



*Pocket Quick  
Reference For the*  
**TOSHIBA**  
*Light Commercial (RAV)  
Twin / Triple and Quad  
Systems*



**TOSHIBA** air conditioning, offer a wide range of single, twin, triple, and quad (Twin on Twin) configurations within the light commercial digital and super digital range of units.

This guide is to assist installers when carrying out a twin, triple, or quad installation.

Twin, triple and quad systems, give the designer more flexibility, allowing for a greater air distribution covering large rooms or rooms not of a geometric design, it is worth noting that for twin, triple or quad installations, all the indoor units must be within the same conditioned space, for individual rooms these would be better suited to either RAS Multi systems, (Up to 5 indoor units connected to a single outdoor unit) or for larger area's the Mini VRF solution.

Installation uses the same principle for twin, triple or quad, a single insulated liquid line and a single insulated suction line connected to the outdoor unit and run into the area being conditioned.

For twinned systems these pipes are connected to a "twin kit", twin kits comprise of suitably sized "Tee" pieces, one for the liquid line and the second for the suction line, dependant on the size of the equipment installed pipe sizes may reduce from the "Tee" piece to the indoor units, please refer to the following charts for confirmation.

For triple systems the main pipes connect to a "Triple Kit (Manifold)", like for the twin system, pipes may reduce in size to the indoor units.

For "Quad" (Twin on Twin), the main pipes connect to a "quad" kit which comprises of suitably sized "Tee" pieces, the main pipes connect to a "Tee" piece, pipe sizes may reduce, these then connect to a second level of "Tee" pieces which in-turn connect to the indoor units.

Pipe sizes, unit combinations etc are detailed in the following charts and drawings.

Please note, there are some restrictions in respect to orientation of the "Tee" pieces or "Manifold".

### For "Twin Kit" or "Quad Kit"

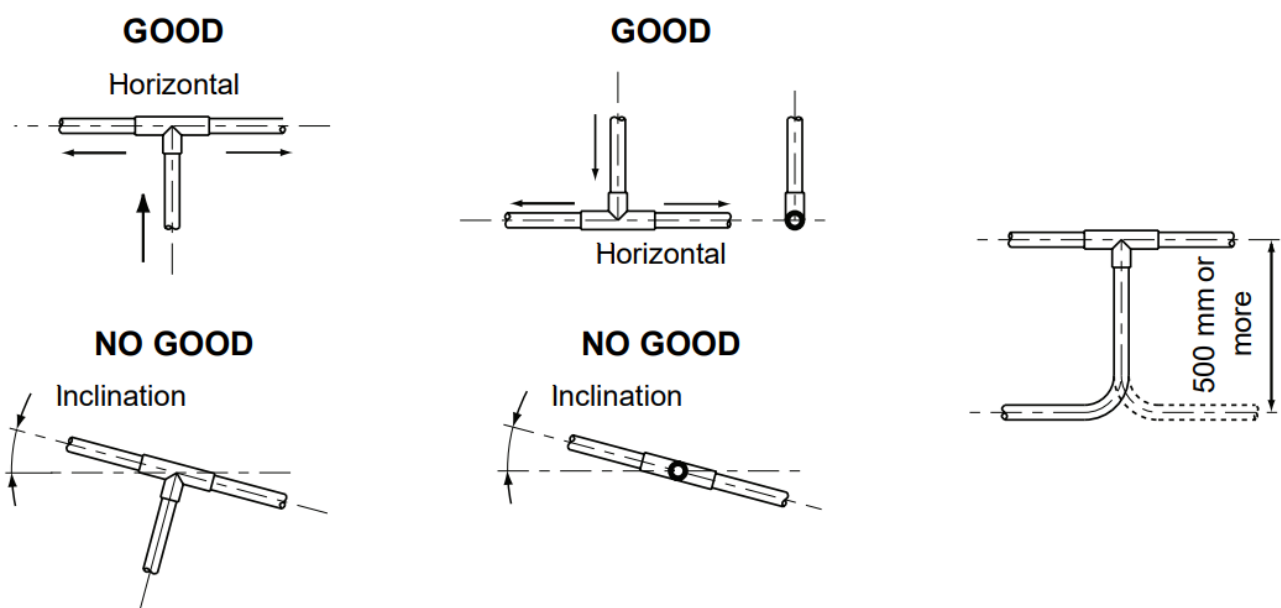


Fig 1

## For "Triple kit"

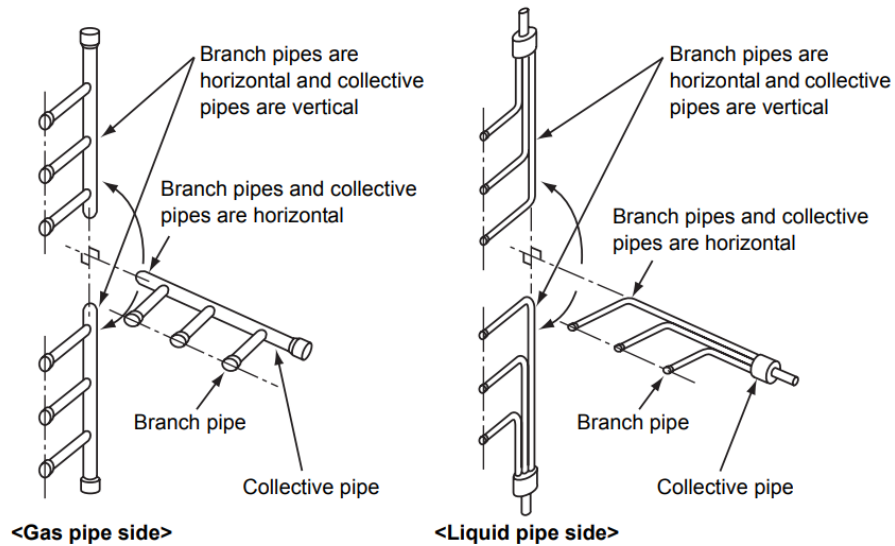


Fig 2

<Gas pipe side>

<Liquid pipe side>

### Restrictions in length of the straight area of the branch pipe (main pipe side)

Provide a straight area of 500 mm or more on the main pipe side of the branch pipe (for both gas pipe and liquid pipe sides).

