LG Electronics

LATS CAD

User's Manual

CAD Drawing & System Check Simulation Program's Tutorial & Manual

LG Electronics
Nov. 10, 2017

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System Requirement

Software

- LATS CAD_32bit:

1. OS: Windows7_with SP1, Windows8, Windows10 (32bit) ***Please keep Windows update is the latest.*

2. AutoCAD: 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018 (32bit)

***In installing AutoCAD, ".NET Framework" have to be installed. (Basically, ".NET Framework" is installed automatically.)*

3. MS Office Excel, Access

- LATS CAD_64bit:

1. OS: Windows7_with SP1, Windows8, Windows10 (64 bit) ***Please keep Windows update is the latest.*

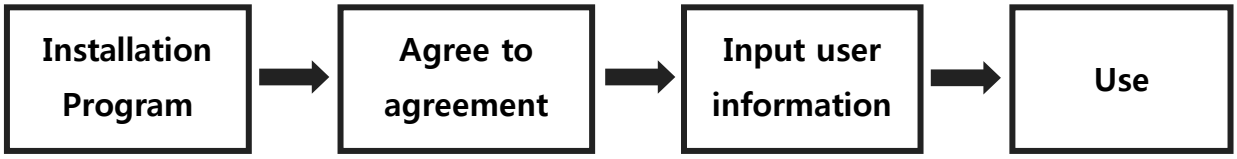
2. AutoCAD: 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018 (64 bit)

***In installing AutoCAD, ".NET Framework" have to be installed. (Basically, ".NET Framework" is installed automatically.)*

3. MS Office

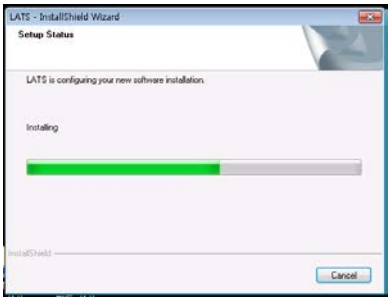
Installation

Procedure for using LATS CAD



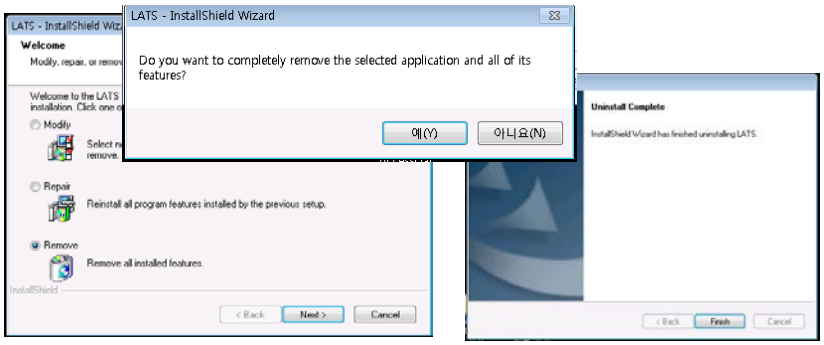
Program installation

1. first install



Click setup

2. reinstall



Click setup

Remove the previous version

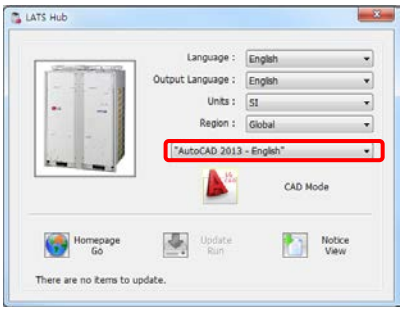
Install

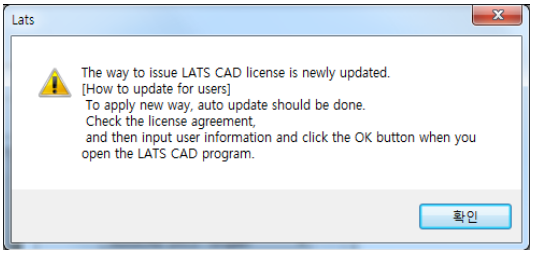
Following

This chapter is written about explanation of functions at LATS, and method and process how to use the functions in general. And It consists of explanation of each functions that user of LATS can understand the functions, when they follow this chapter step by step. If you want more detailed descriptions of each function, check reference page.

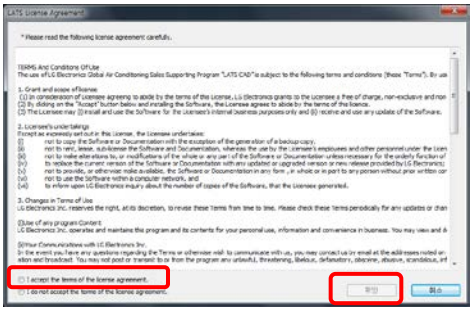
User Registration

1. When LATS is executed after Installing, please execute the CAD Mode.





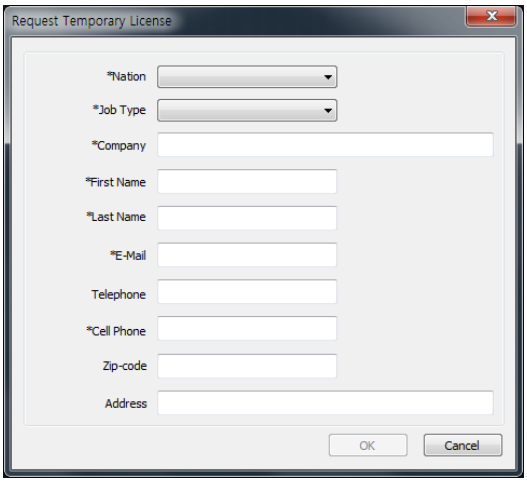
2. Please agree the license agreement. (or please input appload(ap) in command line)



3. For requesting temporary license, input data.(The * marked item is mandatory.)

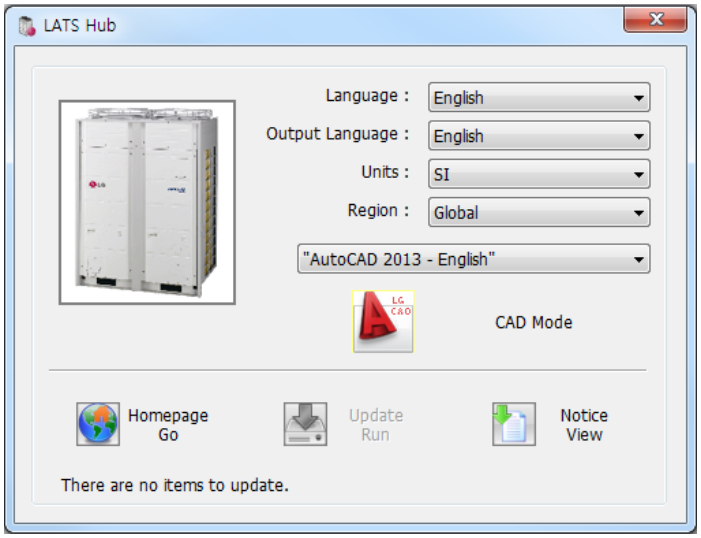
4. After checking the inputted data, click [OK] button for complete request. If you want to cancel, then click [Cancel] button.

5. Temporary license is available during 2 weeks. When the manager issue formal license, you can use.



6. If you are not still issued the license after 2 weeks, please contact LATS CAD manager(lats@lge.com)

LATS Execution



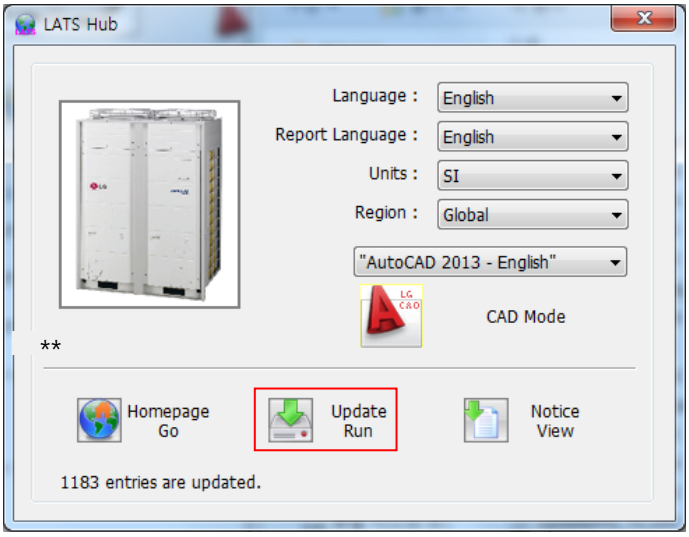
1. Select Language & Units & Region to apply

2. Select AutoCAD version

3. Select [CAD mode] button.

4. View updates or notices (It is activated when there is an update or a notice.)

Caution! When there is an update, please run update.

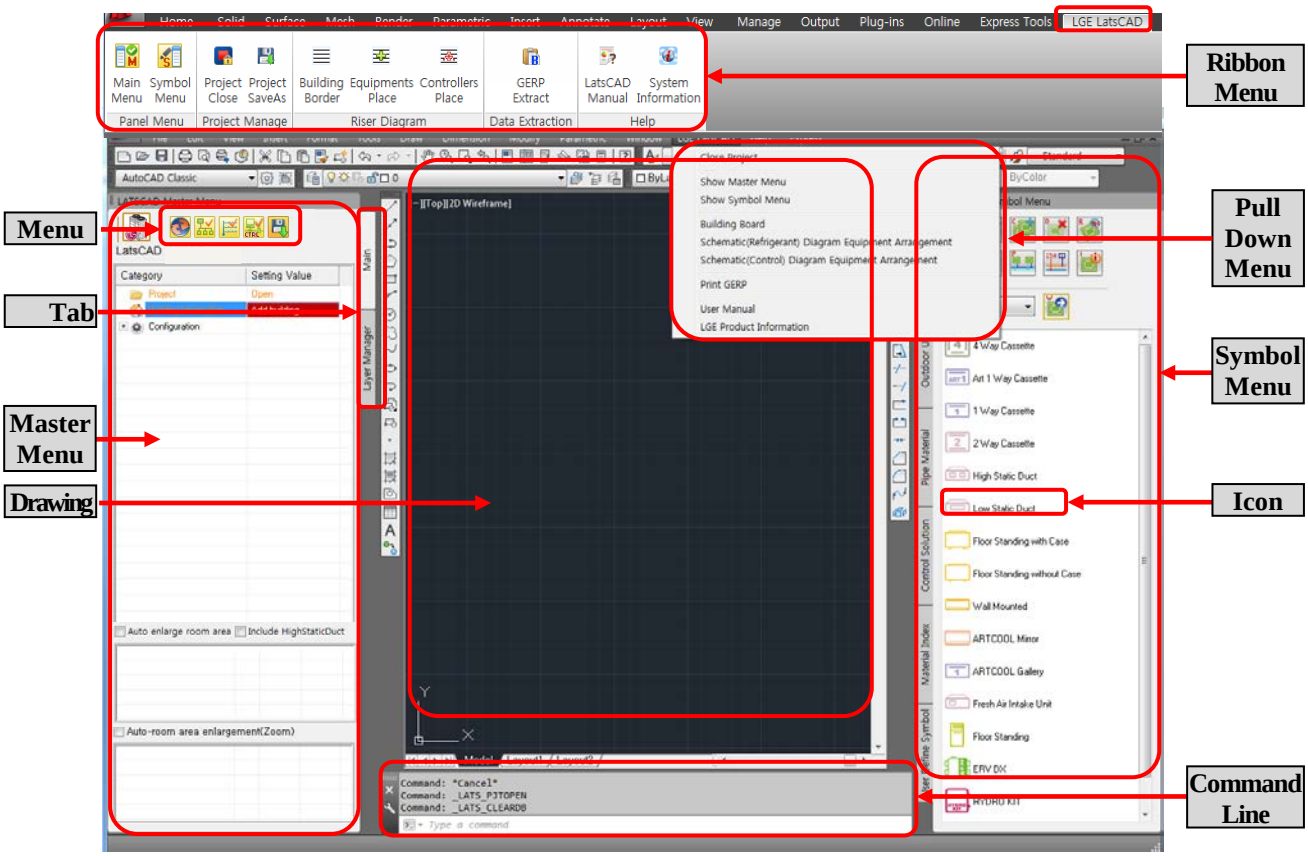


LATS CAD Window

LATS CAD Window is composed with 2 Menus, Drawing, Pull Down Menu(It can be changed to Ribbon Menu if not setting AutoCAD Classic), and Command Line.

Menu has 2 types as Master Menu at left of window and Symbol Menu at right of window. And to show Master Menu or Symbol Menu, click Show Master Menu, Show Symbol Menu on Pull Down Menu or Ribbon Menu. Master Menu has 2 Tabs of Main Tab and Layer Manage Tab. And Symbol Menu has 6 Tabs of Indoor Unit Tab, Outdoor Unit Tab, Pipe Material Tab, Control Solution Tab, Material Index Tab, and User Define Symbol Tab.

LATS CAD has Menus and Icons in the each tab. The Menus has function of Equipment Editing, System Diagram Drawing, and System Checking. The Icons are equipments, pipes, setting environment, etc.



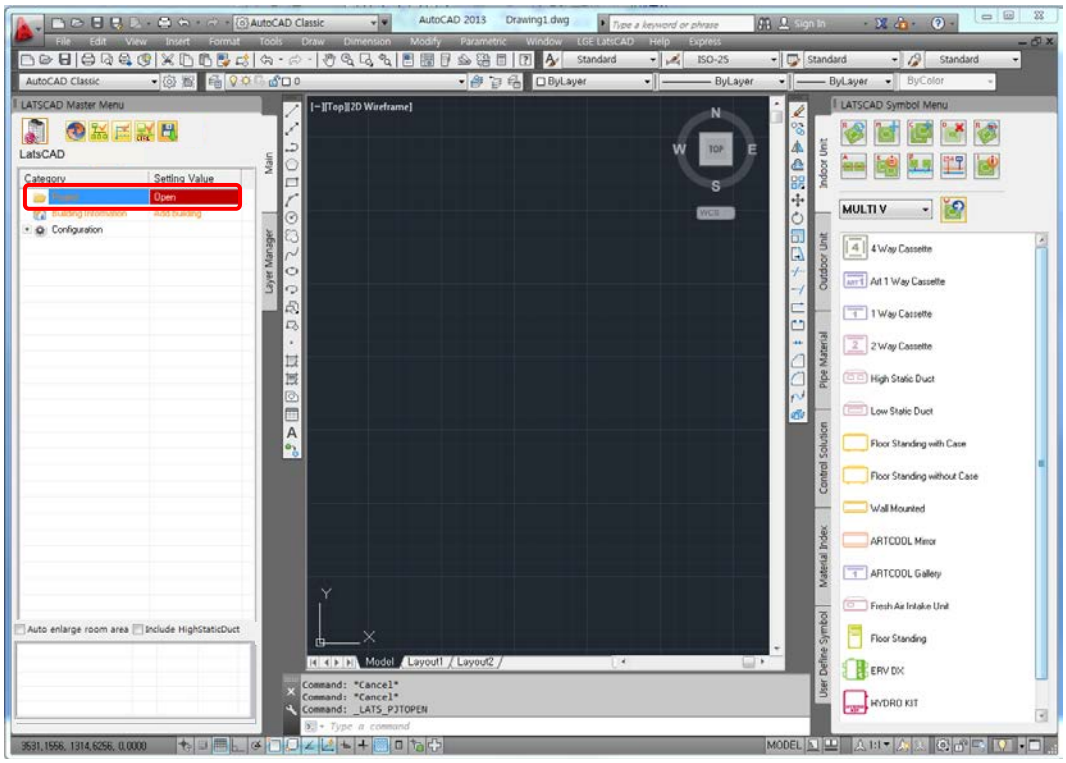
Project Management

Use “New Project” to create a new project, and input “Project Information”.

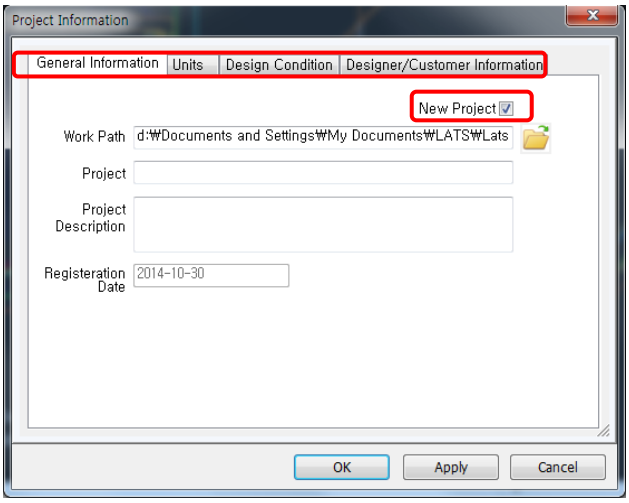
Project Creation

1. Select New Project to set Project Information. The project folder is created at the designated location.

   (Master Menu → “Open” of Project → Click the button “ >> ”)



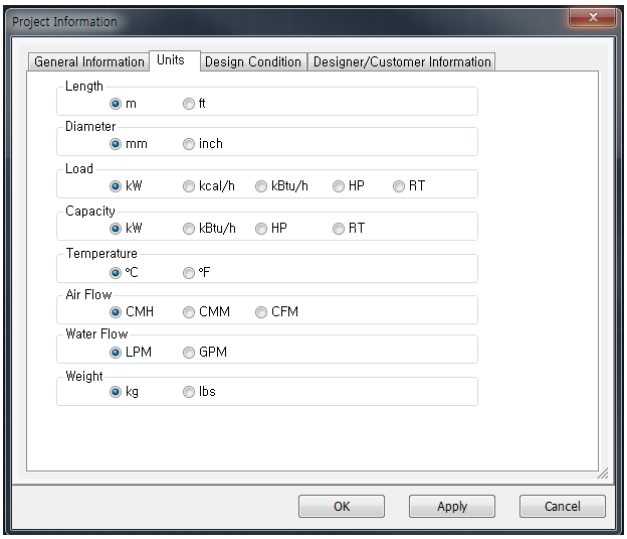
2. Input each of the information by clicking general information, design condition, and designer/Customer Information tab. (Check New Project)



2.1 General Information

- Work Path: Project Folder
- Project: Project Name
- Project Description: Other Project Information
- Registration Date: Working Date (automatically input)

2.2 Units

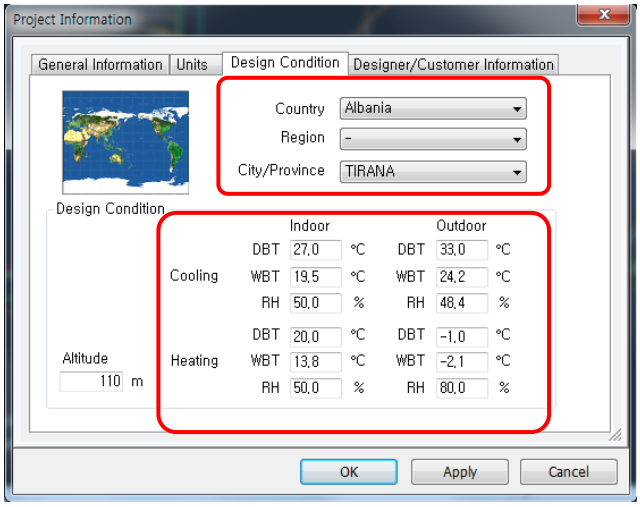


* *Caution! It is only setting value on drawing. For report units, it needs to set on output language of configuration.*

2.3 Design Condition

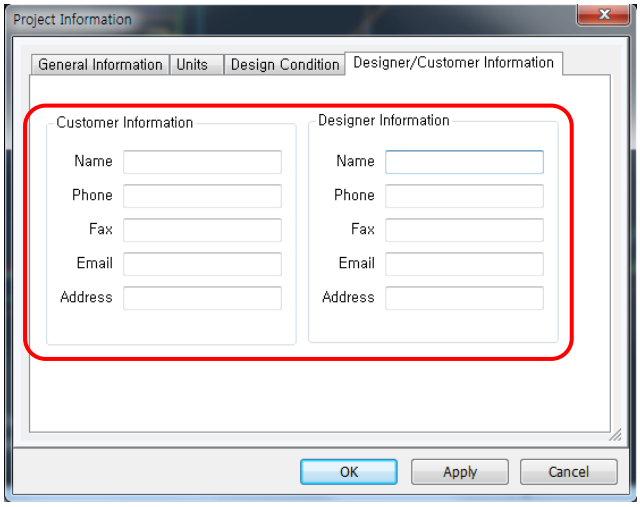
- It sets country, region, and city.

- It verifies cooling/heating dry gate and wet gate temperature conditions.



2.3 Designer/Customer Information

- Input Designer/Customer Information.



Space Information Creation

It creates buildings, floors, and rooms, which are the basic setting elements of the drawing, and sets the Reference Point and area.

There 2 ways, inserting by making an Excel Sheet and directly registering to Master Menu.

Building Creation (Using Excel Sheet)

After creating a project, create "Building Information" using Excel Sheet.

Read Information defined in Excel Sheet to create buildings, floors, and rooms.

< Excel Building Information >

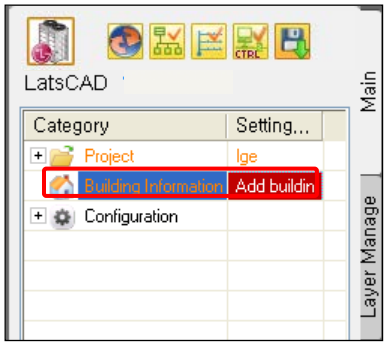
1. Input Building, Floor, and Room Information, location of the drawing, floor height, and room area in the Excel Sheet template.

   Template File is in Dat folder under Program folder. (BldgInfo_Template.xls) The path of the drawing can be input through the interactive box by the user.

	A	B	C	D	E	F	G	H	I	J
1	Builing Information	Name	TEST							
2		File Name								
3		Scale 1 :	100.0	Up	2.0	Down	1.0	Height	3.5	
4										
5	Floor	Room	Height	Heating Total heat		Cooling Sensible heat		Heating Total heat		Area
6				Unit Load	Load	Unit Load	Load	Unit Load	Load	
7	2F		4.0		0.0		0.0		0.0	
8	1F	1R	4.0							
9		2R	4.0							
10		3R	4.0							
11		4R	4.0							
12	1B		4.0		0.0		0.0		0.0	

Caution! When changing the template format, change(insert) only Row Information of the marked category. If other categories are changed, an Error will occur when the Building Information is extracted from the Project.

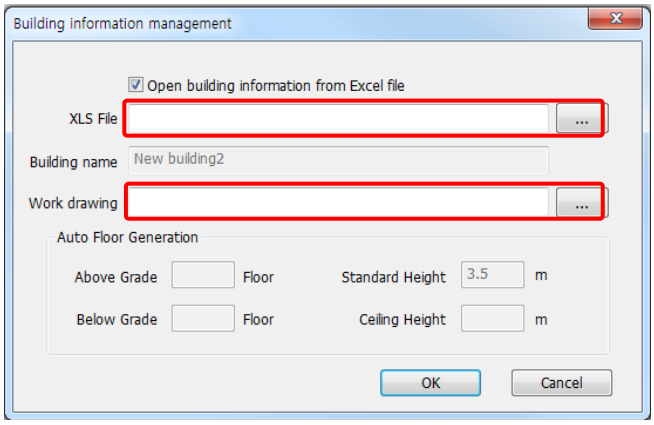
2. Designate the prepared Excel Sheet to create buildings, floors, and rooms.



2.1 Select "Add buildings" in Building Information in Master Menu.

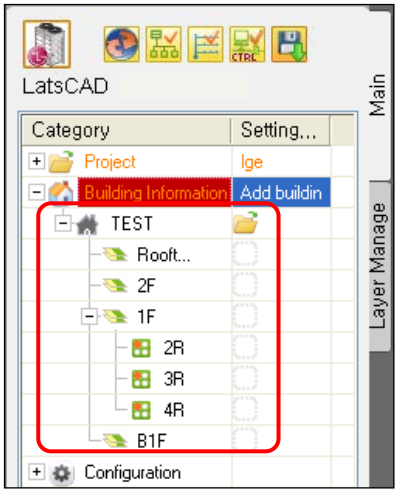
2.2 Select "Open building information from Excel file" in "Building Information Management"

2.3 Select the Excel File (File with Building Information input in the template) and drawing



3. The Building Information input in the Excel File is applied

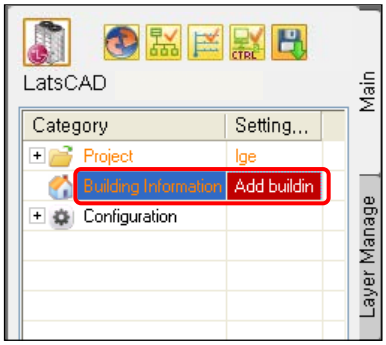
- Test Building is created, and if Room Information is input in the Excel File, Room Information is also applied.



Building Creation (Using Master Menu)

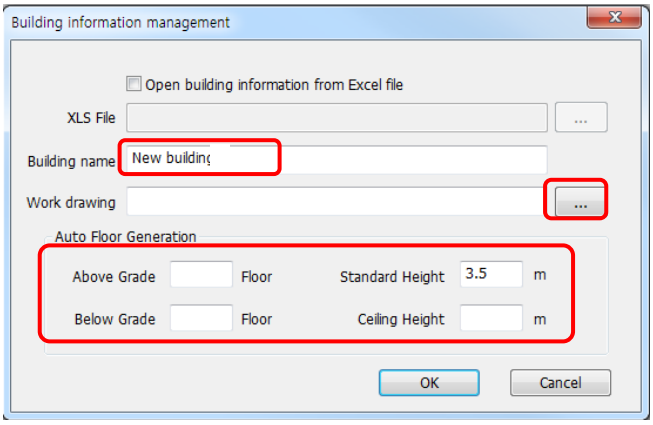
Create Building Information in the Main Tab of Master Menu

1. Select "Add Buildings" of Building Information.



2. Input Building Name, Floor, and Standard Floor Height, and designate the drawing.

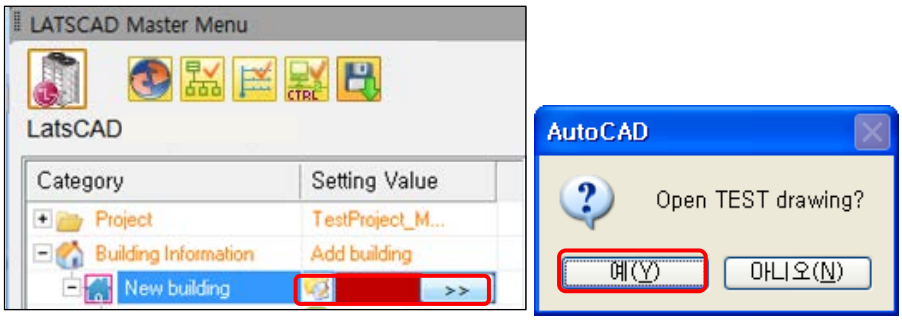
2.1 Drawing name is saved as Project Name_Building Name.dwg, and is copied to Project folder.



Caution! When ceiling concealed duct type Indoor Unit is selected, and it designates the ceil height. Don't have to be input the other case.

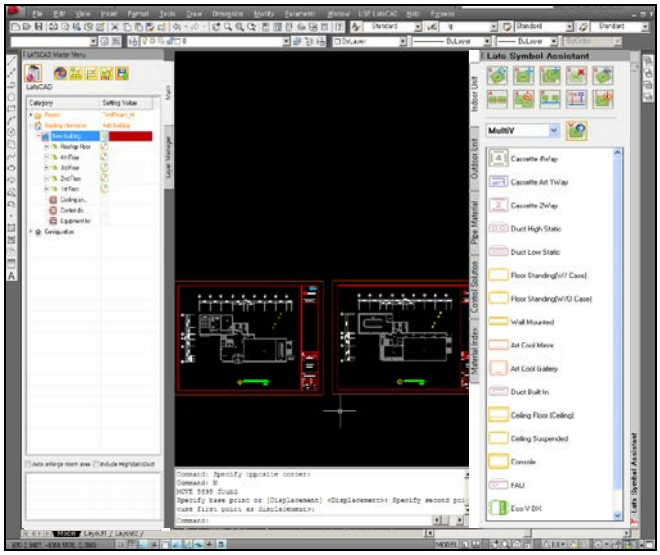
3. Building Information is created as the same in "Open Building Information from Excel File".

4. Opening Building Drawing (Select Building Information and Open the Drawing)



5. For the case of creating building using ExcelSheet, the following steps are also the same.

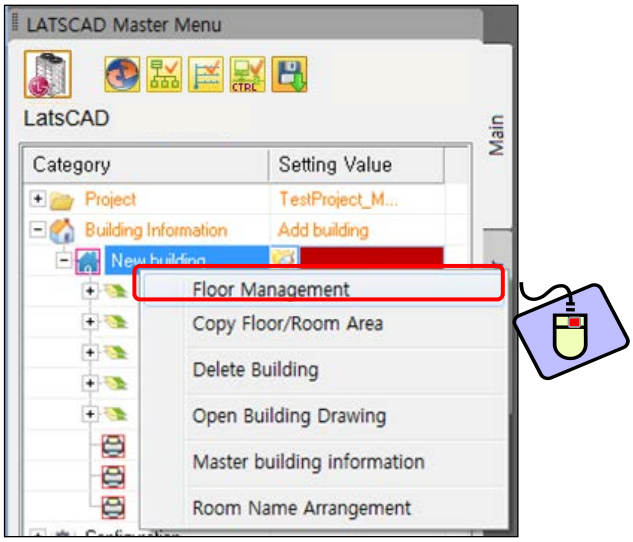
Caution! Default Scale is 1:1



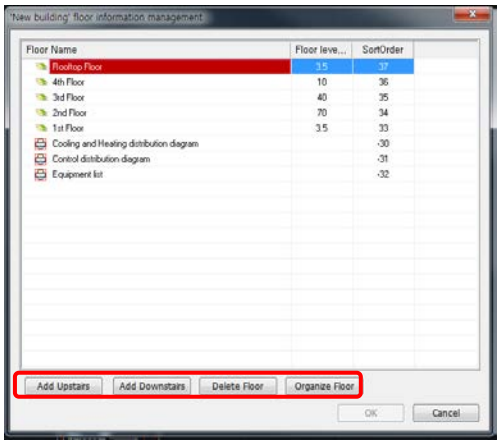
Floor Management

It is able to modify/insert/delete floor information selected automatically, when building creation.

