

MDS Selection Software



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Error Message

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What is MDS Selection Software?

The MDS selection software is a convenient tool to guide user to make the appropriate selection for MDS application. Unlike any conventional system, which consist only a pair of refrigerant piping connecting one indoor with one outdoor, the MDS system offers more with branches and joints connecting multiple indoors to only one outdoors. Besides that, it has the ability to calculate and select the suitable indoors unit base on the cooling / heating requirement. Once user is satisfied with the selection, the software is able to generate a report, consisting on the selected units; type of joints required as well as the length of different pipe diameter used in the system and other information.

Required Information & result

Like any other selection software, a list of information is required before we can start designing the system. Once selection is completed, the software will be able to generate a report of units and accessories requirement.

Required Information

- i) Air-conditioned area
- ii) Type of Indoors models
- iii) Air-conditioned size and operating condition
- iv) Proposed piping layout

Air-Conditioned Area

Before doing any selection, it would be recommended to obtain the architectural drawing from the client. Go through the drawing and identify

- a) Area to condition
- b) Suitable location of outdoors and indoors

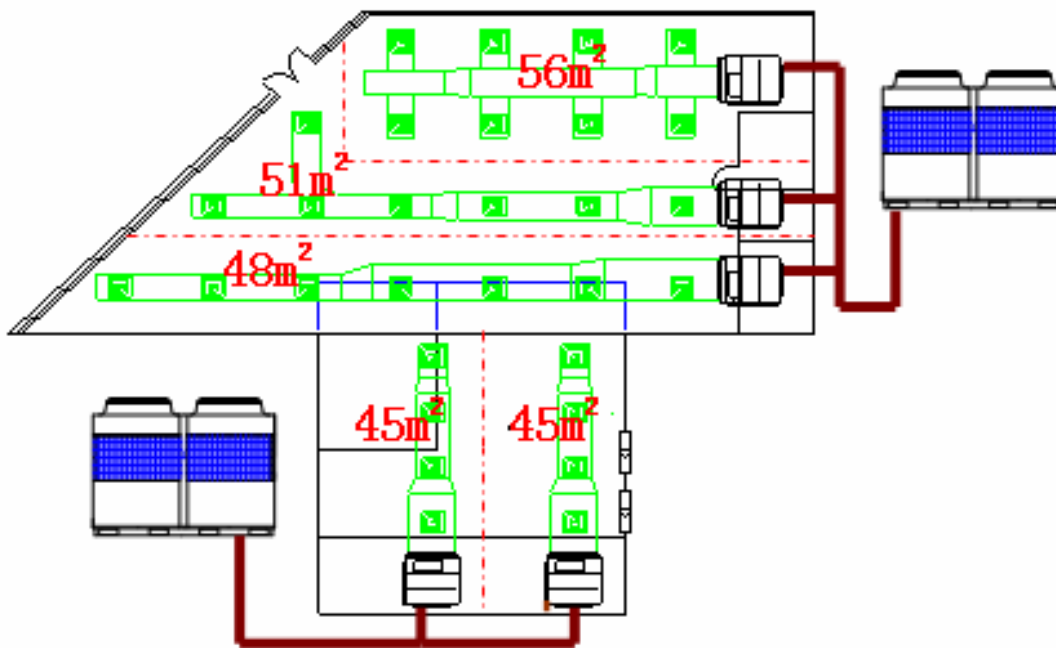


Figure 1 Plan View

Type of Indoor Models

Base on the functions of the air-conditioned area, select the suitable model. MDS system can couple with various indoors model.

Model	Name	Capacity (Btu/h / kW)
Ceiling Concealed Type	MCCD-C	9600 ~ 56000 / 2.8 ~ 16.4
Ceiling Cassette Type	MCKD-A/C	9600 ~ 47800 / 2.8 ~ 14.0
Ceiling Convertible Type	MCMD-C/D/E	12300 ~ 56000 / 3.6 ~ 16.4
Wall Mounted type	MWMD-G	8500 ~ 22200 / 2.5 ~ 6.5

Air-conditioned size and operating condition

From the drawing, determine the area (m^2) that each indoor is required to air-condition. Besides that, user is also required to determine the cooling/heating capacity reference for each function of the air-conditioned area / room type. The operating condition is also necessary for the software to simulate the possible capacity change of the system. Some of the parameter for the operating conditions is such as

- a) outdoor and indoor ambient temperature
- b) location of outdoor versus indoors
- c) maximum piping length
- d) indoor capacity to outdoor capacity ratio

Proposed piping layout

Using the software, draw the piping layout and indoors unit. The software will select the unit base on the cooling/heating capacity reference set and indoor, outdoor operating temperature.

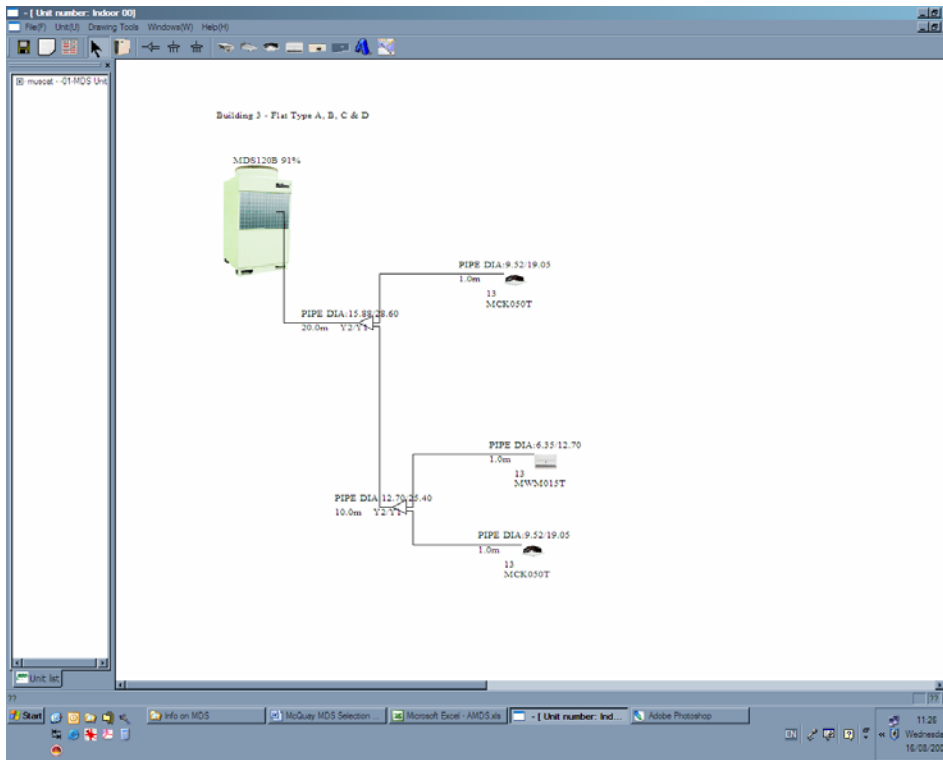


Figure 2 MDS Piping Layout

Result

- i) Schedule of equipment
- ii) Output designed piping layout

Schedule of Equipment

Base on the drawing generated in the selection software and the selected models, this software is able to generate a report which consisting of the units and all required accessories.

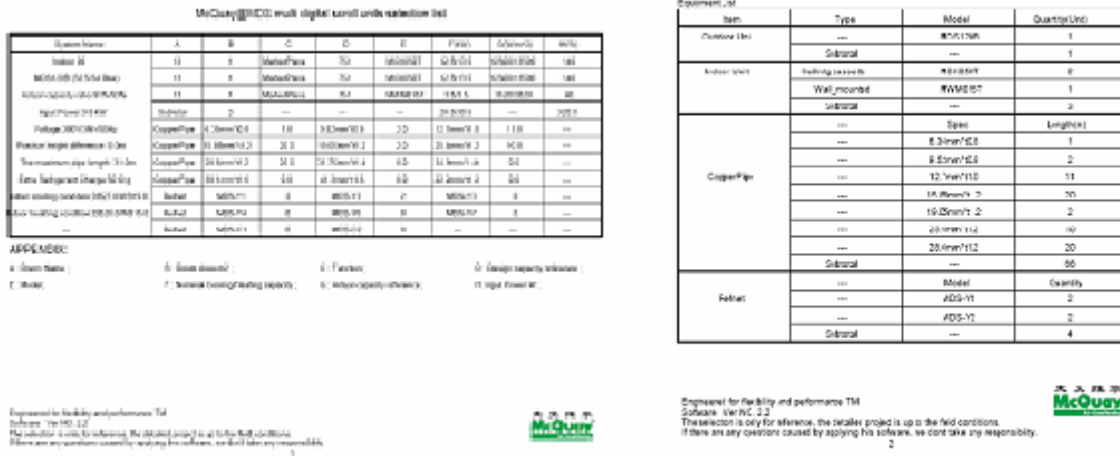


Figure 3 Standard Report from MDS Selection Software

Output designed piping layout

Besides the schedule of equipment, this software is able to generate the piping drawing into a form of bitmap file. This picture file can be attached together with the previous report as the selection report for submission or as a record for future reference. Constructors will then able to install the equipment base on this picture file.

