



Replacement VRV®

VRV[®] III-Q

The Daikin Solution to R-22 Phase Out

- » **Cost effective upgrade for R-22 systems**
- » **Automatic cleaning of refrigerant pipe work**
- » **No limitations on system history**
- » **High efficiency**
- » **Possibility to increase capacity**



RQYQ140-180P



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Includes replacement technology



VRV®III-Q - Replacement VRV® The Daikin Solution to R-22 Phase Out

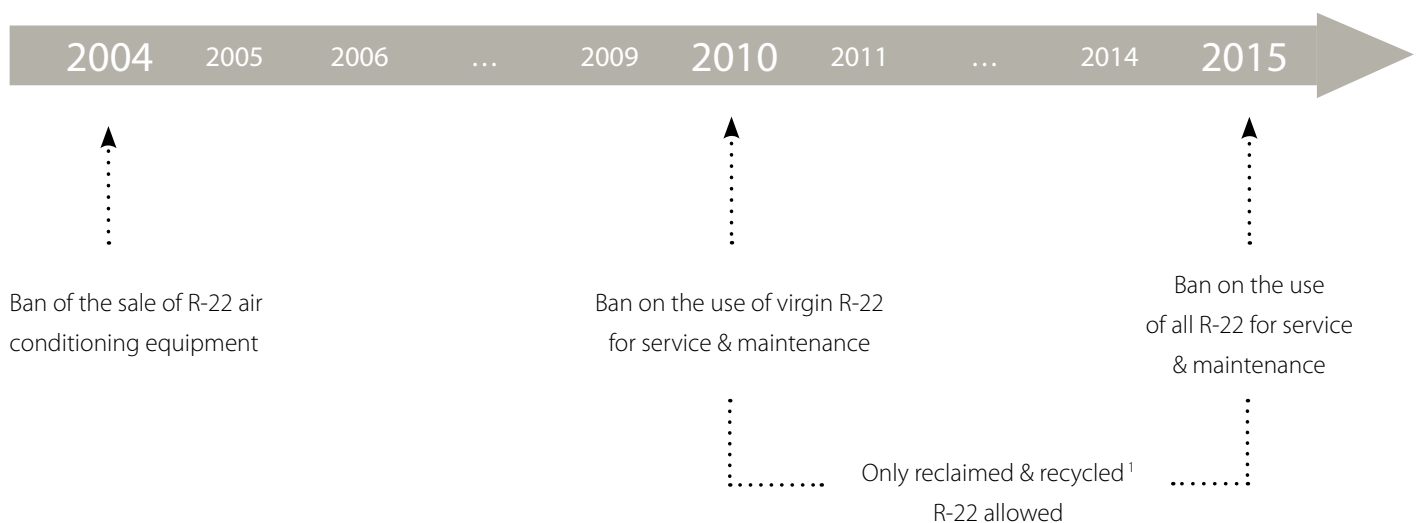
Due to significant developments in heat pump technology, older systems of air conditioning run less efficiently than those available today. Furthermore R-22 will soon be unavailable for servicing these units. To upgrade R-22 systems as cost effective as possible, Daikin replacement VRV® units can be installed using existing pipe-work.

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

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.

When will R-22 be banned in Europe?



¹ Recycled: re-use of R-22 following a basic cleaning process. Recycled R-22 must be re-used by the same company 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)



