

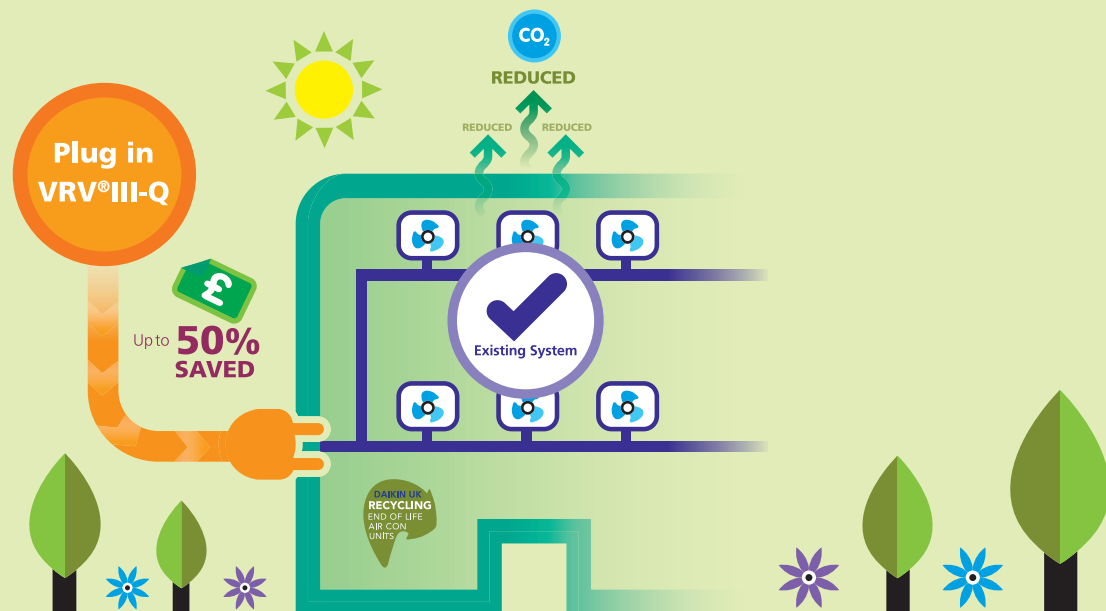


R22



Replacement VRV[®], VRV[®]-IIIQ
The Daikin solution to R-22 phase out





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Due to significant developments in heat pump technology, older systems of air conditioning run less efficiently than those available today.

Furthermore R-22 will soon be unavailable for servicing these units. To upgrade R-22 systems as cost effectively as possible, Daikin replacement VRV[®] units can be installed using existing pipe-work.

Benefits

- Dramatically reduced installed cost – up to 50% saving compared with complete new system.
- Reuse all existing pipework with possibility to reuse existing fan coils.
- Flexibility to use with existing pipework connected to other non-Daikin systems.
- Automatic charging and pipework cleaning function.
- Higher energy efficiency and lower CO₂ emissions than retrofitting refrigerant.
- Major potential to increase system capacity.

When will R-22 be banned in Europe?



¹ Recycled: reuse of R-22 following a basic cleaning process by the same undertaking that carried out the recovery (can be done by installer)
 Reclaimed: reprocessed R-22 in order to meet the equivalent performance of virgin R-22 (by specialized company)

1. R-22 phase-out

What is R-22 and why is it phased-out?

R-22 is a hydrochlorofluorocarbon (HCFC) which was commonly used in air conditioning systems. When R-22 is released into the air, the ultraviolet rays of the sun cause it to decompose and chlorine is released in the stratosphere. Chlorine reacts with ozone, reducing the amount of the ozone. Due to ozone layer depletion, harmful ultraviolet rays reach the surface of the earth giving rise to a number of health and environmental issues. The international community therefore, signed the Montreal Protocol to phase out ozone depletion materials by 2030. The European Union however, decided to ban R-22 already in 2015.

What is the impact on an R-22 installation?

