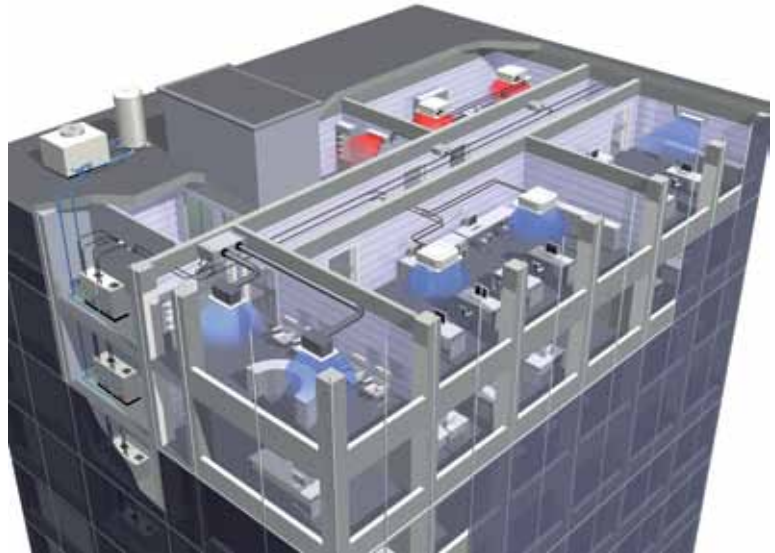


Water cooled VRV outdoor systems

Despite the remarkable energy efficiency and installation flexibility of the air cooled VRV, there are some applications for which the water cooled version provides a more economic and sustainable solution. These apply primarily to **multi storey high rise complexes** in which maximum refrigerant pipe distances can sometimes invalidate the use of an air cooled system. Further situations which are ideal for water cooled VRV use include buildings lacking adequate roof or external space for outdoor condensing units and projects with particularly stringent noise regulations.

The water cooled VRV is now available in 9 models between 8 and 30 HP, in heat recovery, heat pump and most recently, **geothermal** variants. The fast growing geothermal sector in fact, provides an ideal opportunity for ground source heat pumps and offers considerably future potential for its use in very low carbon installations.