1. While Building is selected, after clicking right mouse button, select Floor Management.



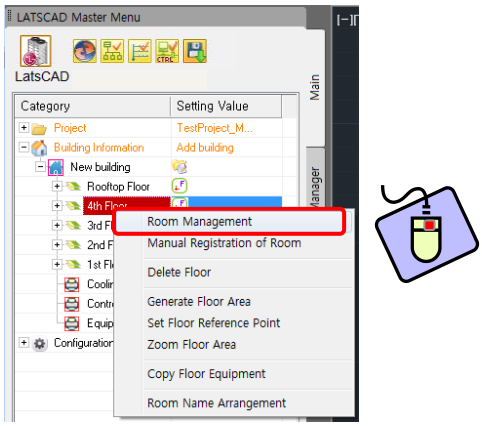
2. If to add/delete floor is needed in addition to the set floors, use Add Floor/Delete Floor function. (Add/Delete after selecting the Floor).



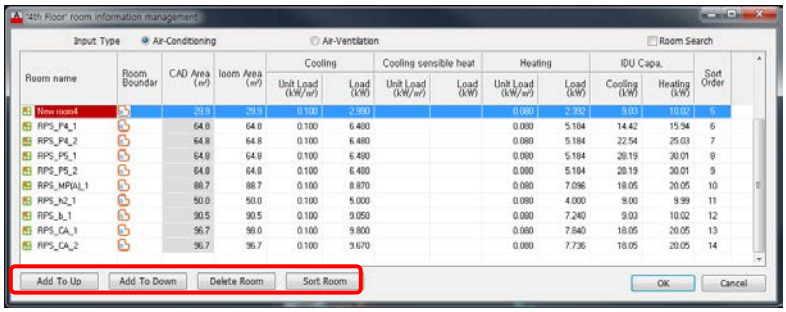
Room Management

It is able to input room information of each floor.

1. While Floor is selected, after clicking the right mouse button, select Room Management.



2. Room Add/Delete is possible for the selected floor.

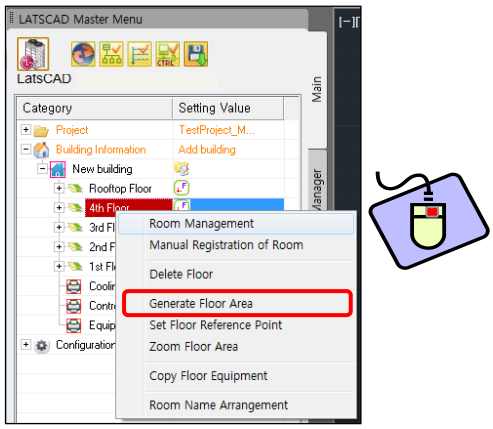


Area Designation

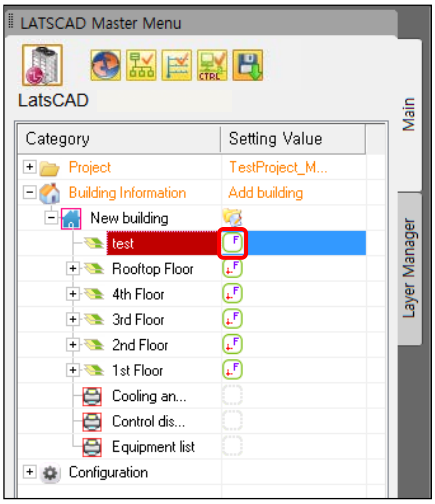
It designates Floor Area, Reference Point, and Room Area.

Caution! To copy Floor/Room Area, the Reference point of the both floors to be copied should be set first.

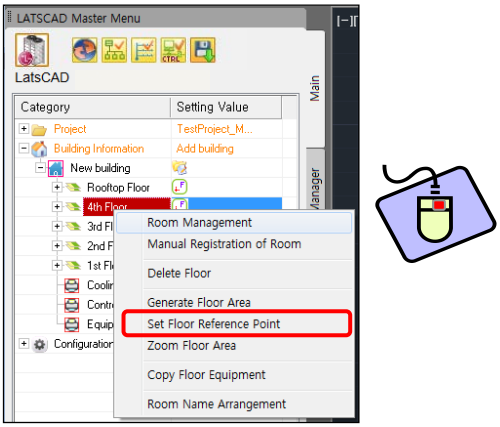
1. Generate Floor Area



- Designate Floor Area using rectangle or poly line, or designate certain area as the Floor Area using Boundary Selection.

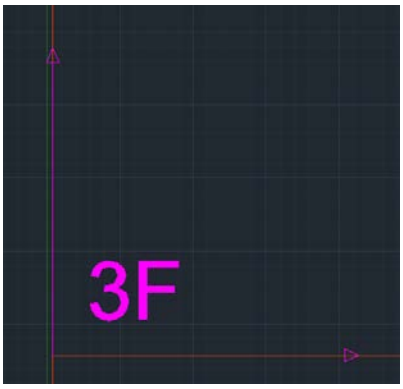


2. Set Floor Reference Point

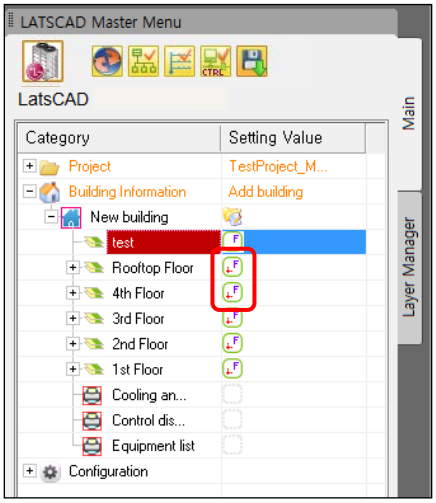


- After Floor Area is designated, designate the Reference Point of the floor.

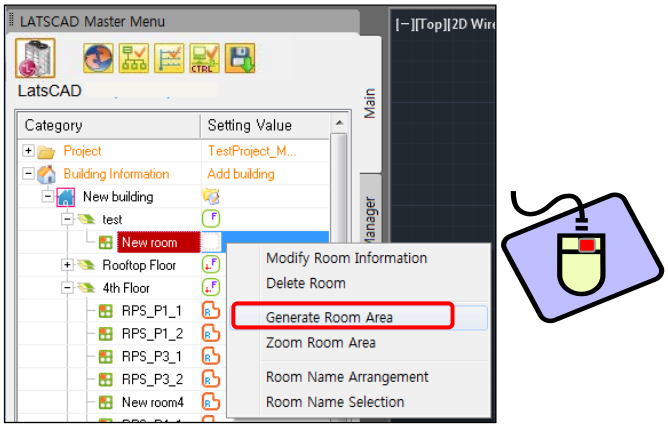
- Set the point being the base of each floor as the Reference Point.



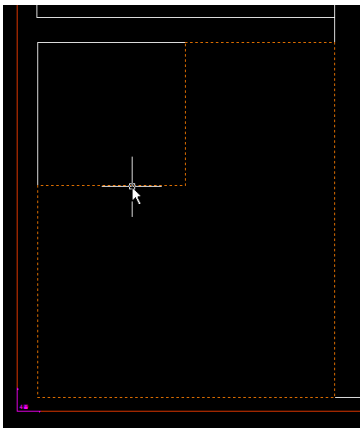
- When the Designation of Floor Area and the Setting of Floor Reference Point are completed, the Floor Icon is updated in Master Menu.



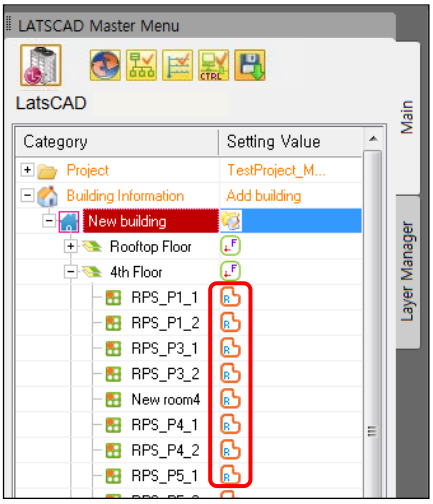
3. Generate Room Area



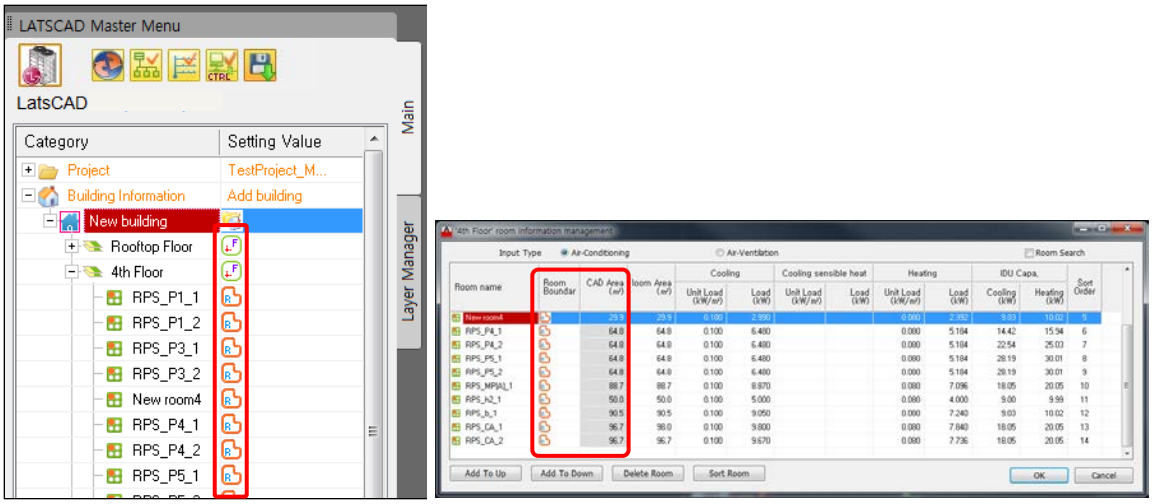
- Designate Room Area using rectangle and poly line, or designate certain area as the Room Area using Boundary Selection.



- When Floor and Room Area are designated, Room Icon is updated in Master Menu.



- When the designation of Floor Area/Floor Reference Point/Room Area is completed, all icons in Master Menu are updated, and the area for each room is recognized in CAD.



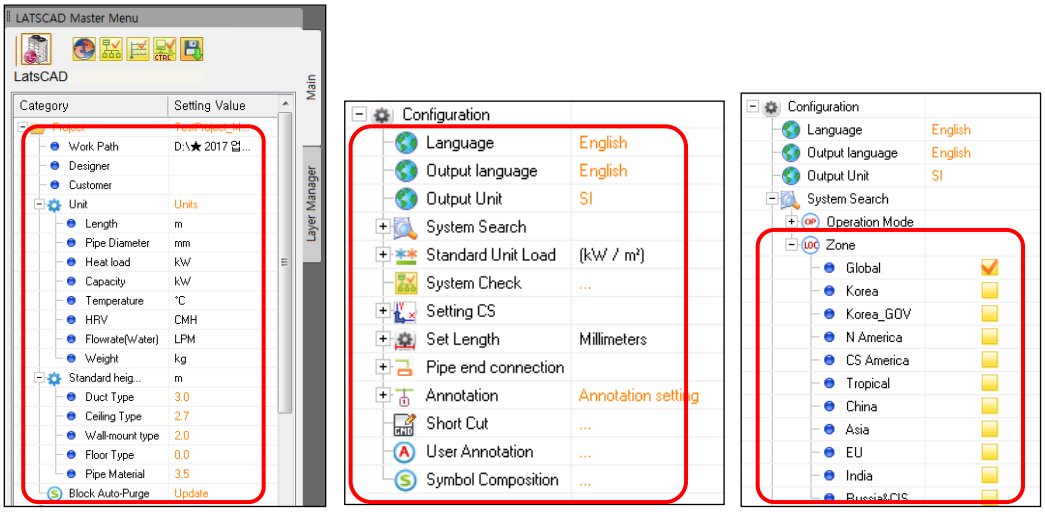
- Area for each Room/Floor may be Expanded/Deleted through Other Area Expansion/Deletion function.

Environment Setting

In LATS CAD, there is two type of environment setting. (Project setting, Program setting)

The project setting (under project button) is affected only the project file. And program setting (Configuration) is affected all working project.

1. It sets the data for Unit for each Project and Standard Height of Indoor Unit.



2. It sets various data through Environment Setting.

Caution! Check Zone of System Search to change Model line-ups according to the selected region.

Equipment Positioning

It selects equipments such as Indoor Unit and Outdoor Unit to position them in the drawing.

Indoor Unit Positioning

Indoor Unit Positioning method has 2 types as Normal Positioning and Auto-arrange Indoor Unit.

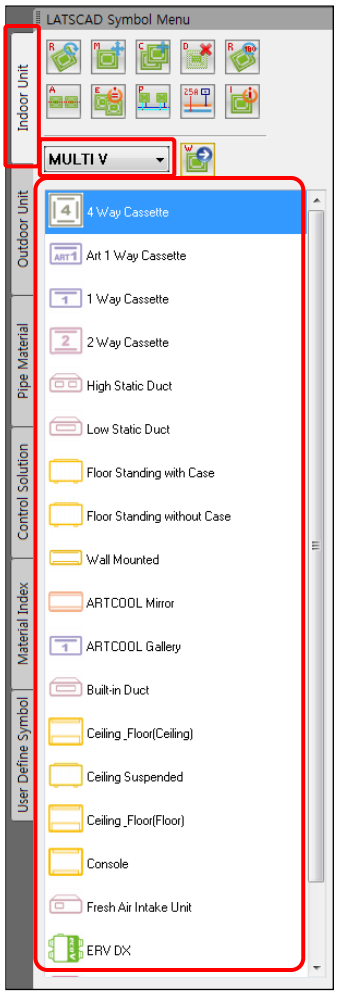
1. Normal Positioning

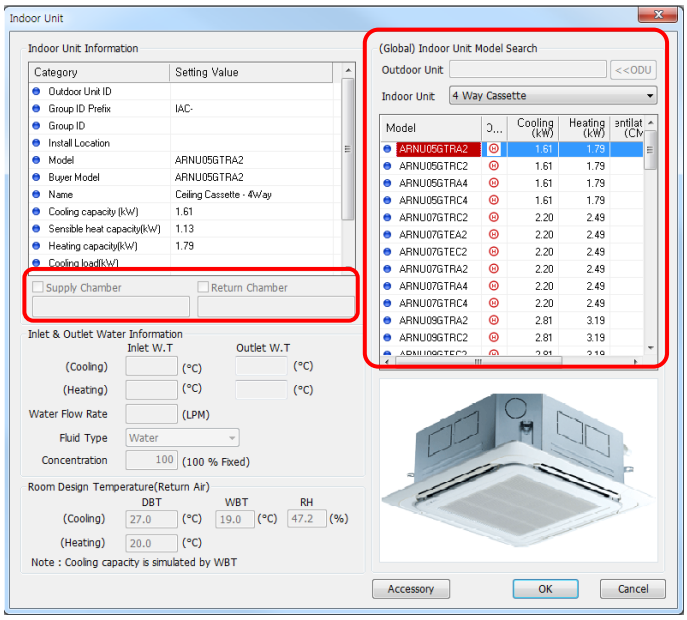
1.1 Select Indoor Unit tab in Symbol Menu.

1.2 Select Product Type. (MULTI V, GHP, MULTI (F), SINGLE CAC, SINGLE RAC)

1.3 Double click Indoor Unit Type icon to be positioned in Indoor Unit tab.

1.4 Select desired Model, and click OK button.

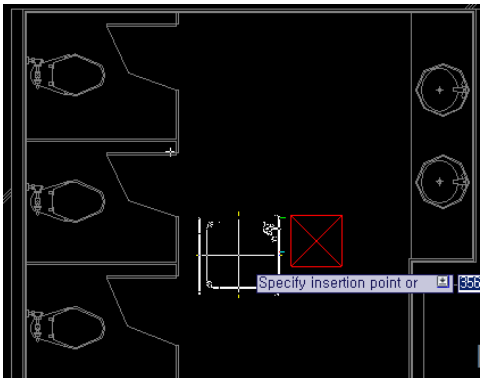


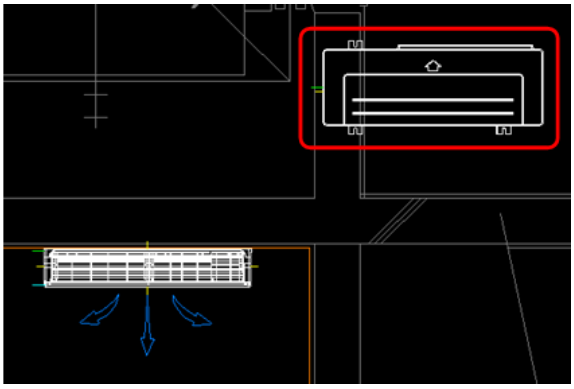


Caution! You may select air supply and exhaust chamber in case of ceiling concealed duct type (high static pressure) Indoor Unit.

1.5 Designate the equipment insertion position.

- If there is an equipment to position as a reference, click reference equipment, or press Enter.





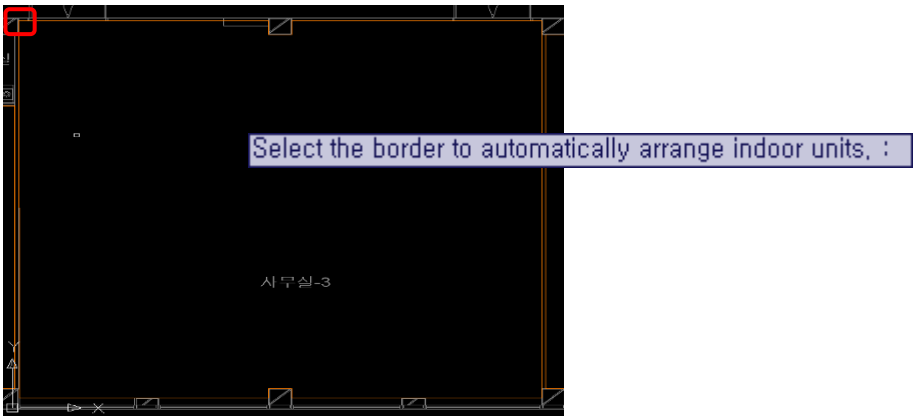
Caution! If SINGLE RAC is selected in Product Type, Outdoor Unit is immediately positioned after positioning Indoor Unit.

2. Auto-arrange Indoor Unit

Position using IDU Wizard function: only activated when Indoor Unit tab in Symbol Menu is selected and after Manual Registration of Room.

2.1 Select Auto-arrange Indoor Unit Menu in Symbol Menu. (MultiV, Multi, Single A Indoor)

2.2 Select Room Area to position

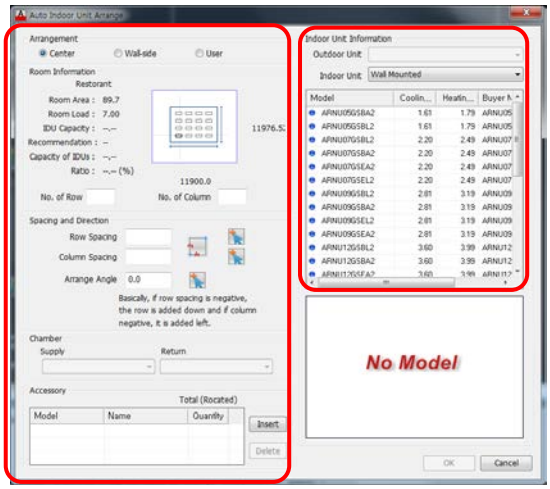


2.2.1 Auto-arrange Indoor Unit

- Select Indoor Unit Type to position (The number of equipments is recommended according to the selected equipment)

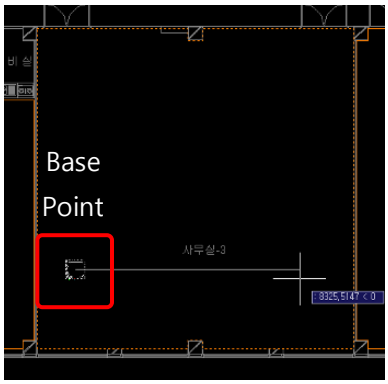
- Select Positioning Option (Positioning Type, Number of Positioning, and Positioning Distance)

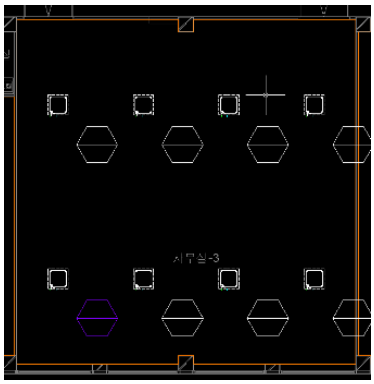
- Select Accessory



2.3 Set Base Point in the drawing

- It is automatically positioned as the decided positioning direction/number of equipments/positioning distance.

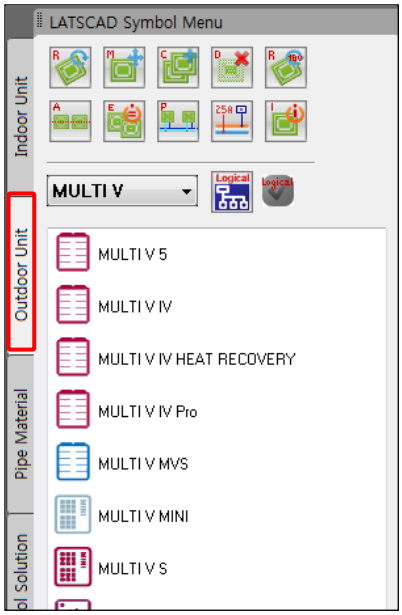




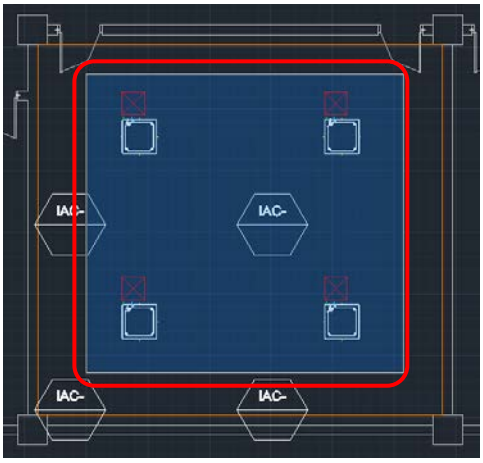
Outdoor Unit Positioning

1. Select Outdoor Unit tab in Symbol Menu.

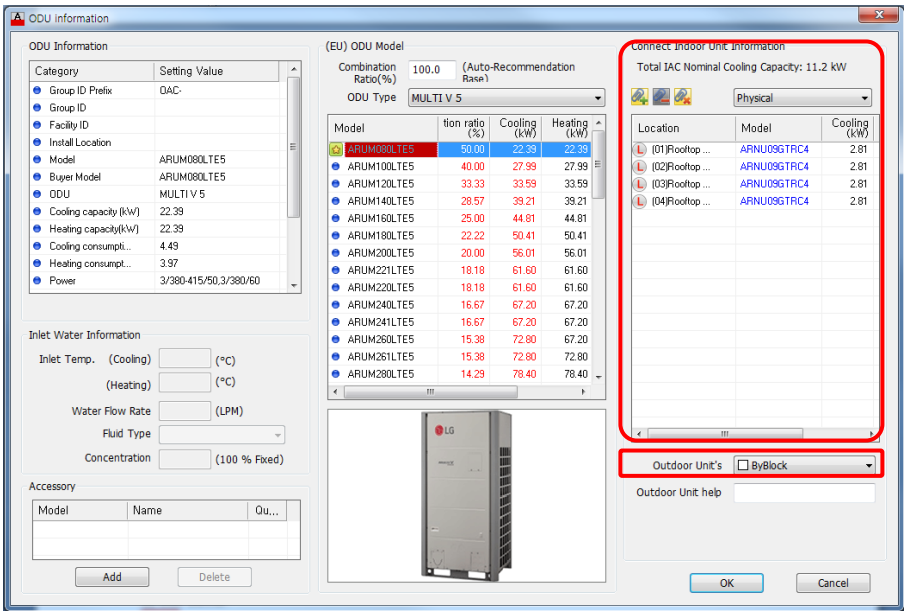
2. Double click Outdoor Unit Type icon to position in Outdoor Unit tab.



3. Select IDU Models to be connected with the selected ODU Model.



4. Select ODU Model, and click OK button

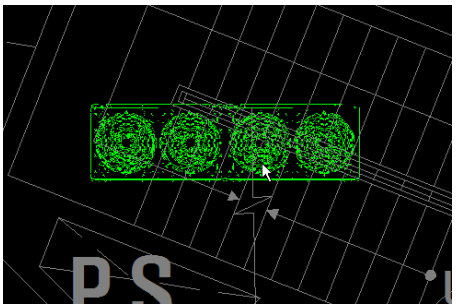


- It is able to check IDUs that you select above step.

- You may set only Indoor Units connected to the corresponding Outdoor Unit as one color by designating Outdoor Unit Group color.

4. Designate Equipment Insertion Position

- If there is an equipment to position as a reference, click reference equipment, or press Enter.

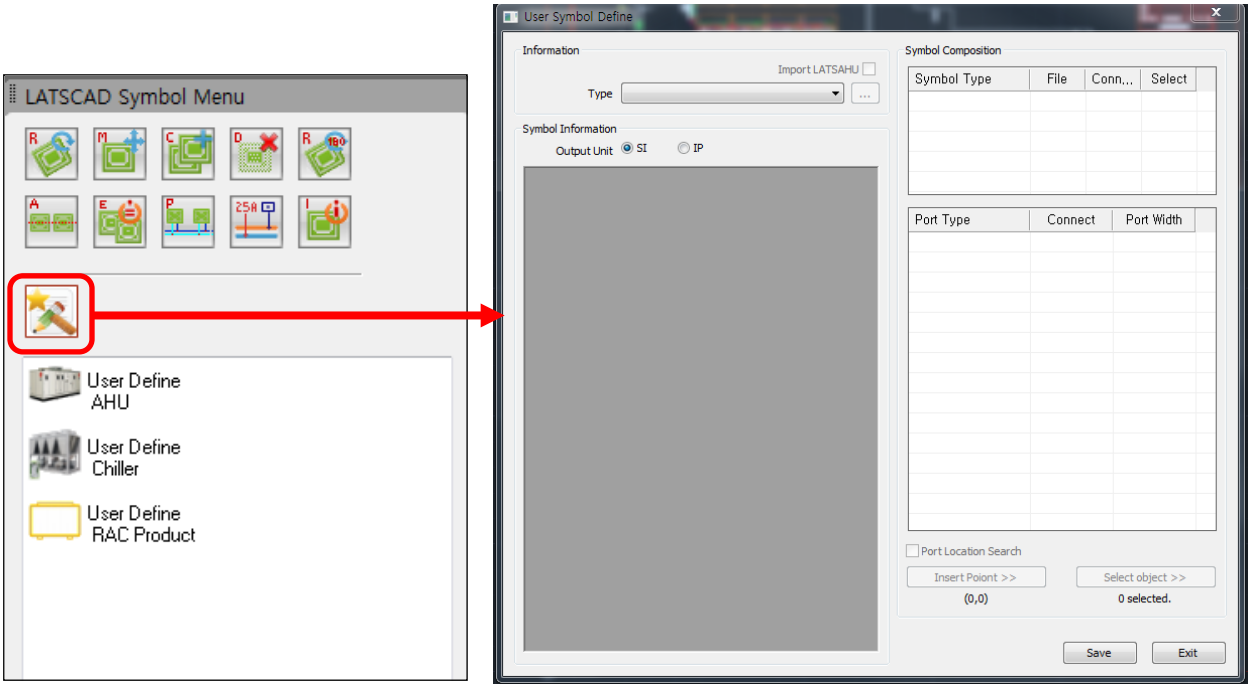


AHU Positioning

AHU Model can be made using User Define or LATS AHU.

1. User Define

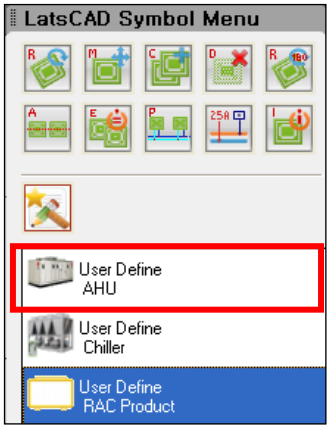
Click the "User Symbol Define Icon".



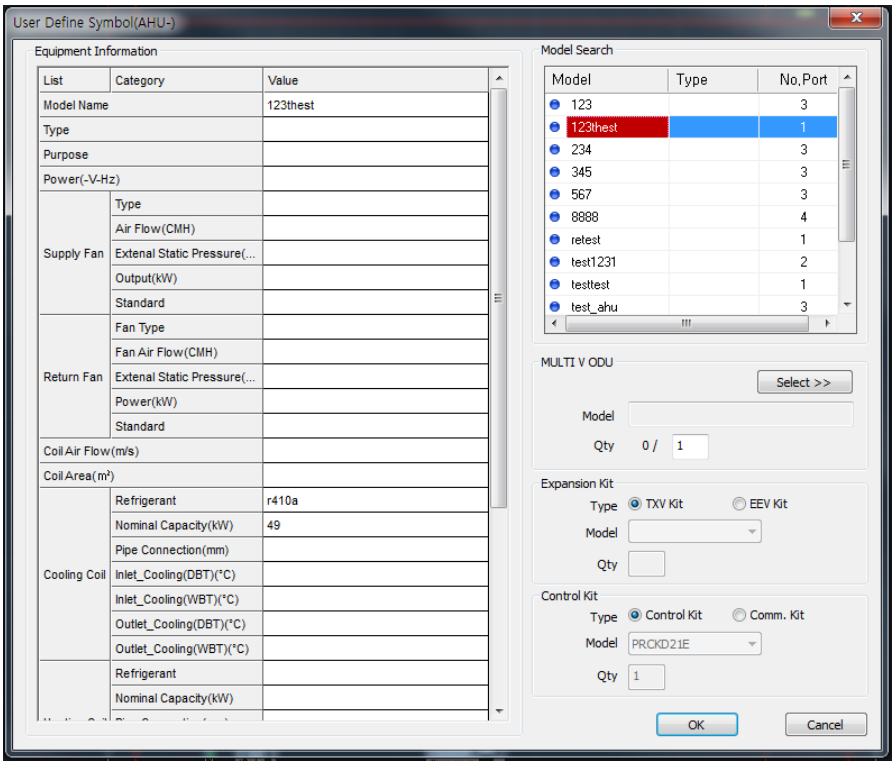
(2) LATS AHU(will be developed.)

