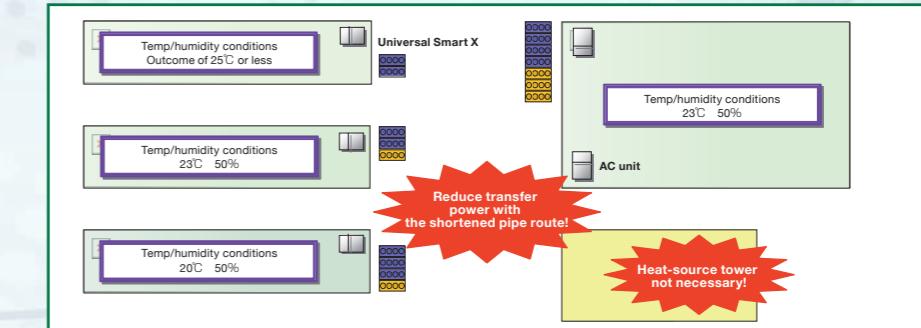


Solution New heat pump system with optimal dispersion to synchronize with your loads and uses.

Centralized heat pump system



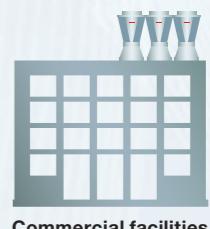
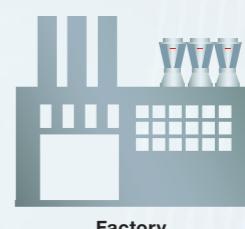
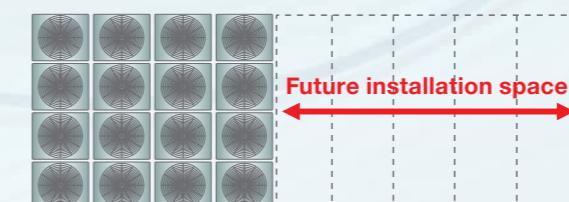
Dispersed Air-cooled heat pump system



2 For installation in stages



Solution Modular design allows the flexibility of increasing number of modules in the future to meet internal load.



Specifications Internal inverter pump

30HP model 40HP model 50HP model Cooling-only

	Standard type			High-EER type			
	400V						
	30HP	40HP	50HP	30HP	40HP	50HP	
Model (A single module unit)	RUA-SP244C5S(M)	RUA-SP334C5S(M)	RUA-SP424C7S(M)	RUA-SP244CN5S(M)	RUA-SP334CN5S(M)	RUA-SP424CN7S(M)	
Cooling capacity (Note 1) (kW)	85.0	118	150	85.0	118	150	
Unit color	Silky shade (Munsell 1Y8.5/0.5)						
Dimensions (Note 2)	Height (mm)	2,300					
Electrical data (Note 1)	Width (mm)	1,080					
Cooling	Depth (mm)	3,400					
Shipping weight (kg)	1,273	1,273	1,308	1,283	1,283	1,318	
Operating weight (kg)	1,301	1,301	1,343	1,313	1,313	1,355	
Power supply (Note 3)	3-phase 3-wire 400V 50/60Hz			3-phase 3-wire 400V 50/60Hz			
Reference current for power supply design (Note 4) (A)	50.5	72.2	81.8	50.5	72.2	81.8	
Nominal current (A)	30.4(31.2)	46.7(48.3)	67.4(69.3)	19.5(19.9)	30.6(31.6)	44.5(46.1)	
Nominal input (kW)	20.8(21.3)	32.1(33.0)	46.3(47.6)	13.3(13.7)	20.9(21.6)	30.5(31.6)	
EER	4.09(3.99)	3.68(3.58)	3.24(3.15)	6.39(6.20)	5.65(5.46)	4.92(4.75)	
Power factor (%)	99						
IPLV (With a 5°C difference) (Note 5)	7.1	7.1	6.8	7.1	7.1	6.8	
Compressor	Type	Hermetic rotary					
Model name	RA792A4F-10UC2						
Motor output×number of units (kW)	5.5 x 4	7.5 x 4	9.25 x 4	5.5 x 4	7.5 x 4	9.25 x 4	
Fan	Type of start	Inverter starter					
Crankcase heater (W)	37 x 4						
Compressor oil	Type	RB74A					
Charge (L)	2.0 x 4						
Condenser coil - air side	Plate fin coil						
Type	Propeller fan						
Air quantity (m³/min)	1,050 (maximum)						
Fan	Type of start	Inverter starter					
Motor output x number of units (kW)	1.0 x 4						
Water spray system (Note 6)	Water spray volume (L/min)	- 13.6 x 1					
Supply water pressure (Note 7) (MPa)	- 0.2						
Control system	Continuous water spraying when outside temperature exceeds setting and compressor capacity exceeds setting						
Pump (Note 4)	Motor output (kW)	1.5					
	Type	Line pump					
	Flow control	Inverter					
	Maximum current (Note 7) (A)	3.1	3.1	2.8	3.1	3.1	2.8
	Maximum input (Note 7) (kW)	2.0	2.0	1.8	2.0	2.0	1.8
Cooler - water side (Note 8)	Brazed plate heat exchanger (SUS316 equivalent)						
Refrigerant	Type	R410A					
	R410A charge (kg)	8.2 x 4					
	Control	Electric expansion valve					
	Capacity control steps (Note 9) (%)	0, 9 ~ 100	0, 6 ~ 100	0, 5 ~ 100	0, 9 ~ 100	0, 6 ~ 100	0, 5 ~ 100
	Operation control	Microprocessor control based on leaving water temperature and temperature difference					
	Defrost system	Distributed reverse cycle system					
	Protective device	High-pressure switch, Over current protection, Inverter overload protection (compressor, fan, pump), Crankcase heater, Open-phase protection, Microprocessor control (compressor time guards, freeze protection, low flow rate, discharge gas overheat protection, low pressure cutout, thermistor error, high water pressure error)					
Piping parameters (Note 10)	Cold/Hot water inlet (A)	50 flange x 1 (JIS10K)	65 flange x 1 (JIS10K)	50 flange x 1 (JIS10K)	65 flange x 1 (JIS10K)		
	Cold/Hot water outlet (A)	50 flange x 1 (JIS10K)	65 flange x 1 (JIS10K)	50 flange x 1 (JIS10K)	65 flange x 1 (JIS10K)		
	Coil drain (A)	PT40 MPT x 1					
Sound level (dBA) (Note 11)	Control box side (dBA)	59.3	61.9	64.2	61.6	67.1	68.3
	Coil side (dBA)	65.5	68.8	72.0	65.4	69.7	72.9
	Water piping side (dBA)	61.4	64.5	67.7	63.1	65.4	68.1

(Note 1) Rated conditions, such as capacity, electrical data, and standard flow rate are as follows.

Cooling : 14°C entering water (EWT), 7°C leaving water (LWT), 35°CDB outdoor air (OAT)

Numbers in brackets indicate values for the capacity listed above under the conditions indicated below.

Cooling : 12°C entering water (EWT), 7°C leaving water (LWT), 35°CDB/24°CWD outdoor air (OAT)

Capacity, power consumption, and EER tolerance values based on AHR1550-590 "Water Chilling Unit".

Note that the electrical data do not include internal pump. Refer to the values indicated for "Pump".

Performance values do not include pump power consumption.

(Note 2) Dimensions do not include projections of water pipe connections and power cable kit. (when installing optional parts)

(Note 3) Even when there is a fluctuation in supply voltage, do not exceed ±10% and keep imbalances between the supply voltages within 2%.

(Note 4) Output of the integrated pump can change depending on the outlet pump head required to comply with the indent. The power supply design at that time differs from those of a standard pump.

Refer to the power supply design items. In addition, refer to pump performance features for operating conditions. (pushing pressure range, etc.)

(Note 5) The indicated value for IPLV (Integrated Part Load Value, cooling) is based on the AHR1550-590 "Water Chilling Unit".

(Note 6) The supply water quality may cause scales and other matter to adhere to the coil surface. If necessary, install a water softener on the supply water side. (Provided locally)

(Note 7) The figure is at an operating condition with maximum water flow rate and maximum pump inverter frequency. (60Hz)

(Note 8) Working pressure : below 0.7 MPa.

(Note 9) Range of capacity control sometimes can vary depending on the unit's operating condition.

(Note 10) The on-site sound level will be higher due to the affection of back noise and sound reflection.

30HP model 40HP model 50HP model Heat pump

	Standard type			High-EER type			
	400V						
	30HP	40HP	50HP	30HP	40HP	50HP	
Model (A single module unit)	RUA-SP244H5S(M)	RUA-SP334H5S(M)	RUA-SP424H7S(M)	RUA-SP244HN5S(M)	RUA-SP334HN5S(M)	RUA-SP424HN7S(M)	
Cooling capacity (Note 1)(kW)	85.0	118	150	85.0	118	150	
Unit color	Silky shade (Munsell 1Y8.5/0.5)						
Dimensions (Note 2)	Height (mm)	2,300					
Electrical data (Note 1)	Width (mm)	1,080					
Cooling	Depth (mm)	3,400					
Shipping weight (kg)	1,303	1,303	1,338	1,313	1,313	1,348	
Operating weight (kg)	1,331	1,331	1,373	1,343	1,343	1,385	
Power supply (Note 3)	3-phase 3-wire 400V 50/60Hz						
Reference current for power supply design (Note 4) (A)	50.5	72.2	81.8	50.5	72.2	81.8	
Nominal current (A)	30.4(31.2)	46.7(48.3)	67.4(69.3)	19.5(19.9)	30.6(31.6)	44.5(46.1)	
Nominal input (kW)	20.8(21.3)	32.1(33.0)	46.3(47.6)	13.3(13.7)	20.9(21.6)	30.5(31.6)	
EER	4.09(3.99)	3.68(3.58)	3.24(3.15)	6.39(6.20)	5.65(5.46)	4.92(4.75)	
Power factor (%)	99						
IPLV (With a 5°C difference) (Note 5)	7.1	7.1	6.8	7.1	7.1	6.8	
Compressor	Type	Hermetic rotary					
Model name	RA792A4F-10UC2						
Motor output×number of units (kW)	5.5 x 4	7.5 x 4	9.25 x 4	5.5 x 4	7.5 x 4	9.25 x 4	
Fan	Type of start	Inverter starter					