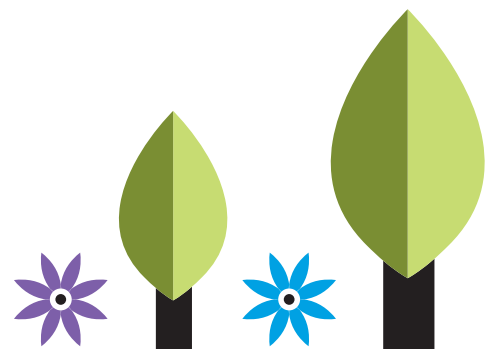
The R-22 phase-out regulation will impact on all currently operating R-22 systems, although reliable R-22 equipment does not need to be replaced immediately because maintenance can be carried out with recycled or reclaimed R-22 until January 1st, 2015. However, as currently not enough R-22 is reclaimed to cover the demand, supply shortages and price increases are expected. If there is no reclaimed R-22 available certain repairs (for example: compressor change) are no longer possible and considerable air conditioning system downtime can occur. It is therefore worthwhile to consider a replacement system before 2015, especially for air conditioning systems with a large impact on the daily running of the business.

2. New technology

The majority of R-22 VRV[®] systems installed in Europe are at least 8 years old. Due to significant technological developments of heat pump technology, older air conditioning systems run less efficiently than those available today. Almost 50% increase (for a 10HP) in efficiency can be achieved by use of the more energy efficient R-410A refrigerant and the latest heat pump technologies. Increased efficiency equates to less energy consumption, lower energy costs and lower CO₂ emissions. Therefore replacing an old R-22 or R-407C VRV[®] installation can lead to significant energy consumption savings.