If you have LATS AHU, you can export the block of LATS AHU.

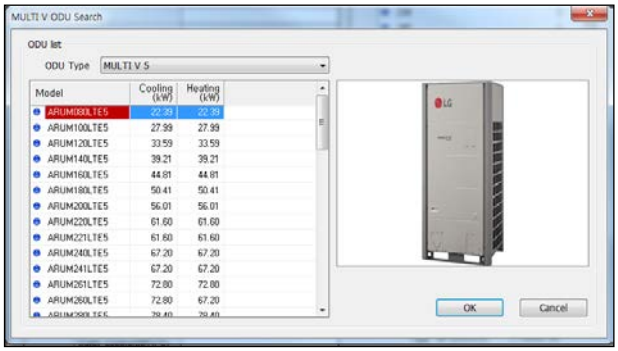
2. It selects the "AHU" in User Symbol Define Tab.



3. AHU Model selects



3.1 The MultiV ODU model selects.



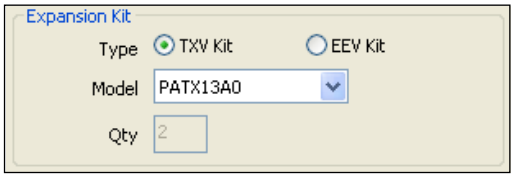
3.1.1 Select “ODU Type”.

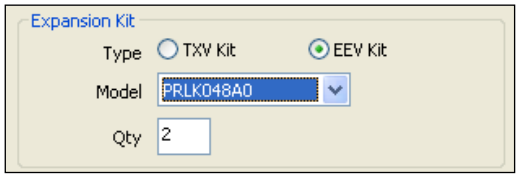
3.1.2 Select ODU Model.

3.1.3 OK.

* The default of ODU quantity is determined by AHU’s No. port. And it can modify.

4. The Expansion model selects.



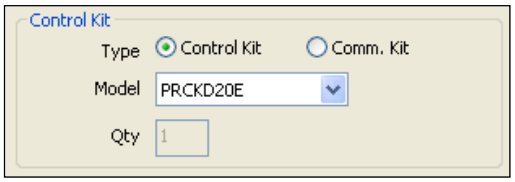


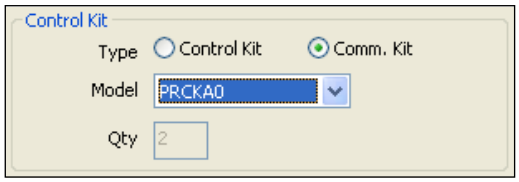
(TXV kit) (EEV kit)

4.1 TXV kit : The model name is determined automatically by ODU total capacity.

4.2 EEV kit : if you select the model name, the equipment's quantity is determined automatically.

5. The Control model selects.





(Control kit) (Comm. kit)

5.1.TXV kit : The model name is determined automatically by ODU total capacity.

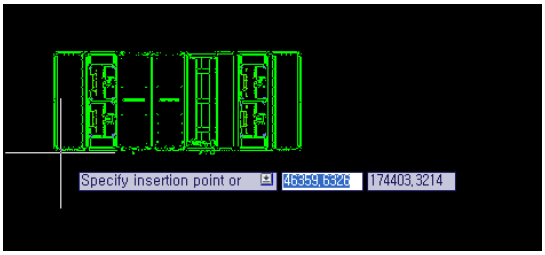
5.2 EEV kit : if you select the model name, the equipment's quantity is determined automatically.

*When Select the EEV kit, It cannot select "Control kit" .

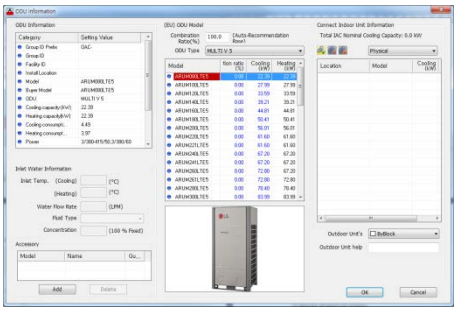
6. Click the "OK".

7. Positioning AHU&ODU

7.1 AHU is positioned.

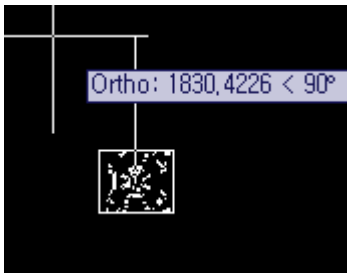


7.2 Check the ODU model. (Click the "OK")

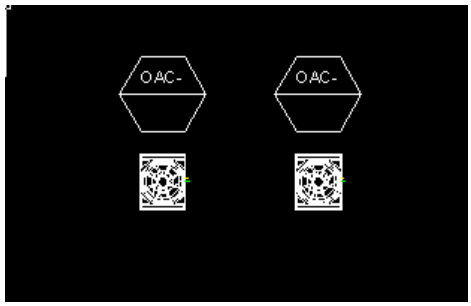


7.3 The first ODU is positioned.

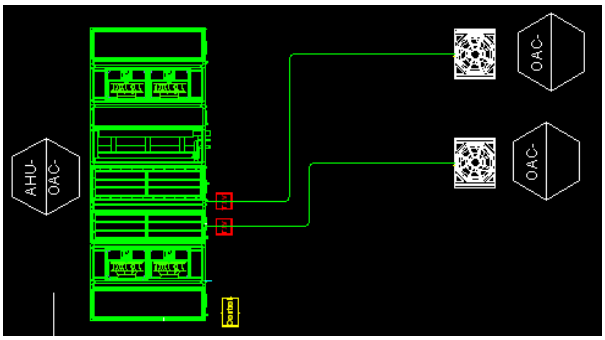
7.4 Select the refrigerant port direction.



7.5 If ODU quantity over to 2, next ODU is positioned.

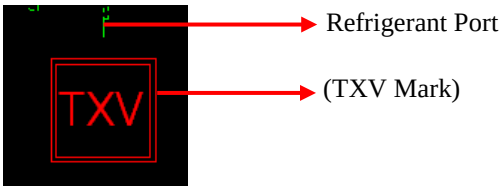


7.6 Connect the AHU model and ODU.

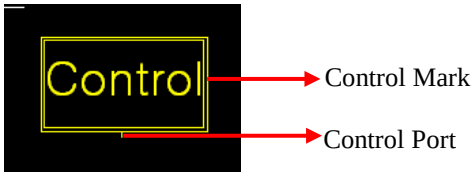


8. Kind of Connect Port

8.1 Refrigerant Port: It is selected making AHU symbol. When AHU is positioned, Expansion mark is positioned.



8.2 Control Port: When AHU is positioned, Control mark & port are positioned.



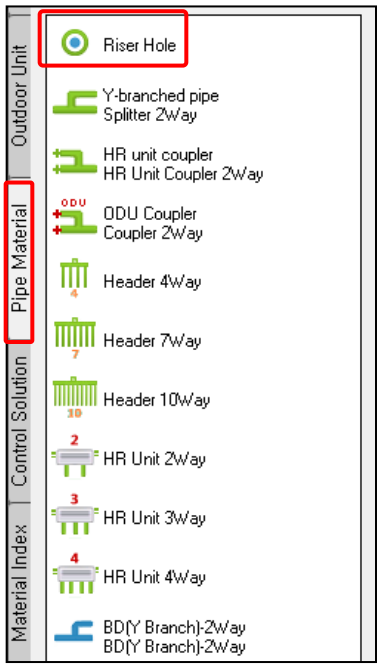
Pipe Connection

It positions the Riser Hole and draws Riser Hole to connect the positioned Outdoor Units and Indoor Units.

Riser Hole Positioning

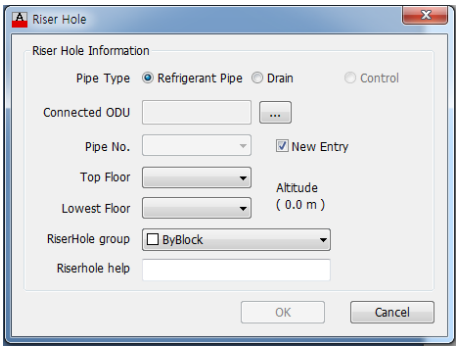
It positions the Riser Hole connecting a floor to the other floor.

1. Double click Riser Hole icon in Pipe material tab in Symbol Menu.



2. Designate Pipe Type (Refrigerant pipe, Drain pipe, Control), Top floor, and l Lowest floor, and Riser Hole group and OK Button, and press Enter.

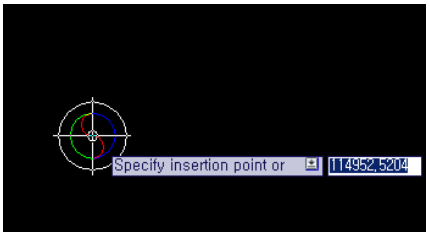
Caution! To designate Control of Pipe Type, check Control riser hole of Control Solution Tab of Symbol Menu.



Caution! To position the Riser Hole, Floor Reference Points have to be set in all floors between the Top Floor and the Lowest Floor.

3. Designate Riser Hole insertion point to position the Riser Hole.

- If there is an equipment to position as a reference, click reference equipment, or press Enter

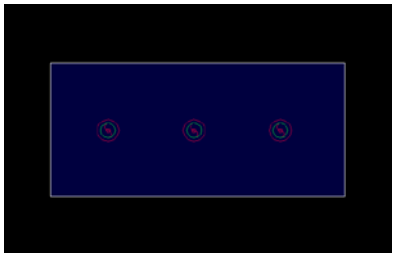


4. Then, based on the Reference Point of the corresponding floor, the Riser Hole is positioned in the same position in each floor.

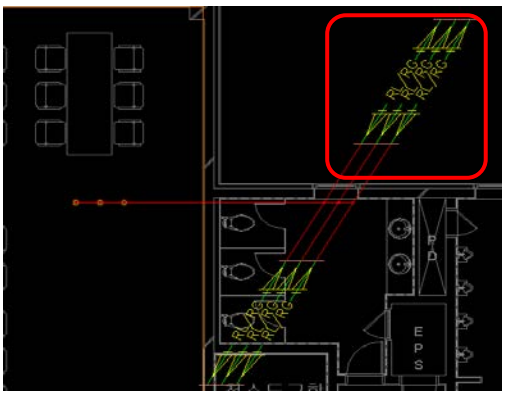
5. Positioning Riser Hole Notes

5.1 Select Equipment and Pipe index Menu in Symbol Menu.

5.2 Select Riser Hole to position Notes. (Multiple selections are possible using drag.)



5.3 When the position is designated, the Riser Hole note is positioned in the corresponding location.



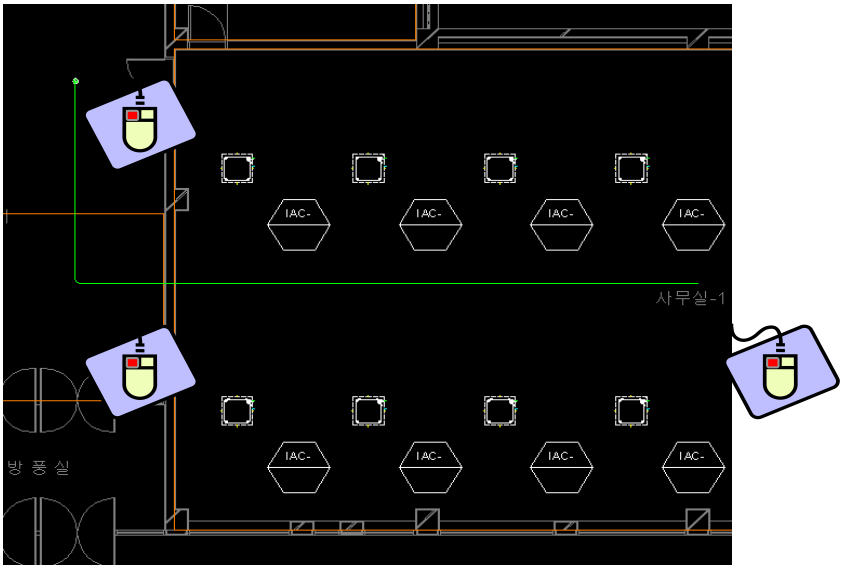
Refrigerant Pipe Connection

Through Piping Equipment Menu in Symbol Menu, Refrigerant Pipe can be drawn from Outdoor Unit or Riser Hole. In this case, show drawing method using Auto-piping functions.

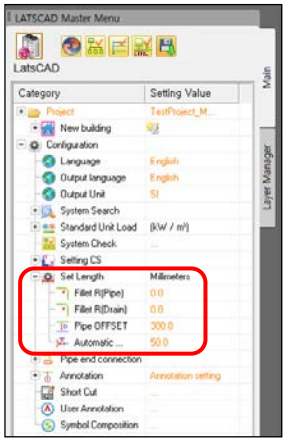
1. Draw Main Pipe by clicking Mouse from Riser Hole or Outdoor Unit Refrigerant Port.

1.1 Draw Main Pipe by clicking Mouse from Riser Hole or Outdoor Unit Refrigerant Port.

1.2 Press Enter, to finish drawing pipe.



- The radius of Pipe bending part can be set in Environment Setting of Main Tab.



2. Pipe connection with Indoor Unit. (Using Auto-piping)

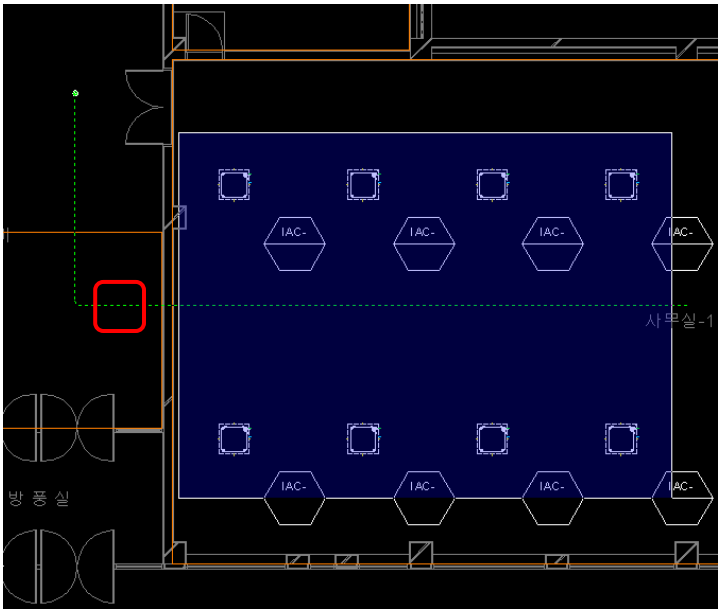
2.1 Select Piping Equipment Menu of Symbol Menu.

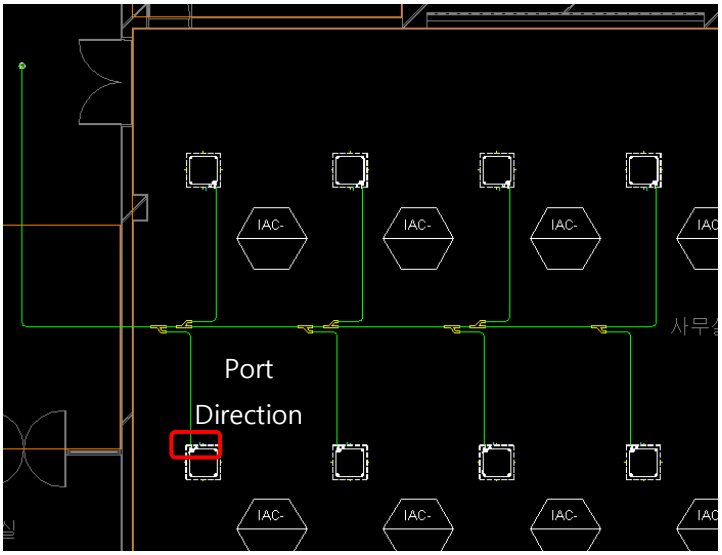
2.2 Input to "S" in command line for Select Auto-piping.

```
[ Select connection point or [Auto-piping(S) Offset Piping(for drain)(O)
                                Independent refrigerant pipe(R) Independent drain pipe(D)] :
```

2.3 First select the Pipe, and select Indoor Units to connect.

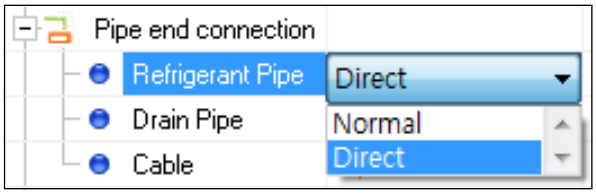
2.4 If you want to finish Auto-piping, press Enter.





Caution! It is automatically connected only when Indoor Unit Port is toward Main Pipe or in parallel.

- The last Indoor Unit connection option (Normal connection, direct connection) can be set in Environment Setting.



- Normal: Insert Branching Pipe in Main Pipe to connect Indoor Unit.

- Direct: Directly connect Indoor Unit without inserting Branching Pipe.

Caution! The Auto Piping is not supported Header / HR unit / 3 or 4 way Branch / HR unit Coupler / ODU Connector.

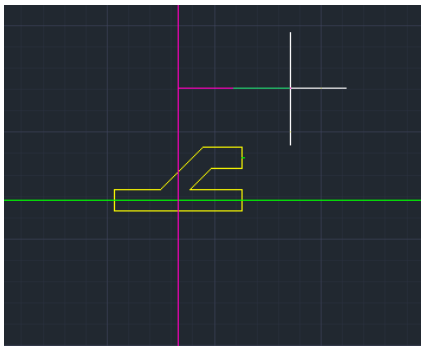
Branching Pipe Connection

1. Y-branched pipe

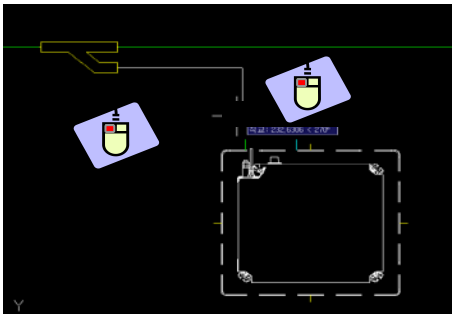
Insert Branching Pipe to Main Pipe to connect to Indoor Unit. (It is automatically connected in Auto-piping.)

1.1 Double click Y Branching Pipe icon in Pipe Material tab in Symbol Menu.

1.2 Select insertion point of Main Pipe, and select left or right direction.



1.3 After selecting Piping Equipment Menu, draw Refrigerant Pipe from the connection point of Branching Pipe to Indoor Unit Port.



Drain Pipe Connection

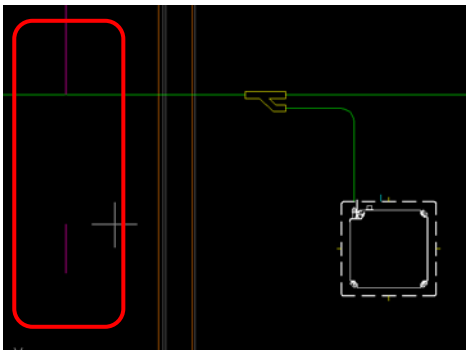
Connect drain Pipe in parallel with Refrigerant Pipe.

1. Select Piping Equipment Menu in Symbol Menu.

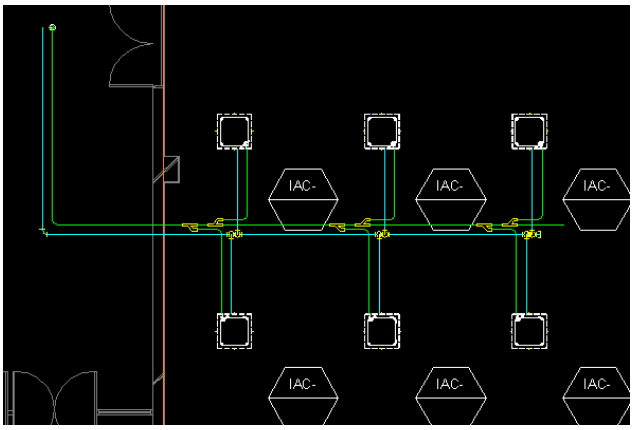
2. Input to "O" in command line for Selecting offset wiring.

```
: Select connection point or [Auto-piping(S) Offset Piping(for drain)(O)
                                                Independent refrigerant pipe(R) Independent drain pipe(D)] :
```

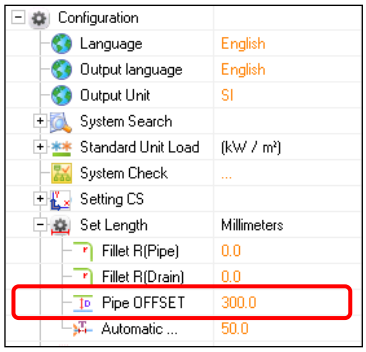
3. After designating parallel path standard Pipe, designate offset direction.



4. Drain Pipe is connected with certain distance offset along Main Pipe.



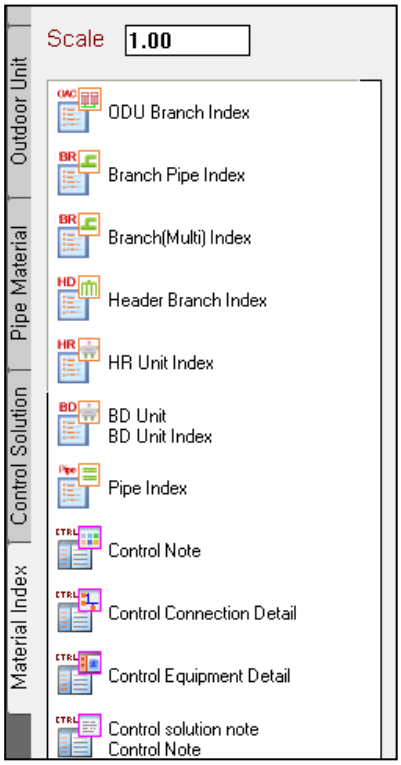
- Offset distance can be designated in Environment Setting of Main Tab.

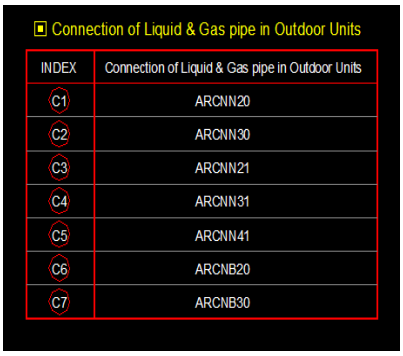


Material Index

The remarks for the Pipe material applied to the drawing may be inserted in Material Index tab in Symbol Menu.

The name of the inserted Model is changed according to the language condition setting of Environment Setting in Main Tab.





Connection of Liquid & Gas pipe in Outdoor Units

INDEX	Connection of Liquid & Gas pipe in Outdoor Units
C1	ARCNN20
C2	ARCNN30
C3	ARCNN21
C4	ARCNN31
C5	ARCNN41
C6	ARCNB20
C7	ARCNB30

Drawing Check

It selects Pipe diameter and Branching Pipe to insert in the drawing, and carries out system efficacy inspection.

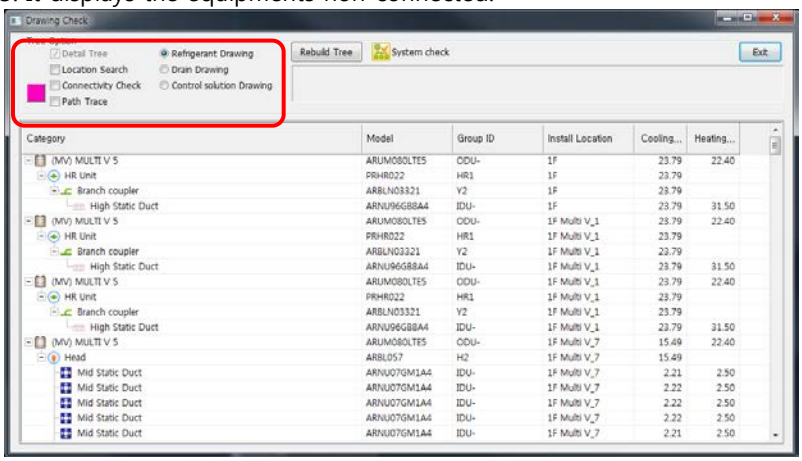
Drawing Check _Pipe Design Check

It updates and shows the connection structure currently composed.

1. It searches the location of the selected equipment and displays the connection relations between Indoor Unit – Outdoor Unit through Tree Option Setting.

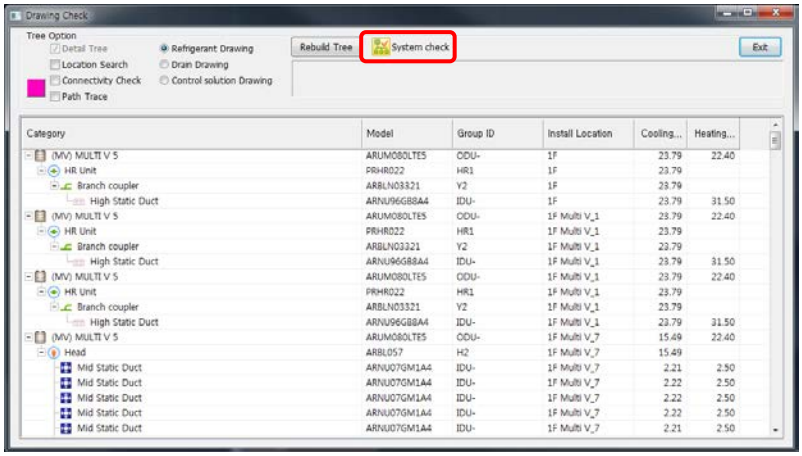
2. Re-composition is possible for each type of Refrigerant, Drain, and Control.

3. It displays the equipments non-connected.



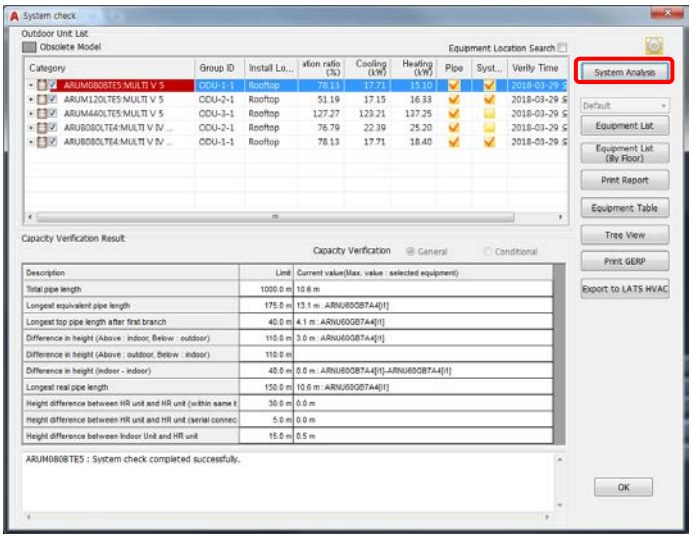
Caution! System check will check capacity and pipe diameters by simulation. To check faults on the drawing, execute drawing check if you want to find faults on the drawing.

System Check

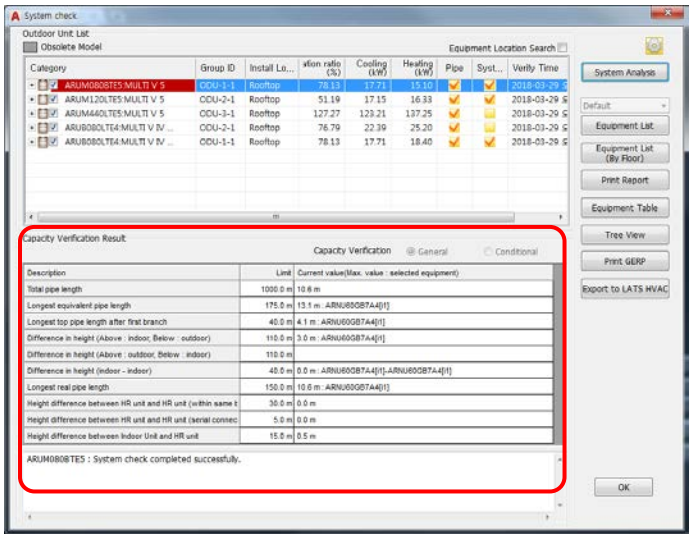


Caution! System check can be executed only when the drawing check has no error.