Specifications Pumpless

30HP model 40HP model 50HP model Cooling-only

		Standard type			High-EER type			
		400V						
		30HP	40HP	50HP	30HP	40HP	50HP	
Model (A single module unit)		RUA-SP244CL5S(M)	RUA-SP334CL5S(M)	RUA-SP424CL7S(M)	RUA-SP244CLN5S(M)	RUA-SP334CLN5S(M)	RUA-SP424CLN7S(M)	
Cooling capacity (Note 1)(kW)		85.0	118	150	85.0	118	150	
Unit color		Silky shade (Munsell 1Y8.5/0.5)						
Dimensions (Note 2)	Height (mm)	2,300						
Width (mm)		1,080						
Depth (mm)		3,400						
Shipping weight (kg)		1,232	1,232	1,254	1,242	1,242	1,264	
Operating weight (kg)		1,260	1,260	1,289	1,272	1,272	1,301	
Power supply (Note 3)		3-phase 3-wire 400V 50/60Hz			3-phase 3-wire 400V 50/60Hz			
Reference current for power supply design (A)		47.0	68.7	78.8	47.0	68.7	78.8	
Electrical data (Note 1)	Nominal current (A)	30.4(31.2)	46.7(48.3)	67.4(69.3)	19.5(19.9)	30.6(31.6)	44.5(46.1)	
Cooling	Nominal input (kW)	20.8(21.3)	32.1(33.0)	46.3(47.6)	13.3(13.7)	20.9(21.6)	30.5(31.6)	
	EER	4.09(3.99)	3.68(3.58)	3.24(3.15)	6.39(6.20)	5.65(5.46)	4.92(4.75)	
	Power factor (%)	99						
IPLV (With a 5°C difference) (Note 4)		7.1	7.1	6.8	7.1	7.1	6.8	
Compressor	Type	Hermetic rotary						
	Model name	RA792A4F-10UC2						
	Motor output x number of units (kW)	5.5 x 4	7.5 x 4	9.25 x 4	5.5 x 4	7.5 x 4	9.25 x 4	
	Type of start	Inverter starter						
	Crankcase heater (W)	37 x 4						
Compressor oil	Type	RB74A						
Charge	(L)	2.0 x 4						
Condenser coil - air side		Plate fin coil						
Fan	Type	Propeller fan						
Air quantity (m³/min)		1,050 (maximum)						
Type of start		Inverter starter						
Motor output x number of units (kW)		1.0 x 4						
Water spray system (Note 5)	Water spray volume (L/min)	-	13.6 x 1					
	Supply water pressure (Note 6)(MPa)	-	0.2					
	Control system	-	Continuous water spraying when outside temperature exceeds setting and compressor capacity exceeds setting					
Cooler - water side (Note 7)		Brazed plate heat exchanger (SUS316 equivalent)						
Refrigerant	Type	R410A						
R410A charge (kg)		8.2 x 4						
Control		Electric expansion valve						
Capacity control steps (Note 8) (%)	0, 9 ~ 100	0, 6 ~ 100	0, 5 ~ 100	0, 9 ~ 100	0, 6 ~ 100	0, 5 ~ 100		
Operation control		Microprocessor control based on leaving water temperature and temperature difference						
Defrost system		Distributed reverse cycle system						
Protective device		High-pressure switch, Over current protection, Inverter overload protection (compressor, fan, pump), Crankcase heater, Open-phase protection, Microprocessor control (compressor time guards, freeze protection, low flow rate, discharge gas overheat protection, low pressure cutout, thermistor error, high water pressure error)						
Piping diameters (Note 9)	Cold/Hot water inlet (A)	50 flange x 1 (JIS10K)	65 flange x 1 (JIS10K)	50 flange x 1 (JIS10K)	65 flange x 1 (JIS10K)			
	Cold/Hot water outlet (A)	50 flange x 1 (JIS10K)	65 flange x 1 (JIS10K)	50 flange x 1 (JIS10K)	65 flange x 1 (JIS10K)			
	Coil drain (A)	PT40 MPT x 1						
Sound level (Note 9)	Control box side (dBA)	59.3	61.9	64.2	61.6	67.1	68.3	
	Coil side (dBA)	65.5	68.8	72.0	65.4	69.7	72.9	
	Water piping side (dBA)	61.4	64.5	67.7	63.1	65.4	68.1	

(Note 1) Rated conditions, such as capacity, electrical data, and standard flow rate are as follows.

Cooling : 14°C entering water (EWT), 7°C leaving water (LWT), 35°CDB outdoor air (OAT)

Numbers in brackets indicate values for the capacity listed above under the conditions indicated below.

Cooling : 12°C entering water (EWT), 7°C leaving water (LWT), 35°CDB/24°CWD outdoor air (OAT)

Capacity, power consumption, and EER tolerance values based on ARI1550-590 "Water Chilling Unit".

Note that the electrical data do not include internal pump. Refer to the values indicated for "Pump".

(Note 2) Dimensions do not include projections of water pipe connections and power cable kit. (when installing optional parts)

(Note 3) Even when there is a fluctuation in supply voltage, do not exceed ±10% and keep imbalances between the supply voltages within 2%.

(Note 4) The indicated value for IPLV (Integrated Part Load Value, cooling) is based on the ARI1550-590 "Water Chilling Unit".

(Note 5) The supply water quality may cause scales and other matter to adhere to the coil surface. If necessary, install a water softener on the supply water side. (Provided locally)

(Note 6) Adjust the flow rate to become close to this supply water pressure with the manual flow adjustment valve on the water spray system inlet. If sufficient supply water pressure is not available, install a pressure pump. (Provided locally)

(Note 7) Working pressure : below 0.98 MPa

(Note 8) Range of capacity control sometimes can vary depending on the unit's operating condition.

(Note 9) The on-site sound level will be higher due to the affection of back noise and sound reflection.

30HP model 40HP model 50HP model Heat pump

		Standard type			High-EER type		
		400V					
		30HP	40HP	50HP	30HP	40HP	50HP
Model (A single module unit)		RUA-SP244HL5S(M)	RUA-SP334HL5S(M)	RUA-SP424HL7S(M)	RUA-SP244HLN5S(M)	RUA-SP334HLN5S(M)	RUA-SP424HLN7S(M)
Cooling capacity (Note 1)(kW)		85.0	118	150	85.0	118	150
Unit color		Silky shade (Munsell 1Y8.5/0.5)					
Dimensions (Note 2)	Height (mm)	2,300					
Width (mm)		1,080					
Depth (mm)		3,400					
Shipping weight (kg)		1,262	1,262	1,284	1,272	1,272	1,293
Operating weight (kg)		1,290	1,290	1,319	1,302	1,302	1,331
Power supply (Note 3)		3-phase 3-wire 400V 50/60Hz					
Reference current for power supply design (A)		47.0	68.7	78.8	47.0	68.7	78.8
Electrical data (Note 1)	Nominal current (A)	30.4(31.2)	46.7(48.3)	67.4(69.3)	19.5(19.9)	30.6(31.6)	44.5(46.1)
Cooling	Nominal input (kW)	20.8(21.3)	32.1(33.0)	46.3(47.6)	13.3(13.7)	20.9(21.6)	30.5(31.6)
	EER	4.09(3.99)	3.68(3.58)	3.24(3.15)	6.39(6.20)	5.65(5.46)	4.92(4.75)
	Power factor (%)	99					
IPLV (With a 5°C difference) (Note 4)		7.1	7.1	6.8	7.1	7.1	6.8
Compressor	Type	Hermetic rotary					
	Model name	RA792A4F-10UC2					
	Motor output x number of units (kW)	5.5 x 4	7.5 x 4	9.25 x 4	5.5 x 4	7.5 x 4	9.25 x 4
	Type of start	Inverter starter					
	Crankcase heater (W)	37 x 4					
Compressor oil	Type	RB74A					
Charge	(L)	2.0 x 4					
Condenser coil - air side		Plate fin coil					

Perspective on Set Specifications (Calculation Method)

Ex.) Internal inverter pump Air-cooled heat pump [High-EER type] 16 combined module units

