

Replacement VRV®

Daikin solution to R-22 phase out



R-410A VRV®-Q outdoor unit

R-410A

R-22 refrigerant piping



R-22 or R-410A indoor

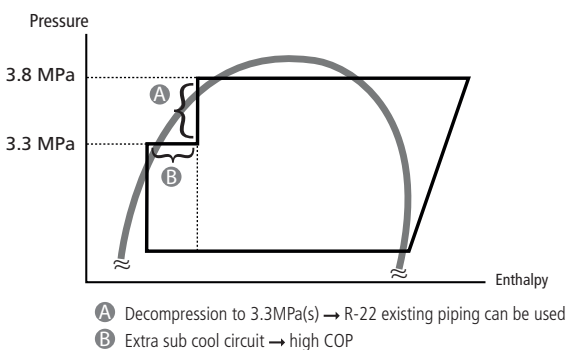
* All units older than the K-Series must be replaced.

* For heat recovery applications, the BS-boxes need to be replaced.

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

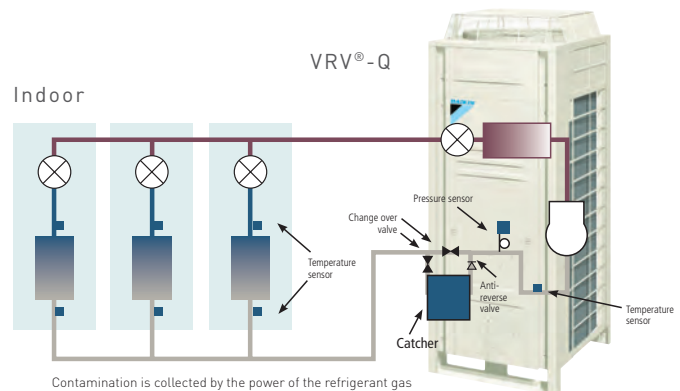
R-22 is a hydrochlorofluorocarbon (HCFC) which was commonly used in air conditioning systems. When R-22 is released into the air, the ultraviolet rays of the sun cause it to decompose and chlorine is released in the stratosphere. Chlorine reacts with ozone, reducing the amount of the ozone. Due to ozone 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.

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 manufacturer's 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

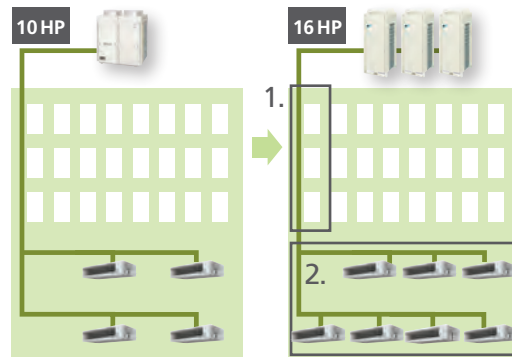
It is possible to spread the various stages of replacement over a certain period of time because the indoor units can remain in many cases. The air conditioning replacement therefore, can be incorporated in the general refurbishment schedule of the building and the investment cost can be spread. A further 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, even when a compressor breakdown has previously occurred.

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.



1. Keep main piping

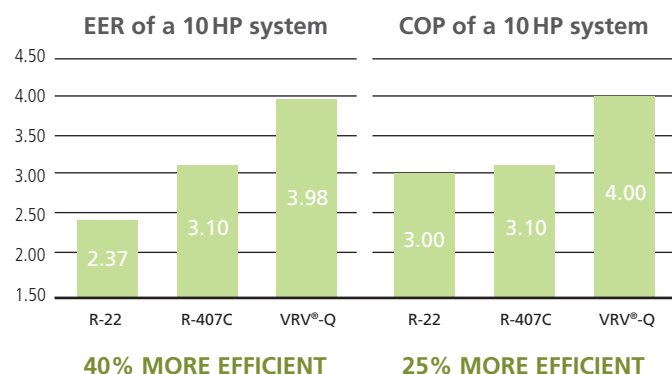
2. Add indoor units

Environmental awareness

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

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.



R-22: RSXY10KA7
 R-407C: RSXP10L7
 R-410A: RQYQ280P

Specifications

HEAT RECOVERY				280	360	460	500	540	636	712	744	816	848	
RQCEQ-P														
Outdoor unit modules		RQEQ140P		2		2	1			1	1			
		RQEQ180P			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	