Standard series



Geothermal series

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Benefits

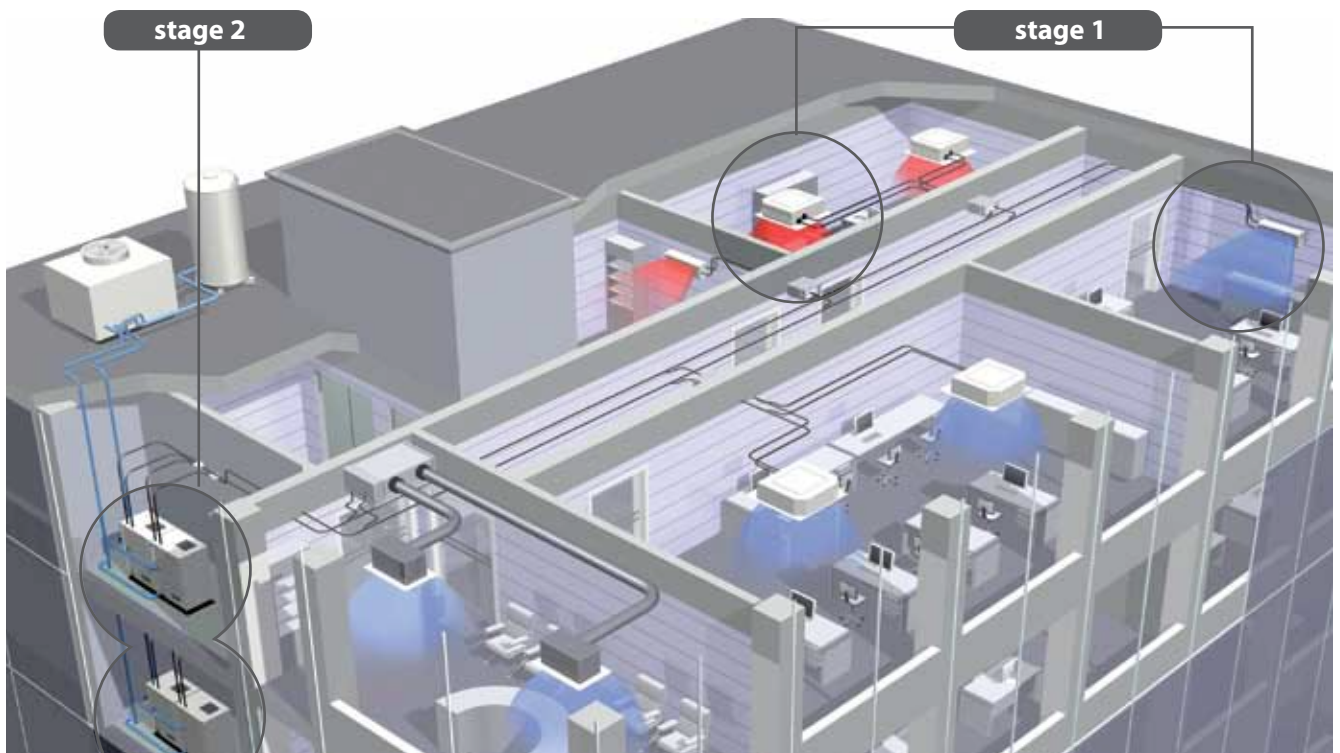


HIGH ENERGY EFFICIENCIES RESULTS FROM 2-STAGE HEAT RECOVERY

VRV-W benefits from a 2-stage heat recovery facility. The first stage is achieved within the refrigerant system and applies to heat recovery units only. Heat exhausted from indoor units in cooling mode is merely transferred to units in areas requiring heating, maximising energy efficiency and reducing electricity costs.

Heat recovery also available on heat pump units

Second stage heat recovery is achieved within the water loop between the water cooled outdoor units. Two-stage heat recovery substantially improves energy efficiency and represents an ideal solution to the requirements of modern office buildings, in which some areas may require cooling even in winter, depending on the degree of sunshine at the time and the number of individuals in the room.

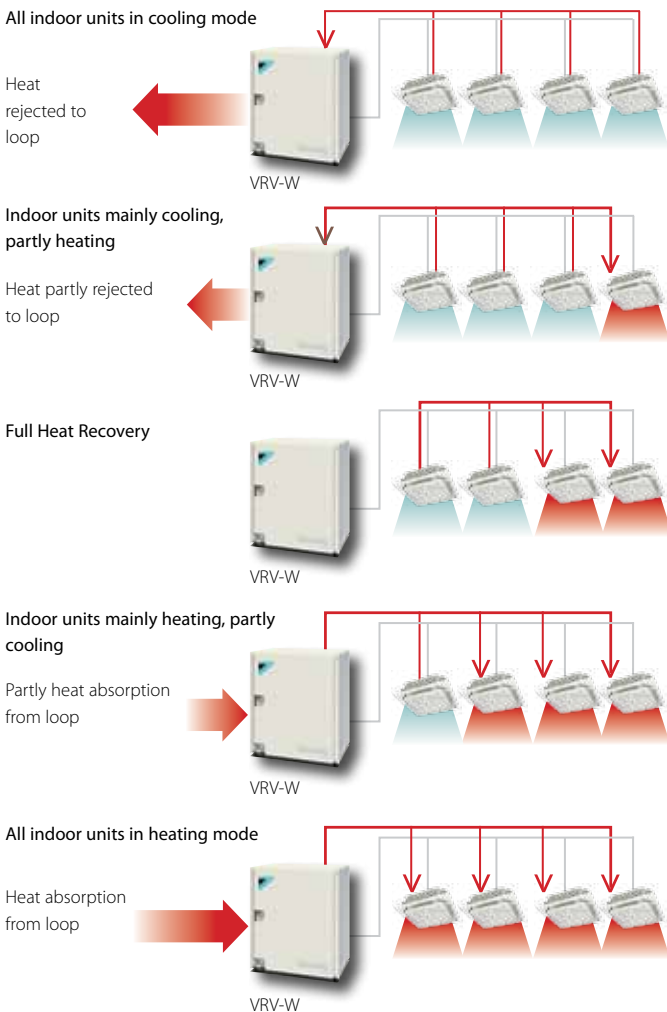




Stage 1: For heat recovery
 Simultaneous heating and cooling within the refrigerant system.