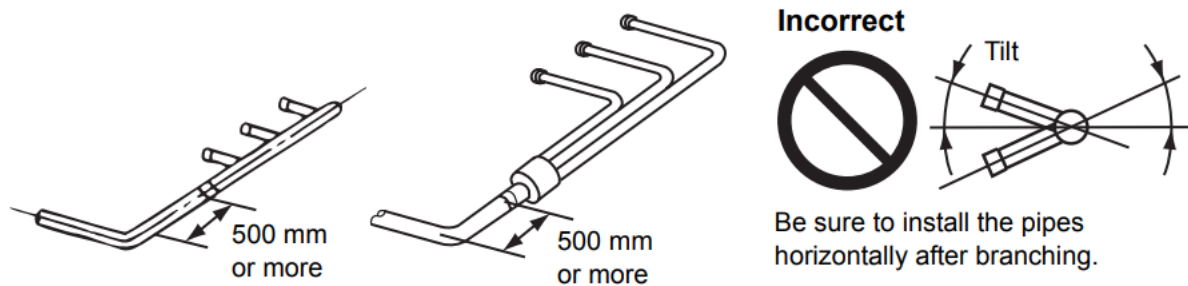


Fig 3

For "Quad kits" – "Twin Kit" repeated three times.

There are also limitation in respect to height difference between the indoor units, the maximum allowable height difference is 0.5m.