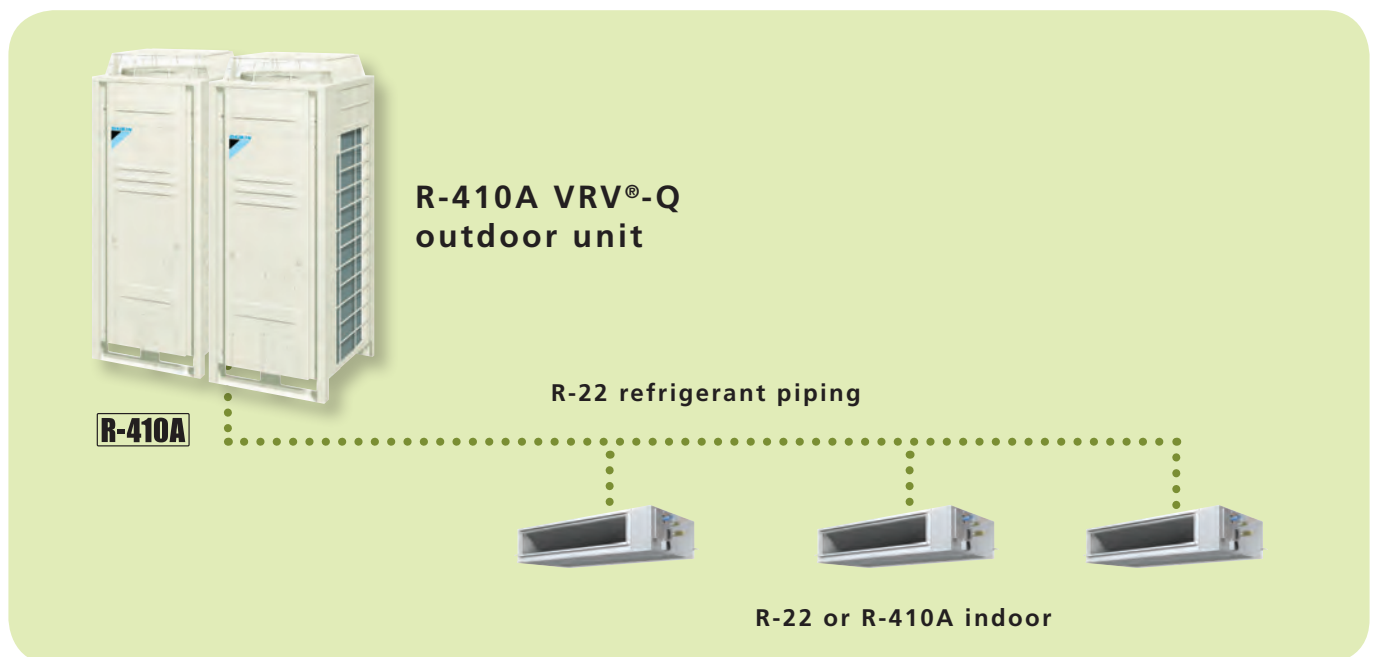
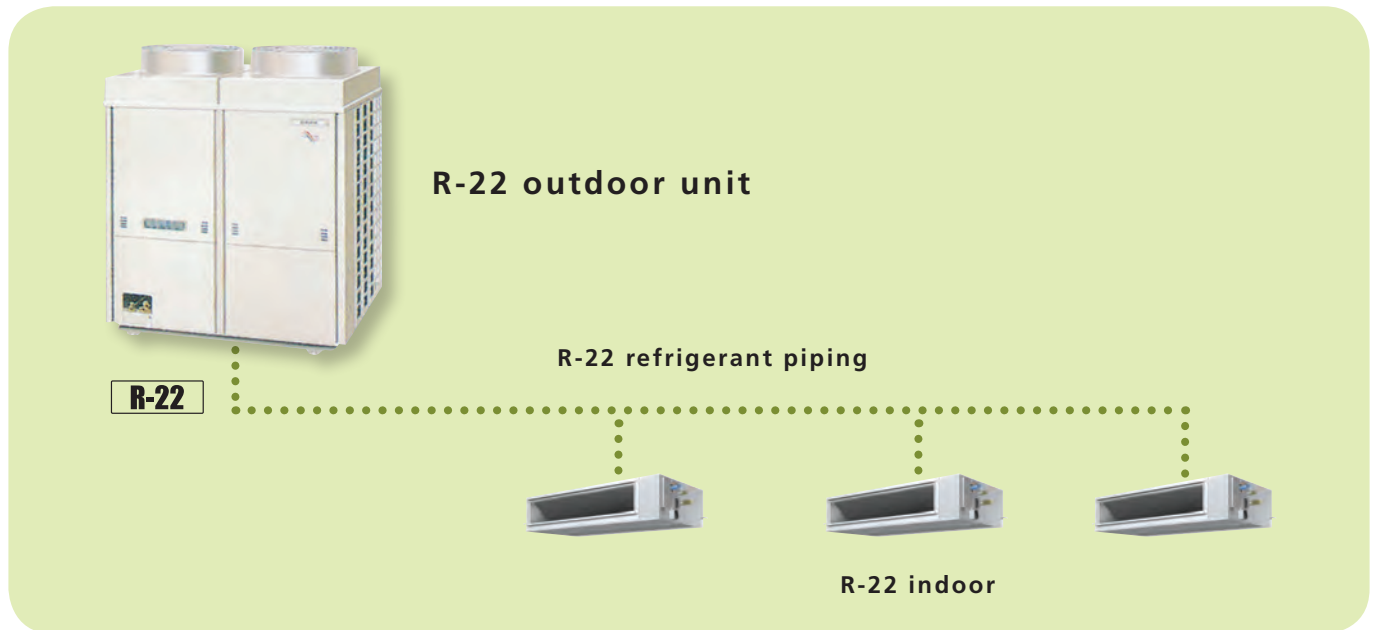
	R-22	R-407C	R-410A
COP	2.37	3.10	3.98
EER	3.00	3.10	4.00
average	2.69	3.10	3.99

R-22: RSXY10KA7
 R-407C: RSXYP10L7
 R-410A: RQYQ280P



The Daikin answer to R-22 phase-out

The VRV[®]-Q solution allows to retain existing R-22 piping and in some cases even the indoor units and controllers and replaces only the outdoor units and BS-boxes (in case of heat recovery installations).

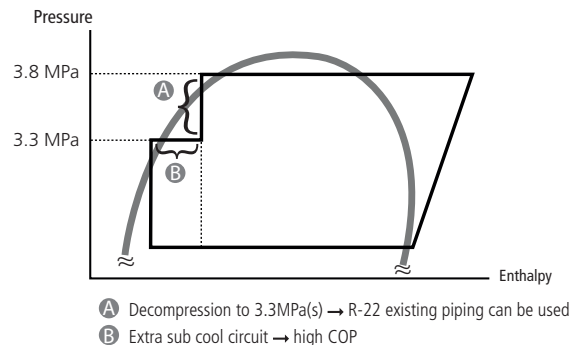


- > Check with your local installer if the indoor units need to be replaced. All units older than the K-Series must be replaced.
- > For heat recovery applications, the BS-boxes need to be replaced.