When mainly cooling is required, the system recycles heat exhausted from the cooling operation for heating purposes. When mainly heating is required, the system uses cooled post-heating operation refrigerant for cooling. Efficiency improves the more simultaneous operation is performed.

Heat recovery between indoor units

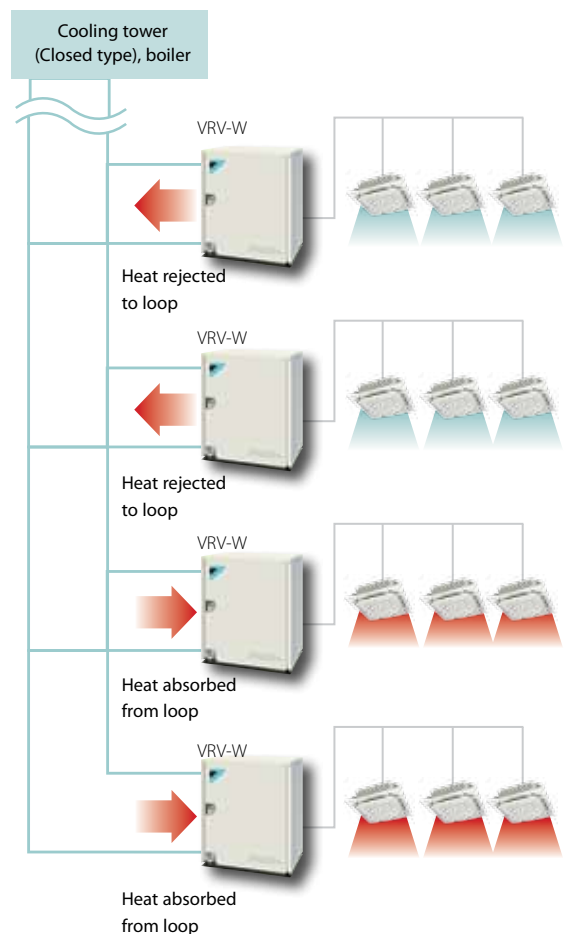


Stage 2: For heat recovery and heat pump!
 Heat recovery between the water cooled outdoor units

For heat recovery and heat pump units!

Heat recovery is also available between systems connected to the same water loop. These systems exchange heat via water, increasing energy efficiency.

Heat recovery between outdoor units
 (Heat recovery and heat pump)



* Above system configurations are for illustration purposes only.

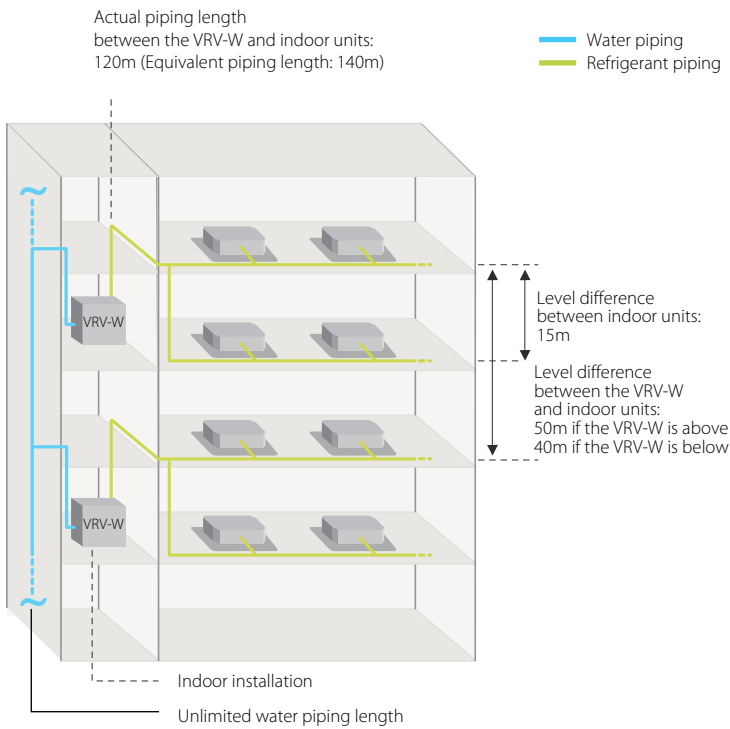
FLEXIBLE PIPING DESIGN

Flexible water piping

Water cooled VRV uses water as its heat source, so it is optimal for large buildings, including tall, multi-storey buildings, because the system can tolerate water pressure of up to 1.96 MPa.