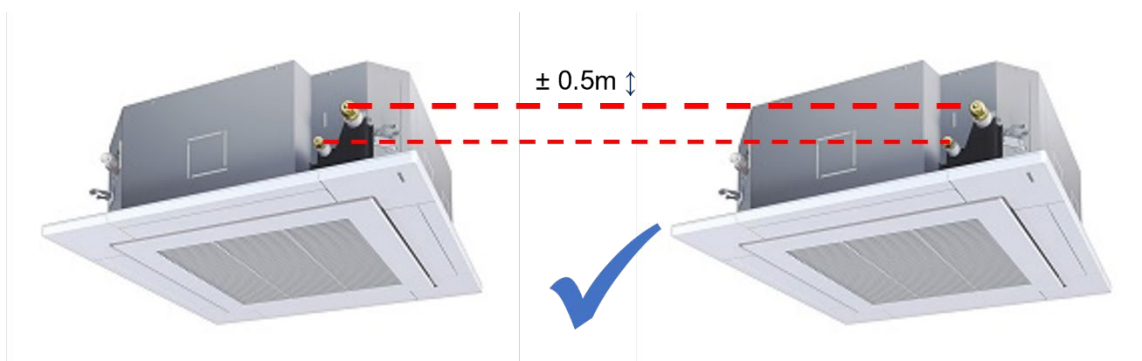


Fig 4

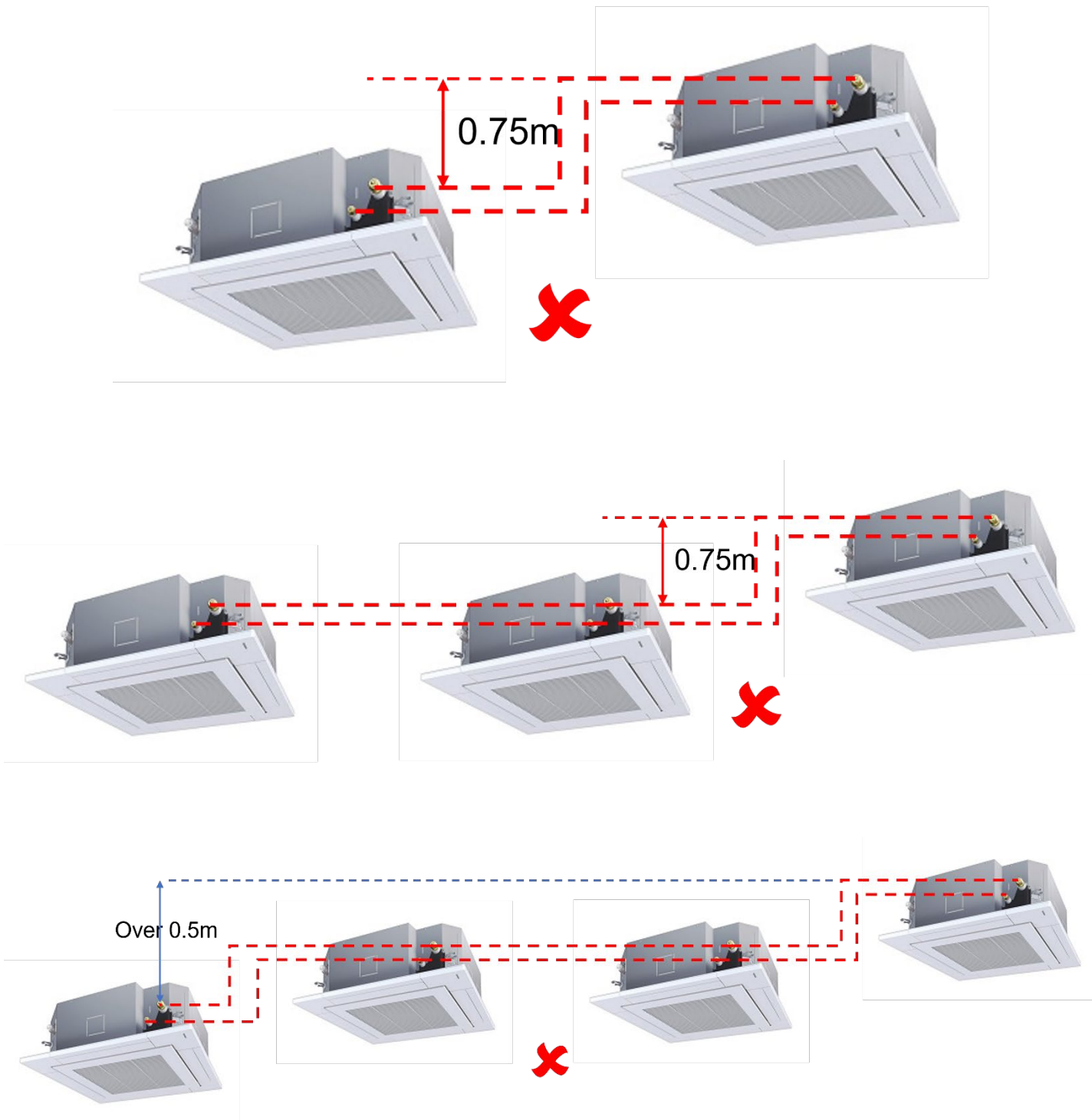
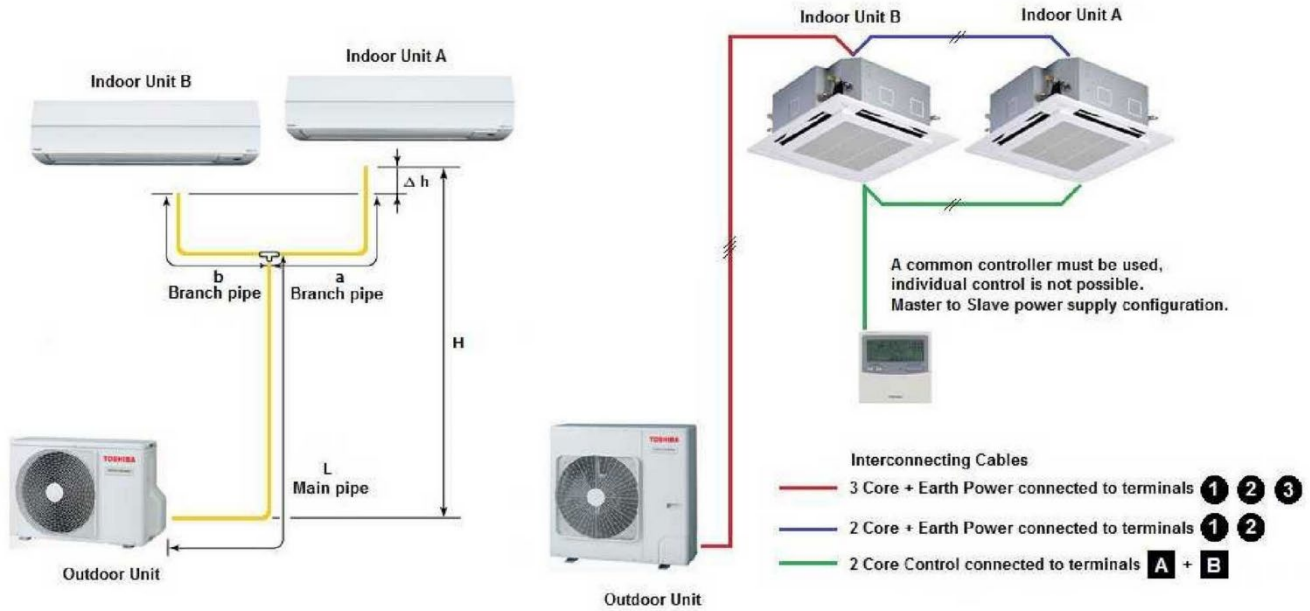


Fig 5

All the indoor units **MUST** be of the same kW duty, (**RAV-RM(HM)901###, units CANNOT BE USED in Twins/Triple/Quad systems.**) different styles of indoor units can be combined, providing the height difference between **ALL** indoor units does not exceed the 0.5m maximum.

In respect to allowable pipe lengths please refer to the following charts, maximum lengths are dependant on the equipment installed.