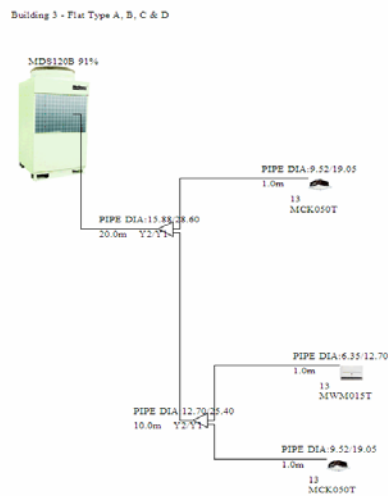


Figure 4 Picture file of Piping Layout

Using this software

Visit McQuay e-Distributors website to download this selection software. Once download, user need to install this software to any computer before start using it.

Executing the Software

- After successful installation, user will be able to access the program from the “Start” menu.

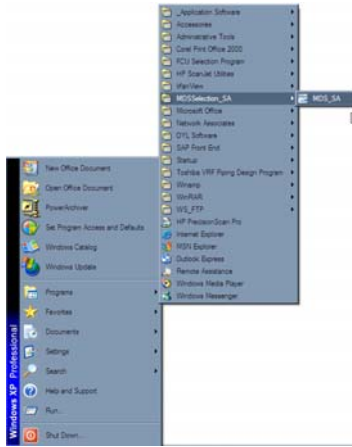


Figure 1 Starting MDS Selection Software

- Once the software is executed, the software will appear as a new window.

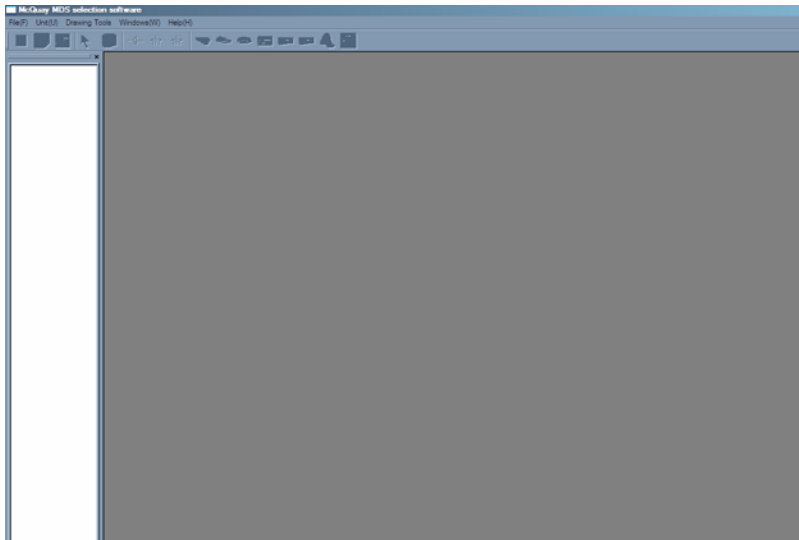


Figure 2 MDS Selection Software Workplace

Starting a New Project

- To start a project, go to “File”, select “New”

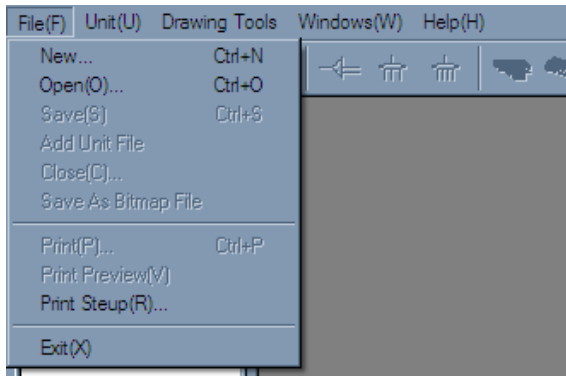


Figure 3 Starting a new project

- A new window with title “New Project” will pop up. Determine the folder location at the “File Path”. Enter the project name at the box beside the wording “File name”. Once the project name is confirmed, click “OK”. The window will then close, leaving only the workplace.

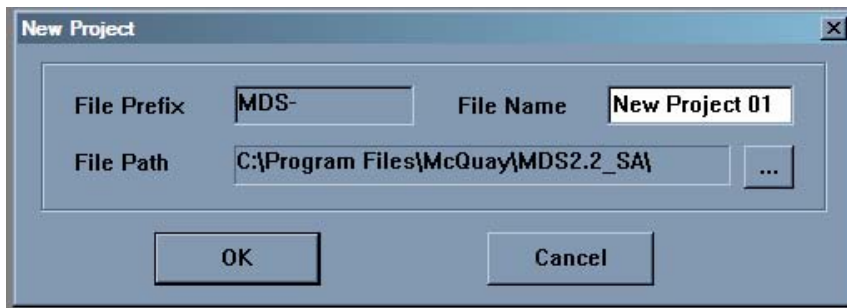


Figure 4 Determine project name and file location

- To create MDS outdoor, go to “Unit”, select “unit management”

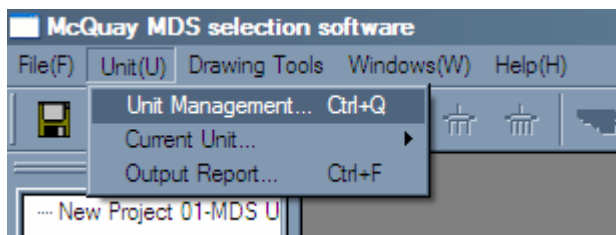



Figure 5 Create MDS Outdoor

Hint! User can click on the “Manager MDS Group” logo  , located 3^d from the left at the icon bar to create MDS outdoor.

- A new window with title “Unit Management” will pop up. Give the new unit a name by entering the name at the “New Unit” box. Once confirm, click on the “New” to create the unit.

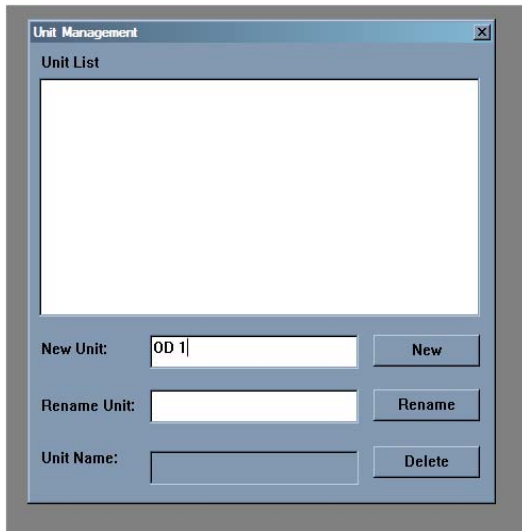


Figure 6 Determine MDS Outdoor Name

- The window will then close, leaving only the workplace. At the left column, the MDS outdoor name will appear under the project name. The workplace will change from grey colour to white colour.