Furthermore, if the currently installed heat source's water temperature is between 10°C and 45°C, it may be possible to use the existing water pipe work and heat source. This alone makes it an ideal system solution for building refurbishment projects.

Because the system is water cooled, outdoor air temperature does not affect its heating capacity. In addition, water cooling means no defrost operation is required, and the resultant rapid start-up time assures quick and comfortable heating, even in cold environment.



Long refrigerant piping length

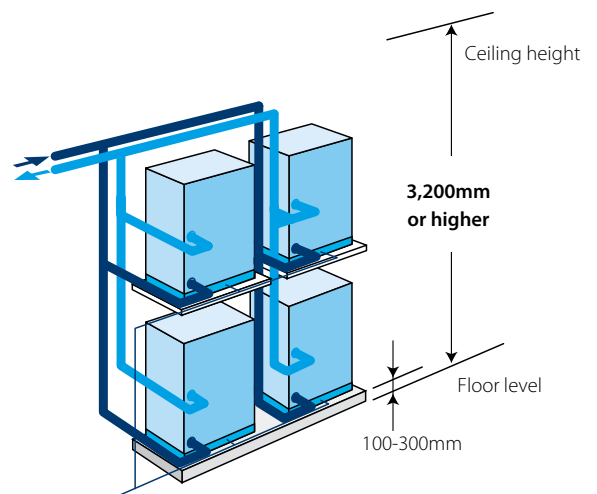
Considerable flexibility is available within the refrigerant circuit since up to 120m actual piping length and 50m* (if the VRV-W outdoor unit is above the indoor units) in height can exist between the VRV-W outdoor units and indoor units. Water piping does not intrude on the occupied spaces, so there are no leakage problems.

* 40m if the VRV-W outdoor unit is below the indoor units.

SPACE SAVING - STACKED CONFIGURATION

The adoption of a new water heat exchanger and optimization of the refrigerant control circuit has resulted in the industry's most compact and lightweight design. The unit weight of 149kg* and height of 1,000mm makes installation easy. Stacked configuration is also possible, contributing further to space savings.

* for 8HP unit



Stacked configuration is possible.



YOUR SYSTEM OPTIMISED FOR THE EUROPEAN CLIMATE - HIGH SENSIBLE MODE

The high sensible mode on the VRV outdoor units optimises the working of the units for the European climate. This optimisation has the following benefits:

Higher energy efficiency

As no energy is wasted on unnecessary dehumidification anymore the system will work more efficiently in cooling mode.

Higher comfort for the end-user

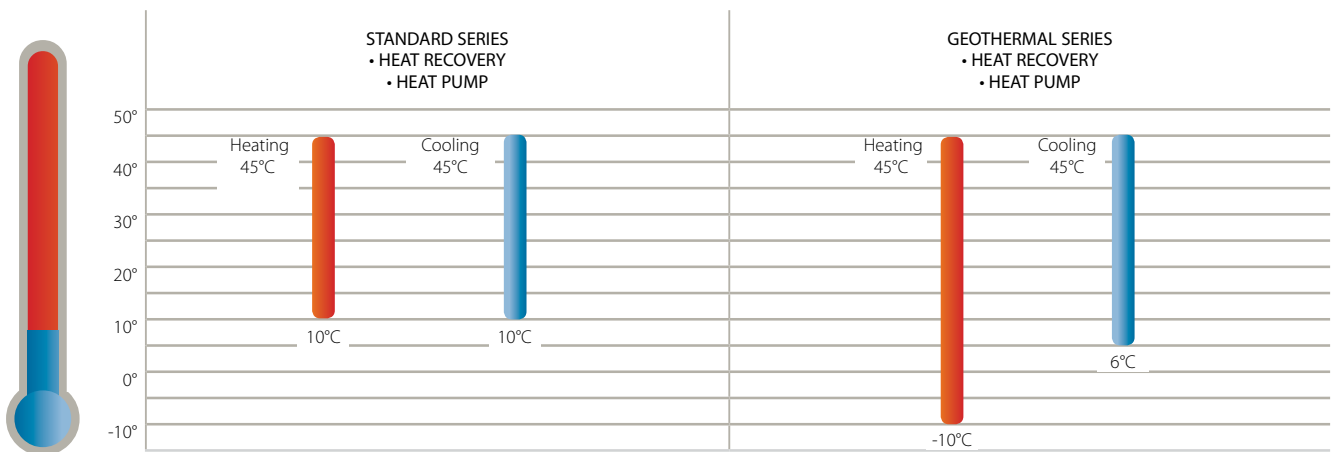
Thanks to the higher evaporation temperature also the discharge temperature of the indoor units will be increased in cooling mode, providing a higher comfort.

