

Number	008 Rev E
Subject	Using ES and IVX condensing units with existing pipe-work
Date	June 2008 (Revised October 2014)

This document has been prepared by Logicool Air Conditioning Distribution Limited and is based on existing Hitachi recommendations for using pipe sizes different to those advertised, and standard industry guidelines for retrofits.



New Hitachi ES, IVX-C and IVX-P Utopia condensing units launched 2013 with improved SEER's and greater system flexibility can also be used with different pipe sizes to those advertised.

The Utopia ES & new IVX Premium and IVX Comfort are compatible with those installations that have been operating with R22 or R407C. This allows installation of the Utopia ES, IVX Comfort and Premium Outdoor Units, which operate with R410A, without having to change pipework even when the thickness is less than the R410A piping specifications.

The existing pipe-work needs to be clean, devoid of any contaminants and have traces of mineral oil lower than 3% of previous system capacity. Ensure that the system is run in test cooling for one hour to recover as much oil from the indoor unit and pipework as possible. It is also advised that the system is pressure tested to manufacturers' recommendations and a triple vacuum.

If utilising existing pipe-work, the recommendations and notes below should be observed. It is advised that **Utopia (ES), IVX-C (Comfort) and IVX-P (Premium)** models can be used when re-using installed pipe.

Where gas pipes of 3/4 or 7/8 soft drawn copper are used an additional dipswitch setting via DSW2 on the condensing unit is required, by setting pin 4 ON. With this setting, the control system adjusts the pressure in order to avoid damage to the existing pipe for R22, in case that its thickness is less than the R410A piping specifications. Otherwise, no settings are necessary (factory setting DSW2 pin 4 OFF)



Hitachi Utopia ES Models

Model	Liquid	1/4"				3/8"					1/2"				5/8"		
	Gas	3/8"	1/2"	5/8"	3/4"	1/2"	5/8"	3/4"	7/8"	1 1/8"	5/8"	3/4"	7/8"	1 1/8"	1 1/8"	7/8"	1 1/8"
RAS 3HVRNS3			30 (1/2)	30 (2)		30 (1)	50										
RAS 4HVRNS3E/ RAS 4HRNS3E				5 (2)	5 (2)	40 (1)	50	50 (4)			30 (3)	30 (3/4)					
RAS (5/6)HVRNS2E/ RAS (5/6)HRNS2E				5 (2)	5 (2)	40 (1)	50	50 (4)			30 (3)	30 (3/4)					
RAS 8HRNSE								30 (1/4)	30 (1)	50		30 (1/3/4)	30 (1/3)	30 (3)			
RAS 10HRNSE										30			30 (1/3)	50 (3)	50 (3)	20 (3)	20 (3)

(1).Reducing gas pipe size will lower cooling capacity due to larger pressure loss in gas piping and narrow operation range.

(2).Reducing liquid pipe size will narrow operation range due to indoor unit relation with expansion valve capacity.

(3).Increasing liquid pipe size will require additional refrigerant charge.

(4).When using Ø19.05 gas pipe (soft. Annealed), please switch ON DSW2-4# (for 3 and 4 HP) or cut jumper JP6 (for 5 to 10 HP) in the Outdoor Unit PCB.

Please note:

- Systems with several indoor units, branch pipes shall be changed to Hitachi-specified models for ES series (R410a).
- Existing outdoor and indoor units for R22 or R407C cannot be used.

Additional Notes:

Install the Renewal kit (mandatory).