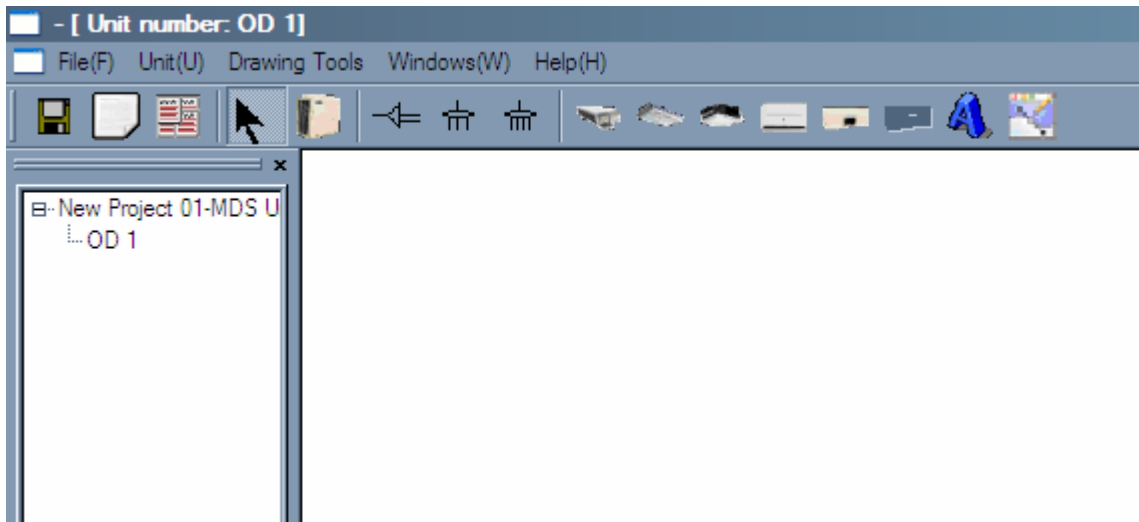

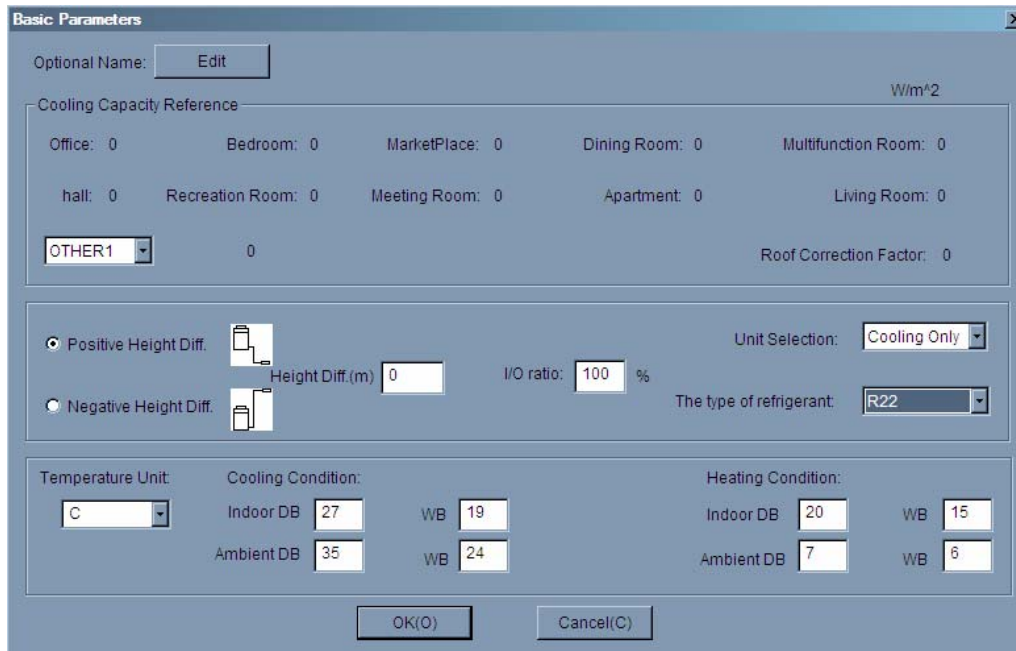


Figure 7 MDS outdoor created

Entering System Operating Reference

- To start inserting the units on to the workplace, the operating conditions of the system need to be determined. To do so, click on the MDS logo  (located 5th from the left, beside the pointer logo)
- After clicking the logo, a new window with title “Basic Parameter” will pop up.



Basic Parameters


Optional Name: Edit


Cooling Capacity Reference W/m²

Office: 0 Bedroom: 0 MarketPlace: 0 Dining Room: 0 Multifunction Room: 0

hall: 0 Recreation Room: 0 Meeting Room: 0 Apartment: 0 Living Room: 0

0 Roof Correction Factor: 0

Positive Height Diff.  Height Diff.(m) I/O ratio: % Unit Selection:

Negative Height Diff.  The type of refrigerant:

Temperature Unit: Cooling Condition: Heating Condition:

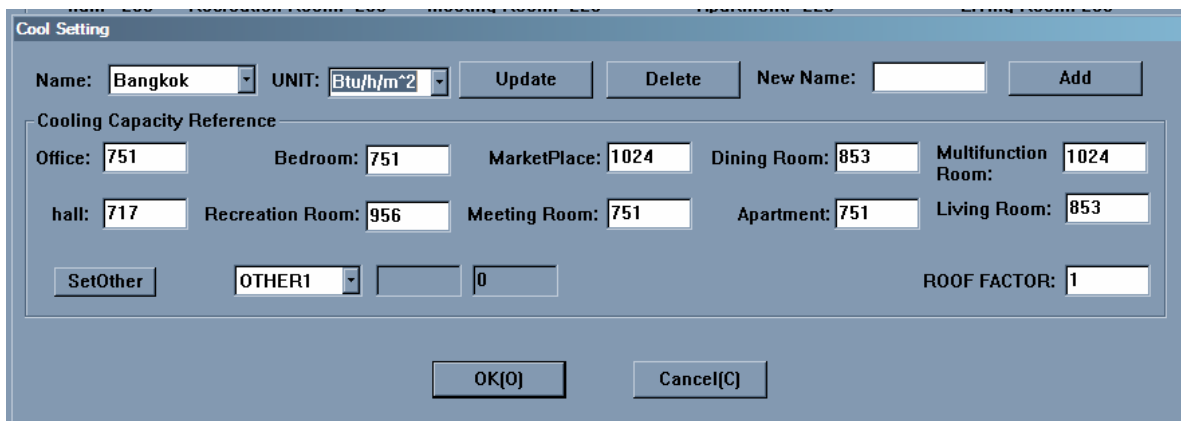
Indoor DB WB Indoor DB WB

Ambient DB WB Ambient DB WB

OK(O) Cancel(C)

Figure 8 Basic parameter window

- The current window shows the default value for the new MDS outdoor. In order to determine the cooling capacity reference for various rooms, click on the “Edit” button.
- A new window with title “Cool Setting” will pop up. The “Name” drop down menu consists of some reference base on various cities or projects. The “Unit” drop down menu allows user to determine the whether to operate the software in SI or metric.



Cool Setting

Name: UNIT: Update Delete New Name: Add

Cooling Capacity Reference

Office: Bedroom: MarketPlace: Dining Room: Multifunction Room:

hall: Recreation Room: Meeting Room: Apartment: Living Room:

 ROOF FACTOR:

OK(O) Cancel(C)

Figure 9 Cooling capacity reference setting

- If there is a requirement for new type of rooms, user is allowed to enter them. Click on "SetOther", a new window will pop up. Type in the rooms name and the cooling capacity reference. Once the data is confirmed, click "OK"

Figure 10 Additional room type

- After all changes of the cooling capacity references are confirmed, type in the name of this project at the column "New Name", then click "Add". After that, the project name will appeared at the "Name" drop down menu. Once confirm, click on "OK" to return back to the basic parameter setting window.

Figure 11 Confirm New Cooling Capacity Reference

Caution! After any changes made on cooling capacity reference, please click on the "Update" button. This will save the data on to particular cities or projects.

- The roof factor only is applicable when the unit is installed under the roof. The cooling capacity reference will multiple the "roof factor" when the unit is selected under top layer. For more information, please refer to Figure 17 in the same chapter for more information.

- At the “Basic Parameters” window, the cooling capacity reference will show the data previously selected. Based on the project criteria, enter the remaining data. Once all data is confirmed, click “OK”
 - *Height Diff. (m)*
This determines the level of the outdoor unit versus the indoor unit. If the outdoor is located above all indoor units, click on “Positive Height Diff”. The maximum value is 50m. If the outdoor is located below all indoor units, click on “Negative Height Diff”. The maximum value is 40m.
 - *Cooling Condition*
Cooling cycle condition for indoors and outdoor.
 - *Heating Condition*
Heating cycle condition for indoors and outdoor.
 - *Occupied coefficient*
Value range from 50% to 120%.
50% - The total indoor capacity is 50% or more less than the outdoor capacity.
Example:
Total Indoor Capacity = 120,000 Btu/h
MDS Outdoor Capacity = 240,000 Btu/h

120% - The total indoor capacity is 120% or less than the outdoor capacity.
Example:
Total Indoor Capacity = 120,000 Btu/h
MDS Outdoor Capacity = 100,000 Btu/h
 - *Type of Refrigerant*
This determines the type of refrigerant that is required for the selection. Click on the drop-down menu, it will show 2 types of refrigerant available, R22 and R410A.

Figure 12 Confirm all data in the Basic Parameter

Sketching the MDS System

- Once return to the workplace, the mouse pointer had changed to a MDS outdoor. By clicking on the work place, a MDS outdoor will appeared.

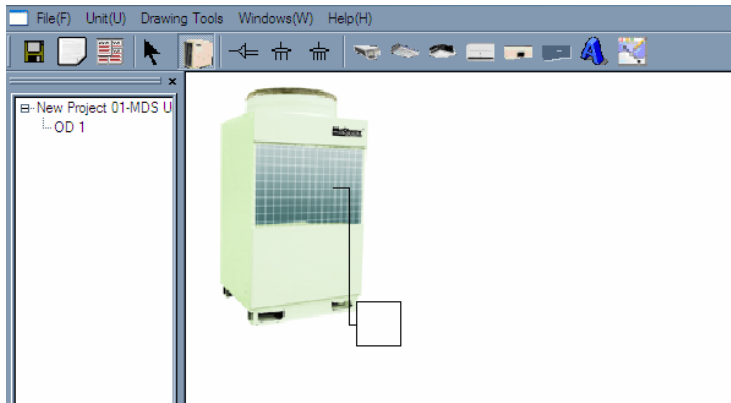


Figure 13 MDS Outdoor created on the work place

Hint! When the pointer is in the form of MDS outdoor, suggest to click it on the top left hand corner of the work place. This will give a better view during unit selection.

- To start the drawing, select the pipe joint by clicking on the logo. There are 3 types of pipe joints.



Refnet Joint or Y-joint.



1 to 3 distributors



1 to 4 distributors

- Once the type of joint is selected, the mouse pointer will turn to that particular joint. By clicking inside the small square, branches will appeared. Repeat this step to get your desire piping layout.

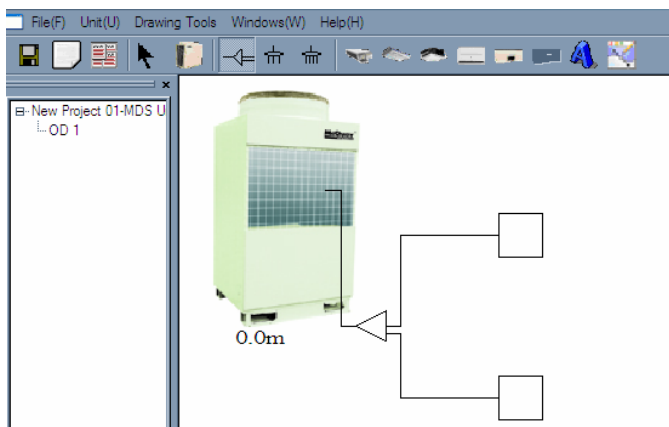


Figure 14 Creating branches

Hint! Increase the view size will result in bigger “square” in the workplace. This will allow user to place the joints or indoors unit into the square easier.