WIDE OPERATION RANGE

Standard water cooled outdoor units have a wide operation range of between 10°C & 45°C inlet water temperature, both in heating and cooling.

For the geothermal series the operation range is extended even more, down to -10°C* in heating and 6°C in cooling mode.

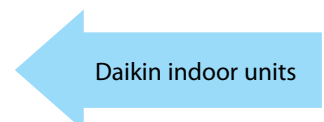
* Ethylene glycol should be added to the water when the water inlet temperature is below 5°C



LOW INDOOR UNIT OPERATION SOUND LEVEL

- › Continuous research by Daikin into reducing operation sound levels has resulted in the development of a purpose designed inverter scroll compressor and fan.
- › Daikin indoor units have very low sound operation levels, down to 25dB(A)

DB(A)	PERCEIVED LOUDNESS	SOUND
0	Threshold of hearing	-
20	Extremely soft	Rustling leaves
40	Very soft	Quiet room
60	Moderately loud	Normal conversation
80	Very loud	City traffic noise
100	Extremely loud	Symphonic orchestra
120	Threshold of feeling	Jet taking off

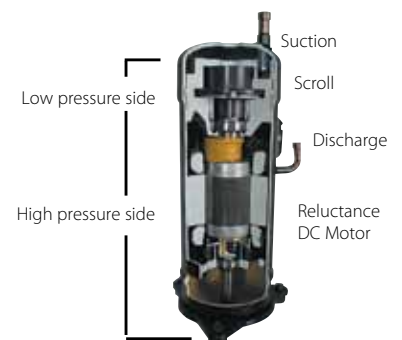
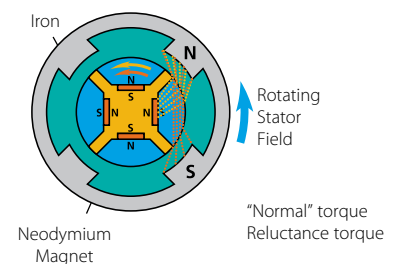


Advanced water cooled VRV technologies



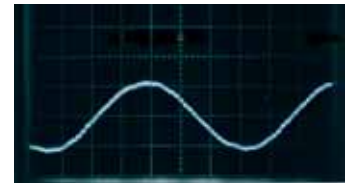
1 RELUCTANCE BRUSHLESS DC COMPRESSOR

- › The reluctance brushless DC motor provides significant increases in efficiency compared to conventional AC inverter motors, simultaneously using 2 different forms of torque (normal and reluctance torque) to produce extra power from small electric currents.
- › **The motor comprises powerful neodymium magnets**, that efficiently generate high torque. These magnets make a major contribution to the energy saving characteristics of the motor.
- › **High thrust mechanism**
By introducing high pressure oil, the reactive force from the fixed scroll is added to the internal force, thereby reducing thrust losses. This results in improved efficiency and suppressed sound level.



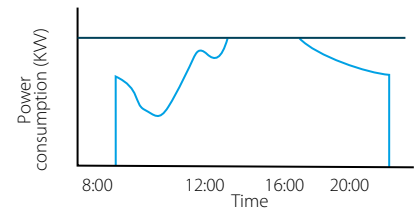
2 SINE WAVE DC INVERTER

Optimizing the sine wave curve, results in smoother motor rotation and improved motor efficiency.