Technologies of VRV[®]-Q

Reduced pressure

As R-22 VRV[®] systems work on a lower pressure than R-410A systems; thus the copper refrigerant piping was also designed for these lower pressures. Therefore the Replacement VRV[®] (VRV[®]-Q) must operate at lower pressures than the standard VRV[®]III series. However thanks to the sub cool circuit a high efficiency level can be kept even with the lower pressures.

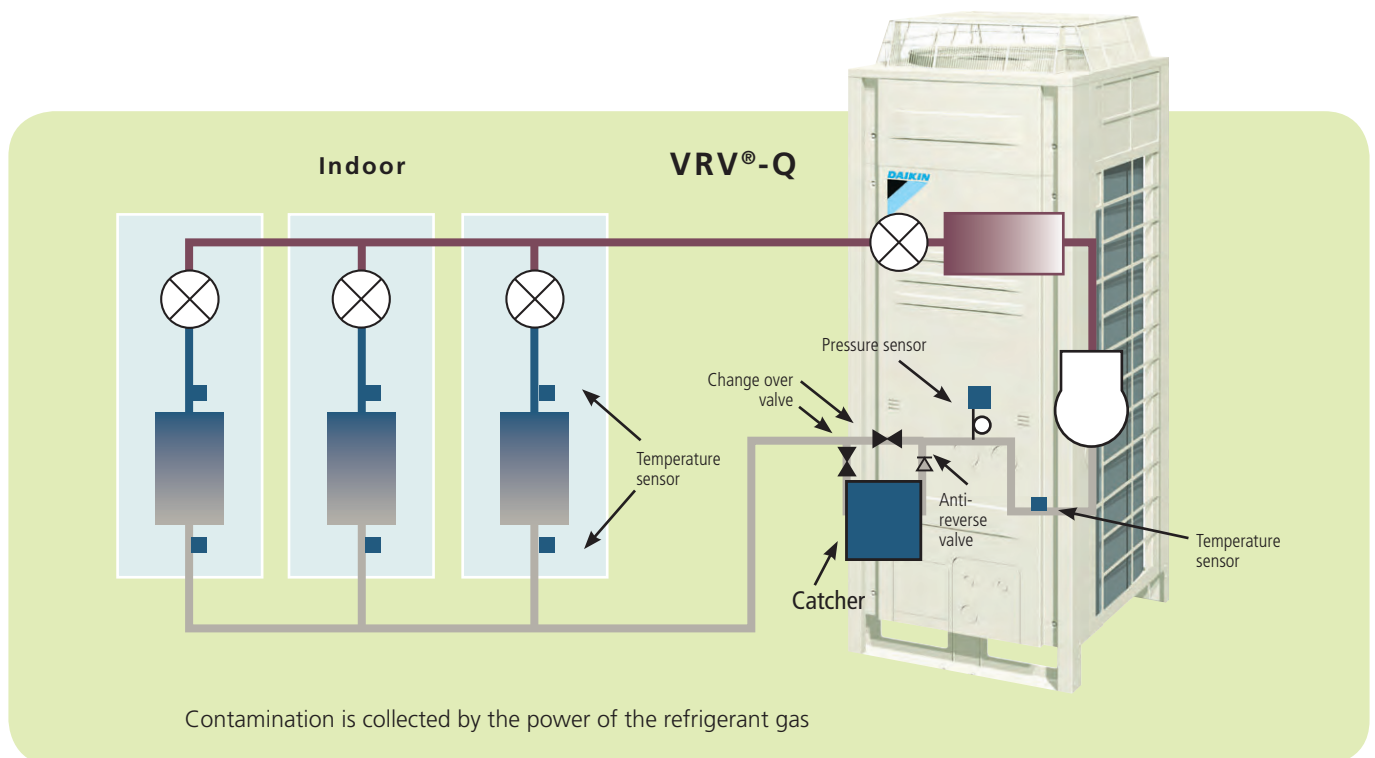


Refrigerant pipe cleaning

When replacing an air conditioning system, the piping is normally replaced as well since traces of old refrigerant and oil mixed with the oil and refrigerant of the new system can cause the equipment to malfunction.