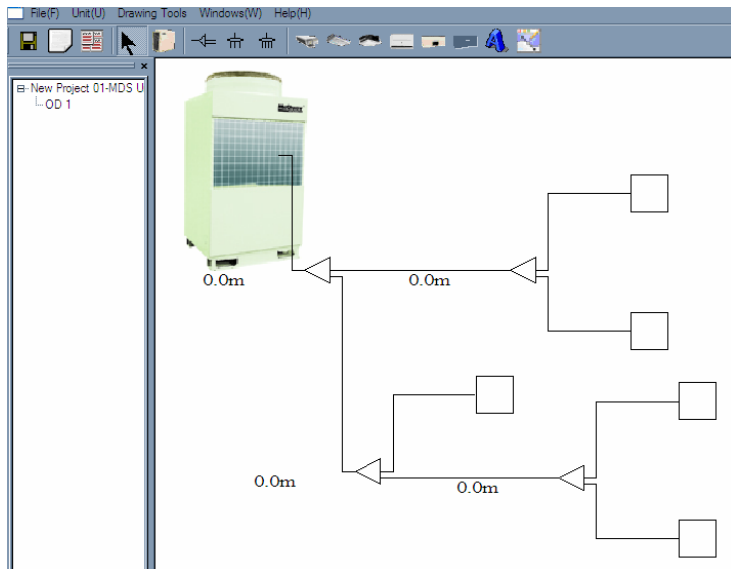



Figure 15 Complete piping layouts

Hint! Remember to save the project. This is a suitable time for user to save the project. To save the project, go to the “File” drop down menu and select save. Besides that, user can click on the “Save” logo, which is the first logo at the tool bar.

- After all the branches are created, users can move them to have around. In order to move or rearrange the branch, click on the “pointer” logo . After that, click on the respective joint.
- The joint and the items after it will be highlighted in red colour. Left click on the joint, hold it and move the joint to the required location. Once the location is confirmed, release it. The move object will remain at the new location.

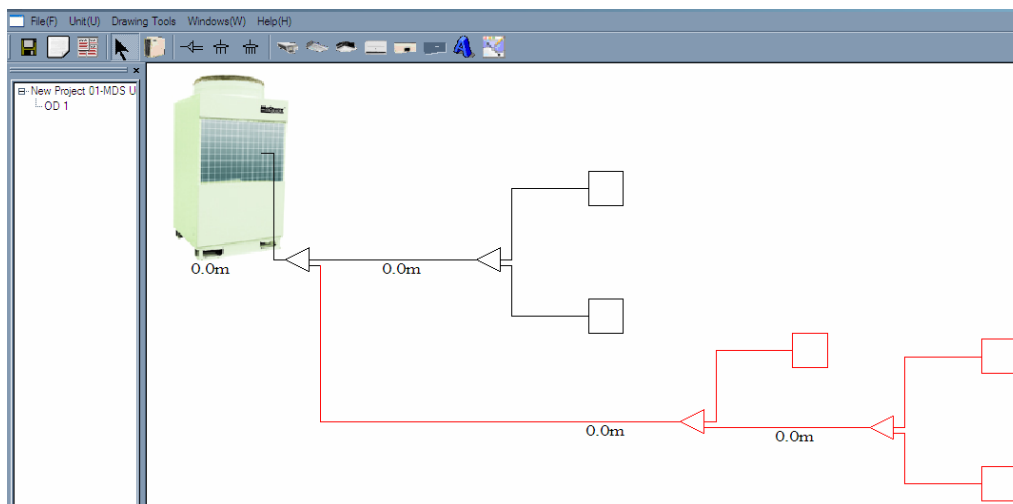


Figure 16 Moving object

Hint! Clicking on the MDS outdoor will enable user to move the whole piping layout.

Selecting Indoors and determine indoors reference

- To insert the indoors, select the required indoors model and place it inside the square.

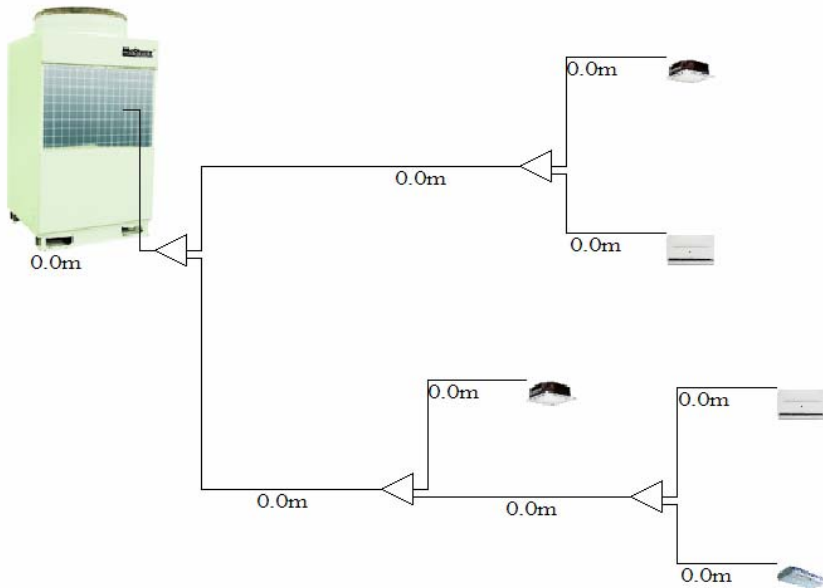


Figure 17 Insert Indoors

- Once all indoors are placed accordingly, user is required to determine the indoor model. To do so, click on the “pointer” logo. Double click at the respective indoor model.
- A new window with title “Indoor Unit Cooling Capacity” will pop up.

The screenshot shows a dialog box titled "Indoor Unit Cooling Capacity" with a close button (X) in the top right corner. The dialog contains the following fields and controls:

- Room Name:** A text input field containing "ROOM1".
- Area:** A text input field containing "55" followed by "m²".
- Facing Direction:** A dropdown menu with "South" selected.
- Floor Number:** A dropdown menu with "Standard Layer" selected.
- Function:** A dropdown menu with "Office" selected, followed by the value "253.0 W/m²".
- Model:** A dropdown menu that is currently empty.
- Appoint Indoor:** A checkbox that is currently unchecked.
- Buttons:** "OK" and "Apply" buttons at the bottom.

Figure 18 Indoor unit cooling capacity

- *Room Name:*
This allow user to determine the name of the room
 - *Area*
The software will calculate the suitable model base on the area of the room. User is required to provide the area of the room.
 - *Facing Direction*
User will need to determine the direction of the external wall for the room.
 - *Floor Number*
User is allowed to determine the room location
Standard Layer
The room is the middle floor location. Unit is not installed under the roof.
Top Layer
The room is at the top floor. Unit is installed under the roof.
 - *Function*
User is required to determine which cooling capacity reference to use. The cooling capacity reference is set previously. Refer to Figure 8 (same chapter) for more information.
 - *Model*
Once user clicks on the “Apply”, this software will select the appropriate model. However, if user wishes to change the model, he or she can select it by click on the drop down menu button.
- Once user is satisfied with the selection, click on box beside the “Appoint Indoor”. By doing soon, user had “locked” the information. All information of the particular indoor cannot be change. This is to avoid user accidentally change the information. If user wishes to change the information, just un-tick the box.

The screenshot shows a dialog box titled "Indoor Unit Cooling Capacity". It contains the following fields and controls:

- Room Name:** Text input field containing "ROOM1".
- Area:** Text input field containing "10", followed by the unit "m²".
- Facing Direction:** Dropdown menu with "South" selected.
- Floor Number:** Dropdown menu with "Standard Layer" selected.
- Function:** Dropdown menu with "Kitchen" selected, followed by the value "300.0 W/m²".
- Model:** Dropdown menu with "MCMD020E" selected.
- Appoint Indoor:** A checked checkbox.
- Buttons:** "OK" and "Apply" buttons at the bottom.

Figure 19 Secured the indoor information

- After all indoors information is completed, user is required to provide the estimated piping length of each branches. Initially, all piping length is shown as 0m. To enter the piping length, firstly, ensure that the “pointer” logo is still active. Secondly, move the pointer to the respective piping length. The piping length will change to a box, allowing user to enter the desire length.