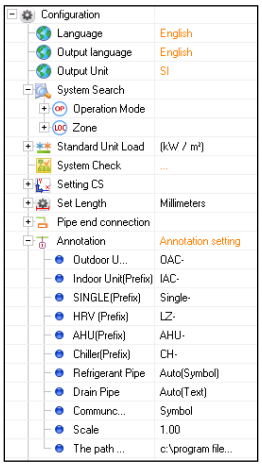
1. System Analysis

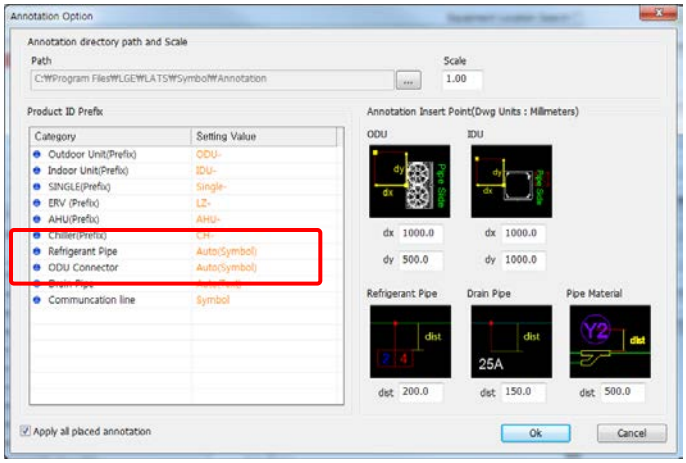


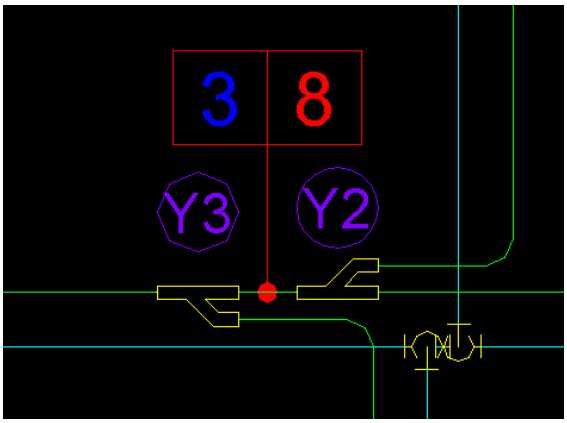
- It shows the system verification result for each system.



- When setting Refrigerant pipe & Drain pipe to mode "Auto" in Annotation Option, Pipe diameter and Branching Pipe annotations are automatically selected.

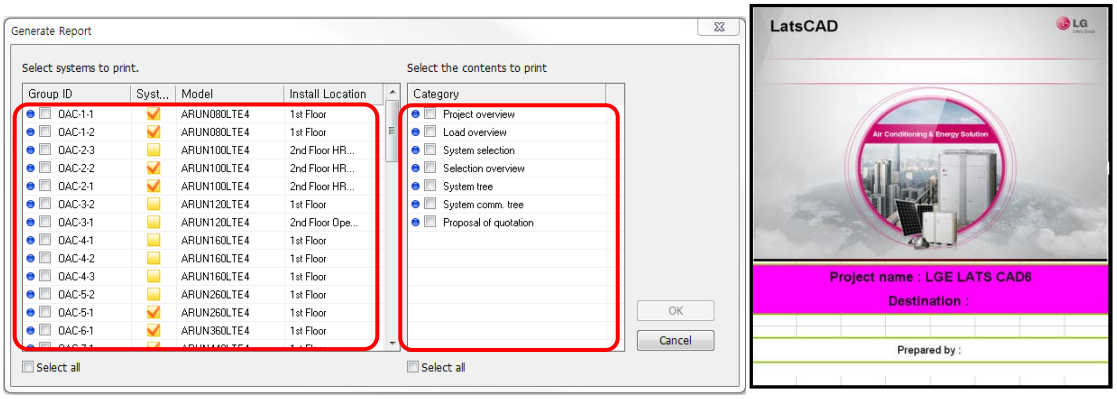






2. Print Report

- After selecting the system to print and the category for output, it outputs the report. (The output contents are listed for each tab of Excel Sheet.)

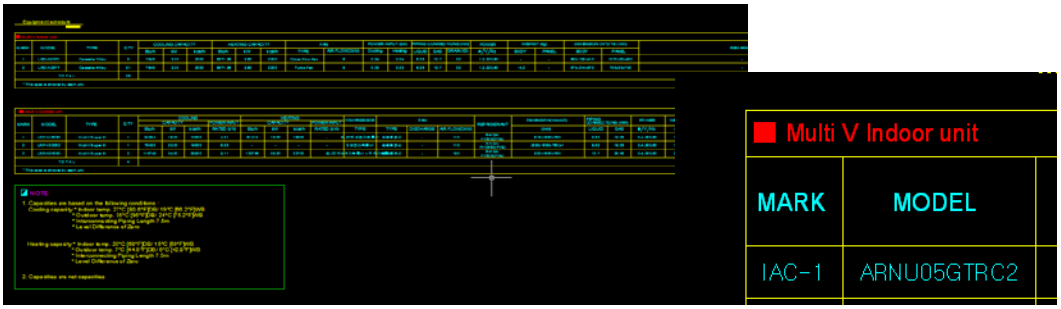


3. Equipment List

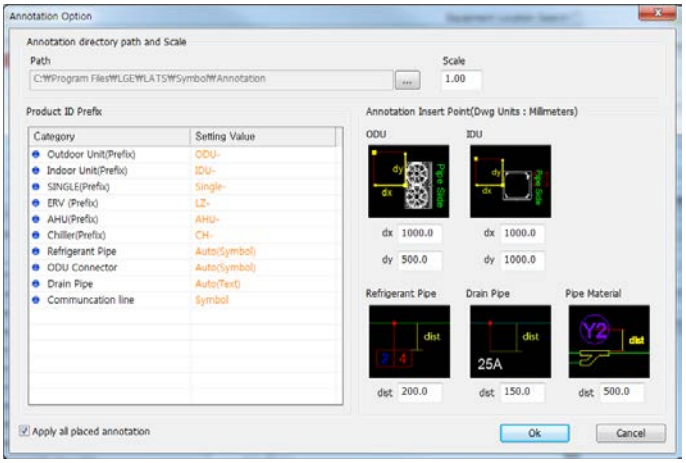
- Select the position to insert List of Equipments in the drawing.

- The contents for equipment and pipe material applied to the drawing are inserted as List of Equipments.

- The mark assigned automatically when insert the Equipment table.

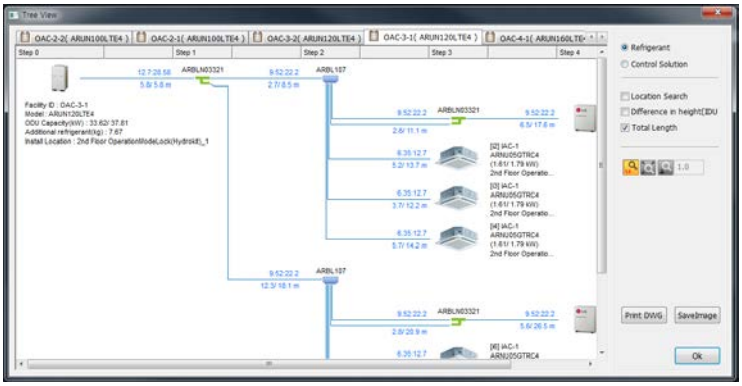


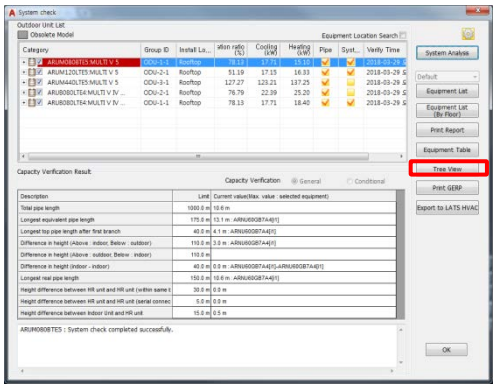
Caution! When change the mark(outdoor unit prefix, indoor unit prefix, and hrv prefix) in the Index, Enter the new equipment list .



4. Tree View

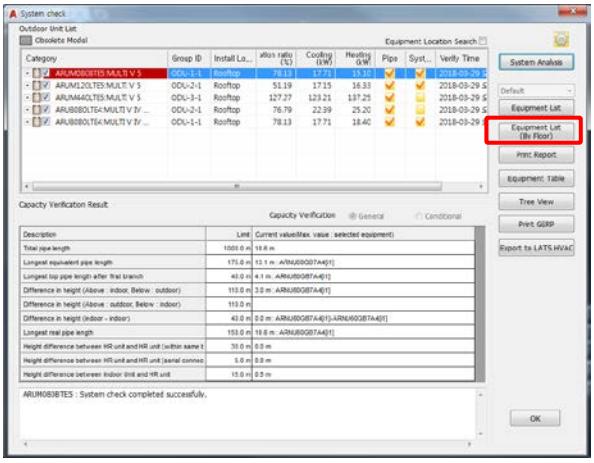
- Verification and changes of property information for the selected equipment are possible.

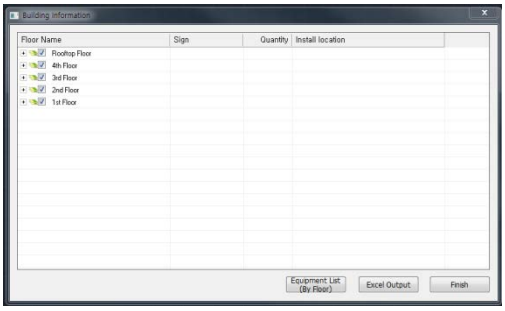




5. Equipment List(By Floor) / Equipment Table / Print GERP.

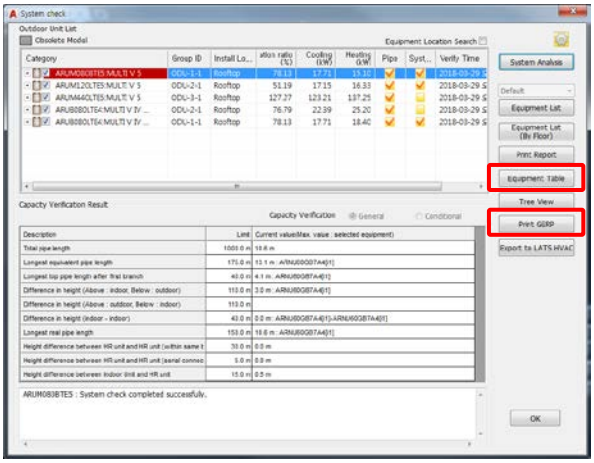
-. Equipment List by the each floor can be position in drawings or to be outputted excel sheet.

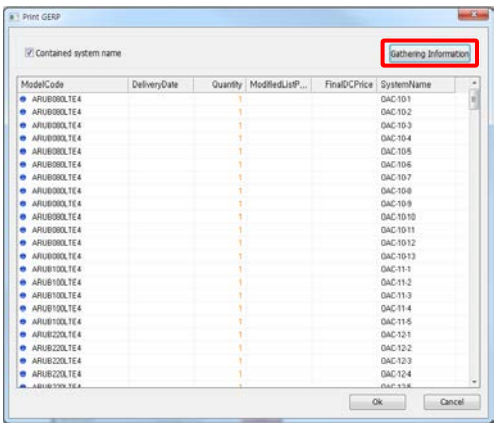


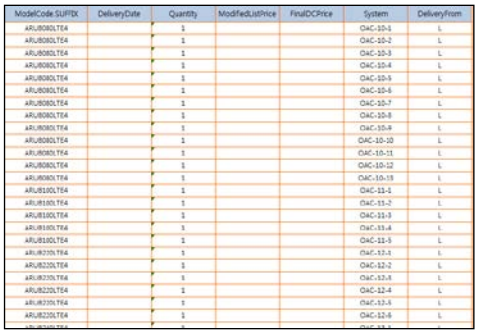


6. Equipment Table / Print GERP

Equipment Table Print GERP is printed with quantity calculation of equipments by Excel Sheets.

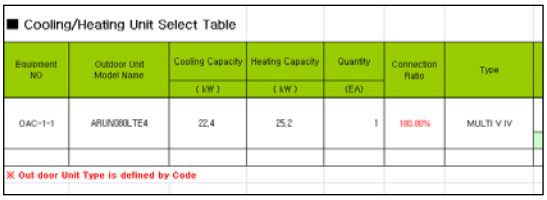






ModelCode.SUFFIX	DeliveryDate	Quantity	ModifiedListPrice	FinalDCPrice	System	DeliveryFrom
ARUB080LTE4		1			OAC-10-1	L
ARUB080LTE4		1			OAC-10-2	L
ARUB080LTE4		1			OAC-10-3	L
ARUB080LTE4		1			OAC-10-4	L
ARUB080LTE4		1			OAC-10-5	L
ARUB080LTE4		1			OAC-10-6	L
ARUB080LTE4		1			OAC-10-7	L
ARUB080LTE4		1			OAC-10-8	L
ARUB080LTE4		1			OAC-10-9	L
ARUB080LTE4		1			OAC-10-10	L
ARUB080LTE4		1			OAC-10-11	L
ARUB080LTE4		1			OAC-10-12	L
ARUB080LTE4		1			OAC-10-13	L
ARUB160LTE4		1			OAC-11-1	L
ARUB160LTE4		1			OAC-11-2	L
ARUB160LTE4		1			OAC-11-3	L
ARUB160LTE4		1			OAC-11-4	L
ARUB160LTE4		1			OAC-11-5	L
ARUB220LTE4		1			OAC-12-1	L
ARUB220LTE4		1			OAC-12-2	L
ARUB220LTE4		1			OAC-12-3	L
ARUB220LTE4		1			OAC-12-4	L
ARUB220LTE4		1			OAC-12-5	L
ARUB220LTE4		1			OAC-12-6	L

<GERP>



■ Cooling/Heating Unit Select Table

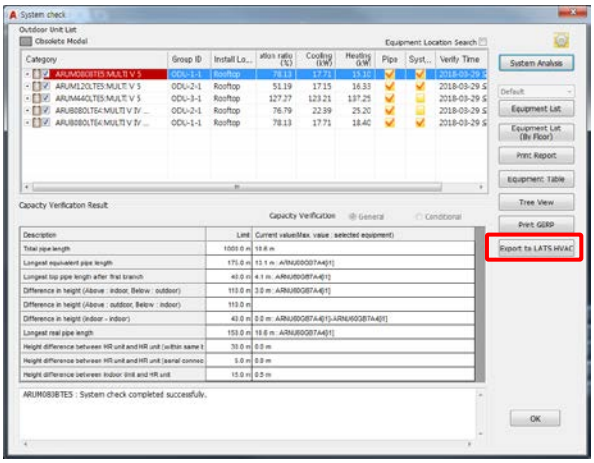
Equipment NO	Outdoor Unit Model Name	Cooling Capacity (kW)	Heating Capacity (kW)	Quantity (EA)	Connection Ratio	Type
OAC-1-1	ARUN080LTE4	22.4	25.2	1	100.00%	MULTI V IV

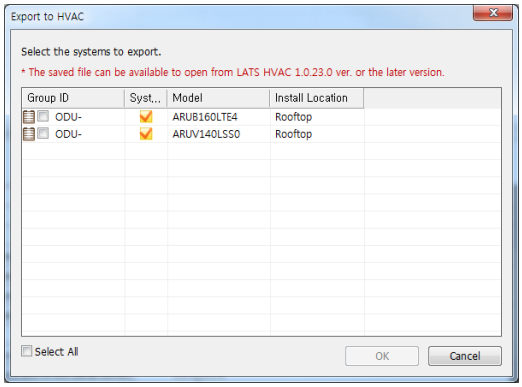
※ Out door Unit Type is defined by Code

<Equipment Table>

7. Export to LATS HVAC

The Systems which are drawn on the project can export to LATS HVAC to check more detail.





* The saved file can be available to open from LATS HVAC 1.0.23.0 ver. or the later version.

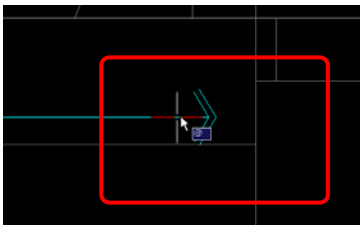
** The saved file can be available to open from LATS HVAC 1.5.2.0 ver.(N.America) or the later version.

Checking Drain Validation

Check Drain Pipe Diameter.

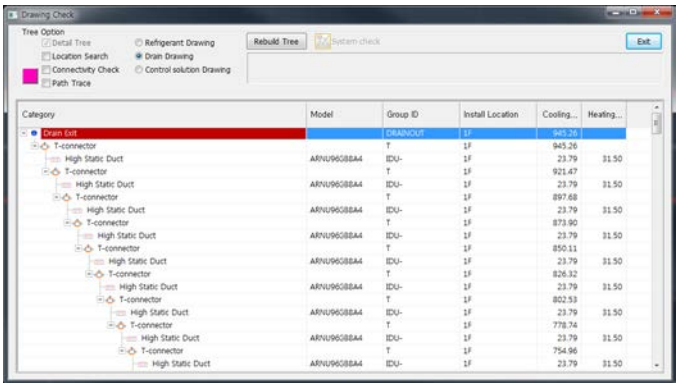
1. Select Drain Exit in Pipe Material in Symbol Menu.

2. After selecting the last exit of Drain Pipe, close the drain exit with “Drain Exit”.

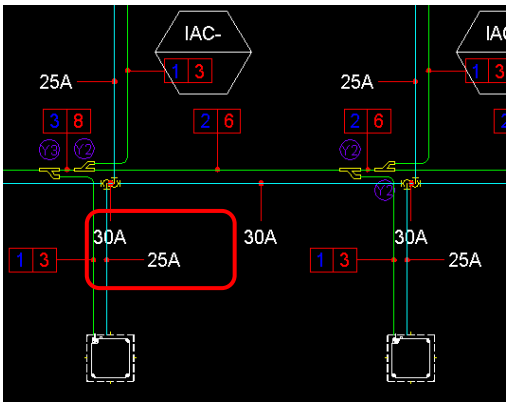


3. Select Checking Drain Validation in Master Menu.

4. It shows Drain Pipe structure from Drain Exit.



5. Drain Pipe Diameter is automatically selected and inserted in the drawing.



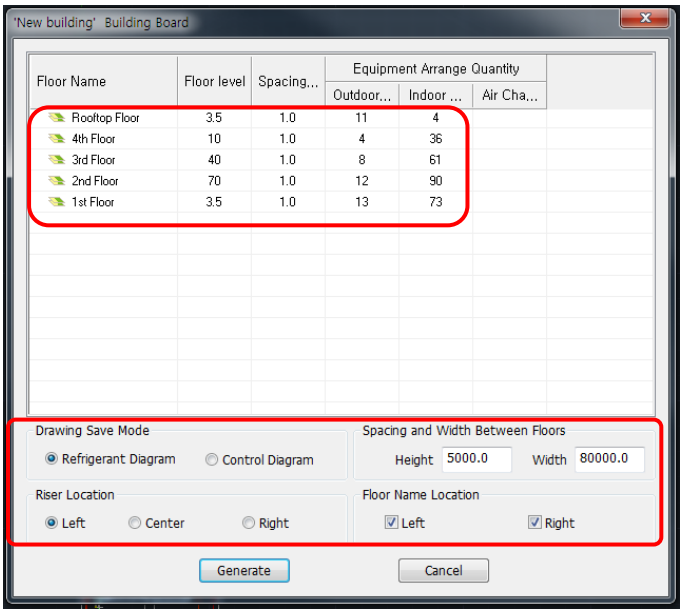
Refrigerant System Diagram Drawing

Building Board Composition

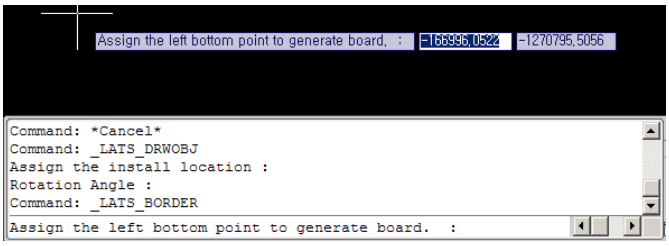
It composes the building board in the drawing of the system diagram before positioning equipment and pipe material.

1. Select "Building Board Composition" in Pull Down Menu or Ribbon Menu (LGE LATS CAD).

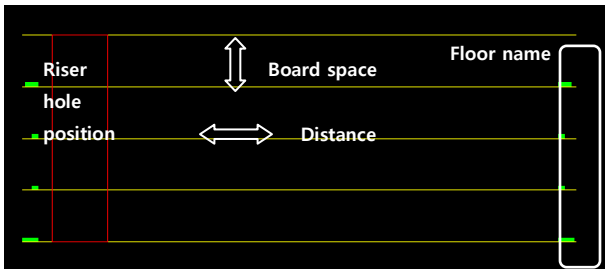
2. Set Building Board Option (Drawing Save Mode, Riser Location, Spacing and Width Between Floors, and Floor Name Location).



2. Select the lower left point to position board in the drawing.



3. Building Board creation is completed to draw system diagram.

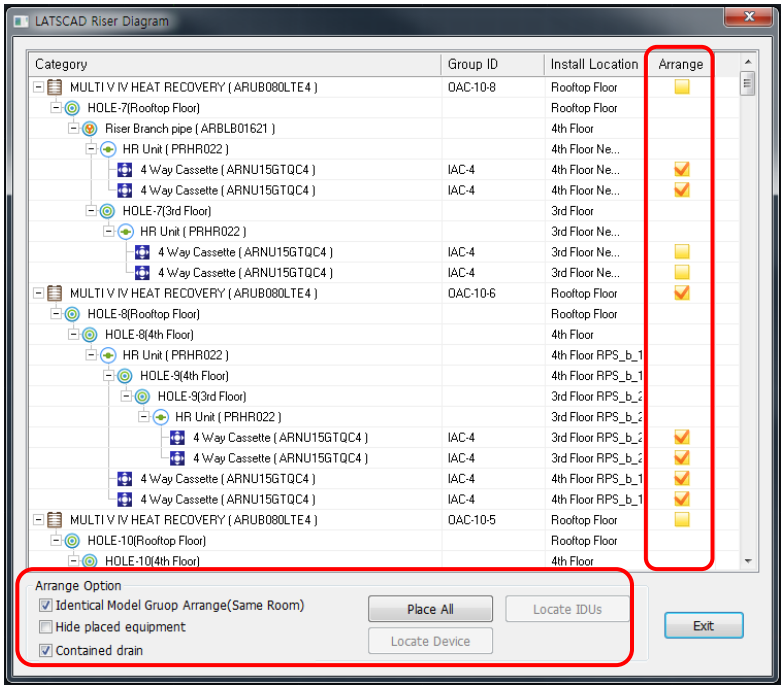


Schematic(Refrigerant) Diagram Equipment Arrangement

It positions the equipments to draw system diagram.

1. Select "LATSCAD → Schematic(Refrigerant) Diagram Equipment Arrangement" in Pull Down Menu or Equipment Place in Ribbon Menu.

- When equipments are positioned in Building Board, the equipments are checked Arrange tab of Riser Diagram.



2. Position the equipments. (Select Arrange Option)

2.1 Identical Model Group Arrange (Same Room)

- When "Identical Model Group Arrange (Same Room)" is selected in Arrange Option, Indoor Unit Notes and Positioned Rooms are displayed as a group.

2.2 Hide Placed equipment

- Hide Equipments of placing in Building Board to Riser Diagram. When all Equipments positioned in Building Board, not exist equipment in Riser Diagram.

2.3 Place All

- select "Place All" → All Equipments of Riser Diagram are positioned in Building Board.

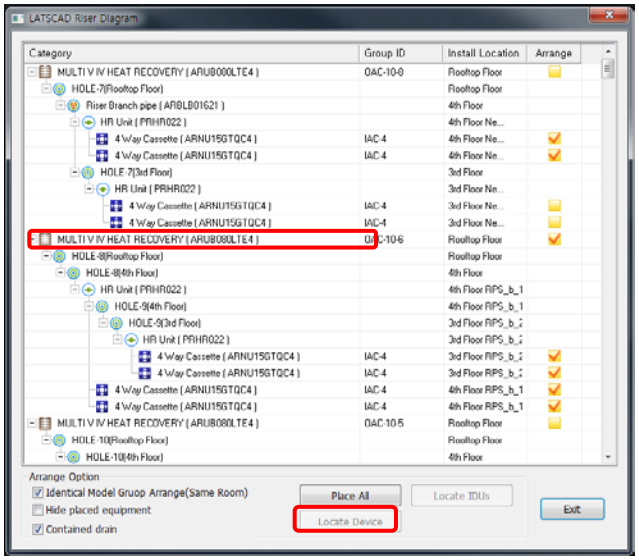
2.4 Locate IDUs

- After selecting Outdoor Unit or Riser in Riser Diagram, select "Locate IDUs" → Indoor Units are positioned in Building Board.

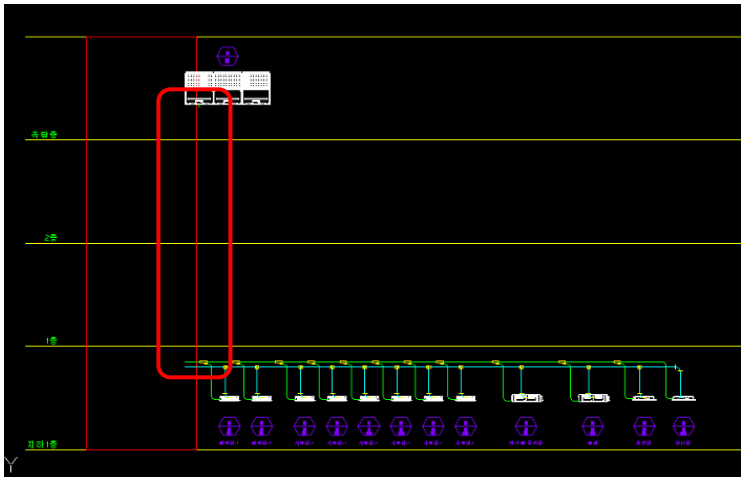
(Indoor Units connected to the selected Outdoor Unit are automatically positioned.)

2.5 Locate Device

- After selecting Outdoor Unit or Indoor Unit in Riser Diagram, select "Locate Device" → The selected equipments are positioned in Building Board.



3. The connection between Outdoor Unit-Indoor Unit is manually connected through Piping Equipment.



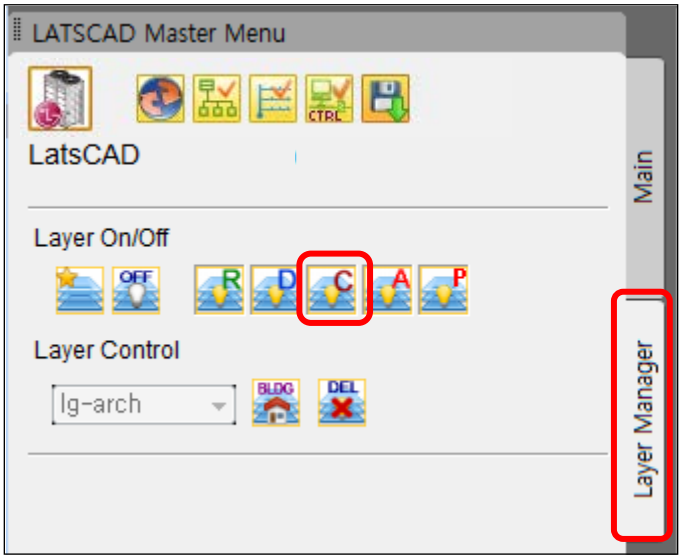
Control Diagram Drawing

Layer Arrangement

It rearranges Layer for Control design.

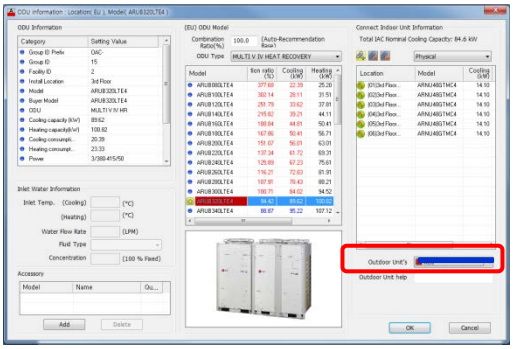
1. Select Layer Manager Tab in Master Menu.

2. Activate Control Layer Menu.



Outdoor Unit Property Information Change

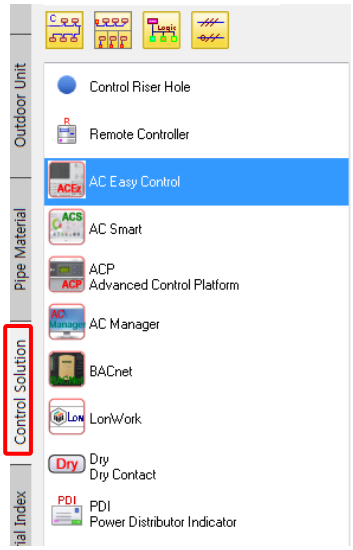
Change the color of Indoor Units connected to the same Outdoor Unit through Outdoor Unit Property Information (Color Change).



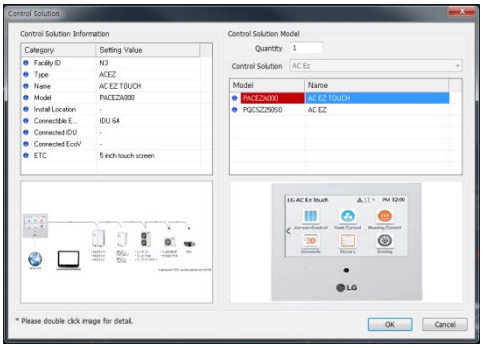
Controller Positioning

1. Select the Controller Solution tab in Symbol Menu.

2. Double click the controller icon to position in Controller Solution tab.

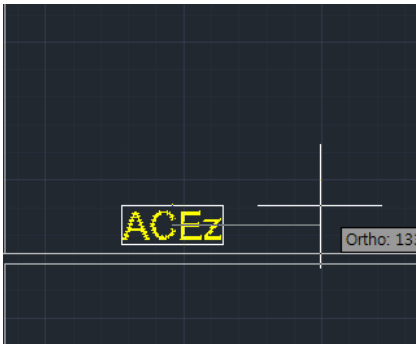


3. Select the Controller Model, and click OK button.



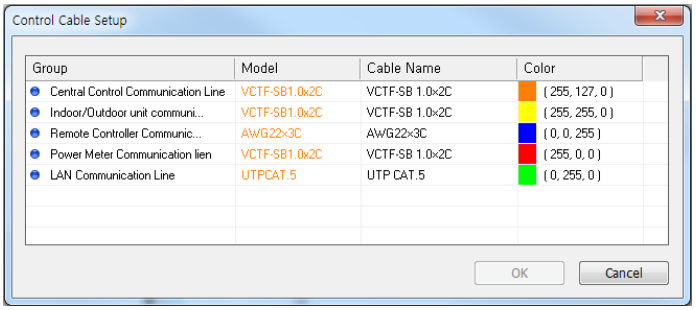
4. Designate Controller Insertion Position

- If there is a Controller to position as a reference, click reference equipment, or press Enter.