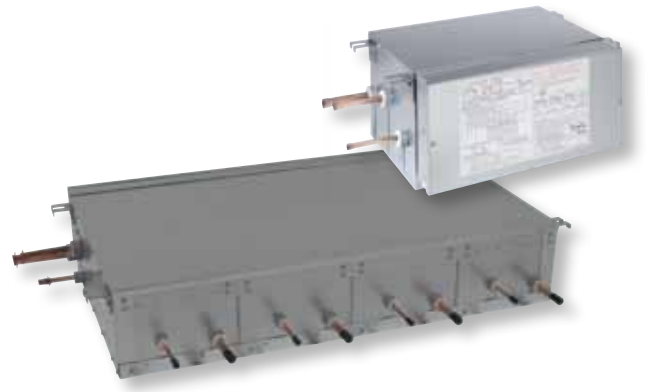
3 I-DEMAND FUNCTION

The newly introduced current sensor minimizes the difference between the actual power consumption and the predefined power consumption.



INDIVIDUAL COMFORT THANKS TO VRVIII BS BOX

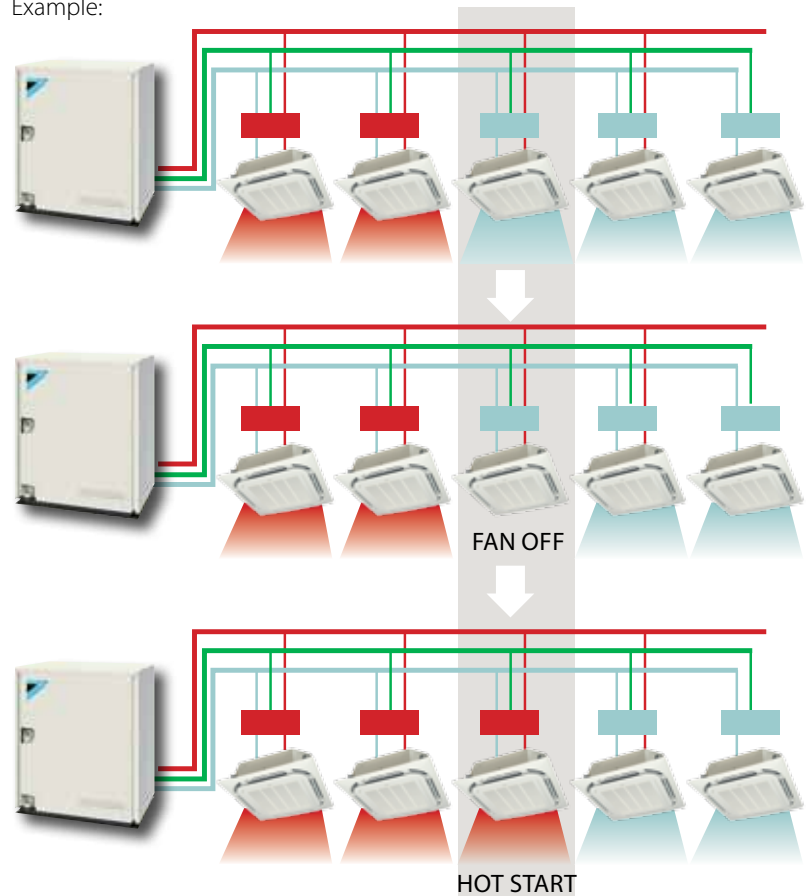
Individual change over from cooling to heating or vice versa of the indoor units is possible. This means that all indoor units who do not change over continue to provide optimum comfort for the users during this process. The BS box comes in individual and multi versions for maximum flexibility, faster installation and best cost.



VRV-WIII

With the VRVIII BS box, the other indoor units can keep heating while the target indoor units are switched from cooling to heating.