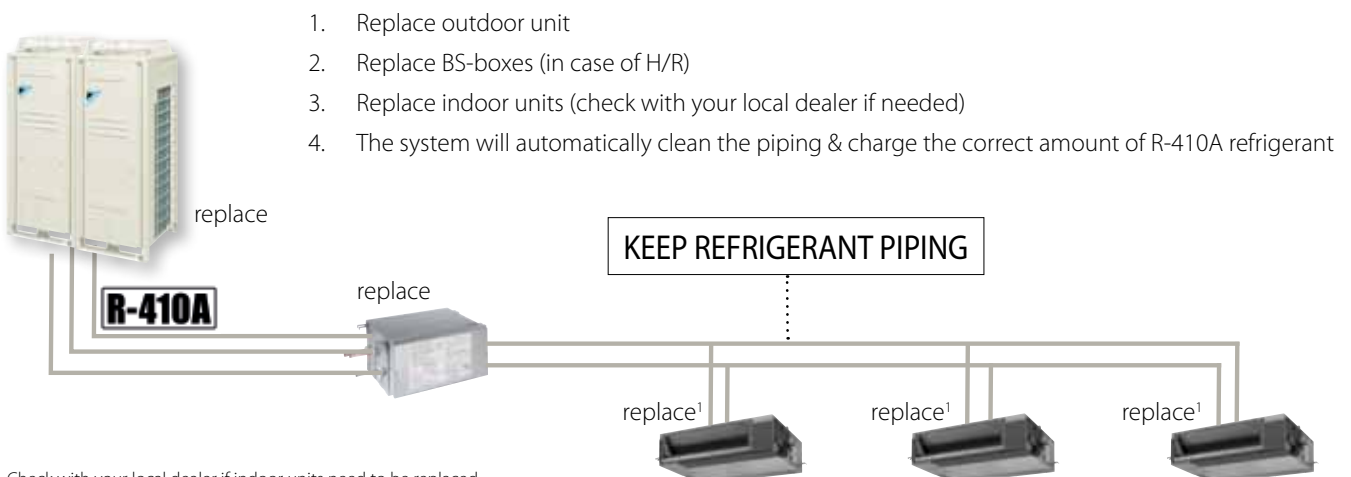
What is the Impact on an R-22 Installation?

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, currently not enough R-22 is reclaimed or recycled to cover the demand, supply shortages and price increases are expected. If there is no reclaimed or recycled 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.

What should be replaced?

Replace your R-22 / R-407C outdoor unit with R-410A technology, but keep your refrigerant piping and in some cases your indoor units¹. In case your indoor units can remain, works only need to be carried out at the outdoor unit and not inside your building (in case of a heat pump installation).



¹ Check with your local dealer if indoor units need to be replaced.



Features of VRV®III-Q

Fast Installation

It is not necessary to remove the existing piping and even the indoor units can remain (depending on type of indoor unit). This means work only has to be carried out at the outdoor unit and not inside your building in case of a heat pump installation. The outdoor unit automatically charges the refrigerant and cleans the refrigerant piping. This unique Daikin feature makes the installation time even shorter.

No Limitations 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.

In this way all correct installed R-22 and R-407C VRV® systems can be replaced.

Limited and Planned-Downtime

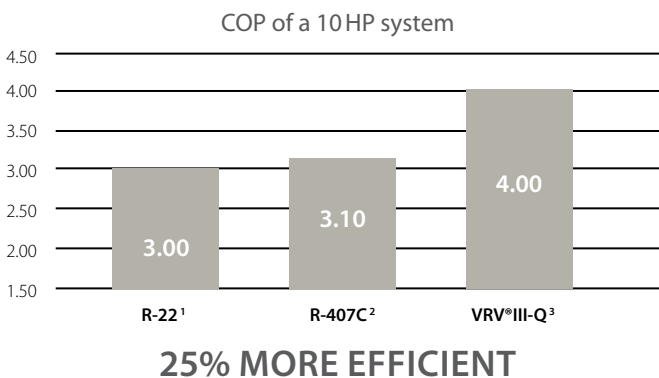
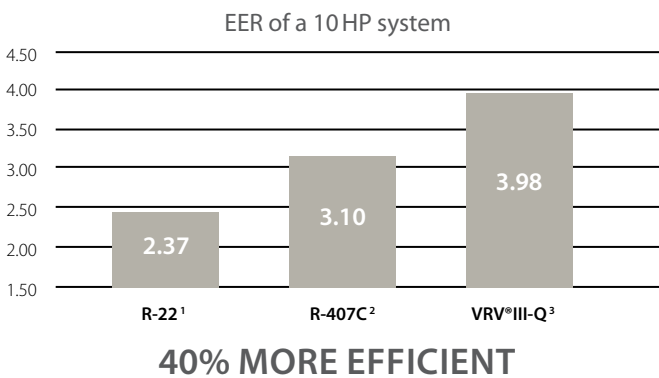
As the refrigerant piping can be maintained the installation is less intrusive and less time consuming than for a completely new system. Moreover, downtime can be carefully planned: whereas if a problem occurs when not enough reclaimed R-22 is available, a long and unplanned downtime can be the result.