**Digital Inverter Twin Split System Piping & Wiring Schematics**



Model (RAV-)	Allowable Piping Length			Height Difference (m)		Number of Bent Portions Maximum or Less
	* Total Length (L + a or L + b) Maximum	† Branch Piping a or b to Furthest Indoor Maximum	‡ Subtractive Piping Length a - b or b - a Maximum	Indoor to Outdoor	Indoor to Indoor (Δh)	
GM561ATP-E GM801ATP-E	30	10	5	±30	±0.5	10
GM1104AT(8)P-E GM1404AT(8)P-E	50	15	10	±30	±0.5	10

\* Total length of pipe between furthest indoor and outdoor unit  
 † Maximum distance of Branch pipe from main pipe distributor to furthest indoor unit  
 ‡ Maximum subtractive distance between pipe branches



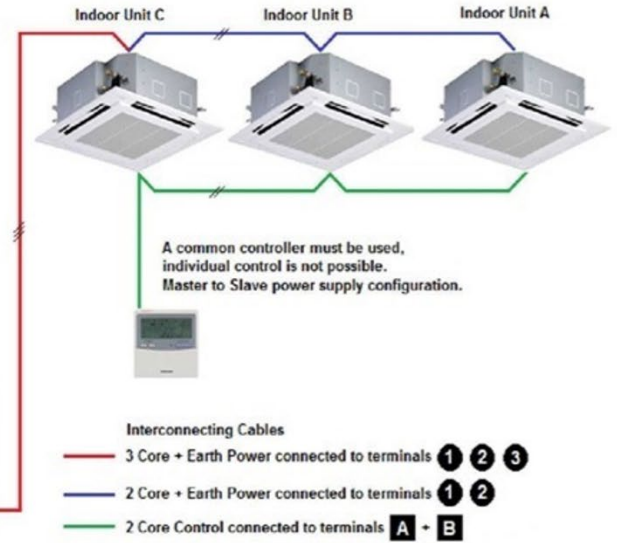
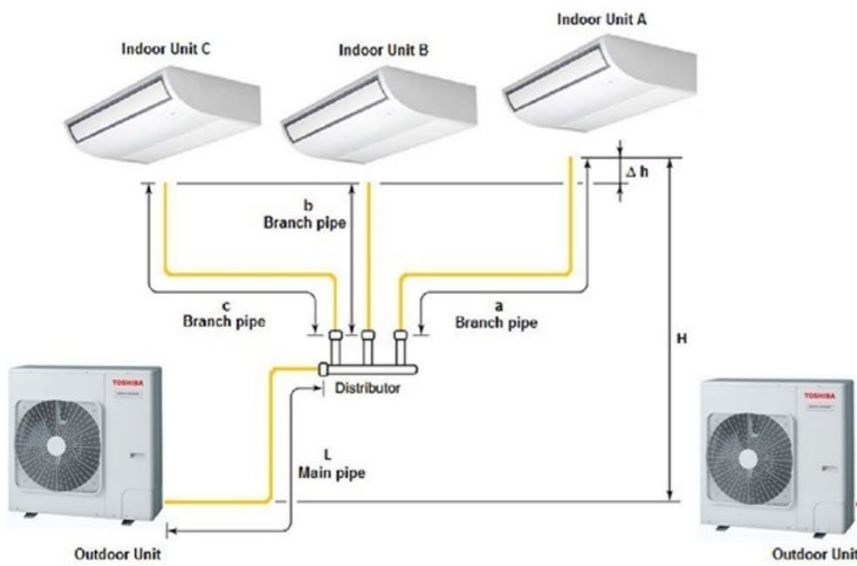
Fig 6

Model (RAV-)	Allowable Piping Length			Height Difference (m)		Number of Bent Portions Maximum or Less
	* Total Length (L + a or L + b) Maximum	† Branch Piping a or b to Furthest Indoor Maximum	‡ Subtractive Piping Length a - b or b - a Maximum	Indoor to Outdoor	Indoor to Indoor (Δh)	
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\* Total length of pipe between furthest indoor and outdoor unit  
 † Maximum distance of Branch pipe from main pipe distributor to furthest indoor unit  
 ‡ Maximum subtractive distance between pipe branches

Fig 7

## Digital Inverter Triple Split System Piping & Wiring Schematics



Model (RAV-)	Allowable Piping Length			Height Difference (m)		Number of Bent Portions Maximum or Less
	* Total Length La + Lb La + Lc Maximum	† Branch Piping a, b or c to Furthest Indoor Maximum	‡ Subtractive Piping Length b - a b - c Maximum	Indoor to Outdoor	Indoor to Indoor (Δh)	
GM1104AT(8)P-E GM1404AT(8)P-E	50	15	10	±30	±0.5	10

\* Total length of pipe between furthest indoor and outdoor unit  
 † Maximum distance of Branch pipe from main pipe distributor to furthest indoor unit  
 ‡ Maximum subtractive distance between pipe branches



Fig 8

Model (RAV-)	Allowable Piping Length			Height Difference (m)		Number of Bent Portions Maximum or Less
	* Total Length La + Lb La + Lc Maximum	† Branch Piping a, b or c to Furthest Indoor Maximum	‡ Subtractive Piping Length b - a b - c Maximum	Indoor to Outdoor	Indoor to Indoor (Δh)	
GM1104AT(8)P-E GM1404AT(8)P-E	50	15	10	±30	±0.5	10

\* Total length of pipe between furthest indoor and outdoor unit  
 † Maximum distance of Branch pipe from main pipe distributor to furthest indoor unit  
 ‡ Maximum subtractive distance between pipe branches