	Ex.) 30 HP x 1 (single unit)	Ex.) 30 HP x 16 units	Calculation method
Model	RUA-SP244HN5SM	RUA-SP244HN5SM + RUA-SP244HN5 x 15 units	—
Cooling capacity (Note 1) (kW)	85.0	1,360	See General Charts or (single unit value) x (number of module units in set)
Heating capacity (Note 1) (kW)	85.0	1,360	—
Unit color	Silky shade (Munsell 1Y8.5/0.5)		—
Dimensions (Note 2)	Height (mm)	2,300	2,300
	Width (mm)	1,080	18,030
	Depth (mm)	3,400	3,400
Shipping weight (kg)	1,271	20,336	(Single unit value) x (number of module units in set)
Operating weight (kg)	1,301	20,816	(Single unit value) x (number of module units in set)
Power supply (Note 3)	3-phase 3-wire 380V 50/60Hz		—
Reference current for power supply design (Note 4)	101	101 x 16	(Single unit value) x (number of module units in set)
Cooling (Note 1)	Nominal current (A)	20.6 (20.9)	624 (637)
	Nominal input (kW)	13.3 (13.7)	213 (219)
	EER	6.39 (6.20)	6.39 (6.20)
	Power factor (%)	99	99
Heating	Nominal current (A)	33.4 (33.5)	1,013 (1,019)
	Nominal input (kW)	21.6 (21.8)	346 (349)
	COP	3.94 (3.90)	3.94 (3.90)
	Power factor (%)	99	99
IPLV (With a 5°C difference) (Note 5)		13.6	—
Compressor	Type	Hermetic rotary	—
	Model name	RA792A4F-10UC2	—
	Motor output x number of units (kW)	5.5 x 4	5.5 x 64
	Type of start	Inverter starter	—
	Crankcase heater (W)	37 x 4	37 x 64
Compressor oil	Type	RB74AF	—
	Charge (L)	2.0 x 4	2.0 x 64
Condenser coil - air side	Type	Plate fin coil	—
Fan	Air quantity (m³/min)	1,050 (maximum)	16,800 (maximum)
	Type of start	Propeller fan	—
	Motor output x number of units (kW)	1.0 x 4	1.0 x 64
Water spray system (Note 6)	Water spray volume (L/min)	13.6 x 4	13.6 x 64
	Supply water pressure (Note 7) (MPa)	0.2	0.2
Pump (Note 4)	Control system	Continuous water spraying when outside temperature exceeds setting and compressor capacity exceeds set	—
	Motor output (kW)	1.5	1.5 x 16
	Type	Line pump	—
	Flow control	Inverter	—
	Maximum current (Note 8) (A)	6.1	6.1 x 16
	Maximum input (Note 8) (kW)	2.0	2.0 x 16
Cooler - water side (Note 9)	Type	Brazed plate heat exchanger (SUS316 equivalent)	—
	R410A charge (kg)	8.6 x 4	8.6 x 64
Refrigerant	Control	Electric expansion valve	—
	Capacity control steps (Note 10) (%)	0, 9~100	—
Operation control	Microprocessor control based on leaving water temperature and temperature difference		—
Defrost system	Distributed reverse cycle system		—
Protective device	High-pressure switch, Over current protection, Inverter overload protection (compressor, fan, pump), Crankcase heater, Open-phase protection, Microprocessor control (compressor time guards, freeze protection, high water temp. cutout, low flow rate, discharge gas overheat protection, low pressure cutout, thermistor error, high water pressure error)		—
Piping diameter (Note 11)	Cold/Hot water inlet (A)	50 flange (JIS10K)	50 flange (JIS10K) x 16
	Cold/Hot water outlet (A)	50 flange (JIS10K)	50 flange (JIS10K) x 16
	Coil drain (A)	PT40 MPT	PT40 MPT x 16
Sound level (Note 11)	Control box side (dB(A))	59.3	67.4
	Coil side (dB(A))	65.5	68.4
	Water piping side (dB(A))	61.4	69.5

- (Note 1) Rated conditions, such as capacity, electrical data, and standard flow rate are as follows.
 Cooling : 14°C entering water (EWT), 7°C leaving water (LWT), 35°CDB outdoor air (OAT)
 Numbers in brackets indicate values for the capacity listed above under the conditions indicated below.
 Cooling : 12°C entering water (EWT), 7°C leaving water (LWT), 35°CDB/24°CWD outdoor air (OAT)
 Capacity, power consumption, and EER tolerance values based on AHR1550-590 "Water Chilling Unit."
 Note that the electrical data do not include internal pump. Refer to the values indicated for "Pump".
- (Note 2) Dimensions do not include projections of water pipe connections and power cable kit. (when installing optional parts)
- (Note 3) Even when there is a fluctuation in supply voltage, do not exceed ±10% and keep imbalances between the supply voltages within 2%.
- (Note 4) Output of the integrated pump can change depending on the outlet pump head required to comply with the indent. The power supply design at that time differs from those of a standard pump. Refer to the power supply design items. In addition, refer to pump performance features for operating conditions. (pushing pressure range, etc.)
- (Note 5) The indicated value for IPLV (Integrated Part Load Value, cooling) is based on the AHR1550-590 "Water Chilling Unit".
- (Note 6) The supply water quality may cause scales and other matter to adhere to the coil surface. If necessary, install a water softener on the supply water side. (Provided locally)
- (Note 7) Adjust the flow rate to become close to this supply water pressure with the manual flow adjustment valve on the water spray system inlet. If sufficient supply water pressure is not available, install a pressure pump. (Provided locally)
- (Note 8) The figure is at an operating condition with maximum water flow rate and maximum pump inverter frequency. (60Hz)
- (Note 9) Working pressure : below 0.7 MPa.
- (Note 10) Range of capacity control sometimes can vary depending on the unit's operating condition.
- (Note 11) The on-site sound level will be higher due to the affection of back noise and sound reflection.

General Charts for Combined Module units : Capacity, Outside Dimensions, and Sound Levels

30HP model

(Note 1)	Cooling capacity (kW)	Heating capacity (kW)	Dimensions (mm) HxWxD (Note 3)	Sound level (dBA) (Note 4)		
				Control box side	Coil side	Water pipe side
RUA-SP244(C)(L)(N) #	85	85	2,300 x 1,080 x 3,400	59.3	65.5	61.4
RUA-SP244(C)(L)(N) # x 2 units	170	170	2,300 x 2,210 x 3,400	62.1	66.9	64.3
RUA-SP244(C)(L)(N) # x 3 units	255	255	2,300 x 3,340 x 3,400	63.7	67.4	65.8
RUA-SP244(C)(L)(N) # x 4 units	340	340	2,300 x 4,470 x 3,400	64.6	67.7	66.7
RUA-SP244(C)(L)(N) # x 5 units	425	425	2,300 x 5,600 x 3,400	65.3	67.9	67.4
RUA-SP244(C)(L)(N) # x 6 units	510	510	2,300 x 6,730 x 3,400	65.8	68.0	67.9
RUA-SP244(C)(L)(N) # x 7 units	595	595	2,300 x 7,860 x 3,400	66.1	68.1	68.2
RUA-SP244(C)(L)(N) # x 8 units	680	680	2,300 x 8,990 x 3,400	66.4	68.2	68.5
RUA-SP244(C)(L)(N) # x 9 units	765	765	2,300 x 10,120 x 3,400	66.6	68.2	68.7
RUA-SP244(C)(L)(N) # x 10 units	850	850	2,300 x 11,250 x 3,400	66.8	68.3	68.9
RUA-SP244(C)(L)(N) # x 11 units	935	935	2,300 x 12,380 x 3,400	67.0	68.3	69.1
RUA-SP244(C)(L)(N) # x 12 units	1,020	1,020	2,300 x 13,510 x 3,400	67.1	68.3	69.2
RUA-SP244(C)(L)(N) # x 13 units	1,105	1,105	2,300 x 14,640 x 3,400	67.2	68.4	69.3
RUA-SP244(C)(L)(N) # x 14 units	1,190	1,190	2,300 x 15,770 x 3,400	67.3	68.4	69.4
RUA-SP244(C)(L)(N) # x 15 units	1,275	1,275	2,300 x 16,900 x 3,400	67.4	68.4	69.5
RUA-SP244(C)(L)(N) # x 16 units	1,360	1,360	2,300 x 18,030 x 3,400	67.4	68.4	69.5

40HP model

(Note 1)	Cooling capacity (kW)	Heating capacity (kW)	Dimensions (mm) HxWxD (Note 3)	Sound level (dBA) (Note 4)		
				Control box side	Coil side	Water pipe side
RUA-SP334(C)(L)(N) #	118	118	2,300 x 1,080 x 3,400	61.9	68.8	64.5
RUA-SP334(C)(L)(N) # x 2 units	236	236	2,300 x 2,210 x 3,400	64.8	70.1	67.4
RUA-SP334(C)(L)(N) # x 3 units	354	354	2,300 x 3,340 x 3,400	66.3	70.6	68.9
RUA-SP334(C)(L)(N) # x 4 units	472	472	2,300 x 4,470 x 3,400	67.2	70.9	69.9
RUA-SP334(C)(L)(N) # x 5 units	590	590	2,300 x 5,600 x 3,400	67.9	71.1	70.5
RUA-SP334(C)(L)(N) # x 6 units	708	708	2,300 x 6,730 x 3,400	68.4	71.2	71.0
RUA-SP334(C)(L)(N) # x 7 units	826	826	2,300 x 7,860 x 3,400	68.7	71.3	71.4
RUA-SP334(C)(L)(N) # x 8 units	944	944	2,300 x 8,990 x 3,400	69.0	71.4	71.7
RUA-SP334(C)(L)(N) # x 9 units	1,062	1,062	2,300 x 10,120 x 3,400	69.2	71.4	71.9
RUA-SP334(C)(L)(N) # x 10 units	1,180	1,180	2,300 x 11,250 x 3,400	69.4	71.5	72.0
RUA-SP334(C)(L)(N) # x 11 units	1,298	1,298	2,300 x 12,380 x 3,400	69.6	71.5	72.2
RUA-SP334(C)(L)(N) # x 12 units	1,416	1,416	2,300 x 13,510 x 3,400	69.7	71.5	72.3
RUA-SP334(C)(L)(N) # x 13 units	1,534	1,534	2,300 x 14,640 x 3,400	69.8	71.6	72.4
RUA-SP334(C)(L)(N) # x 14 units	1,652	1,652	2,300 x 15,770 x 3,400	69.9	71.6	72.5
RUA-SP334(C)(L)(N) # x 15 units	1,770	1,770	2,300 x 16,900 x 3,400	70.0	71.6	72.6
RUA-SP334(C)(L)(N) # x 16 units	1,888	1,888	2,300 x 18,030 x 3,400	70.0	71.6	72.7

50HP model

(Note 1)	Cooling capacity (kW)	Heating capacity (kW)	Dimensions (mm) HxWxD (Note 3)	Sound level (dBA) (Note 4)		
Control box side	Coil side	Water pipe side				

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General Charts for Combined Module units : Standard Water Flow Rate / Water Volume Range
Leaving (LVG)/Entering (ETG) water temperature difference = 7°C