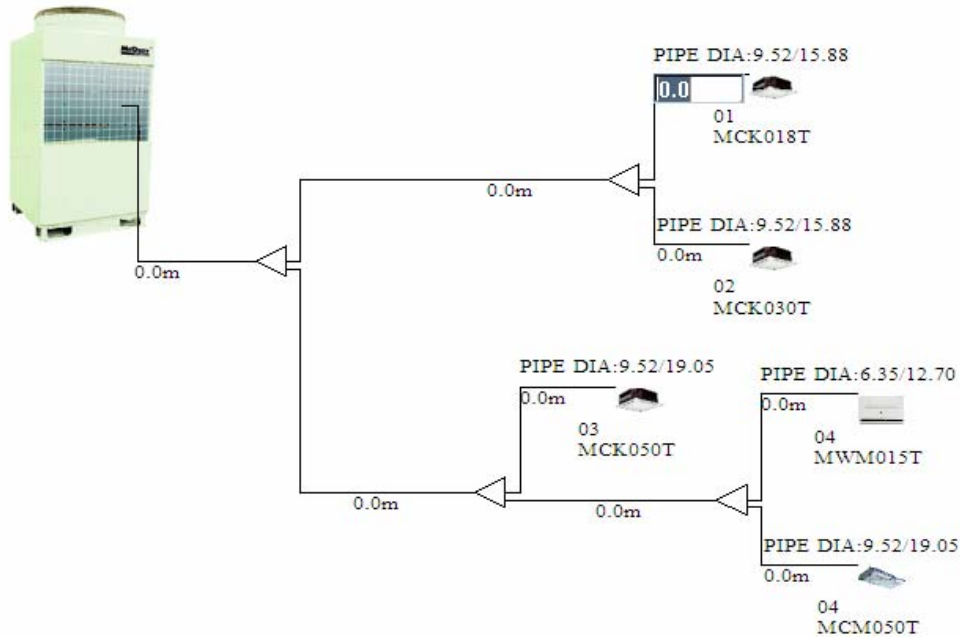


Figure 20 Entering desire piping length

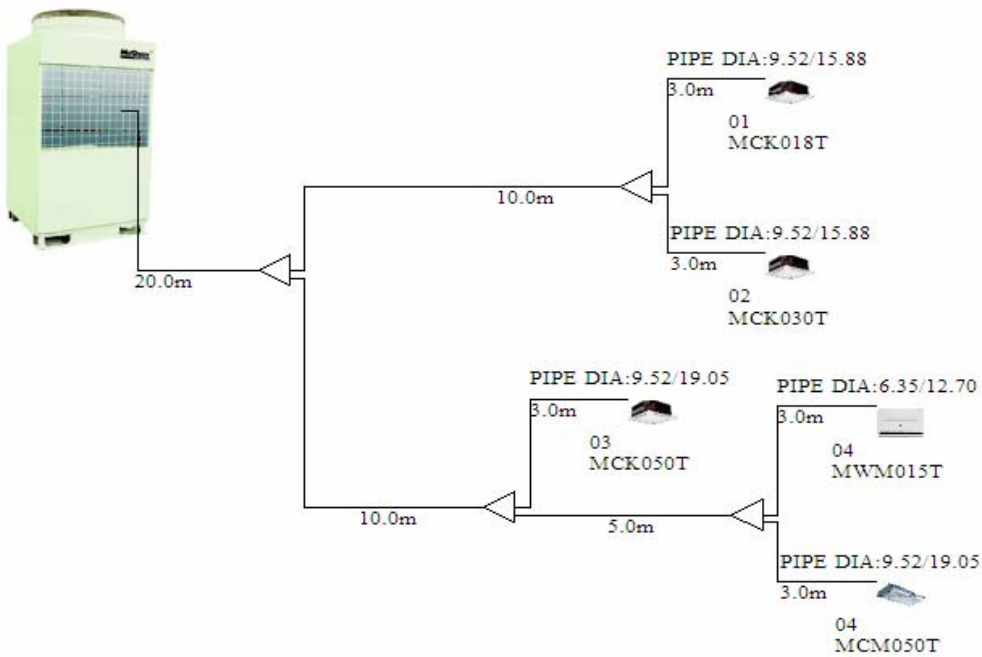


Figure 21 Complete piping lengths

Selecting Outdoor

- Once all piping length is completed, user is now able to size the outdoor unit. Go to the “Unit” drop down menu, select “Current Unit”, select “Calculate”.

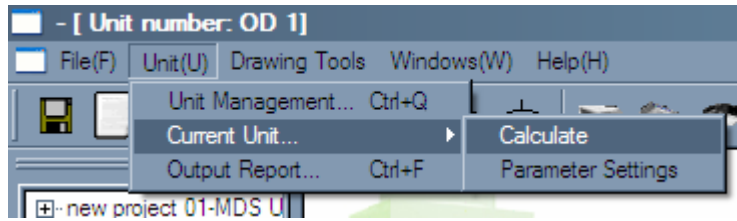


Figure 22 Sizing outdoor unit

- A new window with title “Please select outdoor unit-R22” will pop up. The suitable outdoor model will be highlighted in bold.
- The cooling capacity, heating capacity and maximum indoor unit will be listed besides the model name. The “Refer Information” state the indoor capacity to outdoor capacity ratio user had selected previously. It also shows the total capacity of the current system.
- To select the outdoor, just click on the model name. A black dot will appeared at the front of the selected model. Click “OK” to finish the selection.

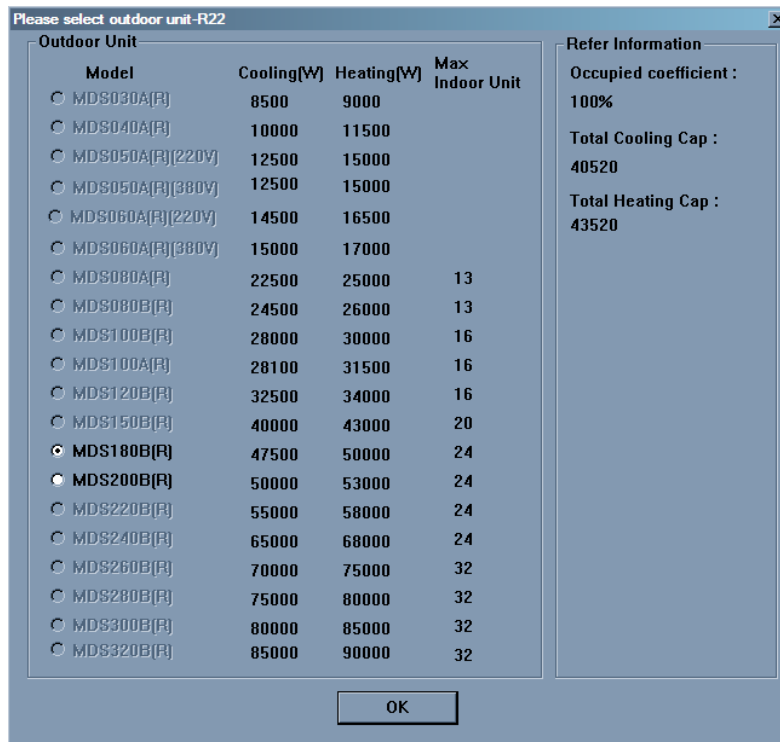


Figure 23 Software generated suitable outdoor model

Hint! Click on the “Calculation” logo  to size the outdoor unit.

- Once return to the workplace, user will notice that outdoor model picture will change to the appropriate model.
- Besides that, the selected outdoor name appeared out top of the outdoor unit with a percentage value beside it.
- With this, the selection process is completed. Remember to save the project.

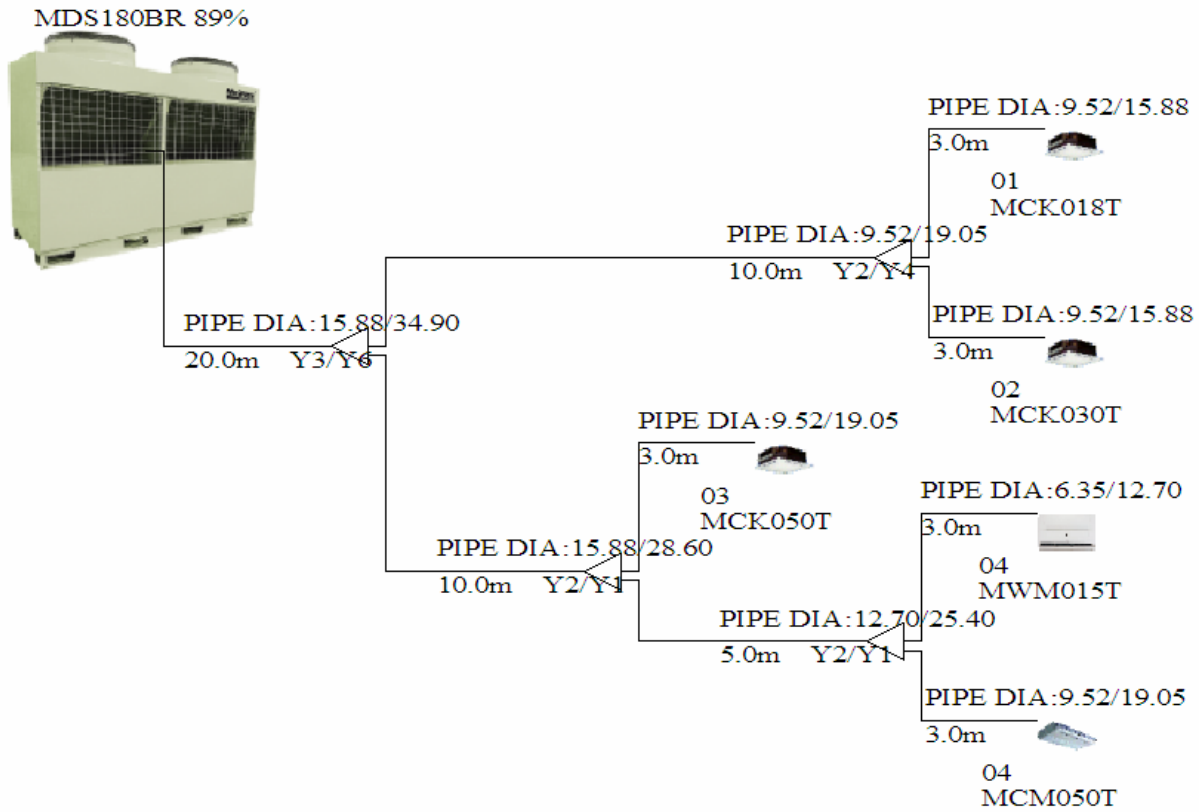


Figure 24 Completed selection

Creating additional MDS system for the same project

- Some project may consist more than one MDS system. Hence, this software allows user to add new system into the existing project.
- Go to “File” drop down menu, select “Open”.