In order to allow re-use of existing R-22 piping with an R-410A system Daikin developed a technology to capture and retain the contamination left in the refrigerant piping. During the charging of the system, R-410A refrigerant starts circulating through the copper piping collecting the contamination left in the refrigerant piping.

The refrigerant including the remaining oil from the R-22 system is filtered in the outdoor unit and the contamination is deposited in the outdoor unit. This process is executed only once and takes about 1 hour (depending on system characteristics). Daikin is the first manufacturer in the industry to develop this combination of automatic charging and refrigerant pipe cleaning function.



Features of VRV[®]-Q

Warranty

Unlike using drop in refrigerants, the VRV[®]-Q condensing unit is provided with a manufacturers warranty, providing the existing pipework condition is deemed suitable for re-use.

Fast installation

It is not necessary to remove the existing piping and even the indoor units can remain (depending on type of indoor unit). The unit automatically charges the refrigerant and cleans the refrigerant piping. This unique Daikin feature makes the installation time even shorter.

Limited and planned-downtime

As the refrigerant piping can be maintained the installation is less intrusive and less time consuming than for a completely new system. Moreover, downtime can be carefully planned: whereas if a problem occurs when not enough reclaimed R-22 is available, a long and unplanned downtime can be the result.

Limited and phased investment cost

It is possible to spread the various stages of replacement over a certain period of time because the indoor units can remain in many cases. The air conditioning replacement therefore, can be incorporated in the general refurbishment schedule of the building and the investment cost can be spread. A further reduction in installation cost can be achieved by maintaining the old refrigerant copper pipe work.

No restrictions on system history

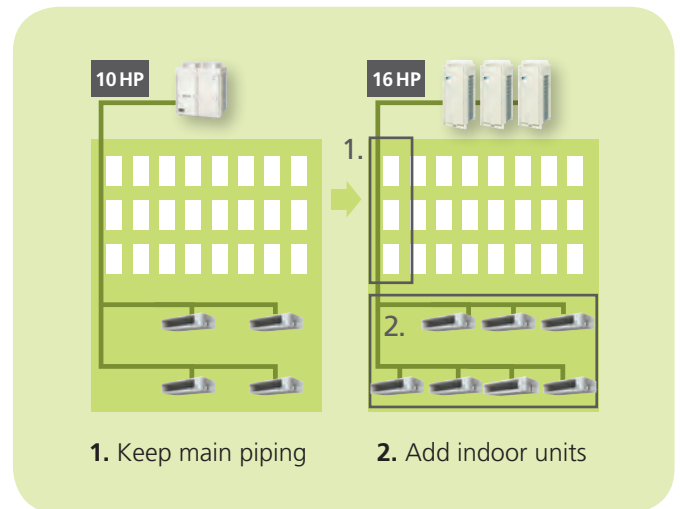
As a result of the combined automatic charging and refrigerant pipe cleaning function, it is possible to ensure a clean piping network.

Environmental awareness

R-410A not only has a zero ozone depletion potential, it is also proven to be more energy efficient than R-22.

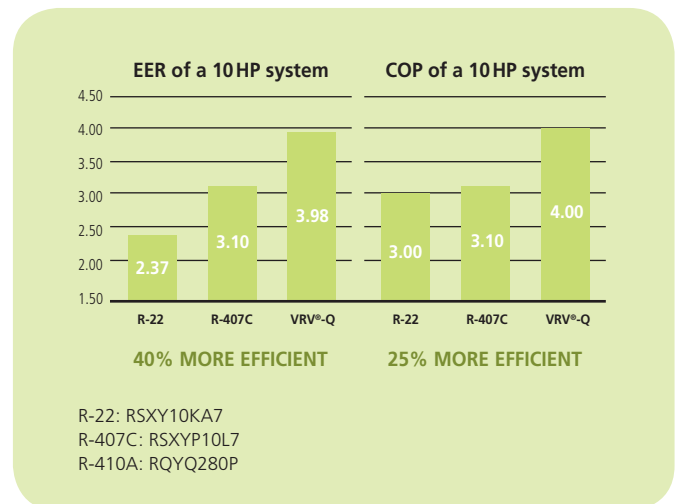
Possibility to increase capacity

Cooling loads often increase subsequent to the initial installation of the air conditioning system. The Replacement VRV[®] (VRV[®]-Q) enables system capacity to be increased without changing the refrigerant piping (depending on system characteristics). For example: It is possible to install a 16 HP Replacement VRV[®] on the refrigerant piping of an R-22 10 HP system.