Example:



Standard series

SPECIFICATIONS

VRV-W Standard series - Heat recovery - Heat Pump

OUTDOOR UNIT				RWEYQ8P	RWEYQ10P	RWEYQ16P	RWEYQ18P	RWEYQ20P	RWEYQ24P	RWEYQ26P	RWEYQ28P	RWEYQ30P		
System	Outdoor unit module 1			RWEYQ8P	RWEYQ10P	RWEYQ8P	RWEYQ10P		RWEYQ8P	RWEYQ10P				
	Outdoor unit module 2			-	-	RWEYQ8P		RWEYQ10P	RWEYQ8P		RWEYQ10P			
	Outdoor unit module 3			-	-	-		-	RWEYQ8P			RWEYQ10P		
Capacity range	HP			8	10	16	18	20	24	26	28	30		
Cooling capacity	Nom.	kW			22.4 ¹	26.7 ¹	44.8 ¹	49.1 ¹	53.4 ¹	67.2 ¹	71.5 ¹	75.8 ¹	80.1 ¹	
Heating capacity	Nom.	kW			25.0 ²	31.5 ²	50.0 ²	56.5 ²	63.0 ²	75.0 ²	81.5 ²	88.0 ²	94.5 ²	
Power input - 50Hz	Cooling	Nom.	kW			4.55	6.03	9.10	10.6	12.1	13.7	15.1	16.6	18.1
	Heating	Nom.	kW			4.24	6.05	8.48	10.3	12.1	12.7	14.5	16.3	18.2
EER				4.89	4.14	4.92	4.63	4.41	4.91	4.74	4.57	4.43		
COP				5.81	5.08	5.87	5.48	5.21	5.91	5.62	5.40	5.19		
Maximum number of connectable indoor units				17	21	34	36							
Indoor index connection	Min.			100	125	200	225	250	300	325	350	375		
	Nom.			200	250	400	450	500	600	650	700	750		
	Max.			260	325	520	585	650	780	845	910	975		
Dimensions	Unit	HeightxWidthxDepth	mm	1,000x780x550										
Weight	Unit	kg		149	150									
Heat exchanger	Type			Stainless steel plate										
Sound pressure level	Cooling	Nom.	dBA	50	51	53	54		55		56			
Compressor	Type			Hermetically sealed scroll compressor										
Operation range	Inlet water temperature	Cooling	Min.-Max. °CDB	10~45										
		Heating	Min.-Max. °CWB	10~45										
Refrigerant	Type			R-410A										
	Charge			kg	3.5	4.2								
	Control			Electronic expansion valve										
Refrigerant oil	Type			Synthetic (ether) oil										
Piping connections	Liquid	Type		Flare connection										
		OD	mm	9.52		12.7	15.9		19.1					
	Gas	Type		Braze connection										
		OD	mm	19.1 ³	22.2 ³	28.6 ³		34.9 ³						
	Discharge gas	Type		Braze connection										
		OD	mm	15.9 ⁴ / 19.1 ⁵	19.1 ⁴ / 22.2 ⁵	22.2 ⁴ / 28.6 ⁵		28.6 ⁴ / 34.9 ⁵						
	Piping length	OU - IU	Max.	m	120									
		After branch	Max.	m	90 ¹⁵									
Total piping length	System	Actual	m	300										
Level difference	OU - IU	Outdoor unit in highest position/Indoor unit in highest position		50/40										
		IU - IU	Max.	m	15									
Power supply	Phase/Frequency/Voltage			Hz/V				3~/50/380-415		-				
Current - 50Hz	Maximum fuse amps (MFA)			A				25		35		45		

(1) Cooling: indoor temp. 27°CDB, 19°CWB; Inlet water temperature: 30°C; equivalent refrigerant piping: 7.5m; level difference: 0m. (2) Heating: indoor temp. 20°CDB; inlet water temperature: 20°C; equivalent piping length: 7.5m; level difference: 0m (3) In case of heat pump system, gas pipe is not used (4) In case of heat recovery system (5) In case of heat pump system (6) This unit should not be installed outdoors, but indoors e.g. in a machine room. (7) Hold ambient temperature at 0-40°C and humidity at 80%RH or less. Heat rejection from the casing: 0.64kW/8HP (8) Select wire size based on the larger value of MCA or TOCA (9) Hold ambient temperature at 0-40°C and humidity at 80%RH or less. Heat rejection from the casing: 0.71kW/10HP

