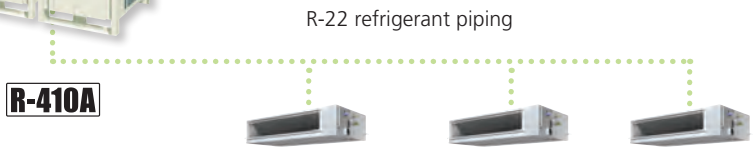
Replacement VRV®

Daikin solution to R-22 phase out

R-410A VRV®-Q
outdoor unit

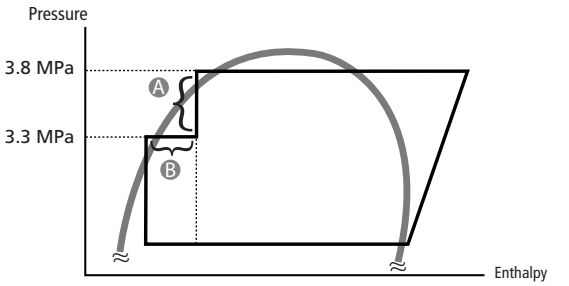


* All units older than the K-Series must be replaced.
* For heat recovery applications, the BS-boxes need to be replaced.

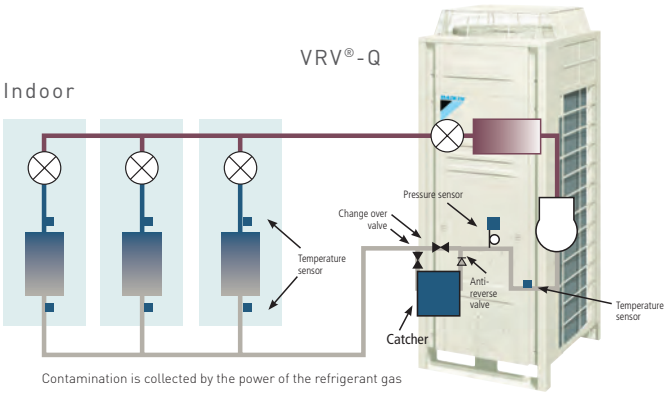
What is R-22 and why is it phased-out?

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



Ⓐ Decompression to 3.3MPa(s) ➞ R-22 existing piping can be used
Ⓑ Extra sub cool circuit ➞ high COP



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

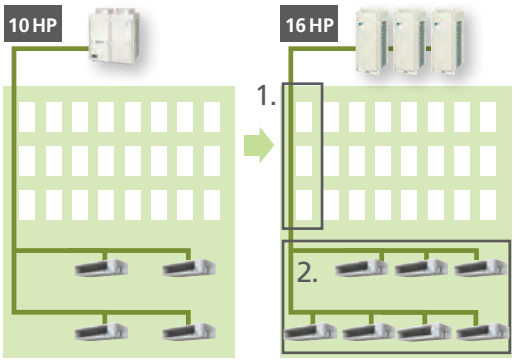
It is possible to spread the various stages of replacement over a certain period of time because the indoor units can remain in many cases. The air conditioning replacement therefore, can be incorporated in the general refurbishment schedule of the building and the investment cost can be spread. A further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



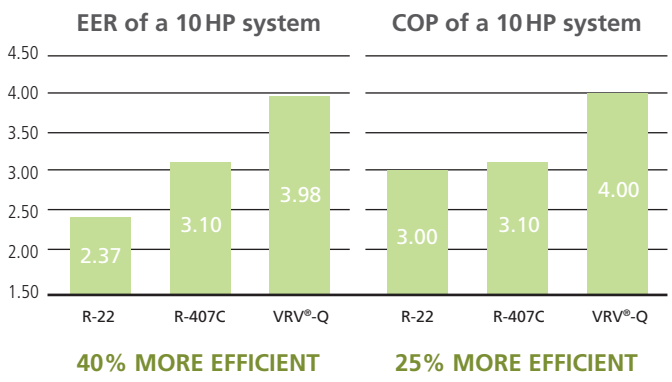
1. Keep main piping **2.** Add indoor units

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 CO_2 emissions.



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

Specifications

HEAT RECOVERY

RQCEQ-P				280	360	460	500	540	636	712	744	816	848
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.	dBA	57	61	61	62	63	64	63	64	65	66
Fan	type			Propeller									
	air flow rate (nominal at 230V)	cooling	m^3/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 equiliser tube		mm	-	-	-	-	-	-	-	-	-	-
	max. total length		m	300									
	max. length between	OU-IU	m	120 (actual length)									
	level difference	OU-IU	m	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