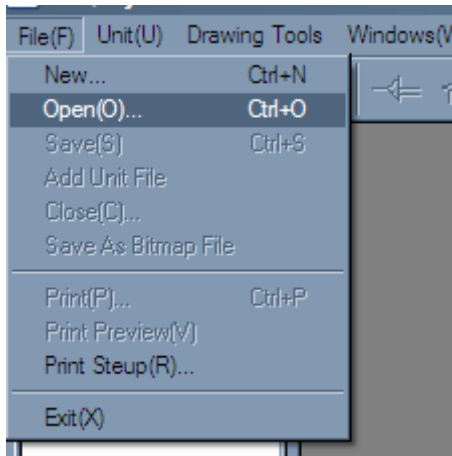


Figure 1 Open an existing project

- A new window with title “Open Project” will pop up. Select the existing project shown in the list. If the project is listed, click on the browse button , look for the desire location and selected the projects that need to be opened.
- Once the browsed project is selected, the name will appear at the “Project Name:” column. Click “OK” to open the project.

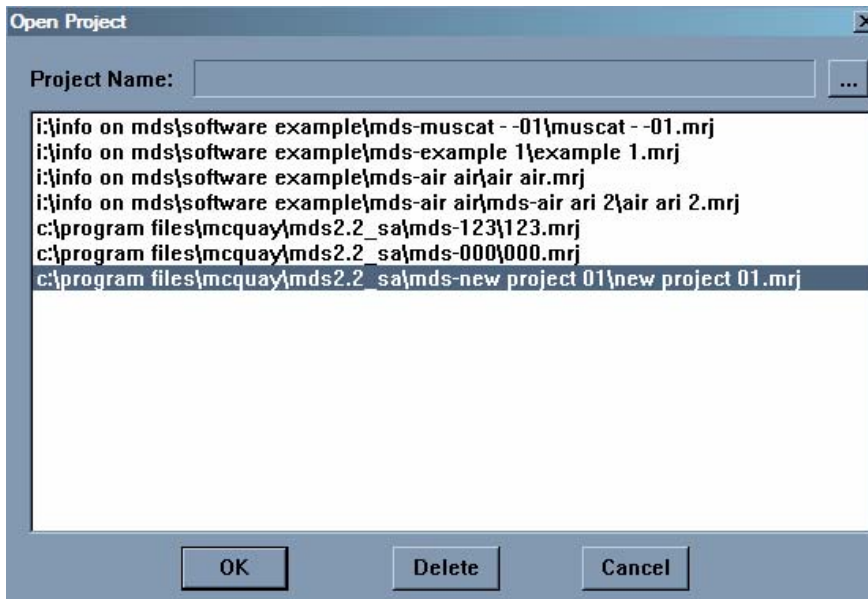


Figure 2 Select an existing project

- When return to the workplace, the existing project will appeared. At the left column, the project name and the existing MDS system is listed.

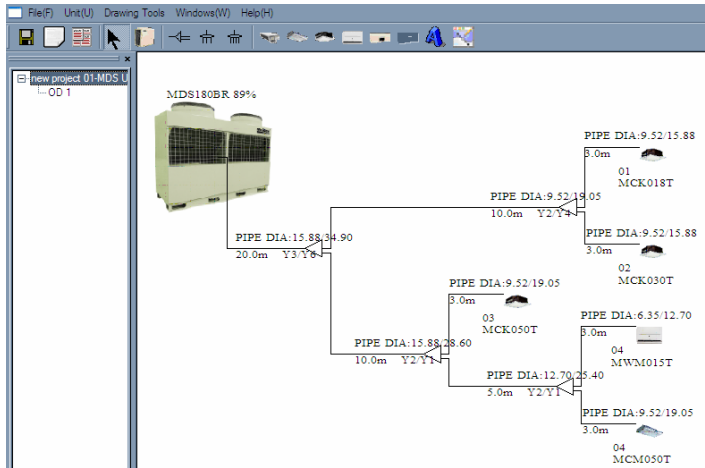



Figure 3 Existing Project

- To add additional MDS system, click on the “Manager MDS Group” logo .
- A new window with title “Unit Management” pop up. The existing outdoor system is listed on the white colour region.
- To add a second MDS system, type the name at the “New Unit” box. Once confirm, click on the “New” to create the unit.

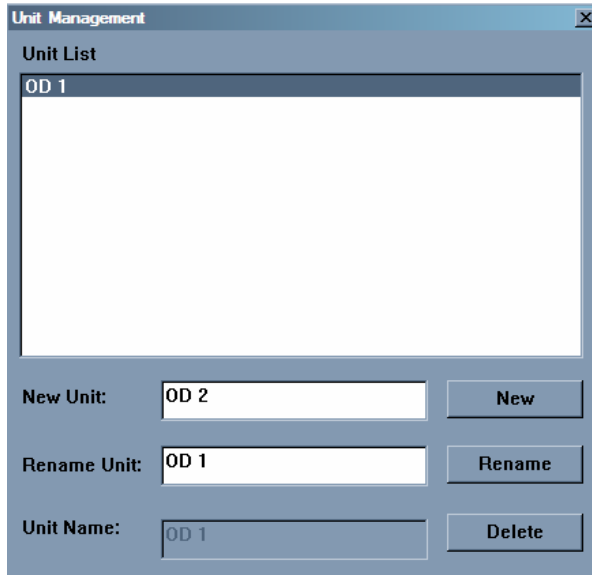


Figure 4 Create new MDS outdoor

-
- The window will close and prompt back to the workplace. Notice the left column now consist of the new MDS system.

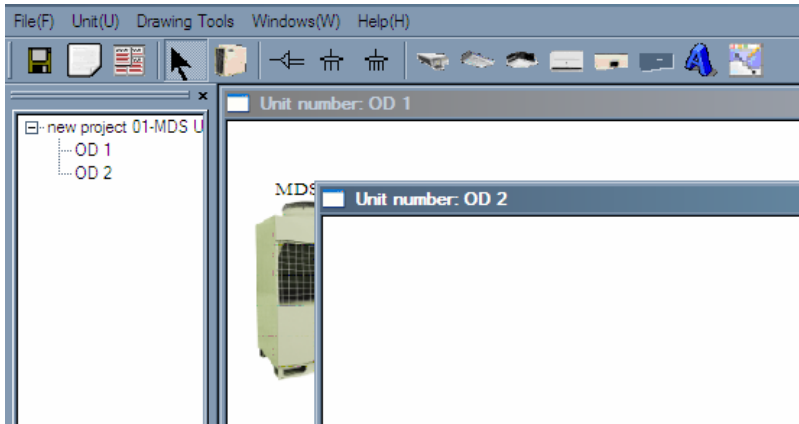


Figure 5 New MDS System at the Workplace

- To continue, please refer to the topic “Using this software”, under the sub topic “Entering System Operating Reference” to complete the selection.

Changing operating condition / basic parameter

- Some time, there is a change of the operating condition for the project, i.e. different cooling capacity reference, different indoor and outdoor ambient, etc.
- Hence, instead of redo the whole project, user is allowed to modify the basic parameter.
- To do so, click on “Unit” drop down menu, select “Current Unit” and then Parameter Settings”