› For more information on BS boxes, please refer to page 44

Geothermal series

BENEFITS

Using ground water as a renewable energy source

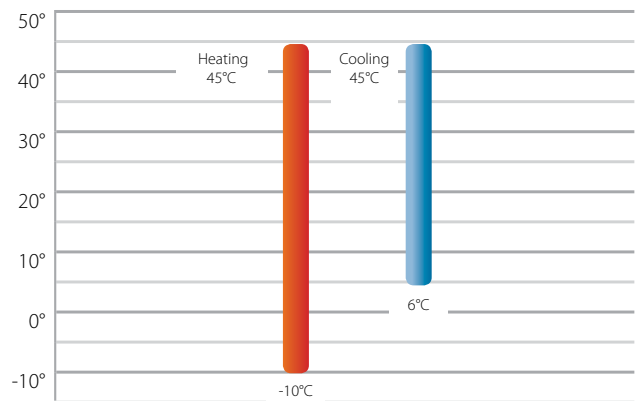
Superior efficiency, even in the most extreme outdoor temperatures

Because the temperature of ground water, lakes and rivers, remains relatively constant the year round, our water-cooled system maintains its superior efficiency, even in the most extreme outdoor temperatures, when the efficiency of air-cooled systems goes down.

Extended operation range

The water cooled geothermal series have an inlet water temperature down to -10°C* in heating, extending the water cooled application range.

* Ethylene glycol should be added to the water when the water inlet temperature is below 10 °C



SPECIFICATIONS

OUTDOOR UNIT				RWEYQ8PR	RWEYQ10PR		
Capacity range			HP	8	10		
Cooling capacity	Nom.			kW	22.4 ¹	26.1 ¹	
Heating capacity	Nom.			kW	25.0 ²	31.5 ²	
Power input - 50Hz	Cooling	Nom.			kW	6.30	6.30
	Heating	Nom.			kW	4.30	6.20
EER					4.89	4.14	
COP					5.81	5.08	
Maximum number of connectable indoor units					17	21	
Indoor index connection	Min.			100	125		
	Nom.			200	250		
	Max.			200	250		
Dimensions	Unit	HeightxWidthxDepth	mm	1,000x780x550			
Weight	Unit			kg	149	150	
Heat exchanger	Type		Stainless steel plate				
Sound pressure level	Cooling	Nom.	dB(A)	50	51		
Compressor	Type		Hermetically sealed scroll compressor				
Operation range	Inlet water temperature	Cooling	Min.~Max. °CDB	6~45			
		Heating	Min.~Max. °CWB	-10~45			
Refrigerant	Type	R-410A					
	Charge	kg	3.5	4.2			
	Control	Electronic expansion valve					
Refrigerant oil	Type		Synthetic (ether) oil				
Piping connections	Liquid	Type	Flare connection				
		OD	mm	9.52			
	Gas	Type	Braze connection				
		OD	mm	19.1 ³	22.2 ³		
	Discharge gas	Type	Braze connection				
		OD	mm	15.9 ⁴ / 19.1 ⁵	19.1 ⁴ / 22.2 ⁵		
Piping length	OU - IU	Max.	m		120		
	After branch	Max.	m		90 (15)		
Total piping length	System	Actual	m		300		
Level difference	OU - IU	Max.	m		50/40		
	IU - IU	Max.	m		15		
Power supply	Phase/Frequency/Voltage		Hz/V		3~/50/380-415		
Current - 50Hz	Maximum fuse amps (MFA)		A		25		

(1) Cooling: indoor temp. 27°CDB, 19°CWB; Inlet water temperature: 30°C; equivalent refrigerant piping: 7.5m; level difference: 0m. (2) Heating: indoor temp. 20°CDB; inlet water temperature: 20°C; equivalent piping length: 7.5m; level difference: 0m (3) In case of heat pump system, gas pipe is not used (4) In case of heat recovery system (5) In case of heat pump system (6) This unit should not be installed outdoors, but indoors e.g. in a machine room. (7) Hold ambient temperature at 0-40°C and humidity at 80%RH or less. Heat rejection from the casing: 0.64kW/8HP (8) Select wire size based on the larger value of MCA or TOCA