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 most 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.

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% in cooling can be realized, by virtue of technological developments in current 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.

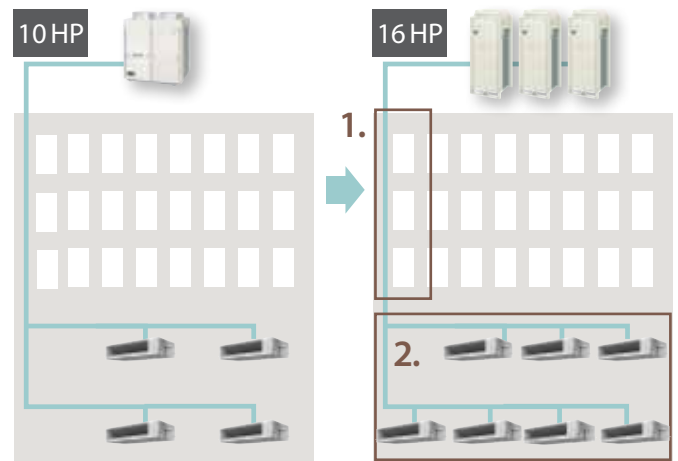


Environmental Awareness

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®III-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. Install indoor units with a higher total capacity

¹ R-22: RSXY10KA7

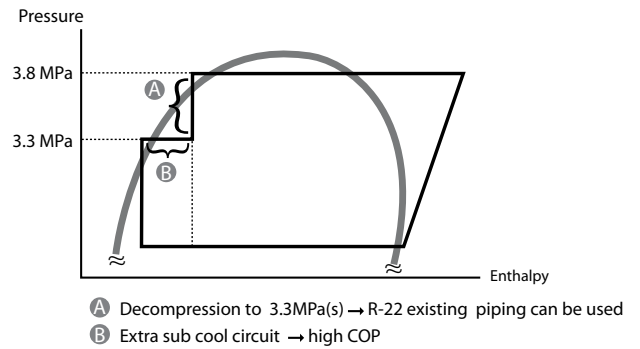
² R-407C: RSXYP10L7

³ R-410A: RQYQ280P

Technologies of VRV®III-Q

Reduced Pressure

As R-22 VRV® systems used to 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®III-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.