30HPmodel

(Note 1)	Standard flow rate (L/min)	Flow rate range (L/min)	Minimum water loop volume (Note 4·5·6)	In-unit water volume (L)
RUA-SP244(C)(N) #	174	75 ~ 244		28
RUA-SP244(C)(N) # x 2 units	348	75 ~ 487		56
RUA-SP244(C)(N) # x 3 units	522	75 ~ 731		84
RUA-SP244(C)(N) # x 4 units	696	75 ~ 975		112
RUA-SP244(C)(N) # x 5 units	870	75 ~ 1,218		140
RUA-SP244(C)(N) # x 6 units	1,044	75 ~ 1,462		168
RUA-SP244(C)(N) # x 7 units	1,218	75 ~ 1,706		196
RUA-SP244(C)(N) # x 8 units	1,392	75 ~ 1,949		224
RUA-SP244(C)(N) # x 9 units	1,566	75 ~ 2,193		252
RUA-SP244(C)(N) # x 10 units	1,740	75 ~ 2,437		280
RUA-SP244(C)(N) # x 11 units	1,915	75 ~ 2,680		308
RUA-SP244(C)(N) # x 12 units	2,089	75 ~ 2,924		336
RUA-SP244(C)(N) # x 13 units	2,263	75 ~ 3,168		364
RUA-SP244(C)(N) # x 14 units	2,437	75 ~ 3,411		392
RUA-SP244(C)(N) # x 15 units	2,611	75 ~ 3,655		420
RUA-SP244(C)(N) # x 16 units	2,785	75 ~ 3,899		448

Internal inverter pump

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40HPmodel

(Note 1)	Standard flow rate (L/min)	Flow rate range (L/min)	Minimum water loop volume (Note 4·5·6)	In-unit water volume (L)
RUA-SP334(C)(N) #	242	75 ~ 338		28
RUA-SP334(C)(N) # x 2 units	483	75 ~ 677		56
RUA-SP334(C)(N) # x 3 units	725	75 ~ 1,015		84
RUA-SP334(C)(N) # x 4 units	966	75 ~ 1,353		112
RUA-SP334(C)(N) # x 5 units	1,208	75 ~ 1,692		140
RUA-SP334(C)(N) # x 6 units	1,450	75 ~ 2,030		168
RUA-SP334(C)(N) # x 7 units	1,691	75 ~ 2,368		196
RUA-SP334(C)(N) # x 8 units	1,933	75 ~ 2,706		224
RUA-SP334(C)(N) # x 9 units	2,175	75 ~ 3,045		252
RUA-SP334(C)(N) # x 10 units	2,416	75 ~ 3,383		280
RUA-SP334(C)(N) # x 11 units	2,658	75 ~ 3,721		308
RUA-SP334(C)(N) # x 12 units	2,899	75 ~ 4,060		336
RUA-SP334(C)(N) # x 13 units	3,141	75 ~ 4,398		364
RUA-SP334(C)(N) # x 14 units	3,383	75 ~ 4,736		392
RUA-SP334(C)(N) # x 15 units	3,624	75 ~ 5,075		420
RUA-SP334(C)(N) # x 16 units	3,866	75 ~ 5,413		448

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30HPmodel

(Note 1)	Standard flow rate • Water pressure loss (Note 2)		Flow rate range (L/min)	Minimum water loop volume (Note 3·4·5)	In-unit water volume (L)
	(L/min)	(kPa)			
RUA-SP244(C)(L)(N) #	174		121 ~ 244	406	28
RUA-SP244(C)(L)(N) # x 2 units	348		244 ~ 487	812	56
RUA-SP244(C)(L)(N) # x 3 units	522		366 ~ 731	1,218	84
RUA-SP244(C)(L)(N) # x 4 units	696		487 ~ 975	1,624	112
RUA-SP244(C)(L)(N) # x 5 units	870		609 ~ 1,218	2,030	140
RUA-SP244(C)(L)(N) # x 6 units	1,044		731 ~ 1,462	2,436	168
RUA-SP244(C)(L)(N) # x 7 units	1,218		853 ~ 1,706	2,842	196
RUA-SP244(C)(L)(N) # x 8 units	1,392		975 ~ 1,949	3,248	224
RUA-SP244(C)(L)(N) # x 9 units	1,566		1,096 ~ 2,193	3,654	252
RUA-SP244(C)(L)(N) # x 10 units	1,740		1,218 ~ 2,437	4,060	280
RUA-SP244(C)(L)(N) # x 11 units	1,915		1,340 ~ 2,680	4,466	308
RUA-SP244(C)(L)(N) # x 12 units	2,089		1,462 ~ 2,924	4,872	336
RUA-SP244(C)(L)(N) # x 13 units	2,263		1,584 ~ 3,168	5,278	364
RUA-SP244(C)(L)(N) # x 14 units	2,437		1,706 ~ 3,411	5,684	392
RUA-SP244(C)(L)(N) # x 15 units	2,611		1,827 ~ 3,655	6,090	420
RUA-SP244(C)(L)(N) # x 16 units	2,785		1,949 ~ 3,899	6,496	448

Pumpless

31.5

50HPmodel

(Note 1)	Standard flow rate (L/min)	Flow rate range (L/min)	Minimum water loop volume (Note 4·5·6)	In-unit water volume (L)
RUA-SP424(C)(N) #	307	75 ~ 430		35
RUA-SP424(C)(N) # x 2 units	614	75 ~ 860		860
RUA-SP424(C)(N) # x 3 units	921	75 ~ 1,290		105
RUA-SP424(C)(N) # x 4 units	1,229	75 ~ 1,720		140
RUA-SP424(C)(N) # x 5 units	1,536	75 ~ 2,150		175
RUA-SP424(C)(N) # x 6 units	1,843	75 ~ 2,580		210
RUA-SP424(C)(N) # x 7 units	2,150	75 ~ 3,010		245
RUA-SP424(C)(N) # x 8 units	2,457	75 ~ 3,440		280
RUA-SP424(C)(N) # x 9 units	2,764	75 ~ 3,870		315
RUA-SP424(C)(N) # x 10 units	3,071	75 ~ 4,300		350
RUA-SP424(C)(N) # x 11 units	3,379	75 ~ 4,730		385
RUA-SP424(C)(N) # x 12 units	3,686	75 ~ 5,160		420
RUA-SP424(C)(N) # x 13 units	3,993	75 ~ 5,590		455
RUA-SP424(C)(N) # x 14 units	4,300	75 ~ 6,020		490
RUA-SP424(C)(N) # x 15 units	4,607	75 ~ 6,450		525
RUA-SP424(C)(N) # x 16 units	4,914	75 ~ 6,880		560

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50HPmodel

(Note 1)	Standard flow rate • Water pressure loss (Note 2)		Flow rate range (L/min)	Minimum water loop volume (Note 3·4·5)	In-unit water volume (L)
	(L/min)	(kPa)			
RUA-SP424(C)(L)(N) #	307		215 ~ 430	717	35
RUA-SP424(C)(L)(N) # x 2 units	614		430 ~ 860	1,434	70
RUA-SP424(C)(L)(N) # x 3 units	921		645 ~ 1,290	2,151	105
RUA-SP424(C)(L)(N) # x 4 units	1,229		860 ~ 1,720	2,868	140
RUA-SP424(C)(L)(N) # x 5 units	1,536		1,075 ~ 2,150	3,585	175
RUA-SP424(C)(L)(N) # x 6 units	1,843		1,290 ~ 2,580	4,302	210
RUA-SP424(C)(L)(N) # x 7 units	2,150		1,505 ~ 3,010	5,019	245
RUA-SP424(C)(L)(N) # x 8 units	2,457		1,720 ~ 3,440	5,736	280
RUA-SP424(C)(L)(N) # x 9 units	2,764		1,935 ~ 3,870	6,453	315
RUA-SP424(C)(L)(N) # x 10 units	3,071		2,150 ~ 4,300	7,170	350
RUA-SP424(C)(L)(N) # x 11 units	3,379		2,365 ~ 4,730	7,887	385
RUA-SP424(C)(L)(N) # x 12 units	3,686		2,580 ~ 5,160	8,604	420
RUA-SP424(C)(L)(N) # x 13 units	3,993		2,795 ~ 5,590	9,321	455
RUA-SP424(C)(L)(N) # x 14 units	4,300		3,010 ~ 6,020	10,038	490
RUA-SP424(C)(L)(N) # x 15 units	4,607		3,225 ~ 6,450	10,755	525
RUA-SP424(C)(L)(N) # x 16 units	4,9				

Capacity Chart / Standard Type (LVG/ENG water temperature difference = 7°C)

30HP model

List of cooling capacities RUA-SP244(C/H)(L)

LVG cold-water temperature (°C)	Item	Outdoor air temperature (°C) (DB)								
		15	20	25	30	35	40	43	46	
4	Cooling capacity (kW)	93.6	89.8	85.7	81.3	76.6	71.8	68.9	65.9	
	Nominal input (kW)	12.4	14.4	16.5	18.5	20.5	22.5	23.7	25.0	
	Water flow rate (L/min)	192	184	176	167	157	147	141	135	
	Nominal current (A)	18.2	21.1	24.0	27.2	30.1	33.1	34.8	18.3	
7	Cooling capacity (kW)	104	99.5	95.1	90.2	85.0	79.7	76.4	73.2	
	Nominal input (kW)	12.1	14.3	16.5	18.7	20.8	22.9	24.2	36.5	
	Water flow rate (L/min)	213	204	195	185	174	163	156	150	
	Nominal current (A)	17.9	20.8	24.3	27.2	30.5	33.6	35.4	37.1	
9	Cooling capacity (kW)	111	106	102	96.4	90.8	85.0	81.5	78.1	
	Nominal input (kW)	12.0	14.3	16.5	18.7	21.0	23.2	24.5	25.9	
	Water flow rate (L/min)	227	217	209	197	186	174	167	160	
	Nominal current (A)	17.3	20.8	24.3	27.2	30.7	33.9	36.0	37.7	
12	Cooling capacity (kW)	122	117	112	106	99.6	93.2	89.3	85.4	
	Nominal input (kW)	11.6	14.1	16.4	18.8	21.1	23.5	24.9	26.3	
	Water flow rate (L/min)	*244	240	229	217	204	191	183	175	
	Nominal current (A)	17.0	20.5	24.0	27.5	31.0	34.5	36.3	38.6	
15	Cooling capacity (kW)	131	126	120	114	107	99.8	95.6	91.4	
	Nominal input (kW)	11.3	13.9	16.4	18.8	21.2	23.6	25.1	26.6	
	Water flow rate (L/min)	*244	*244	*244	233	219	204	196	187	
	Nominal current (A)	16.7	20.2	24.0	27.5	31.0	34.5	36.8	38.8	
20	Cooling capacity (kW)	136	131	125	118	111	103	98.8	94.3	
	Nominal input (kW)	11.1	13.7	16.3	18.8	21.3	23.7	25.2	26.7	
	Water flow rate (L/min)	*244	*244	*244	242	227	211	202	193	
	Nominal current (A)	16.4	20.2	23.7	27.5	31.0	34.8	36.8	38.8	
25	Cooling capacity (kW)	136	131	125	118	111	103	98.8	94.3	
	Nominal input (kW)	11.1	13.7	16.3	18.8	21.3	23.7	25.2	26.7	
	Water flow rate (L/min)	*244	*244	*244	242	227	211	202	193	
	Nominal current (A)	16.4	20.2	23.7	27.5	31.0	34.8	36.8	38.8	
30	Cooling capacity (kW)	136	131	125	118	111	103	98.8	94.3	
	Nominal input (kW)	11.1	13.7	16.3	18.8	21.3	23.7	25.2	26.7	
	Water flow rate (L/min)	*244	*244	*244	242	227	211	202	193	
	Nominal current (A)	16.4	20.2	23.7	27.5	31.0	34.8	36.8	38.8	