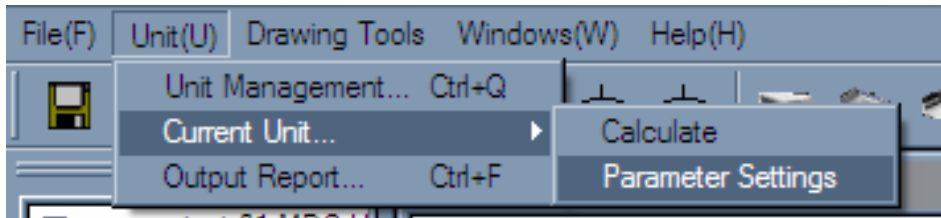


Figure 1 Modify basic parameter

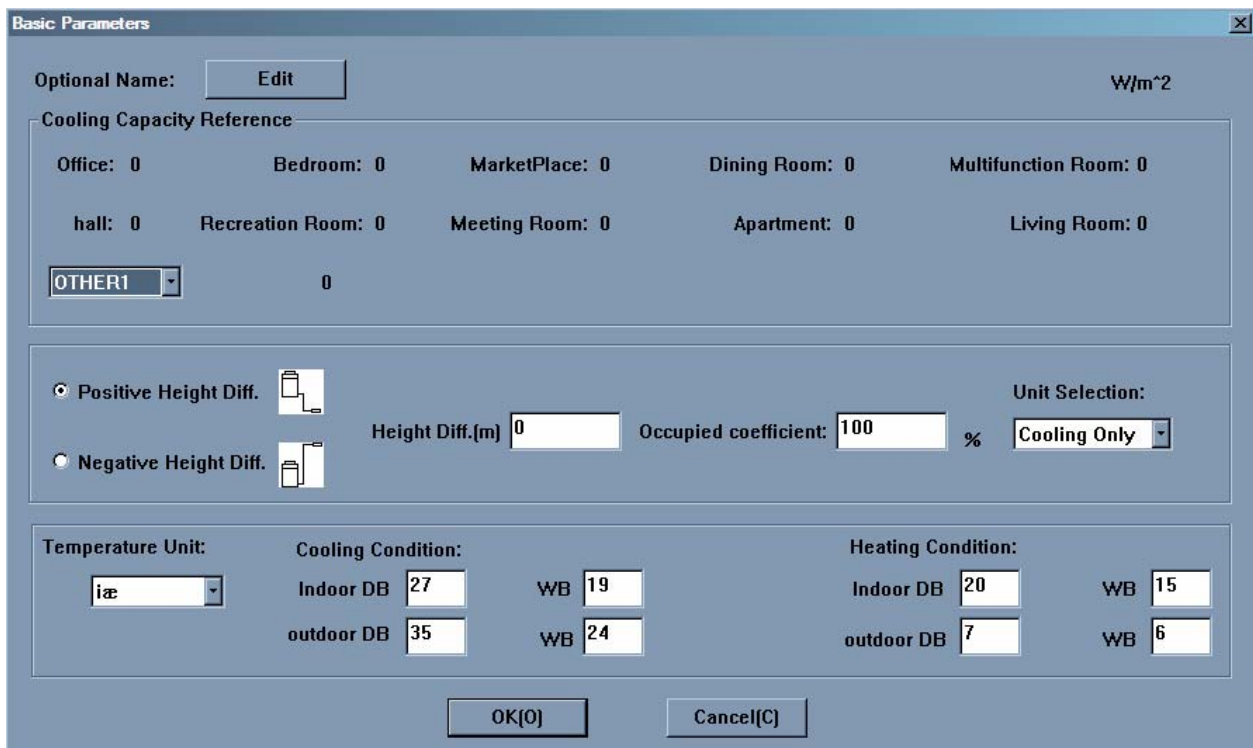

A screenshot of the 'Basic Parameters' dialog box. The window title is 'Basic Parameters'. It has an 'Optional Name:' field with an 'Edit' button and a unit indicator 'W/m²'. The 'Cooling Capacity Reference' section contains a grid of room types with values: Office: 0, Bedroom: 0, MarketPlace: 0, Dining Room: 0, Multifunction Room: 0, hall: 0, Recreation Room: 0, Meeting Room: 0, Apartment: 0, Living Room: 0, and a dropdown menu 'OTHER1' with a value of 0. The 'Positive Height Diff.' section has a radio button selected, a 'Height Diff.(m)' field with '0', an 'Occupied coefficient' field with '100', and a 'Unit Selection:' dropdown with 'Cooling Only'. The 'Negative Height Diff.' section has a radio button unselected. The 'Temperature Unit:' dropdown is set to 'iæ'. The 'Cooling Condition:' section has 'Indoor DB' (27), 'WB' (19), and 'outdoor DB' (35, WB 24). The 'Heating Condition:' section has 'Indoor DB' (20), 'WB' (15), and 'outdoor DB' (7, WB 6). At the bottom are 'OK(O)' and 'Cancel(C)' buttons.

Figure 2 Basic parameter window

- To change the cooling capacity reference for various rooms, click on the “Edit” button and the “Cool Setting” window will pop up.

Figure 3 Cool Setting window

- At the “Name” drop down menu, it shows “Current Parameter”. Change to the project name and perform the necessary changes. Once all the data is confirmed, click “Update” to save the data on to particular cities or project.
- Click “OK” to go back “Basic Parameter” window.
- Click “OK” again to go back to the workplace.
- Assuming no change on the piping layout, click the “Calculation” logo  to size the outdoor unit base on the new operating condition.

For more details steps, please refer to topic “Using this software”

Generating report and piping layout drawing

Generating Report

- After completed any selection with this software, user can create a list of equipment report using this software itself.
- To do so, go to “File” drop down menu, select “Open”.

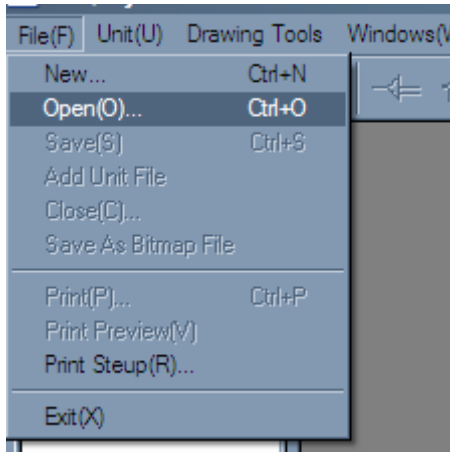


Figure 1 Open an existing project

- A new window with title “Open Project” will pop up. Select the existing project shown in the list. If the project is listed, click on the browse button , look for the desire location and selected the projects that need to be opened.
- Once the browsed project is selected, the name will appear at the “Project Name:” column. Click “OK” to open the project.

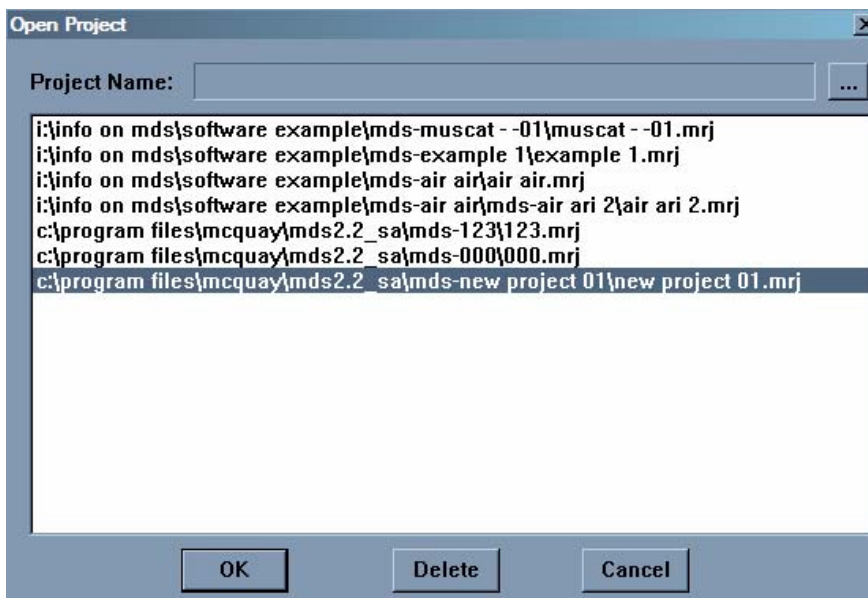


Figure 2 Select an existing project

- When return to the workplace, the existing project will appeared. At the left column, the project name and the existing MDS system is listed.

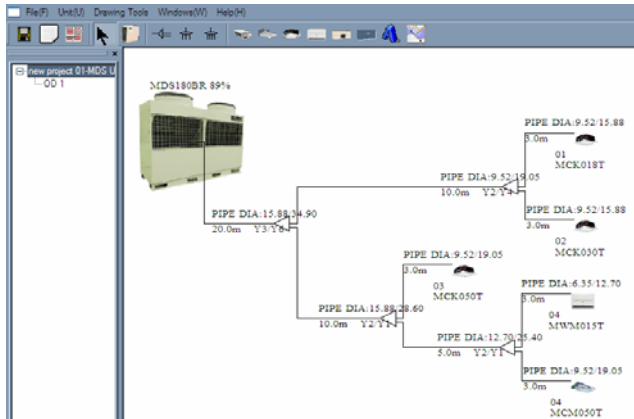


Figure 3 Existing Project

- To generate a report, go to the “Unit” drop down menu, select “Output Report”

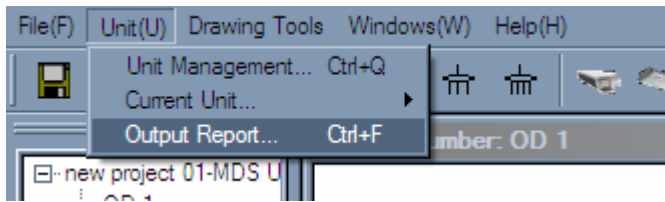


Figure 4 Create MDS report

- A new window with title “Save As” will pop up. Select the desire location and the appropriate file name. Once confirm, click “Save”

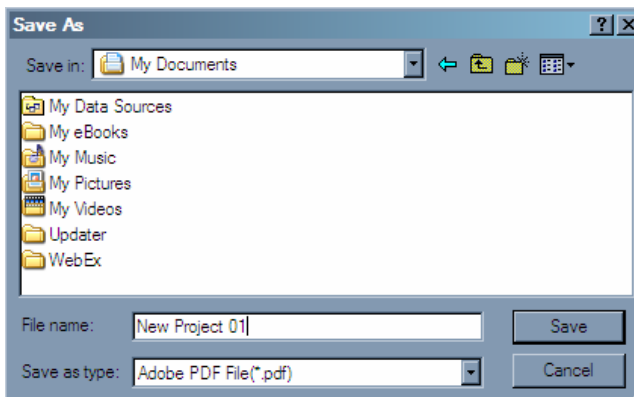


Figure 5 Saving the report

Caution! the report file is in the form of PDF. A program that can view PDF file is required to read the report.