High efficiency

Upgrading an old R-22 system to a Replacement VRV[®] system will result in increased system efficiency. Efficiency gains of more than 40% can be realised, by virtue of technological developments in heat pump technology and the more efficient R-410A refrigerant. Increased energy efficiency equals lower energy consumption, subsequent lower energy costs and lower CO₂ emissions.



Specifications

Heat recovery

				RQCEQ-P												
				280	360	460	500	540	636	712	744	816	848			
Outdoor unit modules	RQEQ140P			2		2	1			1	1					
	RQRQ180P				2	1	2	3		2	1	1				
	RQEQ212P								3	1	2	3	4			
Capacity range	HP			10	13	16	18	20	22	24	26	28	30			
Capacity	cooling	nom.	kW	28.0	36.0	45.0	50.0	54.0	63.6	71.2	74.4	81.6	84.8			
	heating	nom.	kW	32.0	40.0	52.0	56.0	60.0	67.2	78.4	80.8	87.2	89.6			
Power input	cooling	nom.	kW	7.04	10.3	12.2	13.9	15.5	21.9	21.2	23.3	27.1	29.2			
	heating	nom.	kW	8.00	10.7	13.4	14.7	16.1	17.7	20.7	21.2	23.1	23.6			
EER	cooling			3.98	3.48	3.77	3.61	3.48	2.90	3.36	3.19	3.01	2.90			
COP	heating			4.00	3.72	3.89	3.80	3.72	3.79	3.80	3.81	3.77	3.79			
Max n° of indoor units to be connected				16	20	26	29	33	36	40	43	47	50			
Indoor index connection	minimum			125	162.5	200	225	250	275	300	325	350	375			
	standard			250	325	400	450	500	550	600	650	700	750			
	maximum			325	422.5	520	585	650	715	780	845	910	975			
Dimensions	unit	height	mm	1680												
		width	mm	635+ 635				635+ 635+ 635				635+ 635+ 635+ 635				
		depth	mm	765												
Weight	kg			175+ 175				175+ 175+175				179+ 179+179	175+175 +175+179	175+175 +179+179	175+179 +179+179	179+179+ 179+179
Sound pressure	cooling	nom.	dB(A)	57	61	61	62	63	64	63	64	65	66			
Fan	type			Propeller												
	air flow rate (nominal at 230V)	cooling	m³/min	95+ 95	110+110	95+ 95 + 110	95+ 110+110	110+ 110+ 110			95+ 110+ 110+ 110			110+ 110+ 110+ 110		
	external static pressure (max.)			Pa	78											
Compressor	motor	type			Hermetically sealed scroll compressor											
Operation range	cooling	min. - max.	°CDB	-5~43												
	heating	min. - max.	°CWB	-20~15.5												
Refrigerant	type			R-410A												
	charge	kg			10.3+ 10.3	10.6+ 10.6	10.3+10.3 +10.6	10.3+10.6 +10.6	10.6+10.6 +10.6	11.2+11.2 +11.2	10.3+10.6 +10.6+11.2	10.3+10.6 +11.2+11.2	10.6+11.2 +11.2+11.2	11.2+11.2 +11.2+11.2		
	control			Electronic expansion valve												
Piping connections	liquid	mm			9.52	12.7			15.9				19.1			
	gas	mm			22.2	25.4		28.6				34.9				
	discharge gas	mm			19.1		22.2				25.4		28.6			
	pressure equaliser tube	mm			-	-	-	-	-	-	-	-	-			
	max. total length			m	300											
	max. length between			OU-IU	120 (actual length)											
level difference			OU-IU	50 (outdoor unit in highest position)												
Power Supply				3~. 400V. 50Hz												

Notes:

Nominal cooling capacities are based on : indoor temperature: 27°CDB, 19°CWB, outdoor temperature: 35°CDB, equivalent refrigerant piping: 7.5m, level difference: 0m.