List of heating capacities RUA-SP244(H)(L)

LVG hot-water temperature (°C)	Item	Outdoor air temperature (°C) (DB)								
		-15	-10	-5	0	4	7	15		
25	Heating capacity (kW)	51.4	54.9	63.8	73.3	81.8	89.3	112		
	Nominal input (kW)	14.2	14.2	14.2	14.0	13.8	13.4	12.0		
	Water flow rate (L/min)	◇105	◇112	131	150	168	183	229		
	Nominal current (A)	20.8	20.8	20.8	20.5	20.2	19.6	17.6		
30	Heating capacity (kW)	49.2	54.1	62.2	71.9	80.8	88.4	112		
	Nominal input (kW)	15.1	15.4	15.6	15.7	15.6	15.4	14.4		
	Water flow rate (L/min)	◇101	◇111	127	147	165	181	229		
	Nominal current (A)	22.0	22.6	22.9	22.9	22.9	22.6	21.1		
35	Heating capacity (kW)	47.0	52.5	55.3	70.7	80.0	87.3	110		
	Nominal input (kW)	16.1	16.6	17.1	17.4	17.5	17.5	16.8		
	Water flow rate (L/min)	◇96.2	◇108	◇113	145	164	179	225		
	Nominal current (A)	23.7	24.3	25.2	25.5	25.5	25.5	24.6		
40	Heating capacity (kW)	45.2	51.0	55.2	69.9	78.7	86.3	109		
	Nominal input (kW)	17.1	17.8	18.6	19.1	19.4	19.5	19.2		
	Water flow rate (L/min)	◇92.6	◇104	◇113	143	161	177	223		
	Nominal current (A)	24.9	26.1	26.9	28.1	28.4	28.4	28.1		
45	Heating capacity (kW)	43.5	49.5	55.4	68.5	77.7	85.0	107		
	Nominal input (kW)	18.1	19.0	20.0	20.9	21.3	21.6	21.7		
	Water flow rate (L/min)	◇89.1	◇101	◇113	140	159	174	219		
	Nominal current (A)	26.6	27.8	29.3	30.4	31.3	31.7	31.6		
50	Heating capacity (kW)	48.1	55.1	67.5	76.6	83.5	105			
	Nominal input (kW)	20.3	21.6	22.6	23.2	23.6	24.2			
	Water flow rate (L/min)	◇98.5	◇113	138	157	171	215			
	Nominal current (A)	29.8	31.6	33.1	34.2	34.5	35.4			
55	Heating capacity (kW)			55.5	66.3	74.9	81.9	102		
	Nominal input (kW)			23.1	24.4	25.2	25.7	26.7		
	Water flow rate (L/min)			◇114	136	153	168	209		
	Nominal current (A)			33.9	35.4	36.8	37.4	38.9		

List of heating capacities RUA-SP334H(L)

LVG hot-water temperature (°C)	Item	Outdoor air temperature (°C) (DB)								
		-15	-10	-5	0	4	7	15		
25	Heating capacity (kW)	71.2	77.1	87.7	101	112	123	156		
	Nominal input (kW)	21.5	21.4	21.6	21.5	21.3	21.0	19.7		

Capacity Chart / High-EER Type (LVG/ENG water temperature difference = 7°C)

30HP model

List of cooling capacities RUA-SP244(C/H)(L)N

LVG cold-water temperature (°C)	Item	Outdoor air temperature (°C) (DB)							
		20	25	30	35	40	43	46	
	Water spray	ON	ON	ON	ON	ON	ON	ON	
4	Cooling capacity (kW)	84.3	81.4	78.8	76.7	75.0	74.3	73.8	
	Nominal input (kW)	9.0	10.6	12.1	13.3	14.4	14.9	15.4	
	Water flow rate (L/min)	173	167	161	157	154	152	152	
	Nominal current (A)	13.2	15.6	17.9	19.4	21.1	22.0	22.5	
	Cooling capacity (kW)	93.1	90.1	87.3	85.0	83.2	82.4	81.9	
7	Nominal input (kW)	8.7	10.5	12.0	13.3	14.4	15.0	15.4	
	Water flow rate (L/min)	191	185	179	174	170	169	168	
	Nominal current (A)	12.6	15.6	17.6	19.5	21.1	22.0	22.5	
	Cooling capacity (kW)	99.2	96.2	93.2	90.8	88.8	88.0	87.4	
9	Nominal input (kW)	8.5	10.3	11.9	13.2	14.4	15.0	15.4	
	Water flow rate (L/min)	203	197	191	186	182	180	178	
	Nominal current (A)	12.6	15.0	17.6	19.4	21.1	22.0	22.5	
	Cooling capacity (kW)	109	105	102	99.6	97.4	96.5	95.9	
12	Nominal input (kW)	8.1	10.0	11.7	13.1	14.3	14.9	15.4	
	Water flow rate (L/min)	223	215	209	204	199	198	197	
	Nominal current (A)	12.1	14.7	17.0	19.4	20.8	22.0	22.5	
	Cooling capacity (kW)	116	113	109	106	104	103	105	
15	Nominal input (kW)	7.8	9.8	11.5	13.0	14.2	14.8	15.2	
	Water flow rate (L/min)	238	231	223	217	213	211	215	
	Nominal current (A)	11.5	14.4	17.0	19.1	20.8	21.7	22.2	
	Cooling capacity (kW)	120	116	113	110	107	106	108	
20	Nominal input (kW)	7.6	9.7	11.5	12.9	14.2	14.8	15.2	
	Water flow rate (L/min)	*244	238	231	225	219	217	221	
	Nominal current (A)	11.2	14.4	16.7	18.8	20.8	21.4	22.2	
	Cooling capacity (kW)	120	116	113	110	107	106	108	
25	Nominal input (kW)	7.6	9.7	11.5	12.9	14.2	14.8	15.2	
	Water flow rate (L/min)	*244	238	231	225	219	217	221	
	Nominal current (A)	11.2	14.4	16.7	18.8	20.8	21.4	22.2	
	Cooling capacity (kW)	120	116	113	110	107	106	108	
30	Nominal input (kW)	7.6	9.7	11.5	12.9	14.1	14.8	15.2	
	Water flow rate (L/min)	*244	238	231	225	219	217	221	
	Nominal current (A)	11.2	14.4	16.7	18.8	20.8	21.4	22.2	
	Cooling capacity (kW)	120	116	113	110	107	106	108	