Fig 9

Digital Inverter Quad Split System Piping & Wiring Schematics

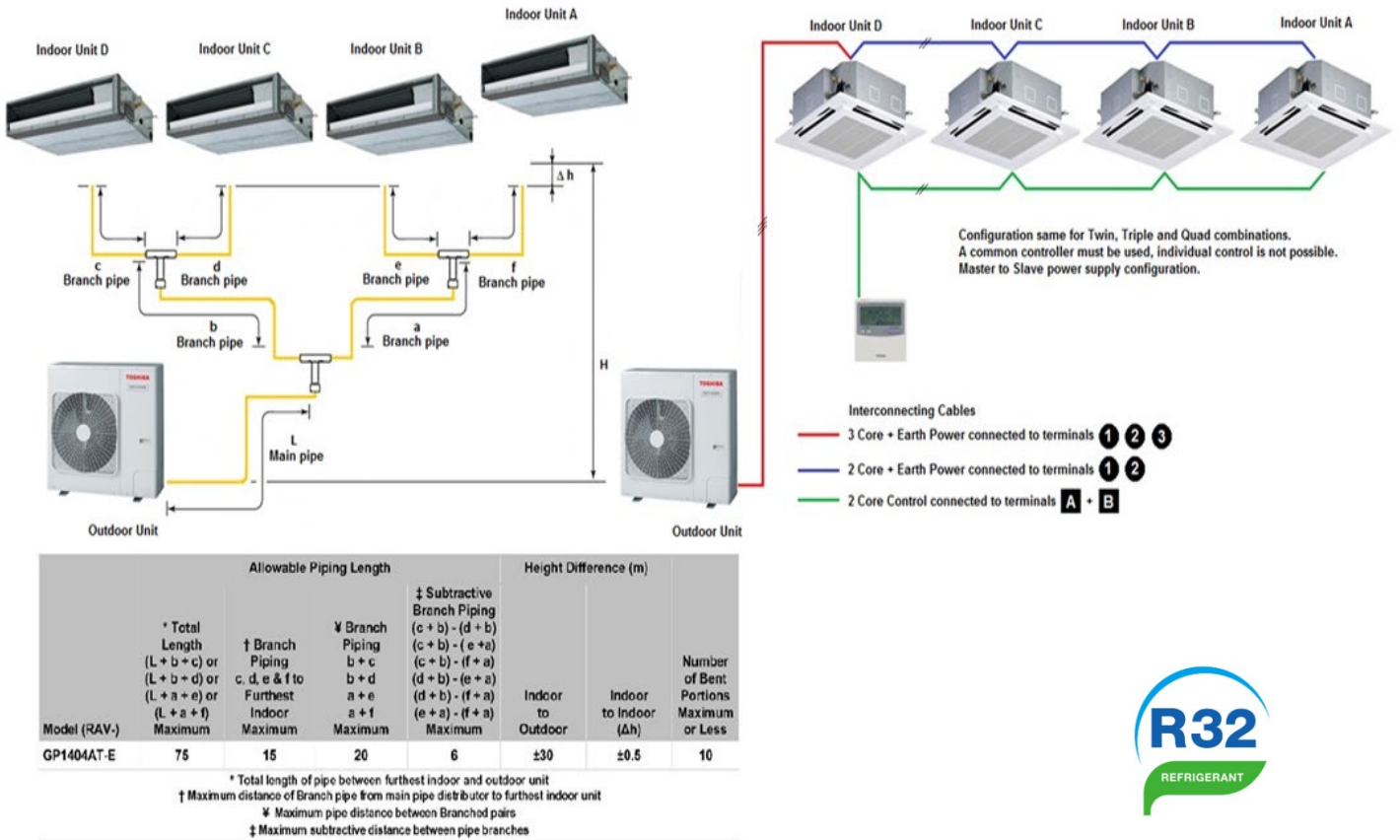


Fig 10

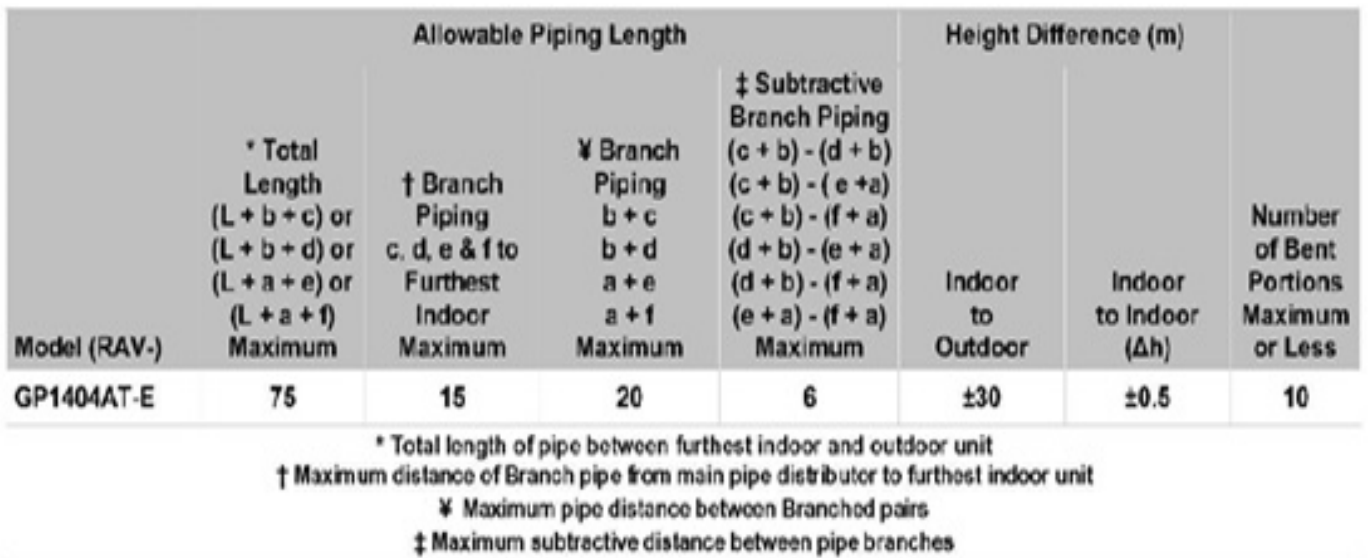


Fig 11

For combinations not listed above, please contact Cool Designs technical for clarification.