Generate Piping Layout

- The piping layout can be generated into a picture file in the form of bitmap format. This picture can be use as reference for indoors, outdoor and joint location during installation.
- To do so, go to “File” drop down menu, select “Save as Bitmap File”

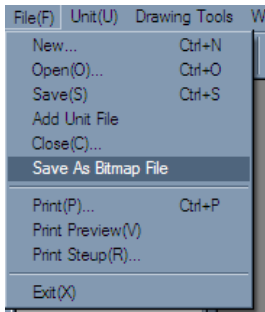


Figure 6 Generating picture file

- A new window with title “Save As” will pop up. Select the desire location and the appropriate file name. Once confirm, click “Save”. The picture is generated. Please go to the desire location and view the file using a picture view program.

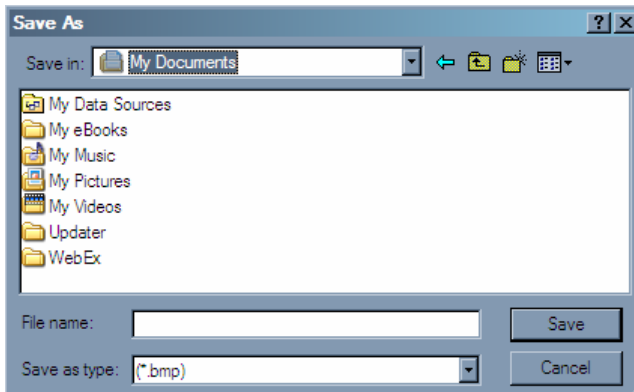


Figure 7 Saving picture file

Error message

- While using the software, error message will occurred after clicking the “Calculation” logo
- The error message will be in red colour. The following is a list of error message.
 - a) Unbalance flow
 - b) Piping length from the first branch is more than 40 meter
 - c) Exceed least favorable pipe length
 - d) No indoor model available



Unbalance Flow

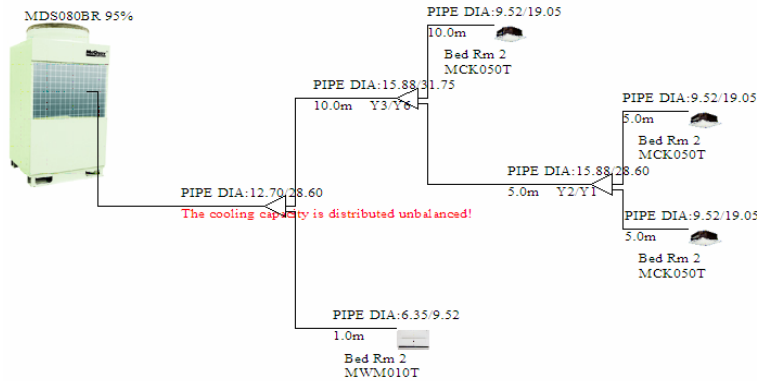


Figure 1 Error message for unbalance flow

This message occurs because the different capacity of a branch is very extreme. At the first branch, there are three units of ceiling cassette size 50. On the other hand, the other branch only connects to one unit of wall mounted. This will cause the refrigerant flow to be unbalance at this joint. Preferable design is to move one of the ceiling cassette to the same branch with the wall mounted unit. This will solve the problem.

Piping length from the first branch is more than 40 meter

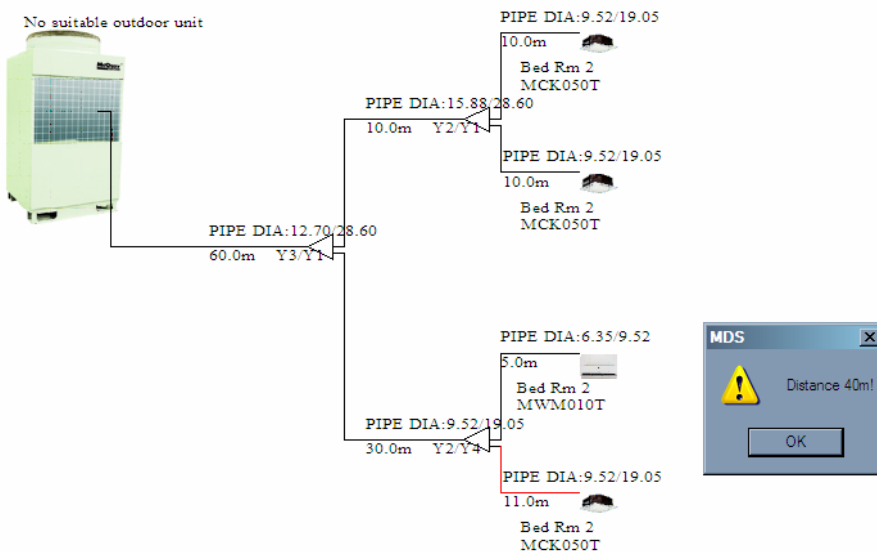


Figure 2 Exceed Piping Limitation from the first branch

This message occurs because the total piping length for the last ceiling cassette unit (piping length in red colour) from the first branch is more than 40 meter. After branches, the refrigerant flow rate will reduce. If the piping length is too long, there is a possibility the refrigerant cannot reach the indoor unit or not able to flow back to the outdoor unit. Thus, the 40 meter from the first joint is maximum piping length tested by the factory. To solve this problem, increase the piping length from the outdoor to the first branch.

Model	3HP	4HP	5 & 6HP	8 & 10HP	12-30 HP
Consequent drop height	20	20	30	50	50
Reversal drop height	20	20	30	40	40
Least favorable pipe length	50	70	70	125	150
Total system pipe length	100	150	150	250	350

Figure 3 Piping Limitation

The Figure 3 shows the limit of the piping length for each model tested by the factory. It is recommended no to exceed these limitation while designing the MDS system. Please find it useful while doing selection for MDS system. All units are in meter.

Exceed least favorable pipe length

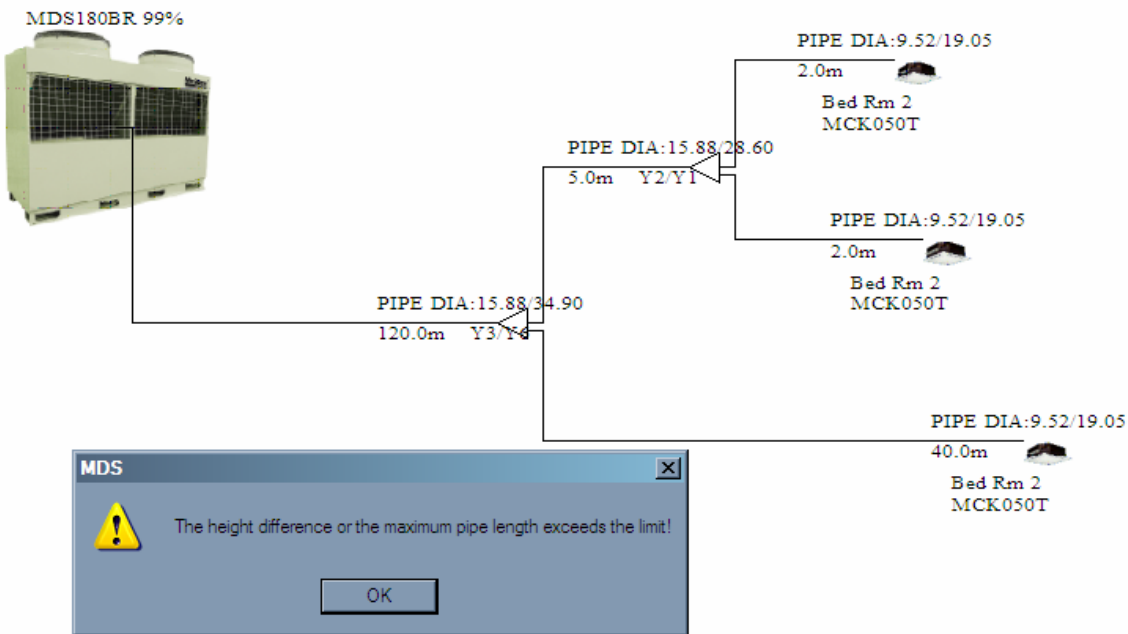


Figure 4 The longest branch exceed the lest favorable pipe length

This message occurs because the total piping length for the longest branch exceeds the least favorable pipe length (refer to Figure 3). If this occurs, user will need to restudy the piping layout and identify a shorter path.

No indoor model available

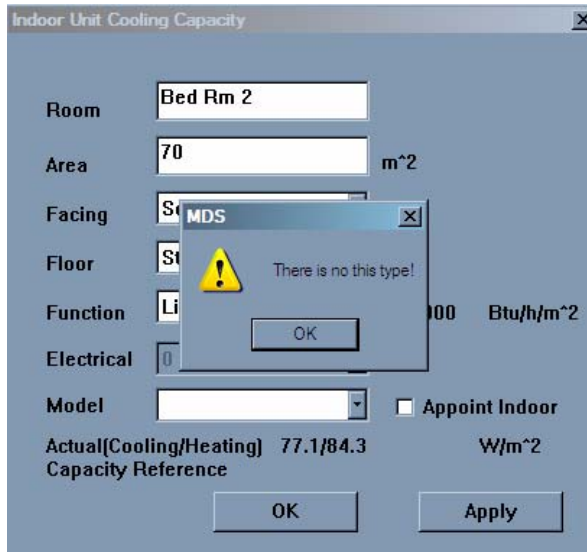


Figure 5 No indoor model available

This error message only occurs while selecting indoor models. Every indoor model had different range. If the selected indoor cannot fulfill the cooling / heating requirement, this message will pop up after user click the "Apply" button. If this happen, user can either

- a) Select a different type of indoor
- b) Use two indoors unit to air-condition the area instead of one units.