40HP model

List of cooling capacities RUA-SP334(C/H)(L)N

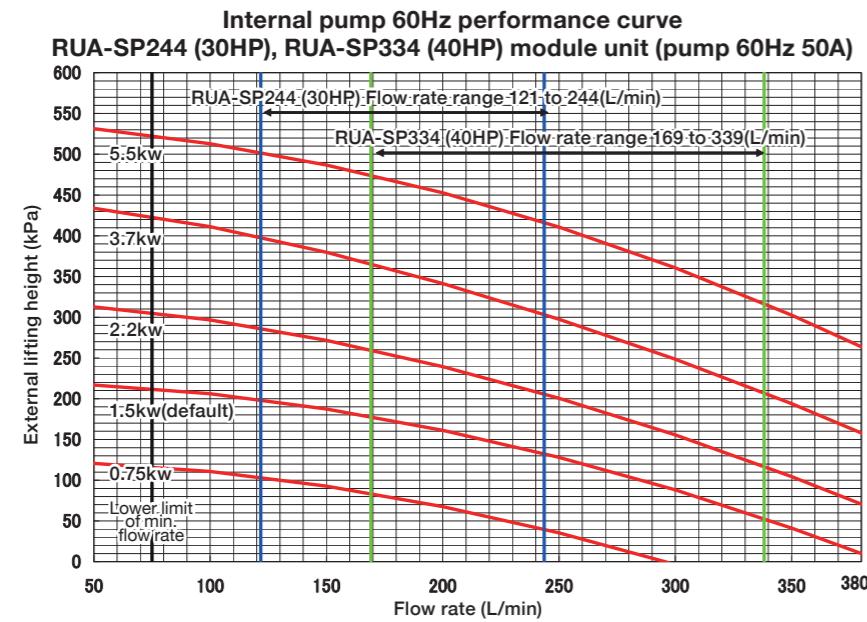
LVG cold-water temperature (°C)	Item	Outdoor air temperature (°C) (DB)							
		20	25	30	35	40	43	46	
	Water spray	ON	ON	ON	ON	ON	ON	ON	
4	Cooling capacity (kW)	117	113	110	107	104	103	105	
	Nominal input (kW)	14.8	17.0	19.0	20.7	22.4	23.2	24.0	
	Water flow rate (L/min)	240	231	225	219	213	211	211	
	Nominal current (A)	21.4	24.9	27.8	30.4	32.5	33.9	35.1	
	Cooling capacity (kW)	130	126	122	118	116	115	114	
7	Nominal input (kW)	14.7	17.0	19.1	20.9	22.7	23.6	24.4	
	Water flow rate (L/min)	266	258	250	242	238	236	233	
	Nominal current (A)	21.4	24.9	28.1	30.6	33.1	34.5	35.6	
	Cooling capacity (kW)	139	134	130	126	123	122	121	
9	Nominal input (kW)	14.6	17.0	19.2	21.1	22.8	23.7	24.6	
	Water flow rate (L/min)	285	274	266	258	252	250	248	
	Nominal current (A)	21.4	24.6	28.1	30.7	33.3	34.8	35.9	
	Cooling capacity (kW)	153	148	143	139	136	134	133	
12	Nominal input (kW)	14.4	16.9	19.2	21.2	23.0	23.9	24.8	
	Water flow rate (L/min)	313	303	293	285	279	274	272	
	Nominal current (A)	21.1	24.9	28.1	31.0	33.6	34.8	36.2	
	Cooling capacity (kW)	164	158	153	149	145	144	142	
15	Nominal input (kW)	14.2	16.8	19.2	21.2	23.1	24.1	24.9	
	Water flow rate (L/min)	336	324	313	305	297	295	291	
	Nominal current (A)	20.8	24.6	28.1	31.0	33.6	35.1	36.5	
	Cooling capacity (kW)	170	164	158	153	150	148	147	
20	Nominal input (kW)	14.1	16.8	19.2	21.2	23.1	24.1	25.0	
	Water flow rate (L/min)	*339	336	324	313	307	303	301	
	Nominal current (A)	20.5	24.6	28.1	31.0	33.6	35.1	36.5	
	Cooling capacity (kW)	170	164	158	153	150	148	147	
25	Nominal input (kW)	14.1	16.8	19.2	21.2	23.1	24.1	25.0	
	Water flow rate (L/min)	*339	336	324	313	307	303	301	
	Nominal current (A)	20.5	24.6	28.1	31.0	33.6	35.1	36.5	
	Cooling capacity (kW)	170	164	158	153	150	148	147	
30	Nominal input (kW)	14.1	16.8	19.2	21.2	23.1	24.1	25.0	
	Water flow rate (L/min)	*339	336	324	313	307	303	301	
	Nominal current (A)	20.5	24.6	28.1	31.0	33.6	35.1	36.5	
	Cooling capacity (kW)	170	164	158	153	150	148	147	

List of heating capacities RUA-SP244H(L)N

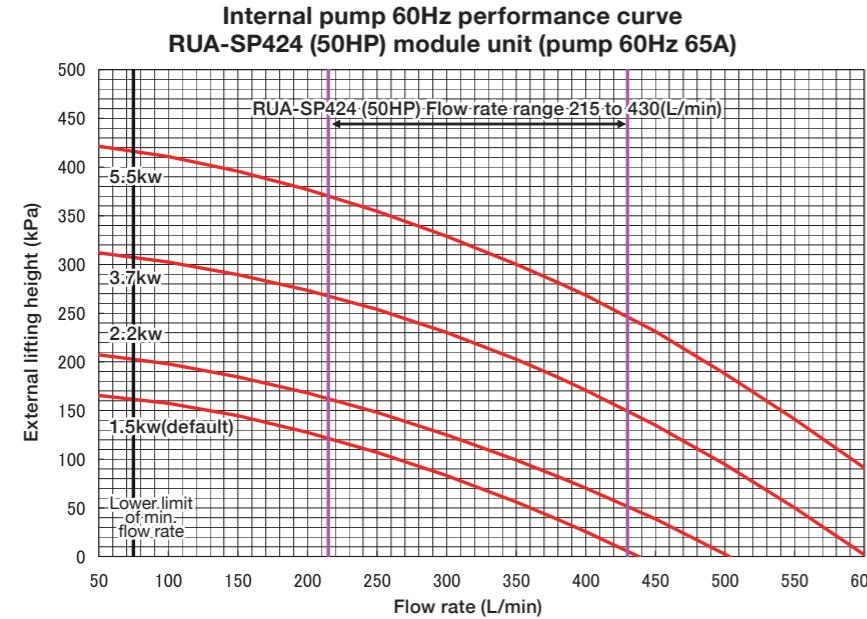
LVG hot-water temperature (°C)	Item	Outdoor air temperature (°C) (DB)							

Pump Characteristics / Internal Inverter Pump

30HP model, 40HP model Internal pump performance curve



50HP model Internal pump performance curve



Pump specification values

Pump output	30, 40HP model					50HP model				
	0.75kW	1.5kW	2.2kW	3.7kW	5.5kW	1.5kW	2.2kW	3.7kW	5.5kW	
Flow rate range ^(*)	Upper section:30HP (L/min) Lower section:40HP					Rated specification range (121~244) Rated specification range (169~339)				
External lifting height ^(**)	Upper section:30HP (kPa) Lower section:40HP					6~162 51~203 150~307 245~416				
Max. operation current ^(*)	(A)	1.6	3.1	4.3	6.9	10.0	2.8	3.8	5.9	8.4
Max. power consumption ^(*)	(kW)	1.0	2.0	2.8	4.5	6.4	1.8	2.4	3.8	5.4
Max. allowable boost pressure	(MPa)	0.54	0.45	0.36	0.24	0.16	0.52	0.48	0.37	0.25
Max. suction head (water temp. 60°C or less)	(kPa)	40	40	40	40	40	40	40	40	40

Note 1: Flow rate range (upper limit), max. current and max. power consumption in the table above are values for a pump. Multiply the number of pumps (module units) by these values depending on the unit size. When selecting anything other than rated output, you can also use values outside of the flow amount range shown in the graph. Use the formula below to find the flow amount range outside of the rated capacity.

Minimum flow rate=capacity x 860/60/10 (maximum temperature difference)

*However, minimum flow amount must be at or above 75L/min

Maximum flow amount=capacity x 860/60/5 (minimum temperature difference)

*However, maximum flow amount must be at or below 380L/min for the 30,40HP model, and at or below 600L/min for the 50HP model

Note 2: Lifting height outside of the unit shown in the table is the value when the pump frequency is 60Hz at the flow rate range above.

The pump lift outside of the machine is the value reached when subtracting the resistance inside the machine from the total pump lift.

Note 3: Max. current and max. power consumption are the max. values when the pump operation frequency is 60Hz.

Note 4: 60Hz pumps are commonly used in the 50Hz area.

Note 5: Select a pump that can handle the needed lift and flow amount.

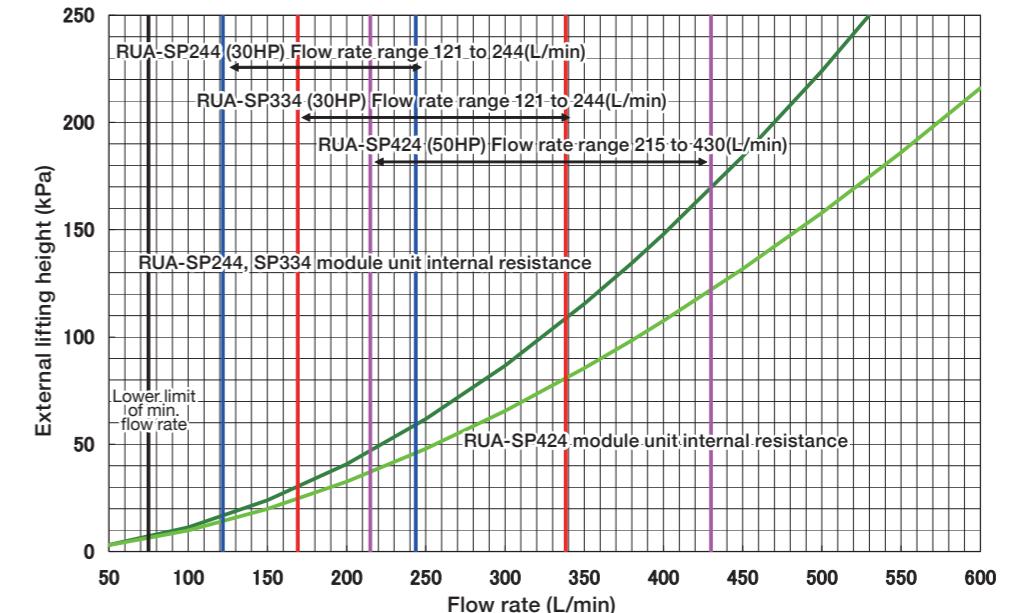
Note 6: In case the nominal current is 380V.