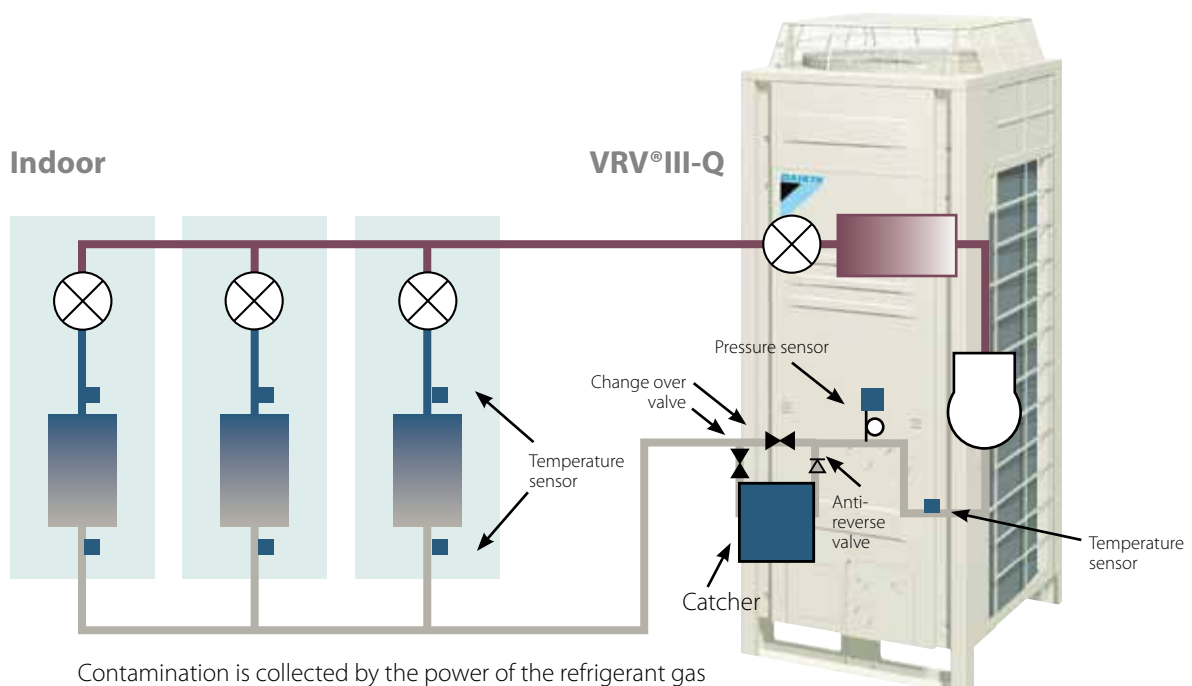


Refrigerant Pipe Cleaning

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.



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
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 equiliser tube		mm	-	-	-	-	-	-	-	-	-	-	
	max. total length			m	300									
	max. length between level difference			OU-IU m	120 (actual length)									
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				RQYP-A						
			140	180	280	360	460	500	540	615	680	730	785	850	
Outdoor unit modules	RQYQ140P		1		2		2	1							
	RQYQ180P			1		2	1	2	3						
	RQYP280A									1	1	1			
	RQYP335A									1			1		
	RQYP400A										1			1	
	RQYP450A											1	1	1	
Capacity range			HP	5	6.5	10	13	16	18	20	22	24	26	28	30
Capacity	cooling	nom.	kW	14.0	18.0	28.0	36.0	46.0	50.0	54.0	61.5	68.0	73.0	78.5	85.0
	heating	nom.	kW	16.0	20.0	32.0	40.0	52.0	56.0	60.0	69.0	76.5	81.5	87.5	95.0
Power input	cooling	nom.	kW	3.52	5.17	7.04	10.3	12.2	13.9	15.5	17.7	19.2	21.2	23.7	25.2
	heating	nom.	kW	4.00	5.37	8.00	10.7	13.4	14.7	16.1	18.8	20.8	22.2	23.8	25.8
EER	cooling			3.98	3.48	3.98	3.48	3.77	3.61	3.48	3.47	3.54	3.44	3.31	3.37
COP	heating			4.00	3.72	4.00	3.72	3.89	3.80	3.72	3.67	3.68	3.67	3.68	3.68
Max n° of indoor units to be connected				8	10	16	20	26	29	33	36	40	43	46	48
Indoor index connection	minimum			62.5	81,25	125	162,5	200	225	250	275	300	325	350	375
	standard			125	162,5	250	325	400	450	500	550	600	650	700	750
	maximum			162.5	211,25	325	422,5	520	585	650	715	780	845	910	975
Dimensions	unit	height	mm	1680											
		width	mm	635		635+ 635		635+ 635+ 635			930+ 930		930+1,240		1,240+1,240
		depth	mm	765											
Weight		nom.	kg	175	175	175+175		175+175+175			292+292		292+384		384+384
Sound pressure		nom.	dBa	54	58	57	61		62	63	62		63		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	185+200	185+233	185+233	200+233	233+233
	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 +11.1			20.9+19.5	27.1+19.5	27.4+19.5	27.4+20.9	27.4+27.1
	control			Electronic expansion valve											
Piping connections	liquid		mm	9.52		12.7		15.9					19.1		
	gas		mm	15.9	19.1	22.2	25.4	28.6					31.8		
	max. total length		m	300											
	max. length between level difference		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 PUMP	RQYQ140PY1	RQYQ180PY1	RQCYQ280PY1 RQCYQ360PY1	RQCYQ460PY1 RQCYQ500PY1	RQCYQ540PY1
Cool / Heat selector	KRC19-26A				
Fixing box	KJB111A				
Outdoor unit multi connection piping kit	-	-	BHFP22P36C	BHFP22P54C	



Daikin's unique position as a manufacturer of air conditioning equipment, compressors and refrigerants has led to its close involvement in environmental issues. For several years Daikin has had the intention to become a leader in the provision of products that have limited impact on the environment. This challenge demands the eco design and development of a wide range of products and an energy management system, resulting in energy conservation and a reduction of waste.

VRV[®] products are not within the scope of the Eurovent certification programme.



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