Nominal heating capacities are based on: indoor temperature: 20°CDB, outdoor temperature: 7°CDB, 6°CWB, equivalent refrigerant piping : 7.5m, level difference : 0m

Accessories

VRV®III-Q - REPLACEMENT VRV® - Heat recovery	RQCEQ280PY1 RQCEQ360PY1	RQCEQ460PY1 RQCEQ500PY1	RQCEQ540PY1 RQCEQ636PY1	RQCEQ712PY1 RQCEQ744PY1 RQCEQ816PY1 RQCEQ848PY1
Fixing box	KJB111A			
Outdoor unit multi connection piping kit	BHFP26P36C	BHFP26P63C		BHFP26P84C

Heating & cooling

				RQYQ-P		RQCYQ-P					
				140	180	280	360	460	500	540	
Outdoor unit modules		RQYQ140P		1		2		2	1		
		RQYQ180P			1		2	1	2	3	
Capacity range		HP		5	6.5	10	13	16	18	20	
Capacity	cooling	nom.	kW	14.0	18.0	28.0	36.0	46.0	50.0	54.0	
	heating	nom.	kW	16.0	20.0	32.0	40.0	52.0	56.0	60.0	
Power input	cooling	nom.	kW	3.52	5.17	7.04	10.3	12.2	13.9	15.5	
	heating	nom.	kW	4.00	5.37	8.00	10.7	13.4	14.7	16.1	
EER	cooling			3.98	3.48	3.98	3.48	3.77	3.61	3.48	
COP	heating			4.00	3.72	4.00	3.72	3.89	3.80	3.72	
Max n° of indoor units to be connected				8	10	16	20	26	29	33	
Indoor index connection	minimum			62.5	81.25	125	162.5	200	225	250	
	standard			125	162.5	250	325	400	450	500	
	maximum			162.5	211.25	325	422.5	520	585	650	
Dimensions	unit	height	mm	1680							
		width	mm	635		635+ 635		635+ 635+ 635			
		depth	mm	765							
Weight			kg	175		175+ 175		175+175+175			
Sound pressure	nom.		dB(A)	54	58	57	61		62	63	
Fan	type			Propeller							
	air flow rate (nominal at 230V)	cooling	m³/min	95	110	95+ 95	110+110	95+ 95+110	95+ 110+110	110+ 110+110	
	external static pressure (max.)			Pa	78						
Compressor	motor	type			Hermetically sealed scroll compressor						
Operation range	cooling	min. - max.	°CDB	-5~43							
	heating	min. - max.	°CWB	-20~15.5							
Refrigerant	type			R-410A							
	charge			kg	11.1		11.1+ 11.1		11.1+11.1+11.1		
	control			Electronic expansion valve							
Piping connections	liquid	mm		9.52		12.7		15.9			
	gas	mm		15.9	19.1	22.2	25.4	28.6			
	max. total length			m	300						
	max. length between			OU-IU	120 (actual length)						
	level difference			OU-IU	50 (outdoor unit in highest position)						
Power Supply				3~, 400V, 50Hz							

Notes:

Nominal cooling capacities are based on : indoor temperature: 27°CDB, 19°CWB, outdoor temperature: 35°CDB, equivalent refrigerant piping: 7.5m, level difference: 0m.
 Nominal heating capacities are based on: indoor temperature: 20°CDB, outdoor temperature: 7°CDB, 6°CWB, equivalent refrigerant piping : 7.5m, level difference : 0m

Accessories

VRV®III-Q - REPLACEMENT VRV® - Heat pump	RQYQ140PY1	RQYQ180PY1	RQCYQ280PY1 RQCYQ360PY1	RQCYQ460PY1 RQCYQ500PY1	RQCYQ540PY1
Cool / Heat selector	KRC19-26A				
Fixing box	KJB111A				
Outdoor unit multi connection piping kit	-	-	BHFP22P36C	BHFP22P54C	

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Daikin units comply with the European regulations that guarantee the safety of the product.

Daikin Europe N.V. participates in the Eurovent Certification Programme for Air Conditioners (AC), Liquid Chilling Packages (LCP) and Fan Coil Units (FC); the certified data of certified models are listed in the Eurovent Directory. Multi units are Eurovent certified for combinations up to 2 indoor units.