Pump Characteristics / Internal Resistance Curve (For pumpless)

Internal resistance curve (For pumpless)

Note: For a unit without a pump, select a pump outside of the heat pump unit considering internal resistance below

Internal resistance curve / Unit without pump



Operating Temperature Range

1. Operating Ranges

30HPmodel 40HPmodel 50HPmodel

Leaving water temperature (Note 1)	Cooling	°C	4~30
	Heating (Note 2) (Note 3)		25~55
	Temperature difference (inlet/outlet)		5~10
Outside air temperature	Cooling	°C	-15~46
	Heating (Note 2) (Note 3)		-15~43DB, 32WB

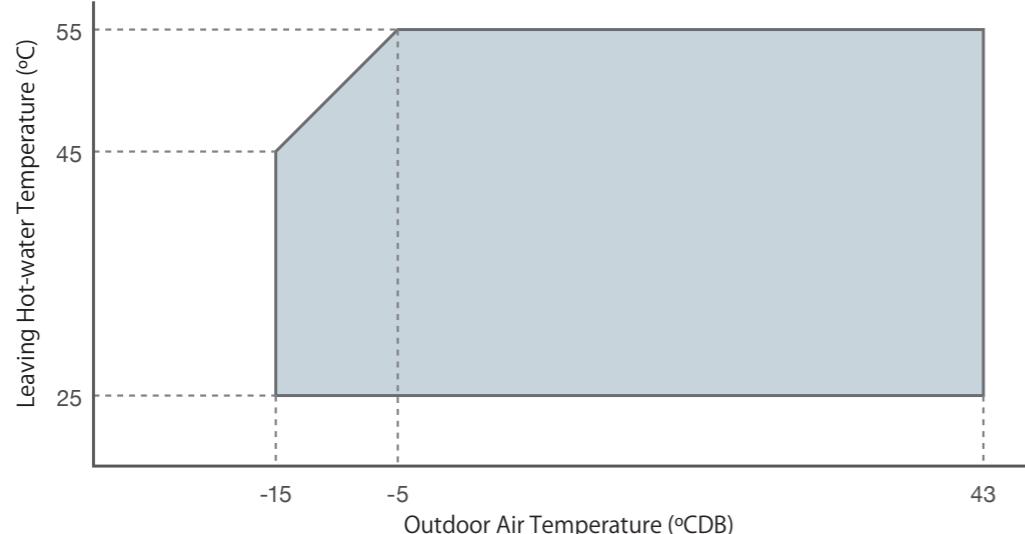
Note 1: LWT not higher than 35°C at cooling or not lower than 20°C at heating operation is allowable till 1 hour after starting up. After then, however, LWT must be within the operating range. Control it with bypass pipe if needed.

Note 2: For heat pump models only.

Note 3: Depend on the outdoor air temperature, leaving hot water temperature is limited as below.

Leaving Hot Water Temperature Range

30HPmodel 40HPmodel 50HPmodel



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2. Operating Range for Water Dispensing Device

Water spray - Water temperature range	°C	10~30
Water spray - Setting outdoor air temperature	°C	20~40

Power Supply Design

Power supply design specifications for each module unit are as below.

Internal pump output for inverter units is 1.5kW (standard), and can be changed to 0.75, 2.2, 3.7, 5.5kW as a special order. (0.75kW not available for 50HP unit)

Note 1: The internal pump can be replaced with another pump with appropriate output according to the lifting height outside of the unit required by a custom option. Since power supply design is different depending on the pump output, be sure to see the values in the corresponding field.

Note 2: Fuse capacities in the tables are for 8 class fuses.

Note 3: Select a power supply transformer that can support values greater than those shown in the tables.

Note 4: Power supply line thickness values are for metal conduits with three or fewer wires inside a single conduit. (or six or fewer wires when two wires are used for one pole)

Note 5: Determine operating condition-specific maximum line length and other parameters in accordance with Indoor Wiring Regulations based on local conditions.

Note 6: The pump operates at a maximum frequency of 60 Hz at a maximum flow rate. (per module unit)

Note 7: A leakage breaker must be installed. Use the one conformed to higher harmonic to prevent malfunction since this unit includes an inverter.

Note 8: Standard Current is the value considering the unbalance of 2% between power supply voltages.

Note 9: The thickness of the ground lead is the value for when using IV wire shown in the table for power supply wire. Refer to IEC60204-15.2 depending on the thickness of the wire used.

Table 1-Minimum cross-sectional area of the external protective copper conductor

Cross-sectional area of copper phase conductors supplying the equipment S mm ²	Minimum cross-sectional area of the external protective copper conductor Sp mm ²
S _c 16	S
16< S _c 35	16
S _c 35	S/2

●Power supply design (400V specifications)

Internal inverter pump model Pumpless model

Internal Pump	Power supply (Note 1,6)	30HP model					40HP model					50HP model												
		50/60Hz 400V					50/60Hz 400V					50/60Hz 400V												
		Model without pump			Model with internal pump		Model without pump			Model with internal pump		Model without pump			Model with internal pump									
Model without pump	For special order	Standard	For special order	Standard	Model without pump	For special order	Standard	For special order	Standard	Model without pump	For special order	Model without pump	For special order	Standard	For special order	Model without pump								
Motor Output (kW)	0.75	1.5	2.2	3.7	5.5	0.75	1.5	2.2	3.7	5.5	0.75	1.5	2.2	3.7	5.5	0.75								
Type	—	Line Pump				—	Line Pump				—	Line Pump				—	Line Pump							
Type of start	—	Inverter				—	Inverter				—	Inverter				—	Inverter							
Control	—	Inverter				—	Inverter				—	Inverter				—	Inverter							
Max. Current (A)	—	1.6	3.1	4.3	6.9	10.0	—	1.6	3.1	4.3	6.9	10.0	—	1.6	3.1	4.3	6.9	10.0						
Max. Input (kW)	—	1.0	2.0	2.8	4.5	6.4	—	1.0	2.0	2.8	4.5	6.4	—	1.0	2.0	2.8	4.5	6.4						
No. of primary connecting part for power supply wiring	Terminal in the power box of each module unit					Terminal in the power box of each module unit					Terminal in the power box of each module unit					Terminal in the power box of each module unit								
Standard Current (Note 8)	47	49	50.5	51.5	54	57	68.7	70.7	72.2	73.2	75.7	78.7	78.8	81.8	82.8	84.8	87.8							
Power Source Capacity (kVA)	32.6	34	35	35.7	37.4	39.5	47.6	49	50	50.7	52.4	54.5	54.6	56.7	57.4	58.7	60.8							
Power Supply (IV: Power Supply ≤ 20m (mm ²)	14					22					38					38								
Supply (IV: Power Supply ≤ 50m (mm ²)	14					22					38					38								
Wiring (CV: Power Supply ≤ 20m (mm ²)	8			14		14			22		22			22		22								
(CV: Power Supply ≤ 50m (mm ²)	14			22		22			38		38			38		38								
Ground (mm ²)	14					22					22					22								
Switch (A)	60					100					100					100								
Fuse (A)	50	60				75	100				75	100				100	100							
Earth Leakage Circuit Breaker (Capacity) (A)	50	60				75	100				75	100				100	100							
Earth Leakage Circuit Breaker (Sensitivity) (mA)	100					100					100					100								

● Selected based on Japanese regulations. Select the appropriate unit based on the laws and regulations of the location where the unit is to be installed.

● Current values for other voltages can be calculated from above data. Consult with Toshiba Carrier if needed.

Option List

Custom Option List
Pump output upgrade
Anti-corrosion & heavy anti corrosion models
Large ΔT specification (10~16 degree C)
Heat machine specification (heating only)
Stainless steel screw set

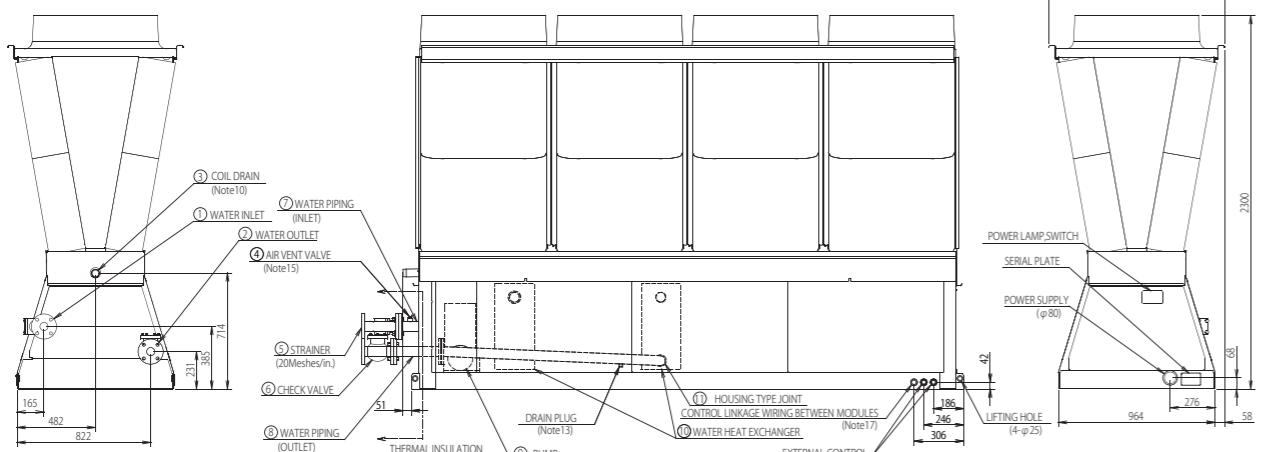
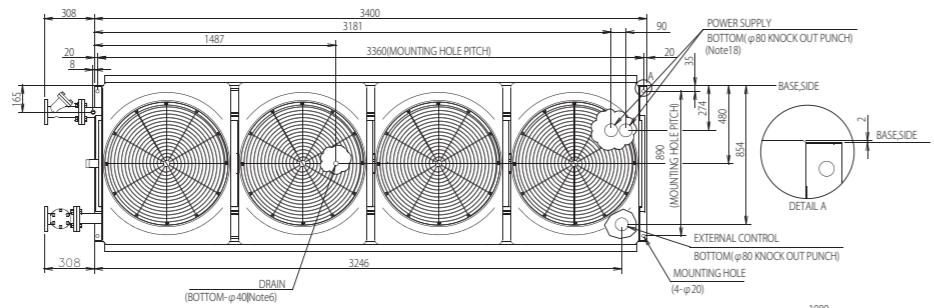
Outline Drawings Standard type / Internal inverter pump & Pumpless

A single module Heat pump unit, Cooling-only 30, 40, and 50HP module units
(Pumpless model excludes pump, and check valves.)

No.	NAME	JOINT
1	WATER INLET	2" FLANGE
2	WATER OUTLET	2" FLANGE
3	COIL DRAIN	PT1/2" EXTERNAL THREAD
4	AIR VENT VALVE	PT1/2" INTERNAL THREAD
5	STRAINER	CASING:equivalent to FC250
6	CHECK VALVE	CASING:equivalent to FC200
7	WATER PIPING (INLET)	JIS10K FLANGE (Note1) Equivalent to SUS304
8	WATER PIPING (OUTLET)	PIPING Equivalent to SUS304
9	PUMP	CASING:FC200
10	WATER HEAT EXCHANGER	PLATE, JOINT Equivalent to SU3316
11	HOUSING TYPE JOINT	SOLDER PURE COPPER GASKET (Note2) EPDM

Note1. ACCORDING TO JIS B 2220.