2 Maximum piping length 50 m. (If the pipe is longer than 50m, existing pipes can be used if cleaning is performed)

3 The capacity of the new unit must be equivalent at the one installed previously.

4 No corrosion No cracks, No scratches or deformations in existing pipes.

5 Dirt insider the pipes shall not be noticeable.

6 Piping thickness, Flare Nuts, gaskets, etc. shall be compliant products.

7 Flare shall be reprocessed.

8 Piping airtight or vacuuming shall be performed precisely as new piping.

Hitachi IVX-Comfort Models

Model	Liquid	1/4"				3/8"				1/2"			5/8"		
	Gas	3/8"	1/2"	5/8"	3/4"	1/2"	5/8"	3/4"	7/8"	5/8"	3/4"	7/8"	1 1/8"	7/8"	1 1/8"
RAS 3 HVNC			30 (1/2)	30 (2)		30 (1)	50								
RAS 4 H(V)NCE				5 (2)	5 (2)	40 (1)	70	50 (4)		30 (3)	30 (3/4)				
RAS 5 H(V)NCE				5 (2)	5 (2)	40 (1)	75	50 (4)		30 (3)	30 (3/4)				
RAS 6 H(V)NCE				5 (2)	5 (2)	40 (1)	75	50 (4)		30 (3)	30 (3/4)				
RAS 8 HNCE								50 (1/4)	50 (1)		50 (1/3/4)	50 (1/3)		50 (1/3)	
RAS 10 HNCE												50 (1/4)	50	50 (1/3/4)	50 (3)
RAS 12 HNCE												50 (1/4)	50	50 (1/3/4)	50 (3)

(Area in bold is nominal pipe sizing)

- 1) Reducing gas pipe size will lower cooling capacity due to larger pressure loss in gas piping and narrow operation range.
- 2) Reducing liquid pipe size will narrow operation range due to indoor unit relation with expansion valve capacity.
- 3) Increasing liquid pipe size will require additional refrigerant charge.
- 4) When using Ø19.05 gas pipe (soft-drawn), please switch ON DSW2-4 in the Outdoor Unit PCB.
- 5) In case that pipe length exceeds 70m in 8 HP, please use a Ø12.7 pipe as a liquid pipe.

In case of exceeding the recommended number of connected Indoor Units of 8 HP (more than 5 Units), please use a Ø12.7 pipe as a liquid

Additional Notes

- Remove P-Traps from existing pipework.
- Do not re-use existing pipework if there is evidence of previous compressor changes or burnt out driers present.
- Do not use Solvent based cleaners if flushing the system
- For twin and triple systems only the main pipe can be re-used and an official distribution pipe should be installed. Please contact Logicool to check the criteria.

Hitachi IVX-Premium Models

Model	Liquid	1/4"				3/8"				1/2"			5/8"		
	Gas	3/8"	1/2"	5/8"	3/4"	1/2"	5/8"	3/4"	7/8"	5/8"	3/4"	7/8"	1 1/8"	7/8"	1 1/8"
RAS 2 HVNP		15 ⁽¹⁾	50	30		15 ⁽³⁾	15 ⁽³⁾								
RAS 2.5 HVNP			50	30		20 ⁽³⁾	20 ⁽³⁾								
RAS 3 HVNP			15 _(1/2)	15 ₍₂₎		30	50								
RAS 4 H(V)NPE				5 ⁽²⁾	5 ⁽²⁾	40 ⁽¹⁾	75	50 ₍₄₎		30 ₍₃₎	30 _(3/4)				
RAS 5 H(V)NPE				5 ⁽²⁾	5 ⁽²⁾	40 ₍₁₎	75	50 ₍₄₎		30 ₍₃₎	30 _(3/4)				
RAS 6 H(V)NPE				5 ⁽²⁾	5 ⁽²⁾	40 ₍₁₎	75	50 ₍₄₎		30 ₍₃₎	30 _(3/4)				
RAS 8 HNPE								50 _(1/4/6)	50 _(1/6)	70 _(5/7)		50 _(1/3/4)	50 _(1/3)	50 _(1/3)	50 ⁽³⁾
RAS 10 HNPE												50 _(1/4)	50	50 _(1/3/4)	50 ⁽³⁾
RAS 12 HNPE												50 _(1/4)	50	50 _(1/3/4)	50 ⁽³⁾

- 1) Reducing gas pipe size will lower cooling capacity due to larger pressure loss in gas piping and narrow operation range.
- 2) Reducing liquid pipe size will narrow operation range due to indoor unit relation with expansion valve capacity.
- 3) Increasing liquid pipe size will require additional refrigerant charge.
- 4) When using Ø19.05 gas pipe (soft-drawn), please switch ON DSW2-4 in the Outdoor Unit PCB.
- 5) In case that pipe length exceeds 70m in 8 HP, please use a Ø12.7 pipe as a liquid pipe.
- 6) In case of exceeding the recommended number of connected Indoor Units of 8 HP (more than 5 Units), please use a Ø12.7 pipe as a liquid

Additional Notes

- Remove P-Traps from existing pipework.
- Do not re-use existing pipework if there is evidence of previous compressor changes or burnt out driers present.
- Do not use Solvent based cleaners if flushing the system
- For twin and triple systems only the main pipe can be re-used and an official distribution pipe should be installed. Please contact Logicool to check the criteria.