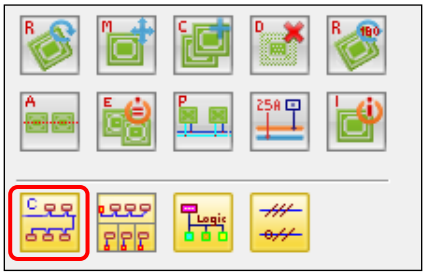
Control Cable Model Setting

It sets Cable Model for each Control communication line.



Control Wiring

It connects Control line between Control Ports. (only exists in Control Solution Tab)



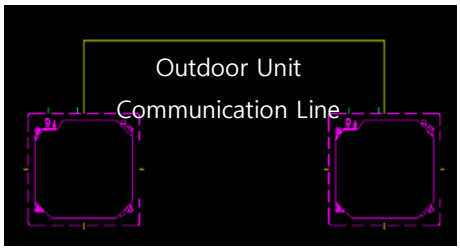
1. Select the Control Wiring Menu.

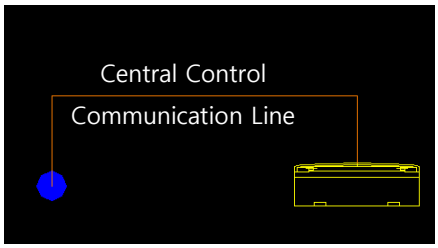
2. Select the Control Port to connect manually, or connect automatically through Auto-piping.

2.1 Manual Connection

- Select Control Riser Hole or Control Port to connect.

- After the connection, remaining Control Ports cannot be used.



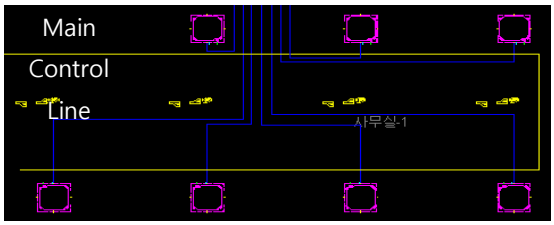


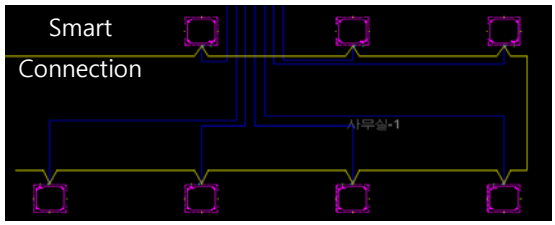
2.2 Automatic Connection (Auto-piping) after drawing Main Control Line

2.2.1 Draw Main Control Line based on the equipments to connect to.

2.2.2 Select Smart Cabling in Control Cabling Option.

2.2.3 After drawing Main Control Line, select Indoor Units to connect to.





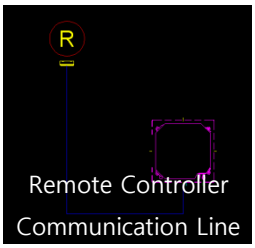
Wiring remote control

It connects Control line between Remote Controller Port and IDU Control Port. (Only exists in Control Solution Tab)

1. Select the Control Wiring Menu.

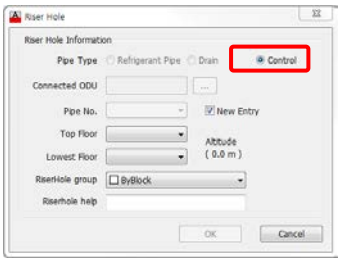
2. Select the Control Port to connect manually, or connect automatically through Auto-piping.

The method to connect the remote control wiring is same with Control Wiring.



Control Riser Hole Positioning

1. Select Control Riser Hole in Control Solution tab in Symbol Menu.

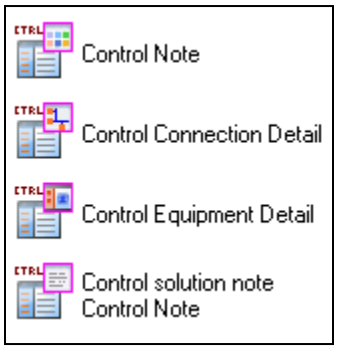


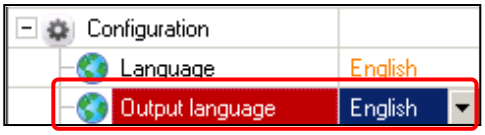
2. After setting Floor Information, position in the desired location.
3. The types of the Control Lines starting from Control Riser Hole are decided by the type of the connected equipment (Control, Indoor Unit, Outdoor Unit, ventilation).

Control Remarks

Remarks for Control equipments applied to the drawing can be inserted in Material Index tab in Symbol Menu.

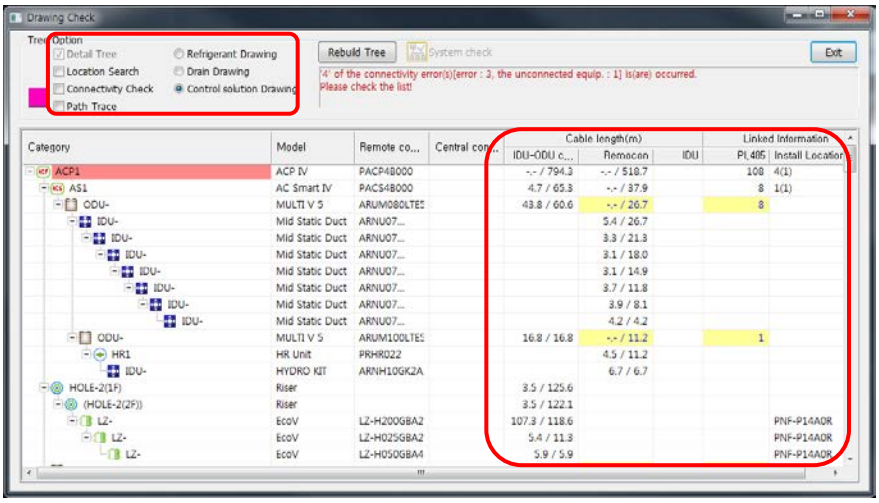
The name of the Model inserted is changed according to output language setting of Environment Setting in Master Menu.





Checking Communication line Validation

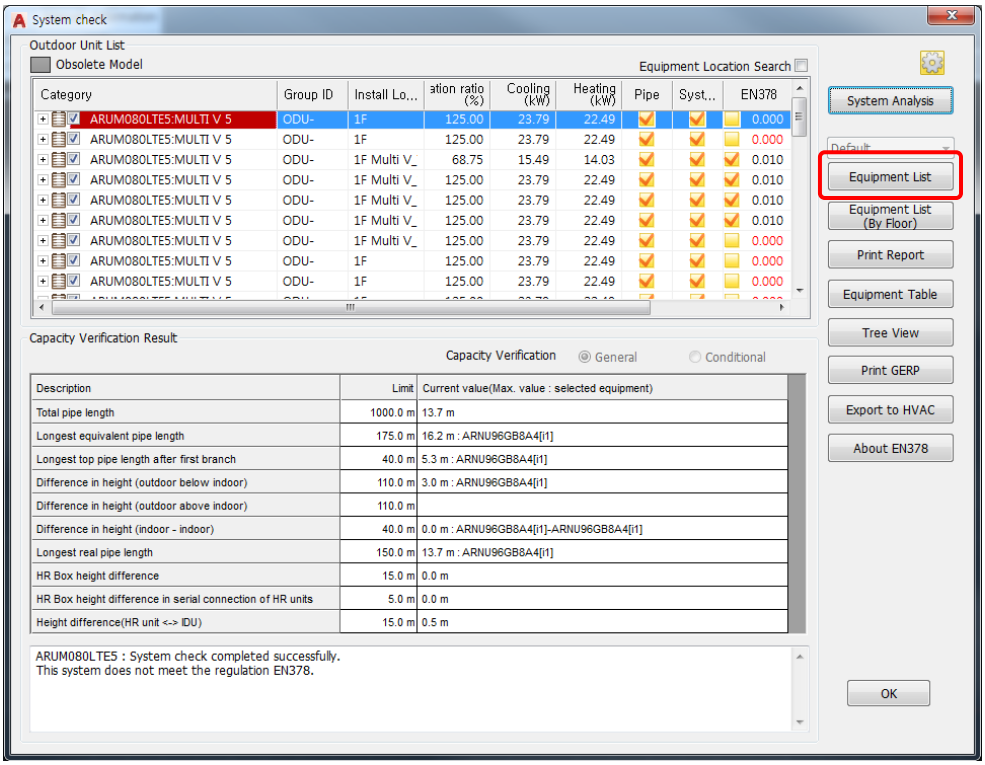
1. Select Checking Communication line Validation.
2. The connection relations of Controller and Indoor/Outdoor Units physically connected are defined based on the central Control line.
3. Cable length, the number of connected Indoor Units, and the number of PI485 Points are verified.

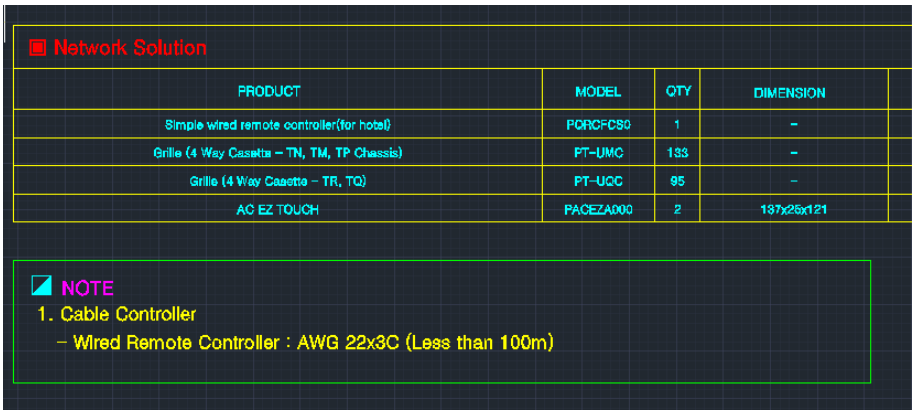


List of Control Equipment

1. Select "System Check" in "Pipe Design Check".

2. Select the Equipment List. (List of Control Equipment is added to the existing Equipment List.)





Network Solution

PRODUCT	MODEL	QTY	DIMENSION
Simple wired remote controller(for hotel)	PQRCFCS0	1	-
Grille (4 Way Cassette – TN, TM, TP Chassis)	PT-UMC	133	-
Grille (4 Way Cassette – TR, TQ)	PT-UCC	95	-
AC EZ TOUCH	PACEZA000	2	137x25x121

NOTE

1. Cable Controller
   - Wired Remote Controller : AWG 22x3C (Less than 100m)

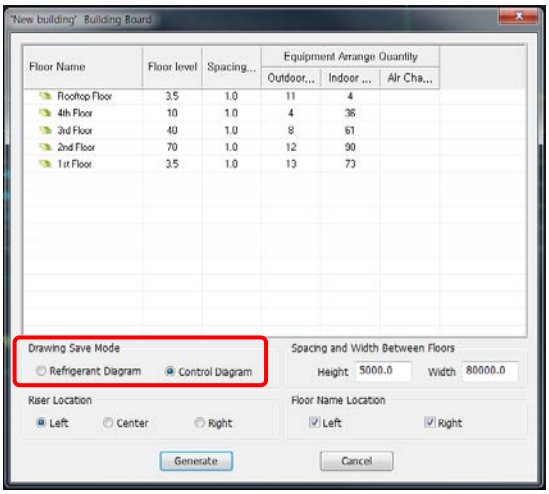
Schematic(Control) Diagram Equipment Arrangement

Draw Control System Diagram based on the positioned Controller and Control Communication Lines.

1. Building Board Composition

1.1 Select Building Board in Pull Down Menu or Ribbon Menu (LGE LATSCAD).

1.2 Select "Control Diagram" in the Drawing Save Mode to create Building Board.

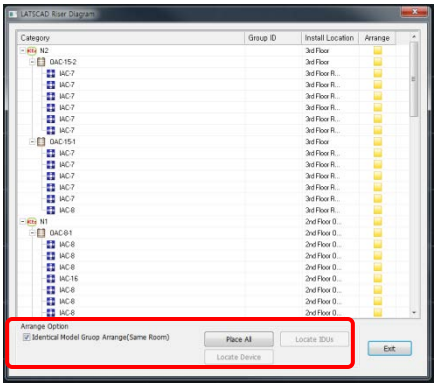


1.3 Designate lower left point in the drawing to insert Building Board.

2. Control System Diagram Equipment Positioning

2.1 Select Schematic(Control) Diagram Equipment Arrangement in Pull Down Menu(LGE LATSCAD).

2.2 Select Arrange Option.



2.2.1 Identical Model Group Arrange (Same Room)

- When "Identical Model Group Arrange (Same Room)" is selected in Arrange Option, Indoor Unit Notes and Positioned Rooms are displayed as a group.

2.2.2 Place All

- select "Place All" → All Equipments of Riser Diagram are positioned in Building Board.

2.2.3 Locate IDUs

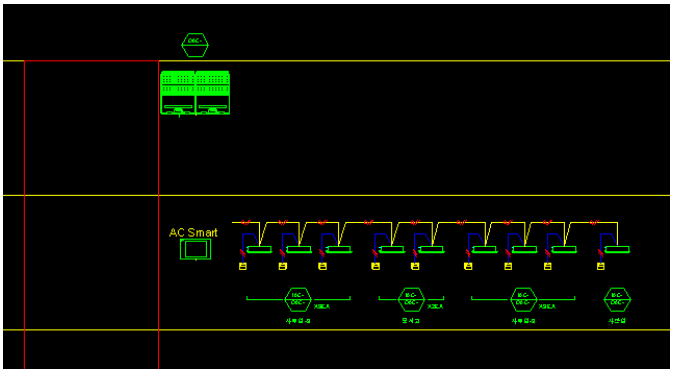
- After selecting Outdoor Unit or Riser in Riser Diagram, select "Locate IDUs" → equipments of Indoor Units are positioned in Building Board.

(Indoor Units connected to the selected Outdoor Unit are automatically positioned.)

2.2.4 Locate Device

- After selecting Outdoor Unit or Indoor Unit in Riser Diagram, select "Locate Device" → The selected equipments are positioned in Building Board.

2.5 Select Control Wiring Menu of Control Solution Tab to connect Indoor/Outdoor Unit Communication Lines and Central Control Communication Line.

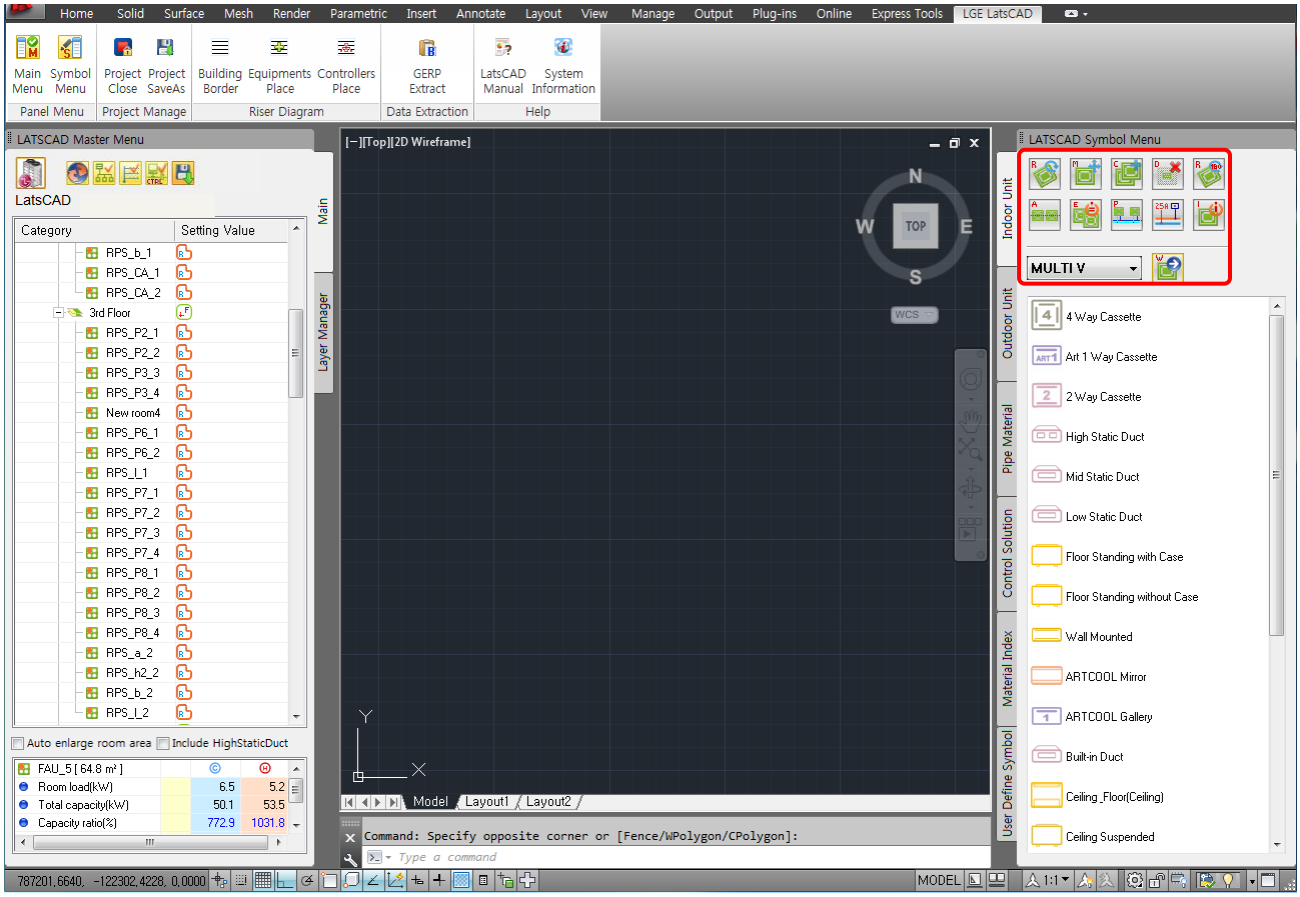


Function Description of Each Icon (Include Ribbon Menu)

It describes which operations are done in the functions in each Icon, and it is the explanation page based on the conditions and the exceptional cases to use the functions.

Equipment Editing

Editing of Indoor Unit, Outdoor Unit, and Pipe Material, and Control Solution, and Material Index Positioning of Pipe Notes can be done. Multiple equipment selection is included in the entire Menu.



Rotate Equipment

It can rotate the positioned equipment based on the central point.

1. Select Rotate equipment menu ( ).

2. Select the object to rotate in the drawing, press Enter.

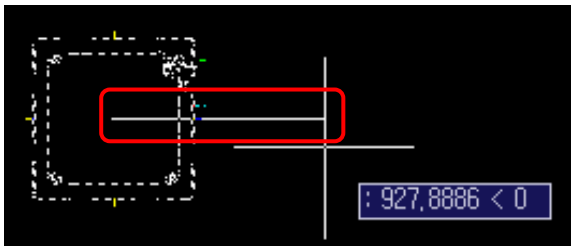
3. Input rotation direction or rotation value.

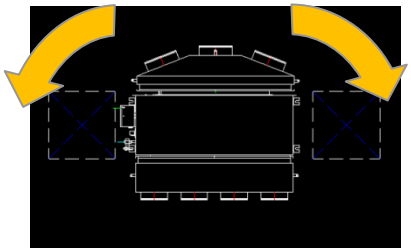
   3.1 You may rotate by selecting the direction to rotate.

   - The 3 o'clock direction is 0 degree.

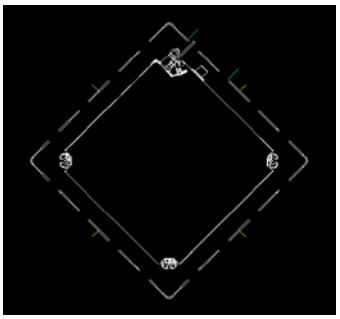
   - For multiple selections, they rotate individually based on the center of each object.

   - For fixed pressure Duct, the equipment and the chamber rotate the same.





   3.2 You may also rotate the equipment by the input of desired angle. (Input angle in the command input line)



Move Equipment

It moves Equipment and Pipe Material from the base point to the selected point.

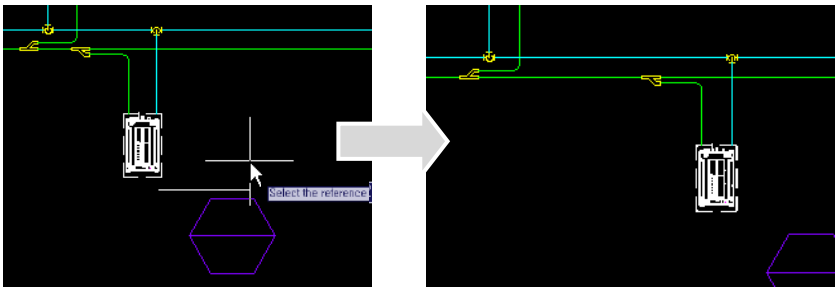
1. Select Move Equipment menu ( ).

2. Select the object to move in the drawing, and press Enter.

3. Select or input the "Move Equipment" base point.

4. Select or input the "Move Equipment" moving point.

- It moves maintaining the connection relations.



Copy Equipment

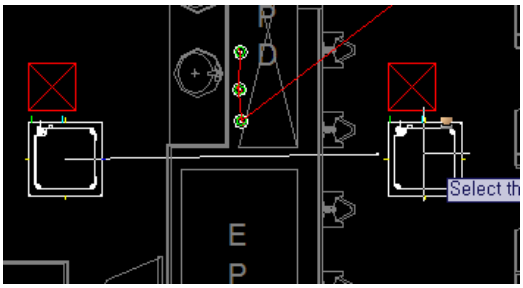
It copies equipment and Pipe Material to the selected point.

1. Select Copy Equipment menu ( ).

2. Select object to copy in the drawing or input Copy Option in the command line.

2.1 Select object to copy in the drawing.

2.1.1 After executing the Menu, when the equipment to copy is selected, the copy of the equipment is immediately possible. Press Enter to finish.



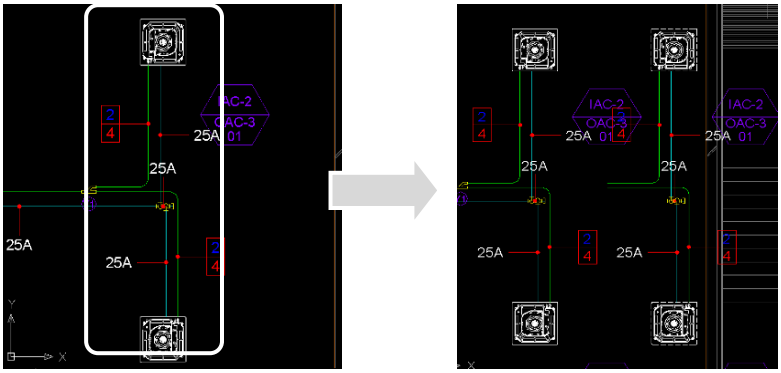
2.2. After executing Copy Equipment Menu, select Copy Option in the command line

```
Select the drawing element to copy.
[Equipment Copy(select equipment)/Multiple Copy[M]/ Floor Copy(F)/ Room Copy(R) ] :
```

2.2.1 Multiple Copy (M)

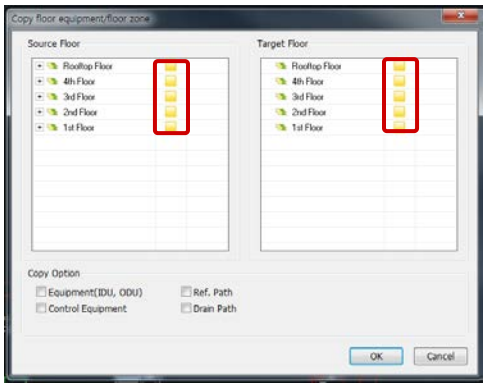
- After selecting Copy Equipment Menu, input "M" in the command line for Multiple Copy.
- Select equipments and materials to copy, and press Enter to finish selecting.
- Select the reference point, click the position of copy.
- The copy of the equipment is immediately possible. Press Enter to finish.

```
Select the reference point. :
```



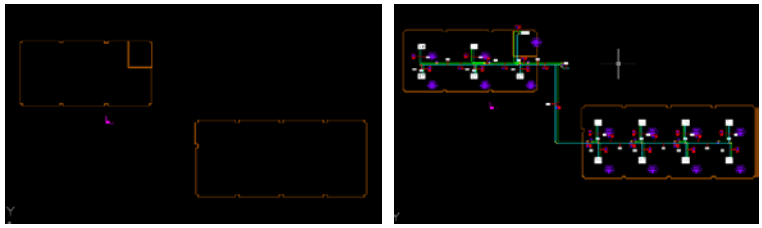
2.2.2 Floor Copy (F)

- After selecting Copy Equipment Menu, input "F" in the command line for Floor Copy.
- Select Source Floor and Target Floor.
- Equipment and Pipe Information are copied exactly. (Reference Point for Copy is the reference point of the Floor.)



Example) For the 1st and 3rd floor with the same drawing, equipment positioning, and Pipe connection, design only the 1st floor and execute Floor Copy.

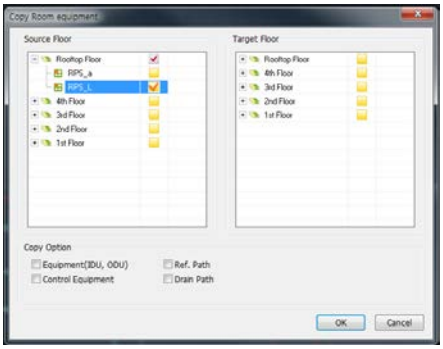
Example) 1st Floor



Example) 3rd Floor before/after

2.2.3 Room Copy (R)

- It copies Equipment and Pipe Information in the certain Room.
- After selecting Copy Equipment Menu, input "R" in the command line for Room Copy.
- Select the Source Room of Floor and the Target Room of Floor.



- Copy the equipments in the Source Room of Floor to the Target Room of Floor. (The base point for Copy is the lower left of the Room Area.)
- The Equipment and Pipe Information are copied exactly.
- Check "Copy pipe and drain(Except Indoor/Outdoor Unit)", to copy only pipe and drain.

Delete Equipment

It deletes the Equipment and Pipe Material.

1. Select Delete Equipment Menu ( ).

2. Select the object to delete in the drawing, and press Enter to finish.

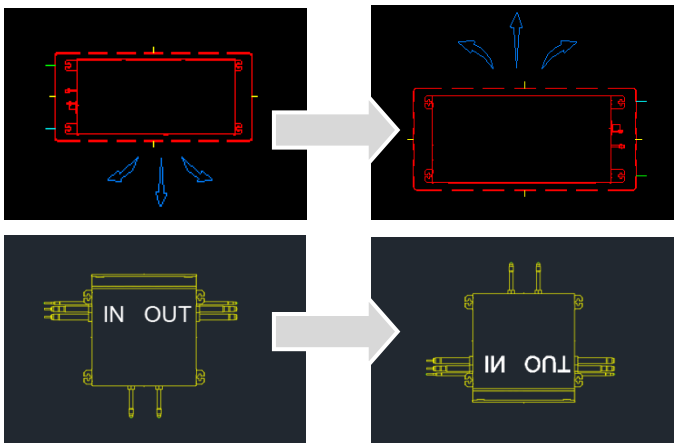
Rotate Equipment (180)

It rotates the selected Equipment or Pipe Material by 180°.

1. Select Rotate Equipment (180) Menu ( ).

2. Select the object to rotate in the drawing, and press Enter to finish.

Caution! Indoor unit and Outdoor unit is rotate 180, but Pipe Material is mirroring.



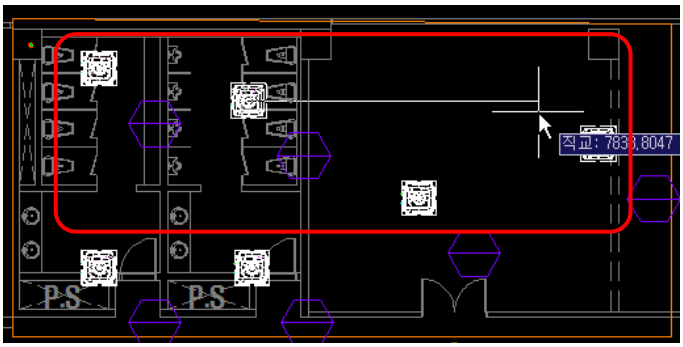
Equipment Assignment

It arranges the selected equipments vertically or horizontally according to the base equipment.

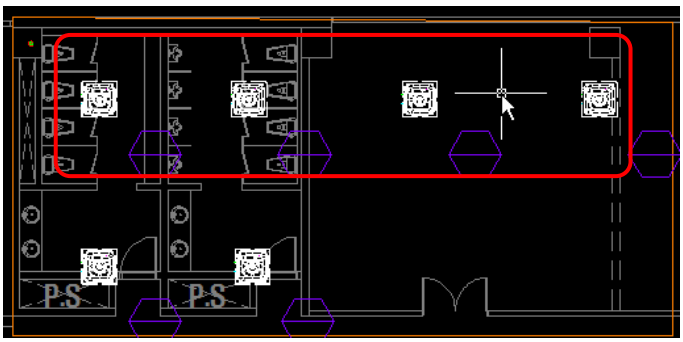
1. Select Equipment Assignment Menu ( ).