HEAT PUMP

Outdoor system					RQYQ140P	*RQYQ8P	*RQYQ10P	*RQYQ12P	*RQYQ14P	*RQYQ16P	*RQYQ18P	*RQYQ20P	*RQYQ22P	*RQYQ24P	*RQYQ26P	*RQYQ28P	*RQYQ30P
System	Outdoor unit module 1				RQYQ140P	RQYQ8P	RQYQ10P	RQYQ12P	RQYQ14P	RQYQ16P	RQYQ8P	RQYQ8P	RQYQ10P	RQYQ12P	RQYQ10P	RQYQ12P	RQYQ14P
	Outdoor unit module 2				-	-	-	-	-	-	RQYQ10P	RQYQ12P	RQYQ12P	RQYQ12P	RQYQ16P	RQYQ16P	RQYQ16P
Capacity range				HP	5	8	10	12	14	16	18	20	22	24	26	28	30
Cooling capacity	Nom.			kW	14.0	22.4	28	33.5	40	45	50.4	55.9	61.5	67	73	78.5	85
Heating capacity	Nom.			kW	16.0	25	31.5	37.5	45	50	56.5	62.5	69	75	81.5	87.5	95
Power input - 50Hz	Cooling	Nom.		kW	3.36	5.24	7.64	10.10	11.6	13.6	12.9	15.4	17.8	20.2	21.3	23.7	25.2
	Heating	Nom.		kW	3.91	6.42	8.59	10.20	12.2	13.6	15.1	16.7	18.8	20.4	22.2	23.8	25.8
EER					4.17	4.27	3.66	3.32	3.45	3.31	3.91	3.63	3.46	3.32	3.43	3.31	3.37
COP					4.09	3.89	3.67	3.68	3.69	3.68	3.74	3.74	3.67	3.68	3.67	3.68	3.68
Maximum number of connectable indoor units					10	17	21	26	30	34	39	43	47	52	56	60	64
Dimensions	Unit	HeightxWidthxDepth		mm	1,680x635 x765	1,680x930x765			1,680x1,240x765		-						
Weight	Unit			kg	175	230	284		381		-						
Sound pressure level	Cooling	Nom.		dBA	54	57	58	60			61	62	63				
Operation range	Cooling	Min.~Max.		°CDB	-5~43	-5~43											
	Heating	Min.~Max.		°CWB	-20~16	-20~15.5											
Refrigerant	Type				R-410A	R-410A											
Piping connections	Liquid	OD		mm	9.5	9.5		12.7			15.9				19.1		
	Gas	OD		mm	15.9	19.1	22.2	28.6						34.9			
	Piping length	Max.	OU - IU	m	120	150											
	Total piping length	System	Actual	m	300	300											
	Level difference	OU - IU		m	50/40	50 (Outdoor unit in highest position)/ 40 (Indoor unit in highest position)											
		IU - IU	Max.	m	15	15											
Power supply	Phase / Frequency / Voltage			Hz / V	3~ / 50 / 400	3~ / 50 / 400											

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

HEAT PUMP

Outdoor system					*RQYQ32P	*RQYQ34P	*RQYQ36P	*RQYQ38P	*RQYQ40P	*RQYQ42P	*RQYQ44P	*RQYQ46P	*RQYQ48P
System	Outdoor unit module 1				RQYQ16P	RQYQ10P	RQYQ10P	RQYQ10P	RQYQ12P	RQYQ10P	RQYQ12P	RQYQ14P	RQYQ16P
	Outdoor unit module 2				RQYQ16P	RQYQ10P	RQYQ10P	RQYQ12P	RQYQ12P	RQYQ16P	RQYQ16P	RQYQ16P	RQYQ16P
	Outdoor unit module 3				-	RQYQ14P	RQYQ16P	RQYQ16P	RQYQ16P	RQYQ16P	RQYQ16P	RQYQ16P	RQYQ16P
Cooling capacity	Nom.			kW	90	96	101	107	112	118	124	130	135
Heating capacity	Nom.			kW	100	108	113	119	125	132	138	145	150
Power input - 50Hz	Cooling	Nom.		kW	27.2	26.9	28.9	31.4	33.8	34.9	35.3	38.8	40.8
	Heating	Nom.		kW	27.2	29.4	30.8	32.4	34.0	35.8	36.0	39.4	40.8
EER					3.31	3.57	3.49	3.41	3.31	3.38	3.51	3.35	3.31
COP					3.68	3.67	3.67	3.67	3.68	3.69	3.83	3.68	3.68
Maximum number of connectable indoor units					64								
Sound pressure level	Cooling	Nom.		dBA	63	64		65					
Operation range	Cooling	Min.~Max.		°CDB	-5~43								
	Heating	Min.~Max.		°CWB	-20~15.5								
Refrigerant	Type				R-410A								
Piping connections	Liquid	OD		mm	19.1								
	Gas	OD		mm	34.9	41.3							
	Piping length	Max.	OU - IU	m	150								
	Total piping length	System	Actual	m	300								
	Level difference	OU - IU		m	50 (Outdoor unit in highest position)/ 40 (Indoor unit in highest position)								
		IU - IU	Max.	m	15								
Power supply	Phase / Frequency / Voltage			Hz / V	3~ / 50 / 400								

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	RQYQ140P	RQYQ8~16P	RQYQ18~32P	RQYQ34~48P
Cool / Heat selector	KRC19-26A			
Fixing box	KJB111A			
Outdoor unit multi connection piping kit	-	-	BHFP22P100	BHFP22P151