## Wiring.

Mains power to outdoor unit, interconnecting cable from outdoor to indoor (Lead Unit - 1), 3 core and earth, (Terminals 1 – 2 – 3 & E), interconnecting cable (Lead -1 to Follower 2,3,4) indoor units, 2 core and earth, (Terminal 1, 2 & E – **NO CONNECTION ON** Terminal 3 follower unit/s).

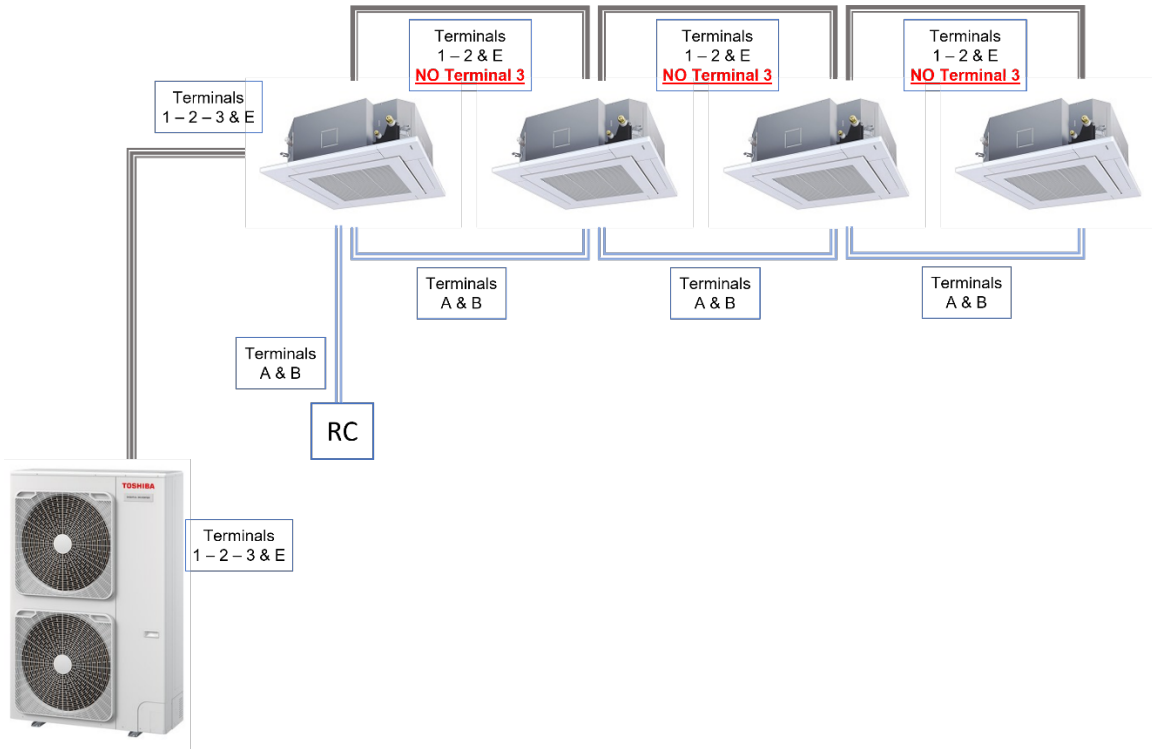


Fig 12

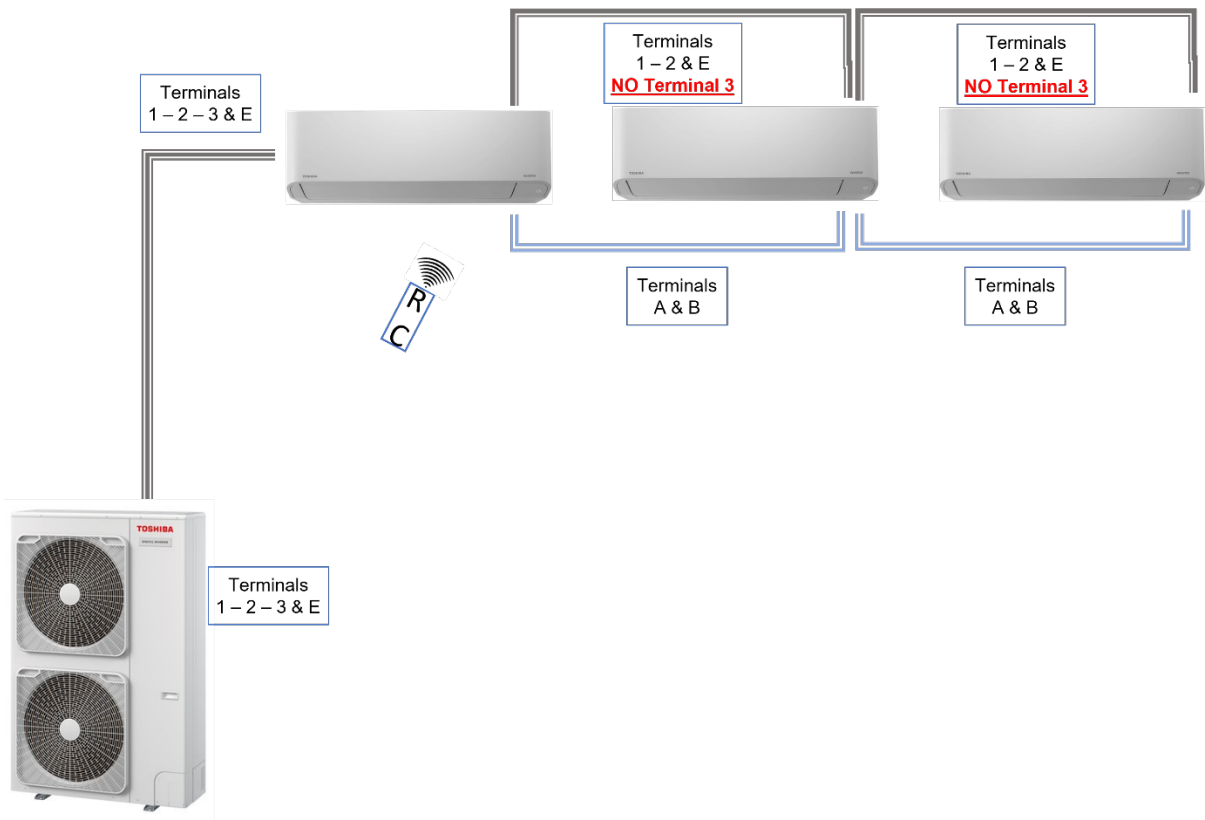


Fig 13



To confirm the addressing of units within a system, enter the "DN Codes" via a hard-wired remote controller, this cannot be done with infra-red or central remotes.

## Accessing DN Codes

\*Accessed via Toshiba hard wired remote controller RBC-AMTU31-E

Press and hold the **TEST (1), SET (2) & CL (3) Buttons** simultaneously for 4 seconds.

The Engineering Menu is accessed at item code 10

1 - Use the **Temperature ▲▼ Buttons** to navigate to item code 12

Data is displayed on the left of the screen.