2. Select the object that becomes the base equipment to arrange in the drawing.

3. Continue to select the equipments by drag or clicks to be arranged and press the Enter key.



<Before>



<After>

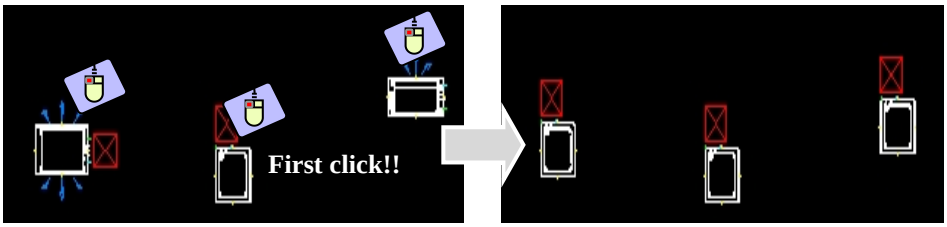
Match Equipment Property

It synchronizes the Property Information of the selected Equipments.

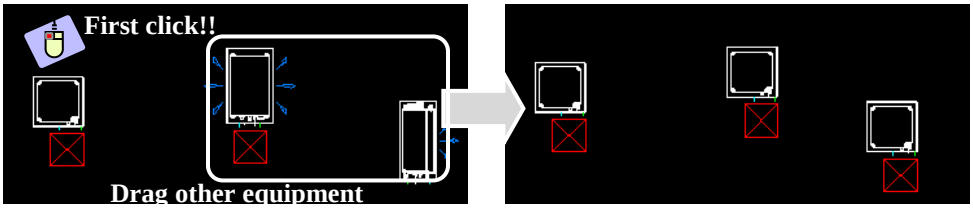
1. Select Match Equipment Property Menu ( ).

2. Select the objects to synchronize in the drawing.

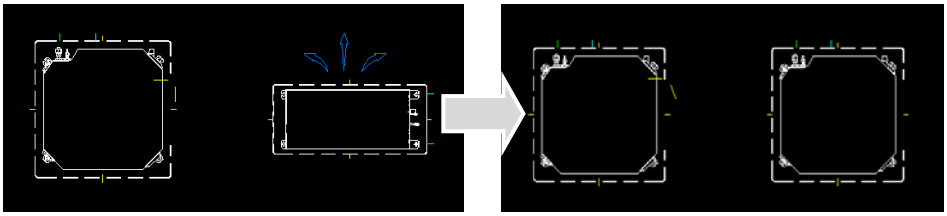
   2.1 When select equipments by click, the first selected equipment becomes the base equipment to synchronize. (Multiple equipments may be selected)



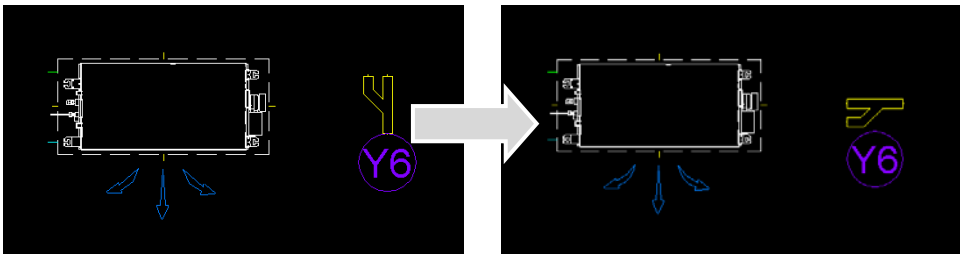
   2.2 When select equipments by drag, at first select the base equipment, and then drag other equipment to synchronize.



   2.3 It synchronizes all of positioning directions and Property Information of the Equipment.



Caution! When other types of symbols are selected, only the positioning direction and the scale are the same.



Piping Equipment

Piping for Refrigerant/Drain Pipe can be done based on the Port of the Equipment.

1. Select Piping Equipment Menu ( ).

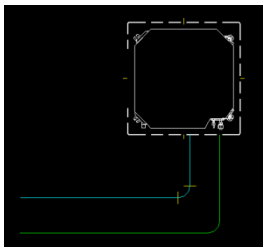
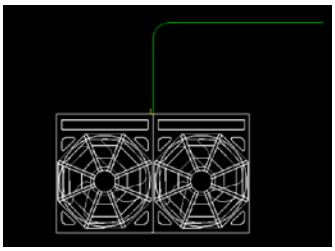
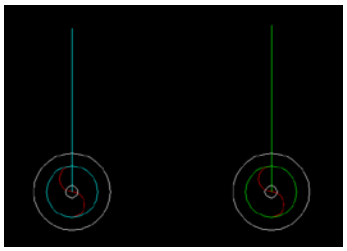
2. Select Port for Manual Piping, or select a Piping Option.

2.1 Manual Piping

2.1.1 After executing Menu, start the connection from Port. (Designate the path for Piping)

2.1.2 It connects from Indoor Unit, Outdoor Unit Port, and Riser Hole.

(It is decided as Refrigerant Pipe or Drain Pipe according to the types of Port and Riser Hole.)

2.2 Select Piping Option (Automatic Piping)

- After executing Menu, you can draw piping using Automatic Piping functions like Auto-piping (S), Offset wiring (O), Independent refrigerant pipe (R), and Independent drain pipe (D)

- Draw Main Pipe for Automatic Piping. (Manually draw by designating the path to Refrigerant Pipe as Main Pipe)

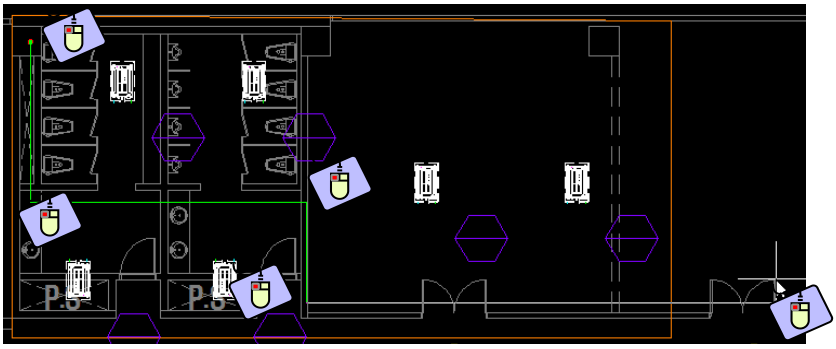
2.2.1 Auto-piping [S]

- Smart piping is possible connecting automatically Main pipe to Indoor Units.

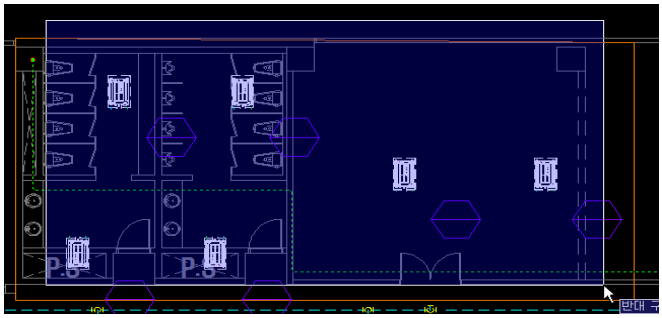
- After executing Menu, input the "S" for Auto-piping in the Command line

```
Select connection point or [Auto-piping(S)] Offset Piping(for drain)(O)
                                                Independent refrigerant pipe(R) Independent drain pipe(D)] :
```

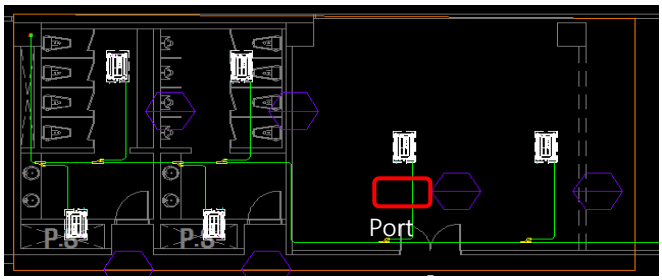
- Draw Main Pipe for Automatic Piping. (Manually draw by designating the path to Refrigerant Pipe as Main Pipe)



- After selecting Main Pipe for Piping, select the equipment for Auto-piping. (After selecting the Refrigerant Pipe drawn as Main Pipe, select the equipment to connect.)

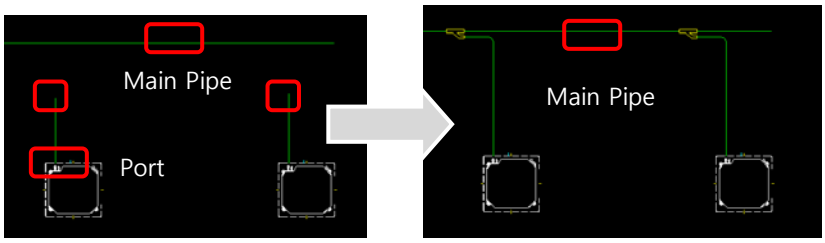


- Automatically connect the selected Pipe and the Equipment (Automatic creation of Branching Pipe)



Caution! It is recommended that execute Automatic Connection when the Port of Indoor Unit is toward Main Pipe or in parallel.

- Auto-piping is possible between already drawn Pipes. (After selecting Main Pipe, select the Pipe to connect, instead of selecting the Equipment.)



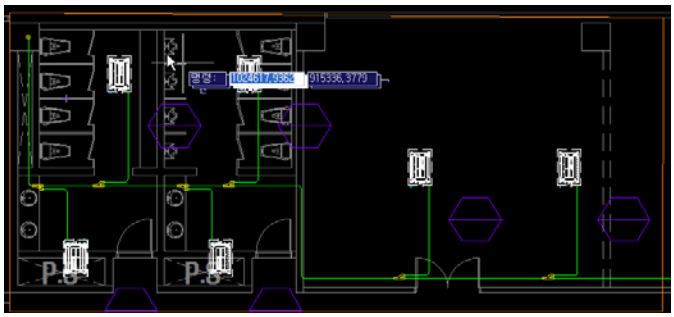
2.2.2 Offset wiring [O]

- Offset wiring is possible connecting automatically drain pipe.

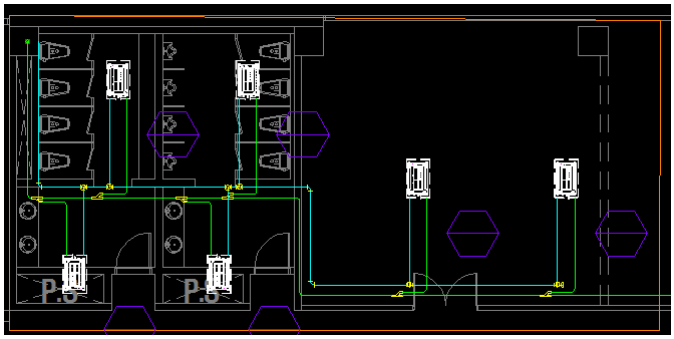
- After executing Menu, input the "O" for Offset wiring in the Command line

```
Select connection point or [Auto-piping(S) Offset Piping(for drain)(O)
                                                Independent refrigerant pipe(R) Independent drain pipe(D)] :
```

- Select already connected Refrigerant Pipe (Main Pipe) and set offset direction



- Drain Pipe is drawn following the lower level structure of the selected Main Pipe, and it is connected to Indoor Unit Drain Pipe Port.



2.2.3 Independent Refrigerant Pipe [R]

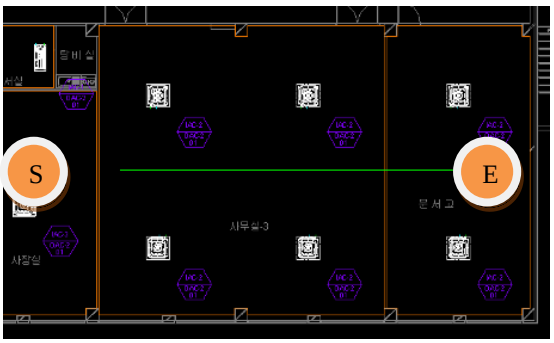
- Independent Refrigerant Pipe is possible without connection to Riser Hole or Port (Refrigerant Pipe).

- After executing Menu, input the "R" for Independent Refrigerant Pipe in the Command line

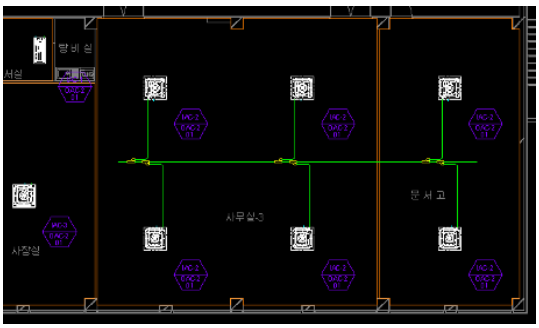
- Position Pipe regardless of the Ports of Riser Hole and Equipment.

```
Select connection point or [Auto-piping(S) Offset Piping(for drain)(O)
                                Independent refrigerant pipe(R) Independent drain pipe(D)] :
```

Caution! The direction of the Pipe is decided by the first selected point.



- And then, Independent Refrigerant Pipe is possible to automatic Connection using Auto Piping to Indoor Units



2.2.4 Independent Drain Pipe [D]

- Independent Drain Pipe is possible without connection to Riser Hole or Port. (Drain Pipe)

- After executing Menu, input the "D" for Independent Refrigerant Pipe in the Command line

```
Select connection point or [Auto-piping(S) Offset Piping(for drain)(O)
                                Independent refrigerant pipe(R) Independent drain pipe(D)] :
```

- Pipe may be positioned regardless of the Ports of Riser Hole and Equipment.

Caution! The direction of the Pipe is decided by the first selected point.

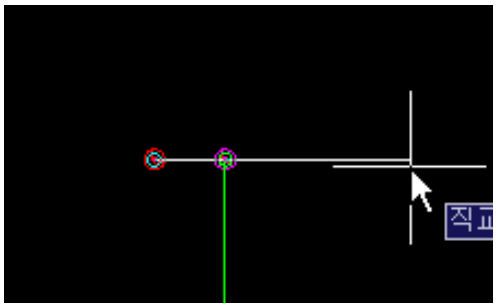
Equipment and Pipe Index

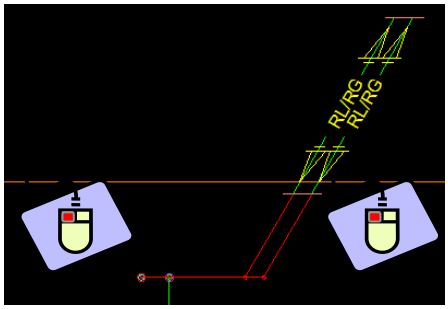
Create Notes for equipment and pipe material.

1. Select Equipment and Pipe Index Menu ( ).

2. Select pipe or riser hole to create notes.

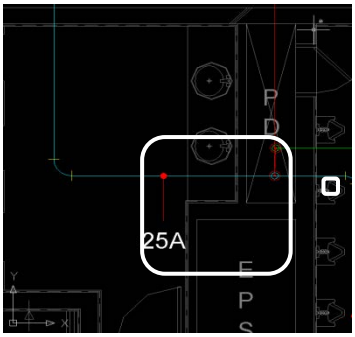
2.1 Select riser hole to position notes, and designate the path. (The same method is applied to control riser hole notes)





2.2 Select pipe to position notes.

- Select pipe to input notes, and designate the position.



Property Information

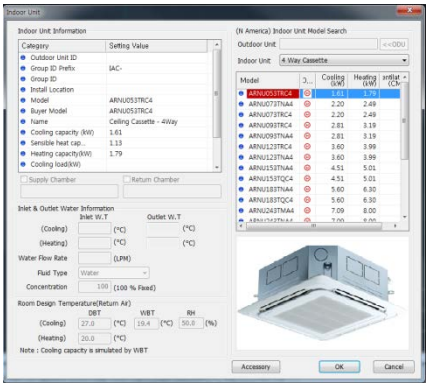
It shows the Property Values of Equipment and Riser Hole.

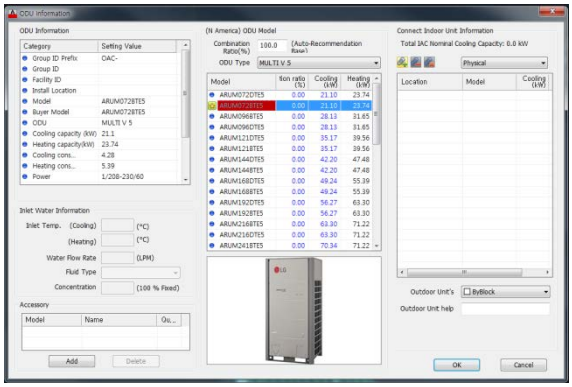
1. Select Property Information Menu ( ).

2. Select the object to see the Property Information in the drawing.

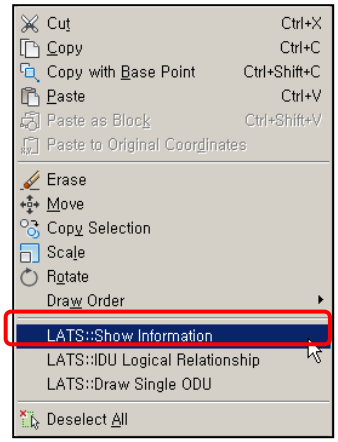
2.1 When Indoor Unit/Outdoor Unit is selected, it shows its property.

2.2 The properties of the selected equipment or Equipment Model can change.



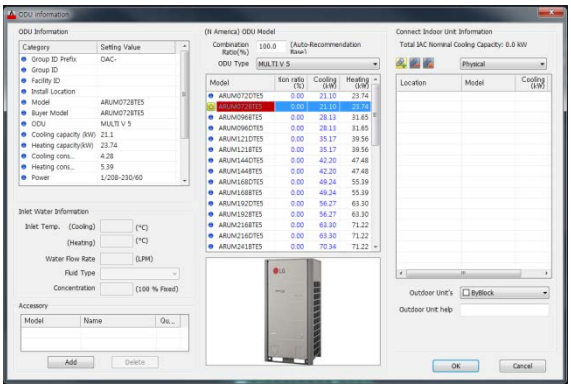


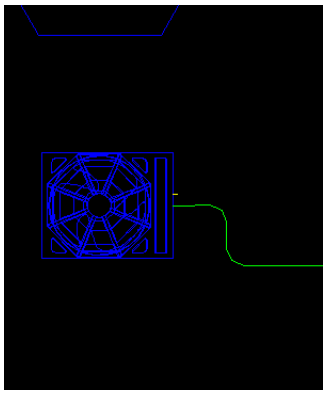
- After selecting the equipment, the same function is supported in LATS Property Information in Pop-up Menu.



2.2.1 Group Color Change (When Outdoor Unit property is changed, the property of the connected Indoor Unit is changed)

(The Color Information of the Equipments connected to Outdoor Unit is changed at once.)

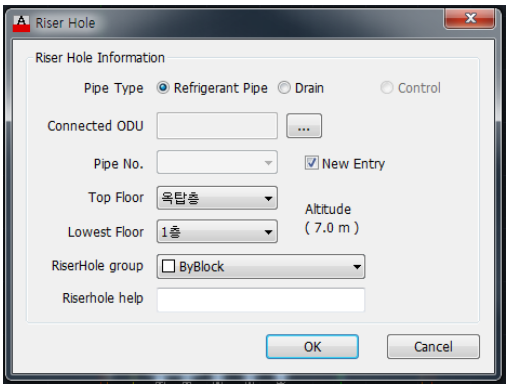




2.2.2 The model of the selected equipment may be changed.

2.2.3 Up/Down Riser Hole Information can be viewed or changed.

- After executing menu, Up/Down Riser Hole
- The property information (Classification/Floor Information/Color) can change.

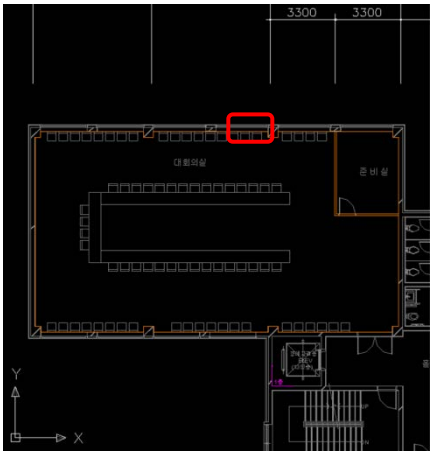


Auto-arrange Indoor Unit

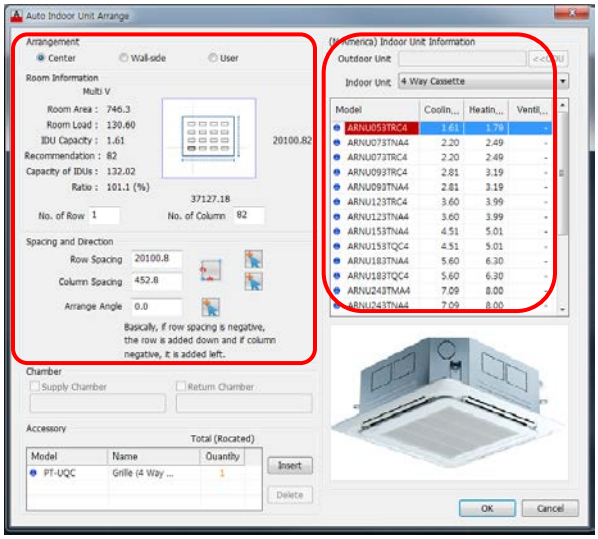
Based on the selected Room and Indoor Unit, Indoor Unit is automatically positioned. (Exists only in Indoor Unit tab of Symbol Menu)

1. Select Auto-arrange Indoor Unit Menu ( ).

2. Select the Room Area Boundary Line to position.

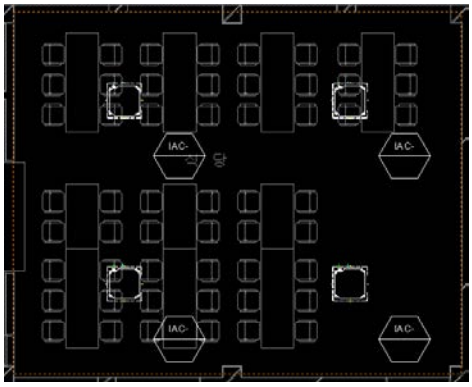


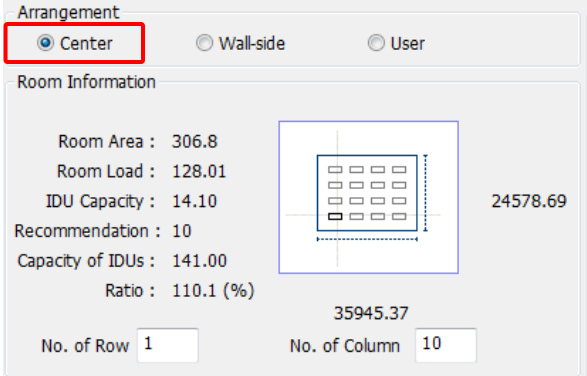
3. When the Indoor Unit to apply is selected, the recommended number of units is provided with the consideration of Room area and load.



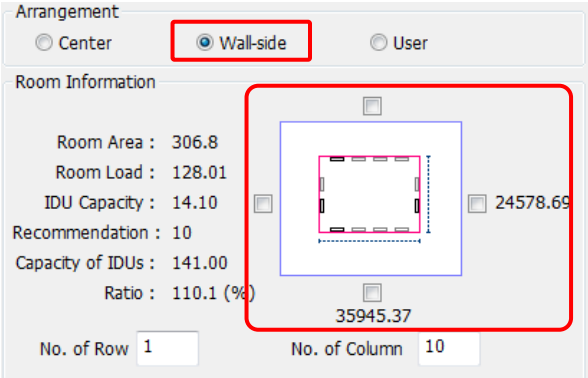
3.1 Arrangement

3.1.1 Center: It positions the selected equipments based on the center of the corresponding "Room".





3.1.2 Wall-side: It positions based on the walls in 4 directions, and it sets the location of the wall to position and the number (row, column).



3.1.3 User: It positions based on the location designated by the user.

3.2 Room Information

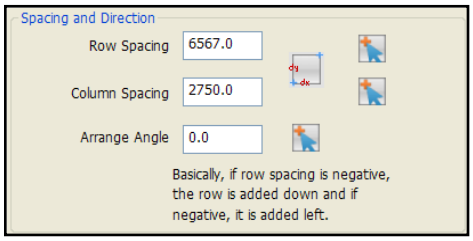
- The Room Area/Room Load of the selected Room Area is displayed, and the recommended number for the Indoor Unit capacity is displayed.

- Input the number of equipments to be positioned through the input of "No. of Row" and "No. of Column".

- When arranging by Wall-side, click which side equipments are positioned.

3.3 Spacing and Direction

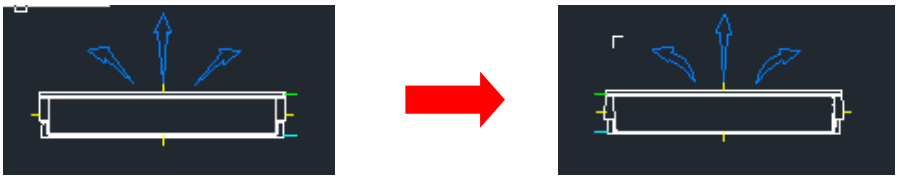
- Designate the gap between the equipments and the angle.



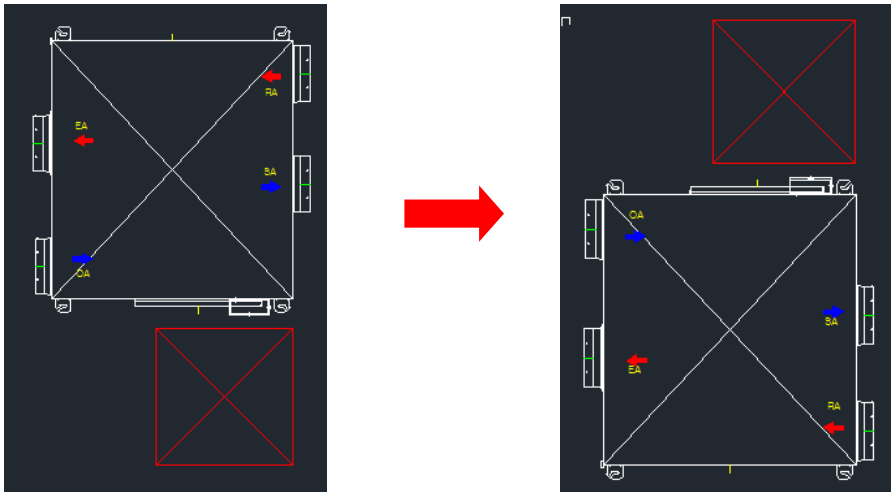
3.4 Port / Symbol Mirror

- Some indoor unit can change port direct. (wall-mounted, floor stand, convertible type etc.) And some ventilation unit can reverse up-down. If you check "port mirror", it will be changed.

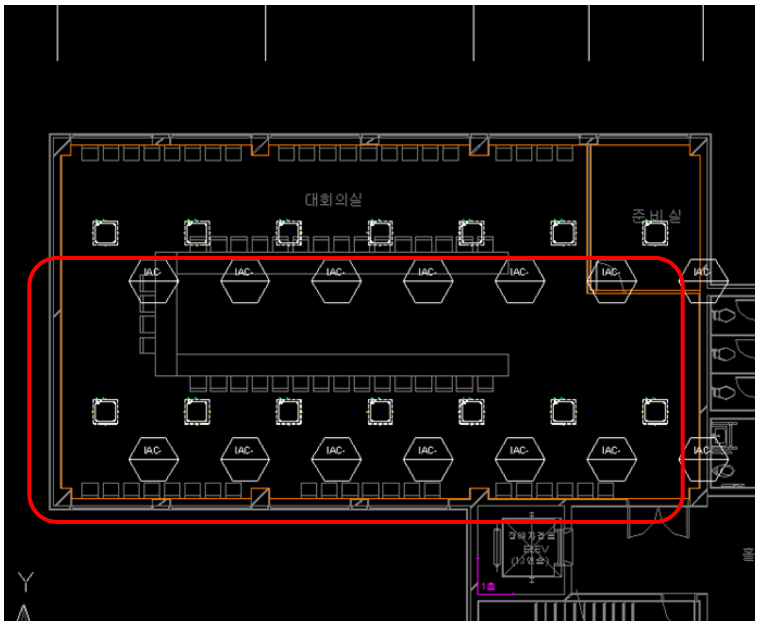
Port mirror :



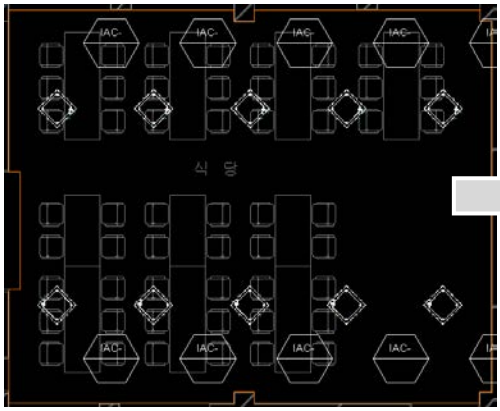
Symbol mirror(reverse up-down) :



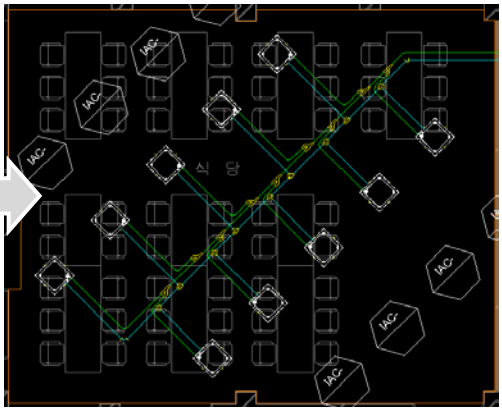
4. It is automatically positioned in the corresponding Room in the drawing according to the set conditions.



- When UCS is changed, automatic positioning according to the changed angle is possible.



