



# Product Up-Date

Subject: **TOSHIBA** VRF Replacement Technology

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**TOSHIBA's** SHRMi and SMMSi VRF systems can now be used as R22/R407c replacement technology.

R22 (HCFC) was commonly used in air conditioning production up to 2004, on 1st January 2015 R22 equipment will become none serviceable, resulting in systems having to be replaced with a more Ozone friendly refrigerant system.

R410a (HFC) is more environmentally friendly and has a zero Ozone Depleting

## Key Benefits.

- ◇ **Reduced installation costs.**
- ◇ **Minimal disruption.**
- ◇ **Cost effective upgrade.**
- ◇ **Lower energy consumption.**
- ◇ **Chance to increase or decrease system capacity.**
- ◇ **Smaller footprint compared to older R22 systems.**
- ◇ **Modular installation.**
- ◇ **Reduces install/labour time.**
- ◇ **High Efficiency—Upgrading older systems to a SHRMi or SMMSi system can result in increased system efficiency of more than 60% in cooling. This is achieved through innovative Toshiba compressor technology developments.**



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## Criteria for VRF replacement technology

The existing system is operational and able to operate in cooling to facilitate pump down. **Non-operational equipment is excluded and cannot be utilised.**

The existing refrigerant pipe work must **NOT** have been left disconnected and open to the atmosphere.

The existing refrigerant pipe work must **NOT** be contaminated and must be in good mechanical condition.

The existing refrigerant pipe work and any refrigerant joints and branch pipes must comply with current “F-GAS” regulations and be fit for purpose.

If this is not possible to confirm, then new joints as recommended for the SHRMi & SMMSi should be installed.

The pipe work and branch/pipe joints must pass a pressure test equivalent to 37bar.

Existing R22 vertical refrigerant pipe work can be reused on the New SHRMi & SMMSi VRF systems only. **Horizontal pipe work must be removed.**

The replacement system must be designed to the remaining vertical refrigerant pipe sizes.

The existing power supply must be checked to ensure it is correctly rated.



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## Procedures for installing VRF replacement technology

1. Run the existing equipment in cool mode for more than 30 minutes.
2. Close service valves and pump refrigerant into condenser, if pump down is not an option then recover refrigerant.
3. Only vertical pipe work can be reused. All horizontal pipe work must be replaced.
4. Remove any existing oil traps and aftermarket driers (permanently).
5. Purge pipe work with oxygen free nitrogen (1bar - 15psig). Check any emerging oil is clean.
6. Flush all the vertical pipe work with an appropriate solvent flushing solution/product.
7. Connect new horizontal refrigerant pipe work in accordance to the manufacturer's guidelines and pipe work schematics designed for the system.
8. Connect the new indoor and outdoor units to the system.
9. Leak test following F-Gas regulations.
10. Triple-evacuate the system prior to commissioning achieving a minimum 4Torr (4000 Micron) for each vacuum. The final vacuum must be maintained for at least 30 minutes.
11. Calculate the additional refrigerant charge using the SHRMi or SMMSi additional refrigerant charging tables in accordance to the liquid pipe sizes within the system.
12. The TCC transmission link (U1 & U2) must be renewed using 1.5mm 2 core screened cable.
13. Operate the system in the cooling mode at first start up
14. Remove gauges and ensure that system service valves are free of leaks.
15. Toshiba commissioning sheets must be completed and returned to the Toshiba technical team for checking. Once checked a confirmation will be sent stating that the warranty is in place, without this process warranty would be invalid.



### SHRMi Pipe Sizing Chart

Main pipe size (inch)		Outdoor capacity (HP)																	
Gas	Liquid	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
3/4"	3/8"																		
	1/2"	X																	
7/8"	3/8"																		
	1/2"	X	X																
1 1/8"	1/2"		X*	X															
	5/8"		X*	X*	X														
	3/4"				X*	X	X	X											
1 1/4"	5/8"				X														
	3/4"				X*	X	X	X	X	X									
1 3/8"	7/8"					X*	X*	X*											
	3/4"							X	X	X									
1 1/2"	7/8"							X*	X*	X	X	X	X	X					
	3/4"							X	X	X	X	X	X	X					
	7/8"							X*	X*							X	X	X	X
1 5/8"	7/8"															X	X	X	X

X\* = Height between Outdoor unit and Indoor Unit <30m, Maximum Diversity of 110%

X = Height between Outdoor unit and Indoor Unit <50m

Total Capacity Code of all Outdoor Units	Discharge pipe size
8hp to below 12hp	3/4"
12hp to below 14hp	3/4"
14hp to below 16hp	7/8"
16hp to below 22hp	7/8"
22hp to below 26hp	1 1/8"
26hp to below 36hp	1 1/8"
36hp or more	1 3/8"





### SMMSi Pipe Sizing Chart

Main pipe size (inch)		Outdoor capacity (HP)																				
Gas	Liquid	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
3/4"	3/8"																					
	1/2"	X																				
7/8"	3/8"																					
	1/2"	X	X																			
1 1/8"	1/2"		X*	X																		
	5/8"		X*	X	X	X	X	X														
	3/4"																					
1 1/4"	5/8"				X	X	X	X														
	3/4"						X	X	X	X	X	X	X	X	X							
1 3/8"	5/8"							X														
	3/4"							X	X	X	X	X	X	X	X							
	7/8"									X	X	X	X	X	X							
1 1/2"	5/8"																					
	3/4"								X	X	X	X	X	X	X							
	7/8"										X	X	X	X	X	X	X	X	X	X	X	X
1 5/8"	7/8"															X	X	X	X	X	X	X

X\* = Height between Outdoor unit and Indoor Unit <30m, Maximum Diversity of 110%

X = Height between Outdoor unit and Indoor Unit <50m

The ECA scheme is a key part of the Government's programme to manage climate change and is designed to encourage businesses to invest in energy saving equipment.

It provides businesses with enhanced tax relief for investment in equipment that meets published energy saving criteria.

For more information, please refer to Toshiba's website

[www.toshiba-aircon.co.uk](http://www.toshiba-aircon.co.uk)



***If you require more information in respect to this update, contact Cool Designs Technical Service or your Cool Designs sales contact.***