2 - Use the **Temperature ▲▼ Buttons** to navigate to item code 13

Data is displayed on the left of the screen.

3 - Use the **Temperature ▲▼ Buttons** to navigate to item code 14

Data is displayed on the left of the screen.

4 - Press **UNIT (4)** to scroll through the units in the system.

Repeat steps 1 – 2 – 3 above to review data for units 2 – 3 – 4

5 - Press **TEST (1)** to exit

The display will go blank and then flash SETTING whilst the system reconfigures.

When SETTING stops flashing press **ON/OFF Button** to restart the operation

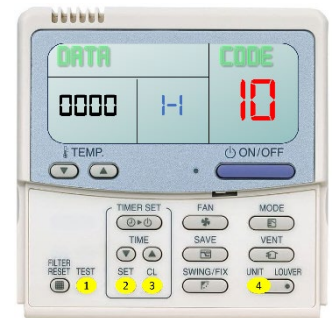


Fig 14

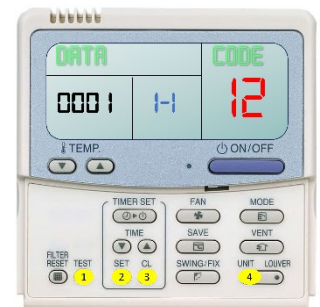


Fig 15

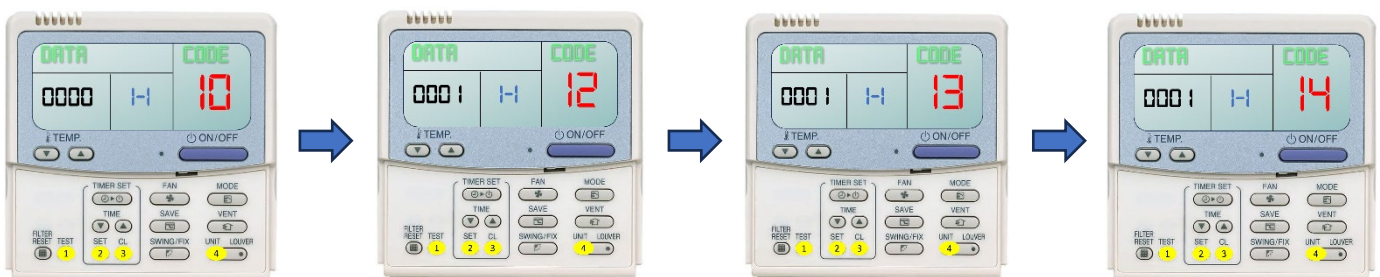


Fig 16

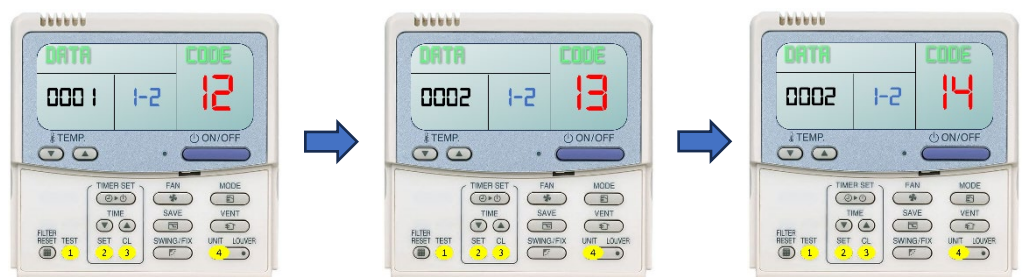


Fig 17

Details to access "DN Codes" from different hard-wired remotes can be found on our web site, <https://cdlweb.info>, pocket guides are available for all hard-wired remotes.