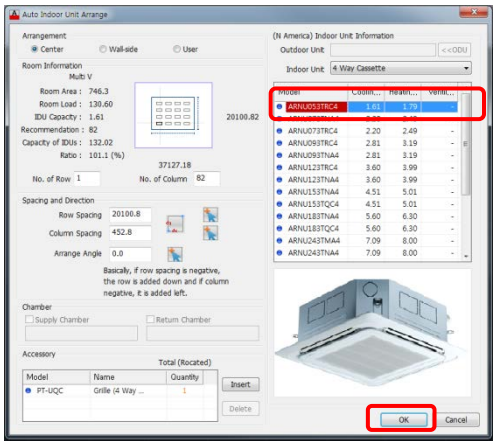
Result of the existing automatic positioning

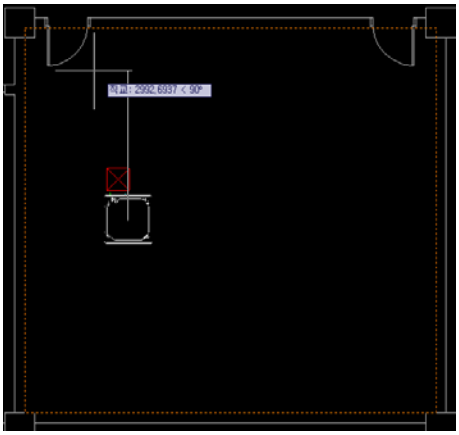


Result of the changed automatic positioning

4.1 Multi V Indoor

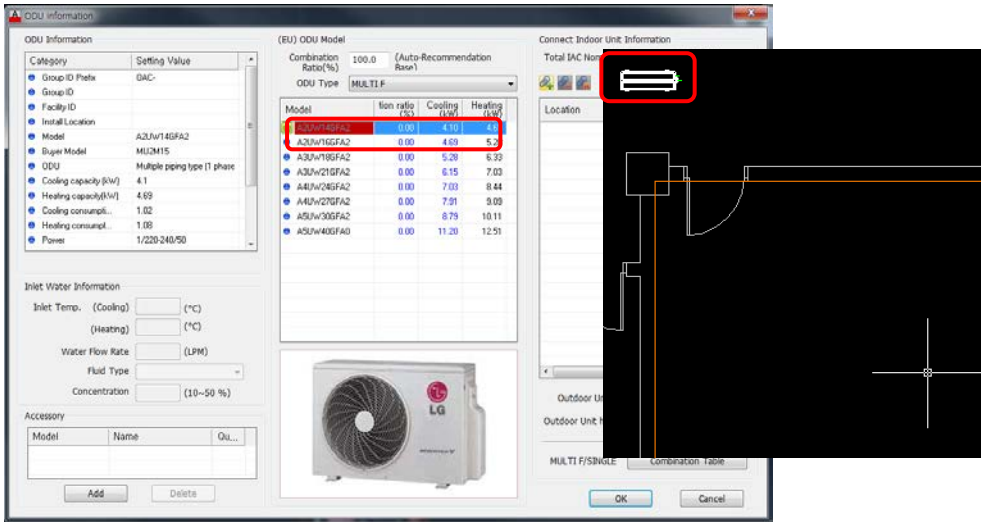
- Select Indoor Unit.



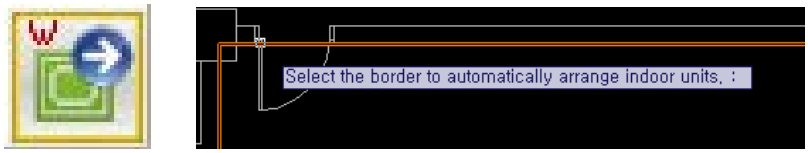


4.2 Multi Indoor & Single A Indoor

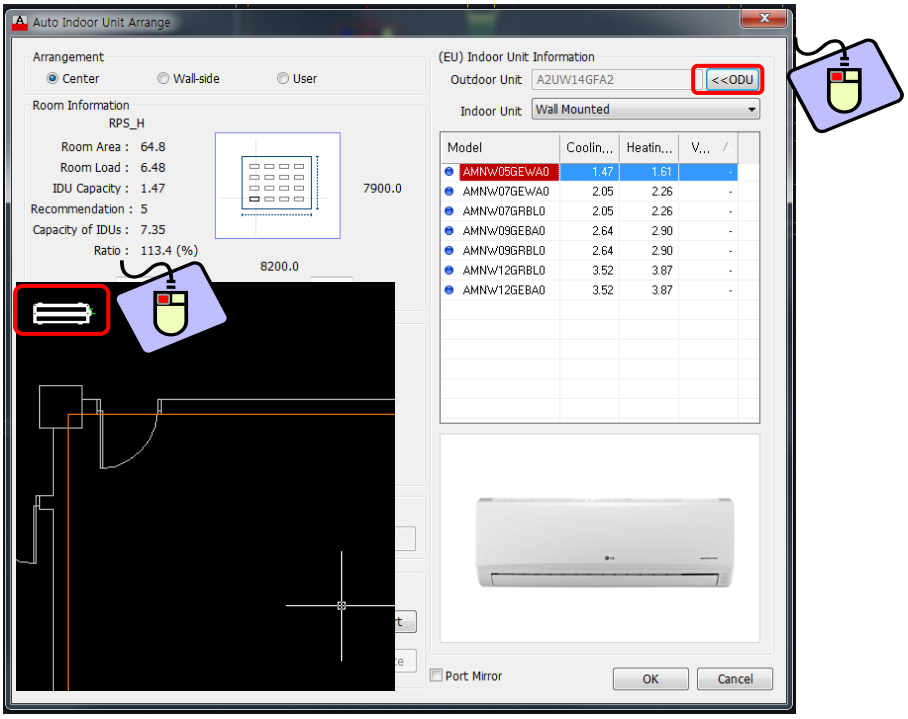
- Insert the ODU Unit before using Auto-arrange Indoor Unit function.



- Use Auto-arrange Indoor Unit function.



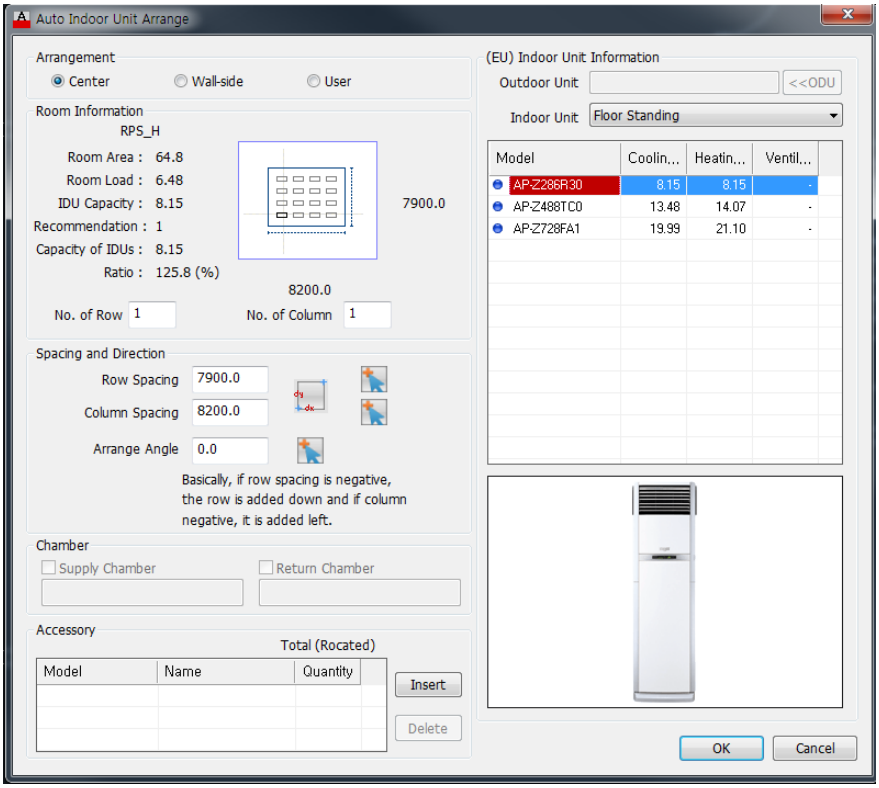
- After select ODU in Indoor Information, Click the ODU unit in drawing.



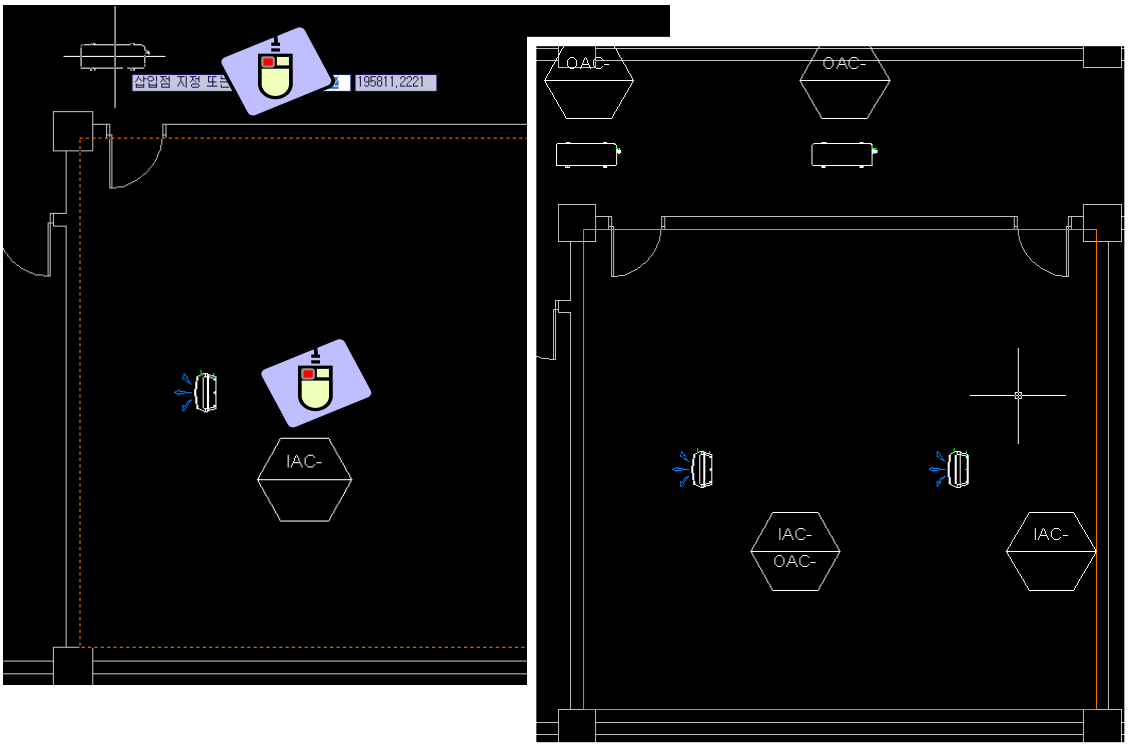
- Select Indoor Unit.

4.3 Single Indoor

- Select Indoor Unit.

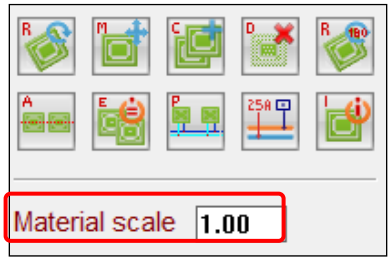


- input the IDU, and then input the ODU in the drawing.

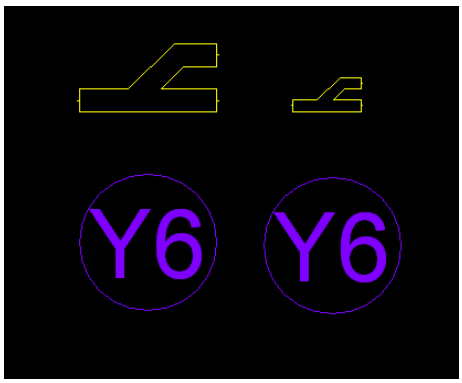


Material Scale (in Material Index)

Material scale can be adjusted for the Material Index tab. (It exists only in Material Index tab of Symbol Menu)



1. After setting the Material scale, select and position the desired Pipe.



Control Wiring

1. Select Control Wiring Menu ( ). (Exists only in Control Solution tab of Symbol Menu)

2. Manual Connection

   2.1 Select the Control Port of the Equipment to connect, and connect without selecting Option.

   2.2 The types of the communication lines are decided by the types of the connected equipments.

   - Indoor Unit (or ventilation)-Indoor Unit (or ventilation), Indoor Unit-Outdoor Unit (or Riser Hole): Outdoor Unit Communication Line

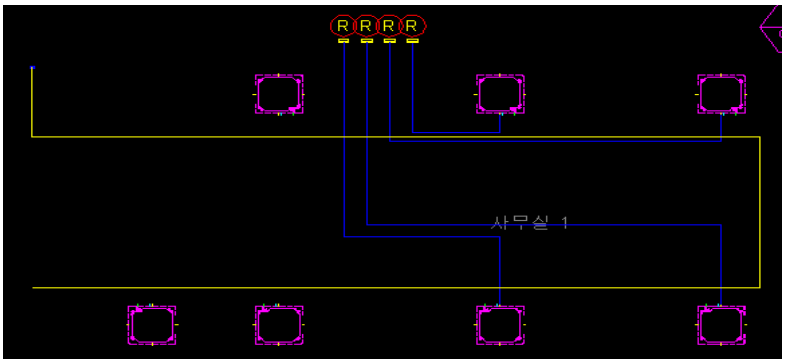
- Controller-Outdoor Unit (or Riser Hole), Controller-Indoor Unit (or ventilation): Central Control Communication Line

3. Select Control Wiring Option

```
Draw the control cable. Select connection point or [Auto wiring(S)] :
```

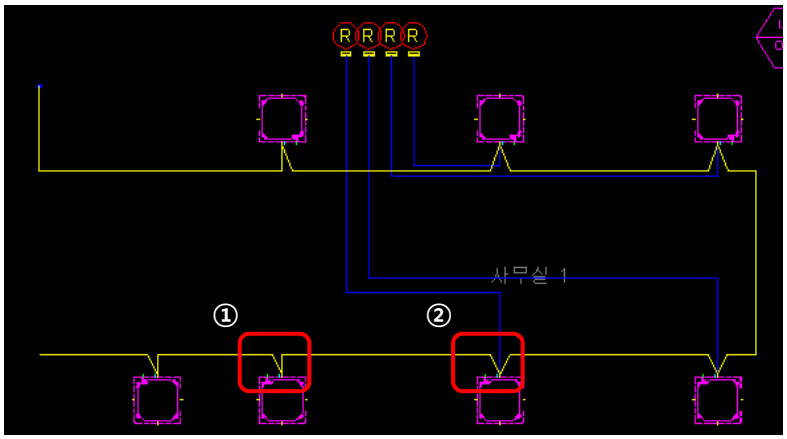
3.1 Auto wiring (S): The same can be applied to the connection between Controllers.

3.1.1 Select Riser Hole or Indoor Unit Port to draw Central Control Line.



3.1.2 Select Auto wiring (S) in Control Wiring Option of Command line.

3.1.3 Select Main Control Line, and select Indoor Units to connect to.



3.1.4 Based on Central Control Line, Indoor/Outdoor Unit Communication Lines are automatically connected.

Caution! If Communication Line is connected to the Control Port of Indoor Unit (or ventilation), the remaining 3 Ports cannot be used.

Wiring remote control

1. Select Control Wiring Menu ( ). (Exists only in Control Solution tab of Symbol Menu)

2. Manual Connection

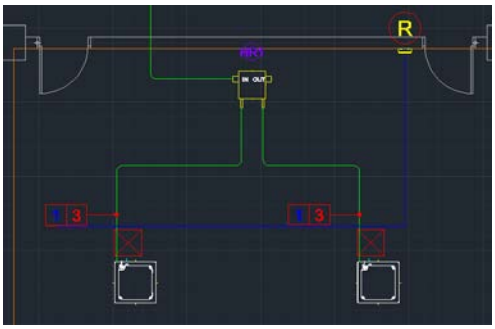
   2.1 Select the Control Port of the Remote controller first and connect to Equipment without selecting Option.

3. Select Control Wiring Option

```
Draw the remote control. Select connection point or [Auto wiring(S)]: Refernce wiring(R)]:
```

   3.1 Auto wiring (S): The same can be applied to the connection between Controllers.

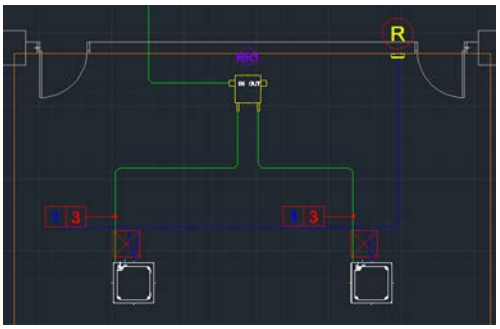
      3.1.1 Select Remote Controller Port and draw the Remote Control Line.



      3.1.2 Select Auto wiring (S) in Wiring Remote Control Option of Command line.

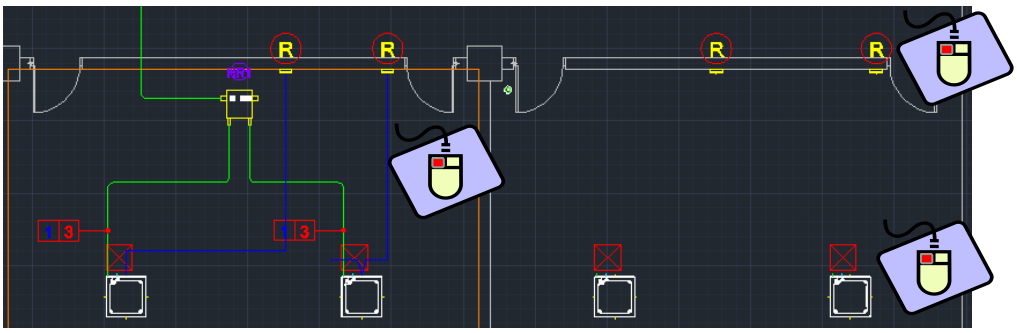
      3.1.3 Select Main Control Line, and select Indoor Units to connect to.

      3.1.4 Based on Central Control Line, Indoor/Outdoor Unit Communication Lines are automatically connected.



3.2 Reference Wiring (R): It connects Remote controller to Indoor Unit by same pattern which is the reference.

3.2.1 Position or Copy the Equipments like the reference Equipment

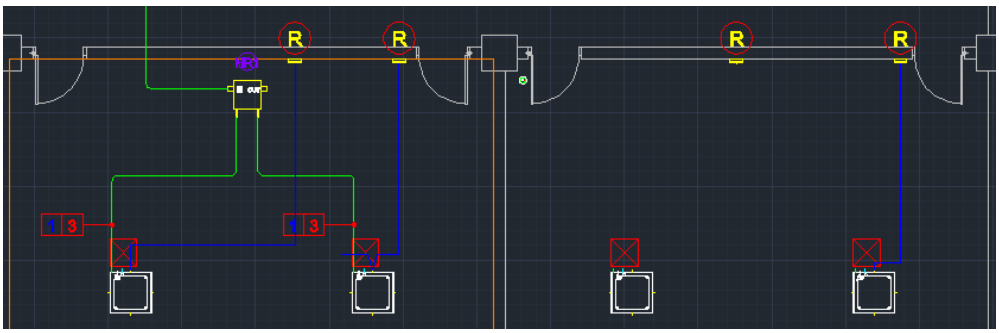


3.2.2 Select Reference wiring (R) in Wiring Remote Control Option of Command line.

3.2.3 Select the reference cable.

3.2.4 Select the Indoor Unit to connect to remote controller and Press the Enter key.

3.2.5 Select the Remote controller to connect and Press the Enter key.



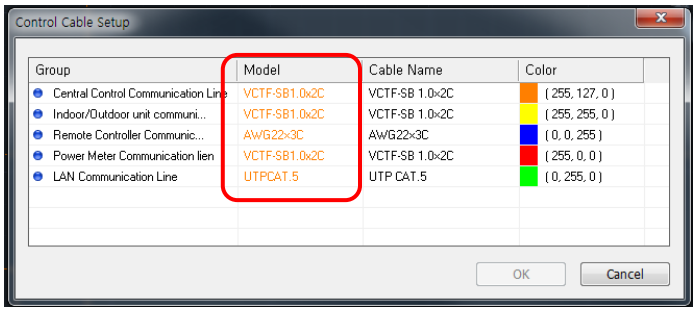
3.2.6 Indoor Unit / Remote control wiring is automatically connected

Control Cable Model Setting

It sets the model for each control cable. (Exists only in Control Solution tab of Symbol Menu)

1. Select control cable model setting Menu ( ).

2. Set the model to be applied to each communication line type.



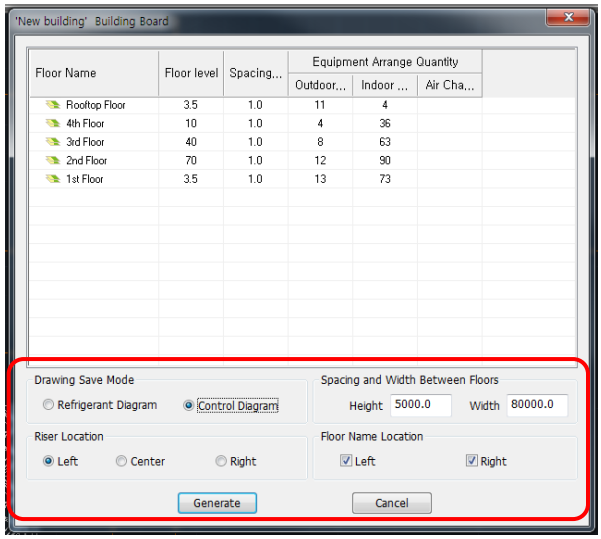
Control System Diagram Drawing

Building Board Composition

It composes the building board in the drawing of the system diagram before positioning Control Solutions.

1. Select "Building Board Composition" in Pull Down Menu or Ribbon Menu (LGE LATS CAD).

2. Set Building Board Option (Drawing Save Mode, Riser Location, Spacing and Width Between Floors, and Floor Name Location).



3. Select the selection of left / under point to generate building board.

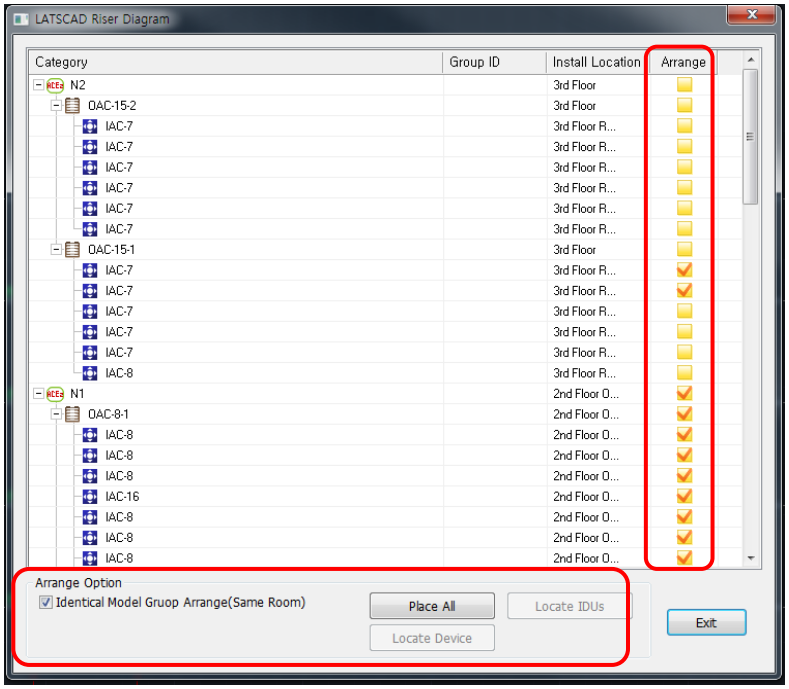
```
Select the reference point to generate building board.(left/under point):
```

Schematic (Control) Diagram Equipment Arrangement

It positions the equipments to draw system diagram.

1. Select "LATSCAD → Schematic(Control) Diagram Equipment Arrangement" in Pull Down Menu or Controller Place in Ribbon Menu.

- When composing the Building Board, System Diagram Type should be selected as Control Diagram.
- When equipments are positioned in Building Board, the equipments are checked Arrange tab of Riser Diagram.



2. Position the equipments. (Select Arrange Option)

2.1 Identical Model Group Arrange (Same Room)

- When "Identical Model Group Arrange (Same Room)" is selected in Arrange Option, Indoor Unit Notes and Positioned Rooms are displayed as a group.

2.2 Hide Placed equipment

- Hide Equipments of placing in Building Board to Riser Diagram. When all Equipments positioned in Building Board, not exist equipment in Riser Diagram.

2.3 Place All

- select "Place All" → All Equipments of Riser Diagram are positioned in Building Board.

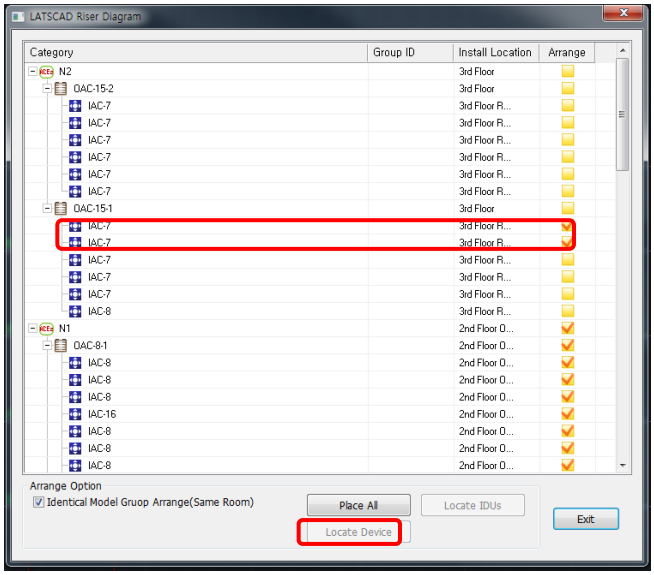
2.4 Locate IDUs

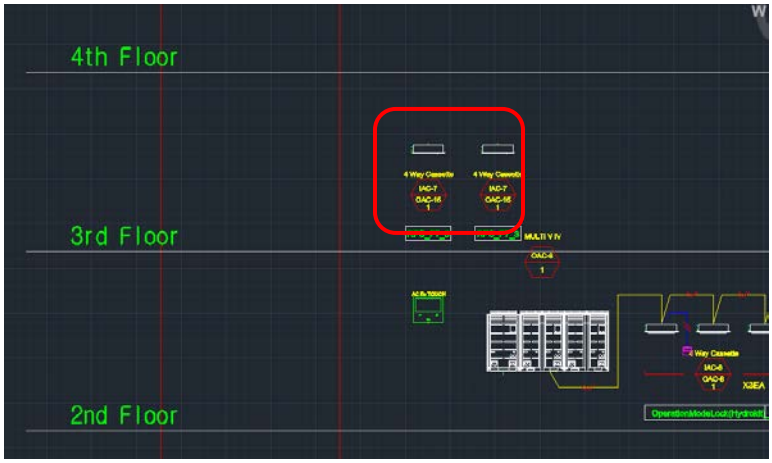
- After selecting Outdoor Unit or Riser in Riser Diagram, select "Locate IDUs" → Indoor Units are positioned in Building Board.

(Indoor Units connected to the selected Outdoor Unit are automatically positioned.)

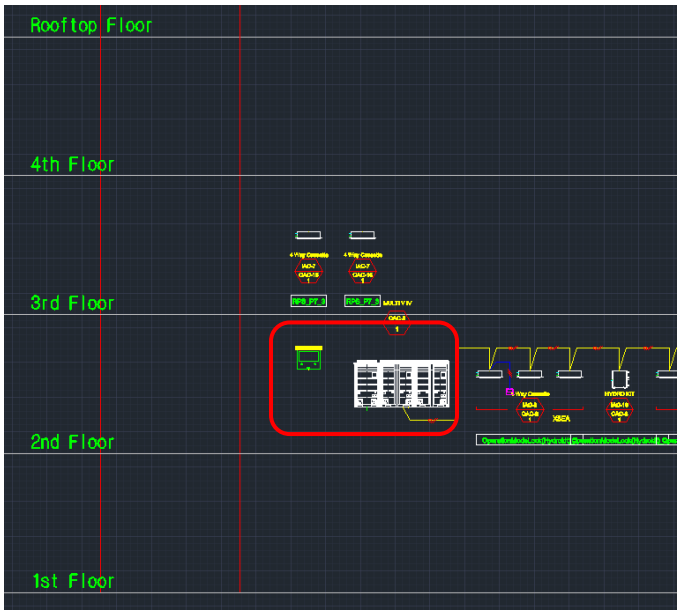
2.5 Locate Device

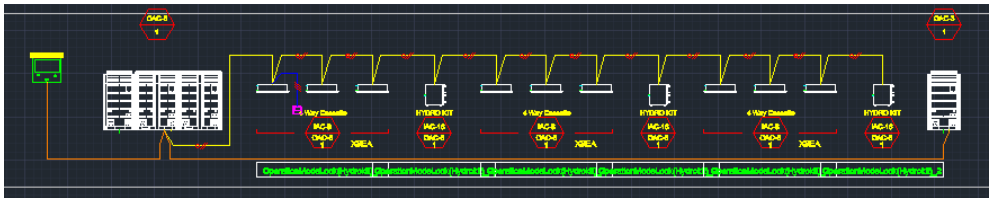
- After selecting Outdoor Unit or Indoor Unit in Riser Diagram, select "Locate Device" → The selected equipments are positioned in Building Board.