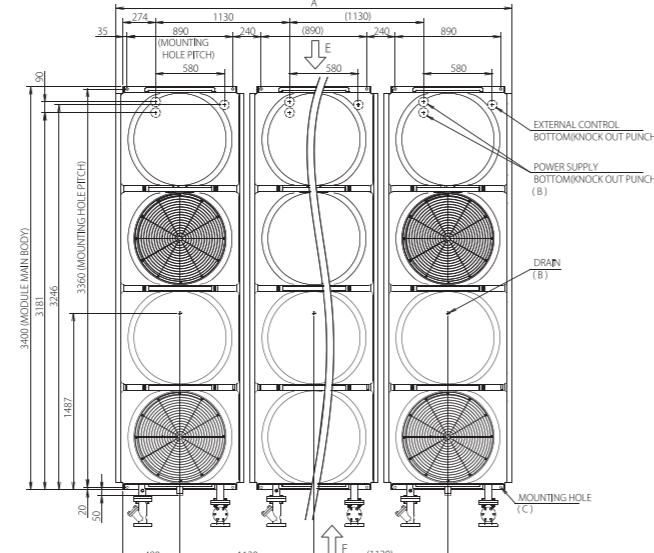
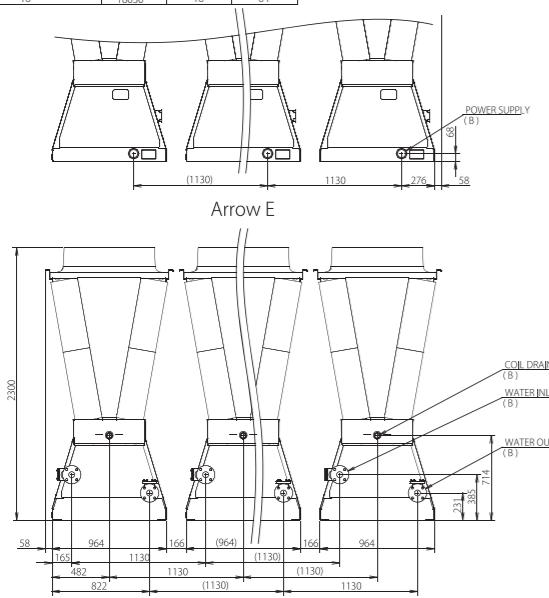
Note2. DESCRIPTION OF WETTED PART.


Combined installation Heat pump unit, Cooling-only 30, 40, and 50HP module units

Note3. Number for A, B, C in the drawing

Number of Modules	A	B	C
1	1080	1	4
2	2210	2	8
3	3340	3	12
4	4470	4	16
5	5600	5	20
6	6730	6	24
7	7860	7	28
8	8990	8	32
9	10120	9	36
10	11250	10	40
11	12380	11	44
12	13510	12	48
13	14640	13	52
14	15770	14	56
15	16900	15	60
16	18030	16	64

Note4. When installing connected modules with a minimum space of 166mm between modules.
It is also possible to installing connected modules with a minimum space of 166mm between modules.
cable (locally supplied) must be prepared in accordance with Table1 The accessory communication wire,
supplied with the USX module, cannot be used to coa new communication en modules is greater than 166mm.
If the clearance is larger, prepare long enough electric-wire and appropriate covering.



The number of modules	A(mm)	B	C	The number of modules	A(mm)	B	C	The number of modules	A(mm)	B	C	The number of modules	A(mm)	B	C
1 module	1080	1	4	5 modules	5600	5	20	9 modules	10120	9	36	13 modules	14640	13	52
2 modules	2210	2	8	6 modules	6730	6	24	10 modules	11250	10	40	14 modules	15770	14	56
3 modules	3340	3	12	7 modules	7860	7	28	11 modules	12380	11	44	15 modules	16900	15	60
4 modules	4470	4	16	8 modules	8990	8	32	12 modules	13510	12	48	16 modules	18030	16	64

Note1. All of 30hp, 40hp, and 50hp have the same dimensional drawings.

Note2. The values indicated above are applied to A through C.

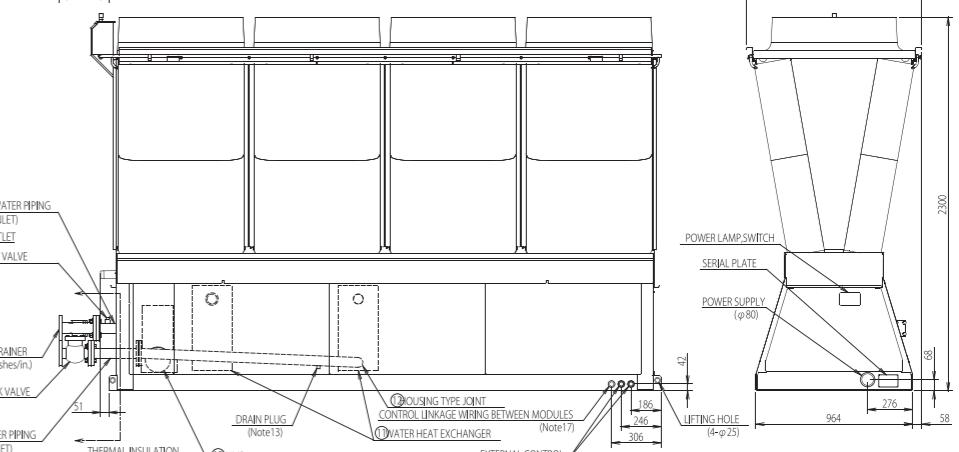
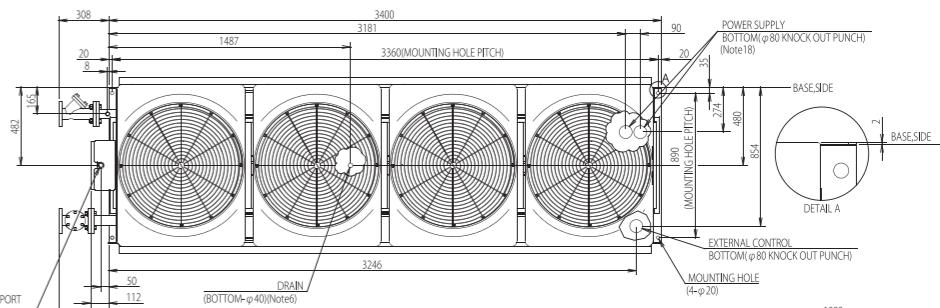
Outline Drawings High-EER type / Internal inverter pump & Pumpless

A single module Heat pump unit, Cooling-only 30, 40, and 50HP module units
(Pumpless model excludes pump, and check valves.)

No.	NAME	JOINT
1	WATER INLET	2" FLANGE
2	WATER OUTLET	2" FLANGE
3	COIL DRAIN	PT1/2" EXTERNAL THREAD
4	AIR VENT VALVE	PT1/2" INTERNAL THREAD
5	STRAINER	CASING:equivalent to FC250
6	CHECK VALVE	CASING:equivalent to FC200
7	WATER PIPING (INLET)	JIS10K FLANGE (Note1) Equivalent to SUS304
8	WATER PIPING (OUTLET)	PIPING Equivalent to SUS304
9	PUMP	CASING:FC200
10	WATER HEAT EXCHANGER	PLATE, JOINT Equivalent to SU3316
11	HOUSING TYPE JOINT	SOLDER PURE COPPER GASKET (Note2) EPDM

Note1. ACCORDING TO JIS B 2220.

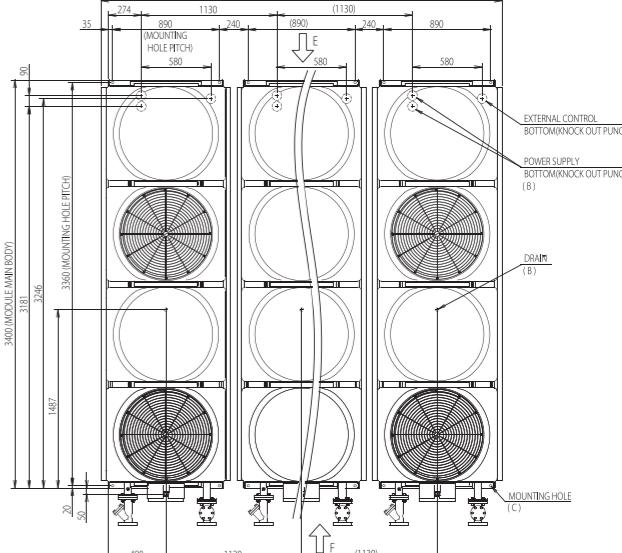
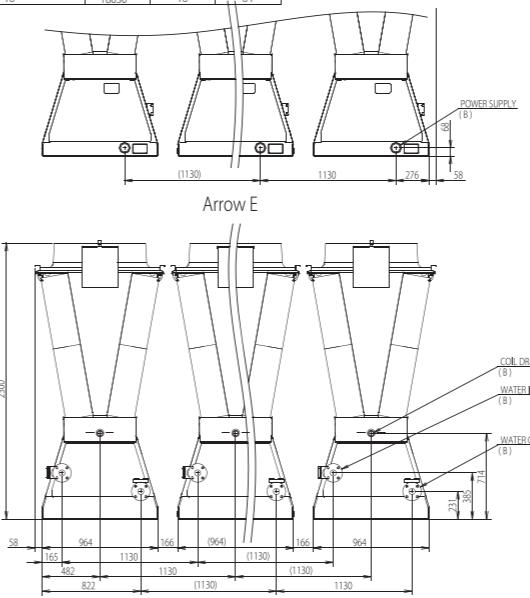
Note2. DESCRIPTION OF WETTED PART.


Combined installation Heat pump unit, Cooling-only 30, 40, and 50HP module units

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