Once "DN Codes" are accessed, record the "Data" for DN Code 12, 13 and 14, for each unit.

DN Code 12 is the System (Outdoor) Address (Between 1 to 28)

DN Code 13 is the Indoor unit Address (Between 1 to 64)

DN Code 14 is the group configuration, 0000 - individual, 0001 - group lead, 0002 - group follower,

**For a twin system the data for the "Lead Unit" should read,**

DN Code 12 – 0001, DN Code 13 – 0001, DN Code 14 – 0001

For the "Follower Unit" press the unit button (4) and scroll through the DN codes 12, 13, 14 the data should read.

DN Code 12 – 0001, DN Code 13 – 0002, DN Code 14 – 0002

**For a triple system the data for the "Lead Unit" should read,**

DN Code 12 – 0001, DN Code 13 – 0001, DN Code 14 – 0001

For the "Follower Unit" press the unit button (4) and scroll through the DN codes 12, 13, 14 the data should read.

DN Code 12 – 0001, DN Code 13 – 0002, DN Code 14 – 0002

For the "Second Follower Unit" press the unit button (4) and scroll through the DN codes 12, 13, 14 the data should read.

DN Code 12 – 0001, DN Code 13 – 0003, DN Code 14 – 0002

**For a quad system the data for the "Lead Unit" should read,**

DN Code 12 – 0001, DN Code 13 – 0001, DN Code 14 – 0001

For the "Follower Unit" press the unit button (4) and scroll through the DN codes 12, 13, 14 the data should read.

DN Code 12 – 0001, DN Code 13 – 0002, DN Code 14 – 0002

For the "Second Follower Unit" press the unit button (4) and scroll through the DN codes 12, 13, 14 the data should read.

DN Code 12 – 0001, DN Code 13 – 0003, DN Code 14 – 0002

For the "Third Follower Unit" press the unit button (4) and scroll through the DN codes 12, 13, 14 the data should read.

DN Code 12 – 0001, DN Code 13 – 0004, DN Code 14 – 0002

On a twin system if the data displayed for the lead unit is  
DN code 12 – 0001, DN code 13 – 0001, DN code 14 – 0001

For the follower unit.

DN code 12 – 0002, DN code 13 – 0001, DN code 14 – 0001

The system has configured incorrectly, powering down and back on will **NOT** correct the error, details how to reconfigure the system are outlined on the page 11.

This could be down to incorrect wiring between the lead and the follower units, wiring between the indoor units should be a 2 core plus earth using terminals, 1 – 2 and E, no connection on terminal 3 of the follower unit/s.

If terminal 3 of the follower unit has a wire connected, power down the system.  
Remove the wire from terminal 3 of the follower unit/s, re apply the power.

The system will now require re-configuring, this is carried out via the hard wired remote.

1 - Access the "DN codes", details available on page 9.

2 - Scroll to "DN code" 12 of the lead unit, using the "Timer UP/DOWN" buttons change the data to "00UN (0099), press "SET (2)".

3 - Press "UNIT (4)" check that the data is still set at "00UN (0099), if not, repeat step 2 above, change the data via the "Timer UP/DOWN" buttons to "00UN (0099), press set (2).

4- For triple/Quad systems, repeat step 3, to cover all indoor units within the system.

5 - Scroll to "DN code" 13 of the lead unit, using the "Timer UP/DOWN" buttons change the data to "00UN (0099), press "SET (2)".

6 - Press "UNIT (4)" check that the data is still set at "00UN (0099), if not, repeat step 5 above, change the data via the "Timer UP/DOWN" buttons to "00UN (0099), press set (2).

7- For triple/Quad systems, repeat step 6, to cover all indoor units within the system.

8 - Scroll to "DN code" 14 of the lead unit, using the "Timer UP/DOWN" buttons change the data to "00UN (0099), press "SET (2)".

9 - Press "UNIT (4)" check that the data is still set at "00UN (0099), if not, repeat step 8 above, change the data via the "Timer UP/DOWN" buttons to "00UN (0099), press set (2).

10 - For triple/Quad systems, repeat step 9, to cover all indoor units within the system.

Once all three "DN Codes, 12,13,14" has been reset to "00UN (0099)" for **ALL** indoor units, press "SET (2)" then "TEST (1)", display will clear and "SETTING" will be displayed, re-configuration can take up to 10 minutes, when re-configuration has been completed "Setting" will no longer be displayed, power up the system via the ON/OFF button.

Press the unit button, the middle display should show, for twin systems 1-1, 1-2 for triple systems (1-1, 1-2, 1-3), for quad systems (1-1, 1-2, 1-3, 1-4).

Details to access "DN Codes" from different hard-wired remotes can be found on our web site, <https://cdlweb.info>, pocket guides are available for all hard-wired remotes.

Contact details:

# Cool Designs Ltd Technical Support

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**Toshiba Air Conditioning**

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**07624 803 017**

**(Type fault code in lower case no spaces)**



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