4. The connection between Outdoor Units and Central Controllers is manually connected through Control Wiring.





System Validation Check

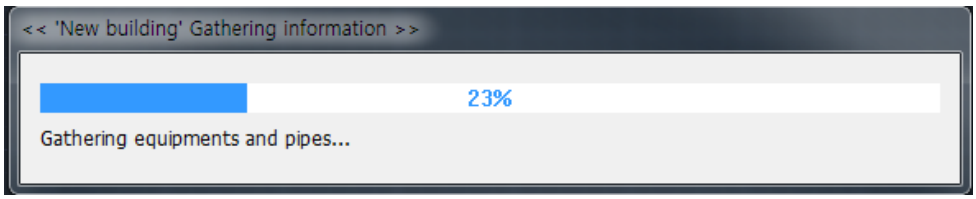
Perform the inspection for pipe diameter, branching pipes, and system efficacy, and show the result.

Drawing Refresh

It shows the initialization of the drawing information and the currently composed Outdoor Unit, Indoor Unit connecting structure.

Perform refresh for the equipment connection information.

If check Drawing Refresh, reflect information of drawing (Auto CAD) in the LATS CAD.

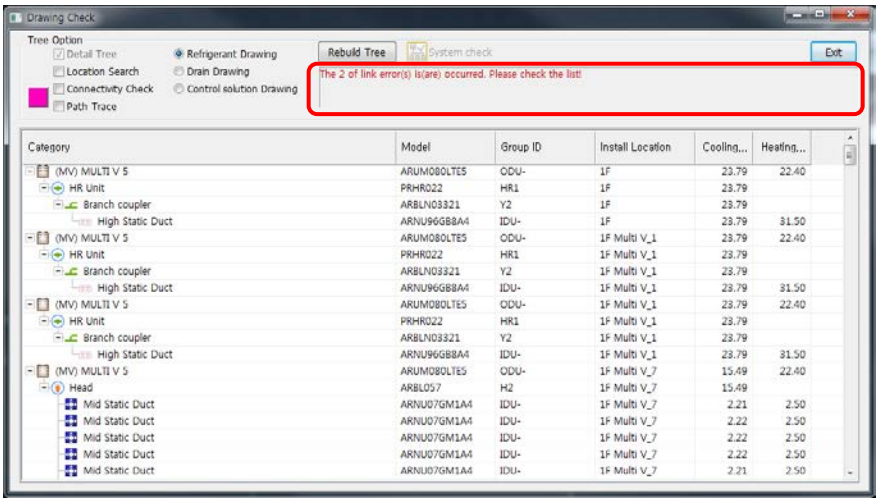


Caution! When use function of Auto CAD like Undo, Delete, Copy..., must check Drawing Refresh.

Checking Connect Condition (Drawing Check)

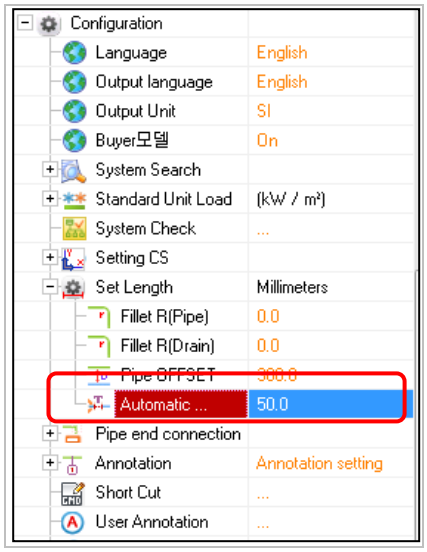
It initializes the drawing information and shows the outdoor unit and indoor unit connection structure currently composed.

Verify the structure diagram of each of refrigerant/drain/control line, and check the error in the connection composition.

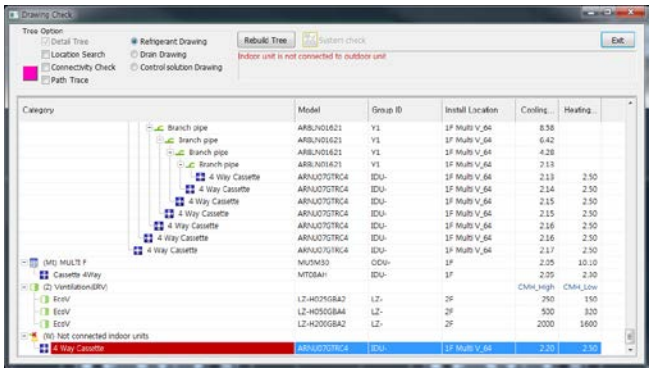


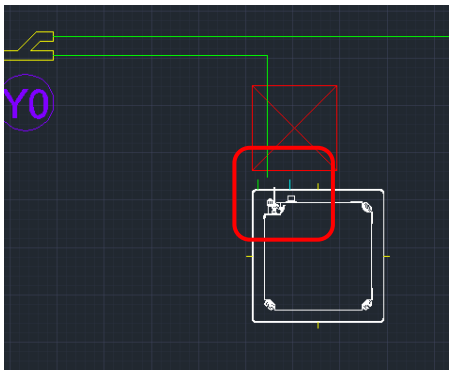
1. Drawing Information Initialization

Initialize the ports of the positioned equipments and perform automatic connection of the equipments that are not connected. (Automatic Link Connection)

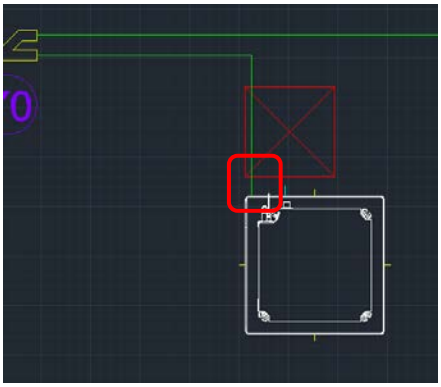


1.1 When there is a port not connected within Automatic Connection Tolerance of Configuration, it is automatically connected.





1.2 Verify Automatic Connection Tolerance, and execute Checking connect Condition → Port is automatically connected

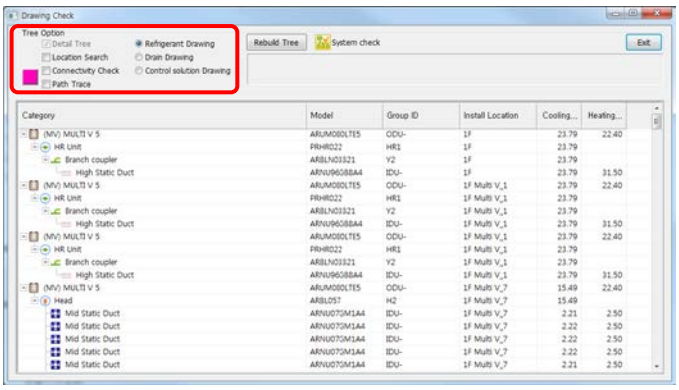


2. Detail Map

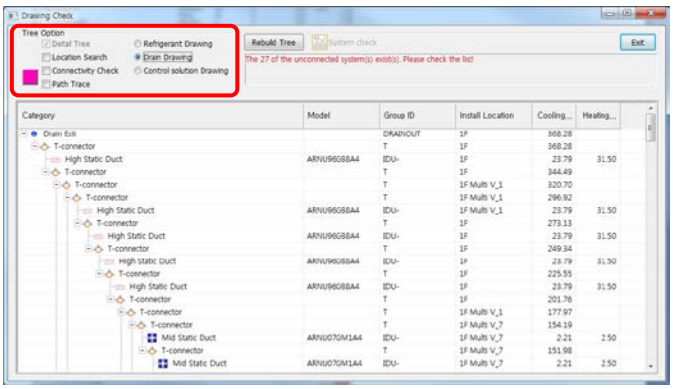
- Select Detail Map in Tree Option, and click Rebuild Tree.

- It is displayed as Detail Map including branching pipes.

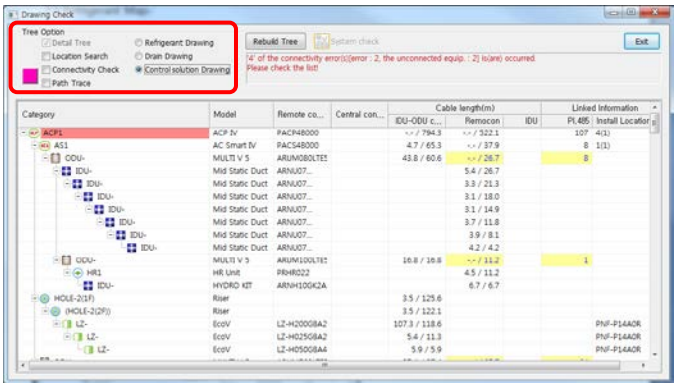
2.1 Refrigerant Map



2.2 Drain Map

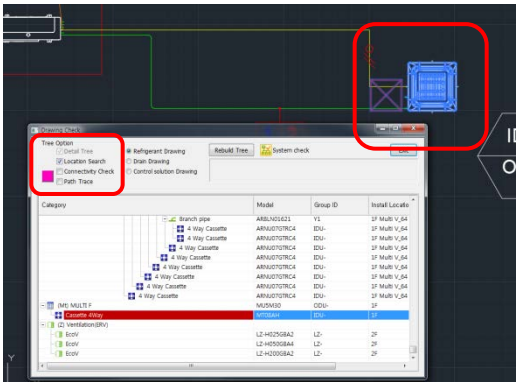


2.3 Control Map



3. Location Search

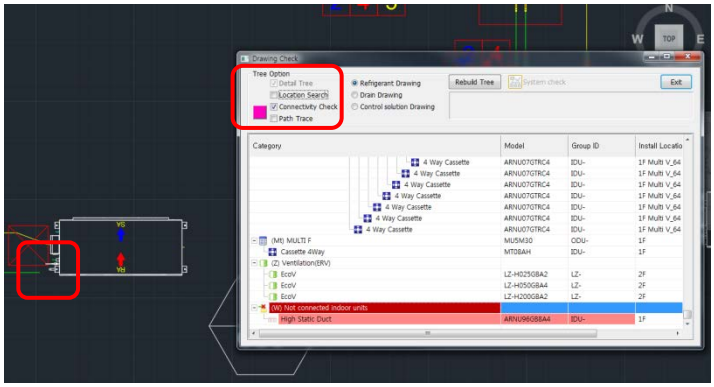
- Move the screen in the drawing to the selected equipment.



4. Connectivity Check

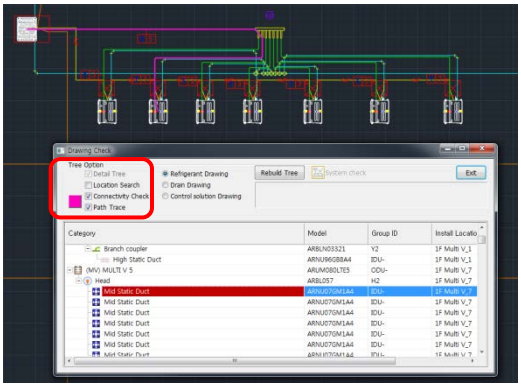
- It can check pipe, drain and control connectivity. If then pipe isn't connected, it will change the color.

- As clicking the Rebuild Tree, the pipe will be connected with ports.



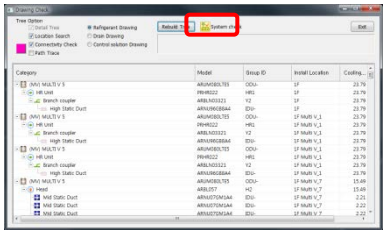
5. Path Trace

- Select Path Trace in Tree Option, and select the indoor unit to verify. The Outdoor Unit Trace of the selected indoor unit is displayed.



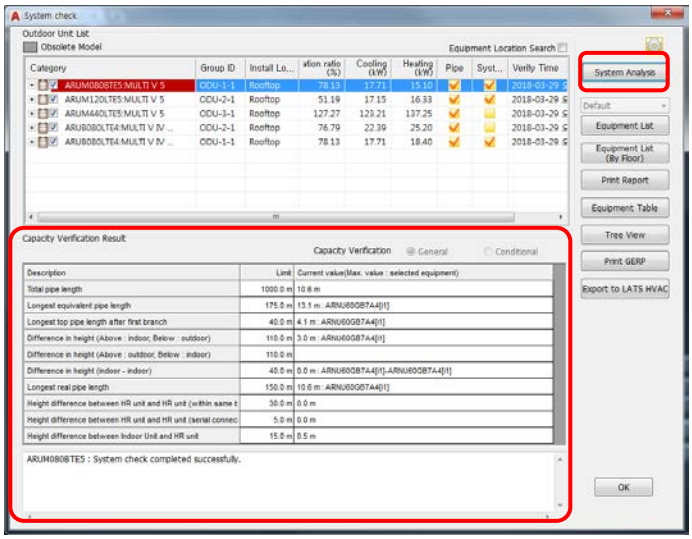
- The equipment connection information is displayed along the pipes, and the connection between riser hole and riser hole is displayed as a straight line.

Checking Refrigerant Pipe Validation (System Check)



1. System Analysis (Perform checking refrigerant pipe validation and verification after connection is completed, and created the result value in the drawing)

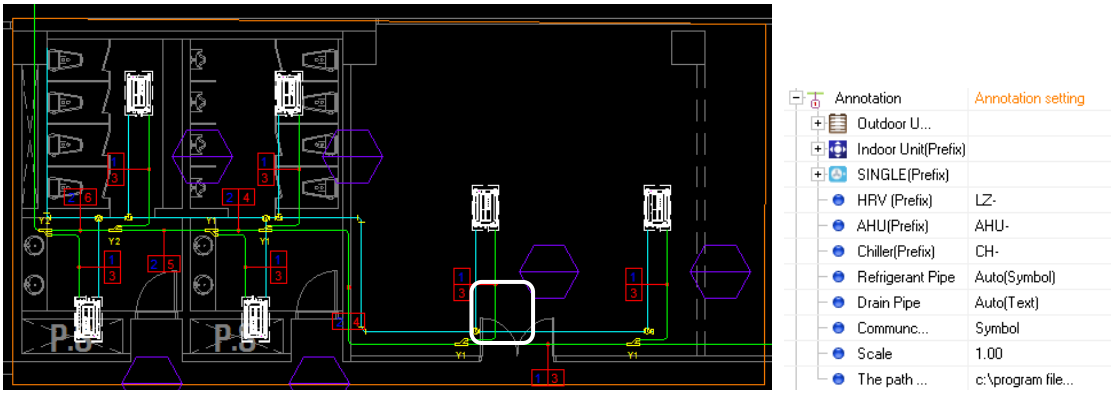
1.1 Select outdoor unit to verify and select system analysis.



1.2 Show the system check result values in Capacity Verification Result.

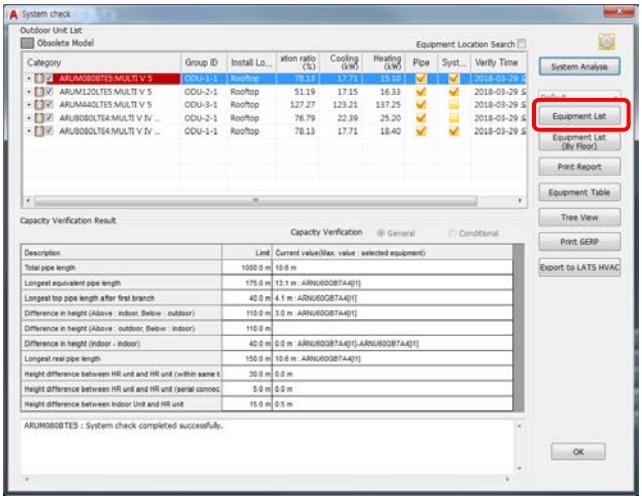
1.3 The pipe diameter and branching pipe symbol are inserted automatically in the drawing.

(When Annotation is set as Manual, it is not displayed. It is input by the user through Equipment and Pipe Index of Symbol Menu, or change the setting on Annotation setting)



2. Equipment List

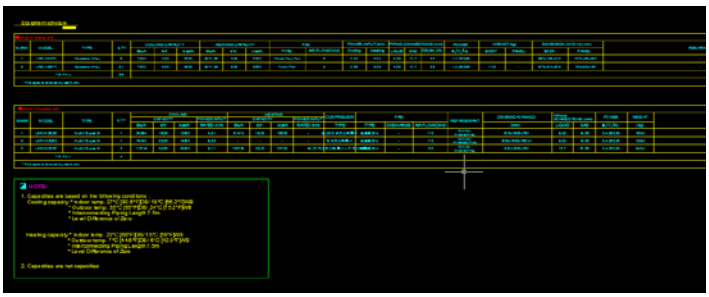
Equipments and pipe information applied to the drawing are output in Table form.



2.1 Click the reference point to enter Equipments list in the drawing.

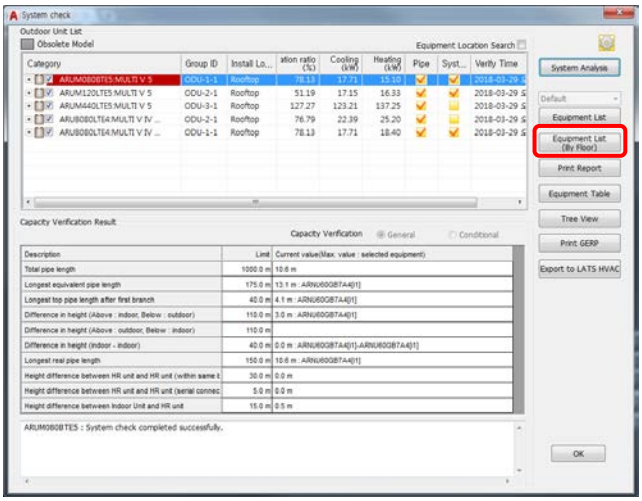
```
Select the reference point to enter equipment list :
```

2.2 Equipment List is inserted in the drawing.

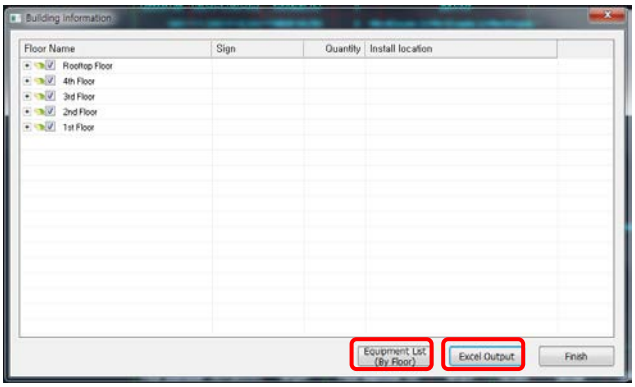


3. Equipment List (By Floor)

Equipments and pipe information by floor applied to the drawing are output in Table form.



2.1 Select how to output equipment list whether by drawings or Excel.

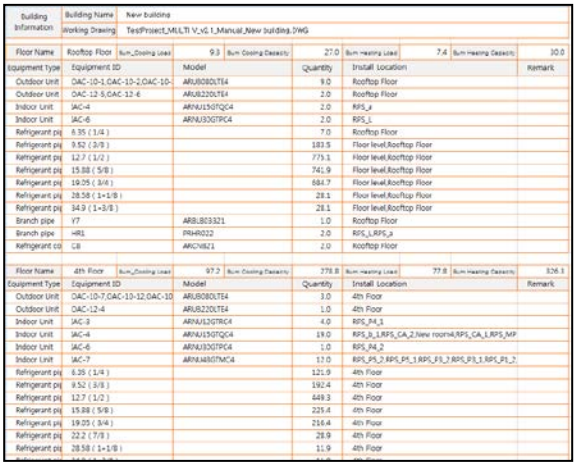


2.2 To output by drawings, click Equipment List (By Floor) and select the reference point to enter Equipments list in the drawing.

```
Select the reference point to enter equipment list :
```

2.3 Equipment List is inserted in the drawing.

2.4 Select how to output equipment list whether by drawings or Excel.



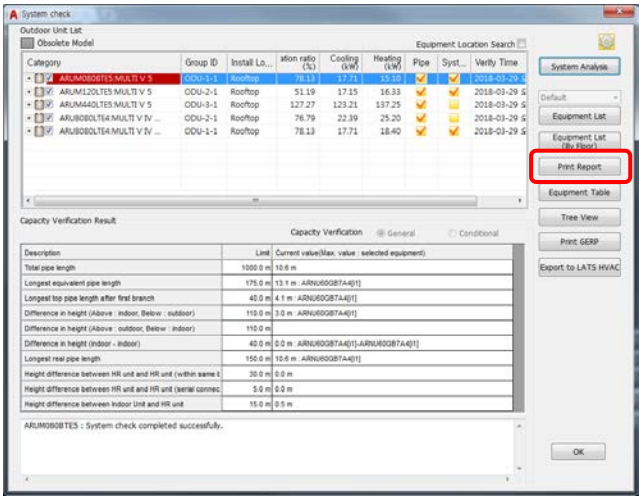
Building Information	Building Name	New building
	Working Drawing	TestProject_MULTI V_VG 1_Manual_New building.DWG

Floor Name	Rooftop Floor	Sum_Cooling Load	9.3	Sum Cooling Capacity	27.0	Sum Heating Load	7.4	Sum Heating Capacity	30.0
Equipment Type	Equipment ID		Model		Quantity	Install Location			Remark
Outdoor Unit	OAC-10-1,OAC-10-2,OAC-10-		ARUB080LTE4		9.0	Rooftop Floor			
Outdoor Unit	OAC-12-5,OAC-12-6		ARUB220LTE4		2.0	Rooftop Floor			
Indoor Unit	IAC-4		ARNU15GTQC4		2.0	RPS_a			
Indoor Unit	IAC-6		ARNU30GTPC4		2.0	RPS_L			
Refrigerant pi	6.35 (1/4)				7.0	Rooftop Floor			
Refrigerant pi	9.52 (3/8)				183.5	Floor level,Rooftop Floor			
Refrigerant pi	12.7 (1/2)				773.1	Floor level,Rooftop Floor			
Refrigerant pi	15.88 (5/8)				741.9	Floor level,Rooftop Floor			
Refrigerant pi	19.05 (3/4)				684.7	Floor level,Rooftop Floor			
Refrigerant pi	28.58 (1+1/8)				28.1	Floor level,Rooftop Floor			
Refrigerant pi	34.9 (1+3/8)				28.1	Floor level,Rooftop Floor			
Branch pipe	Y7		ARBLB03321		1.0	Rooftop Floor			
Branch pipe	HR1		PRHR022		2.0	RPS_L,RPS_a			
Refrigerant co	CB		ARCN821		2.0	Rooftop Floor			

Floor Name	4th Floor	Sum_Cooling Load	97.2	Sum Cooling Capacity	378.8	Sum Heating Load	77.8	Sum Heating Capacity	326.3
Equipment Type	Equipment ID		Model		Quantity	Install Location			Remark
Outdoor Unit	OAC-10-7,OAC-10-12,OAC-10		ARUB080LTE4		3.0	4th Floor			
Outdoor Unit	OAC-12-4		ARUB220LTE4		1.0	4th Floor			
Indoor Unit	IAC-3		ARNU12GTRC4		4.0	RPS_P4_1			
Indoor Unit	IAC-4		ARNU15GTQC4		19.0	RPS_b_1,RPS_CA_2,New room4,RPS_CA_1,RPS_MP			
Indoor Unit	IAC-6		ARNU30GTPC4		1.0	RPS_P4_2			
Indoor Unit	IAC-7		ARNU48GTMC4		12.0	RPS_P5_2,RPS_P5_1,RPS_P3_2,RPS_P3_1,RPS_P1_2			
Refrigerant pi	6.35 (1/4)				121.9	4th Floor			
Refrigerant pi	9.52 (3/8)				192.4	4th Floor			
Refrigerant pi	12.7 (1/2)				449.3	4th Floor			
Refrigerant pi	15.88 (5/8)				225.4	4th Floor			
Refrigerant pi	19.05 (3/4)				216.4	4th Floor			
Refrigerant pi	22.2 (7/8)				28.9	4th Floor			
Refrigerant pi	28.58 (1+1/8)				11.9	4th Floor			

4. Print Report

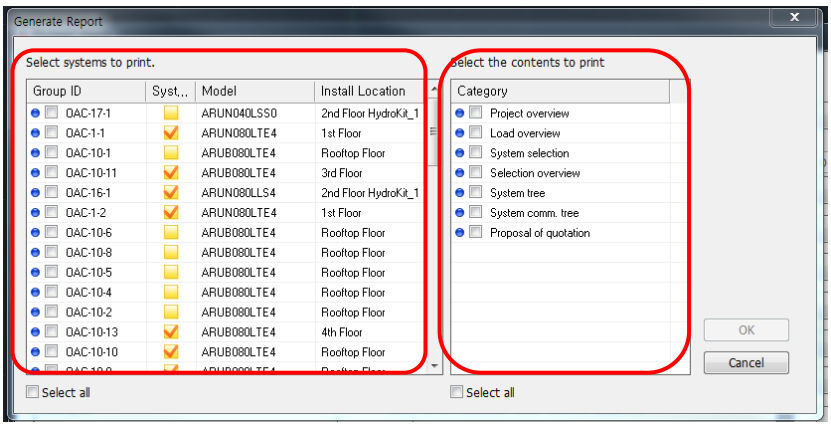
4.1 It outputs the designed drawing information in a report format.



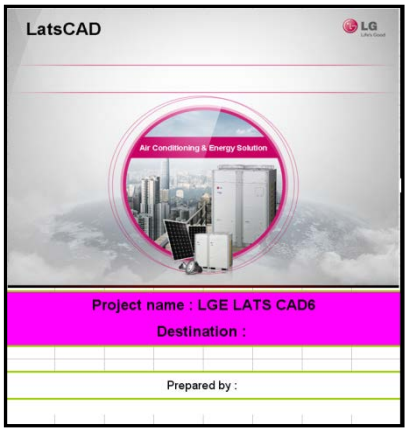
4.2 Select the contents to print.

- Select the systems that are printed(It is able to check which system is system-checked.

- Select the contents to print through checking each option or "Select all".

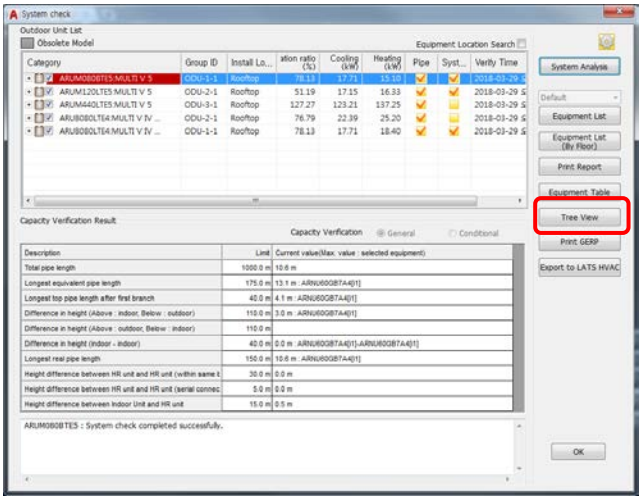


4.3 The report is print in Excel File format.

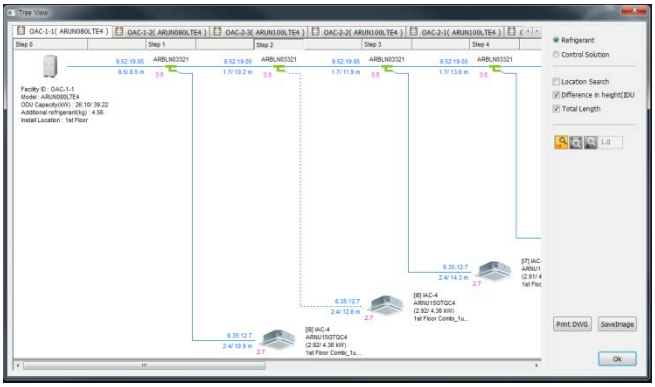


5. Tree View

Tree view can check each system information.



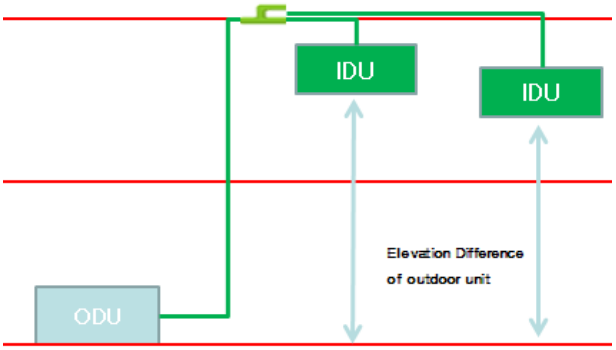
5.1 It is able to show each of Refrigerant system diagram and control system diagram.



5.2 Location Search

- Move the screen in the drawing to the selected equipment.

5.3 Difference in height (IDU-ODU):



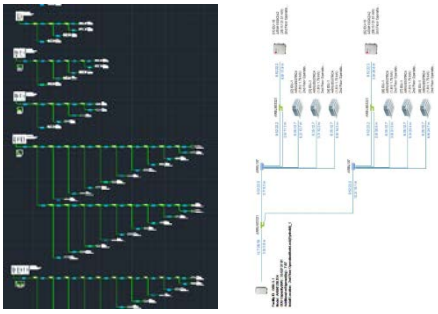
5.4 Total Length

- Total Length means the length from outdoor unit to the selected equipment.

5.5 “Print DWG” and “Save Image”

- To output Tree diagram to drawings, click the “Print DWG”.

- To output Tree diagram to image file (.jpeg), click the “Save Image”.

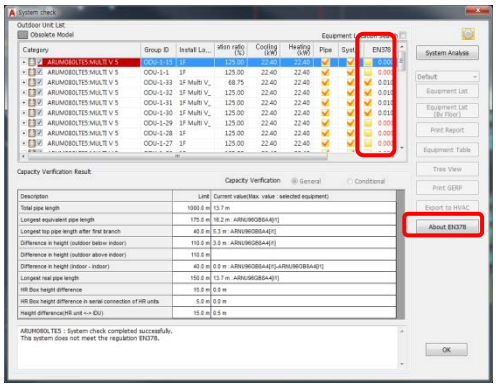


6. About EN378 (Only for EU)

- EN378: It is the European regulation that the amount of refrigerant leakage should satisfy the equation (The amount of refrigerant per volume of room is equal or less than 0.44).

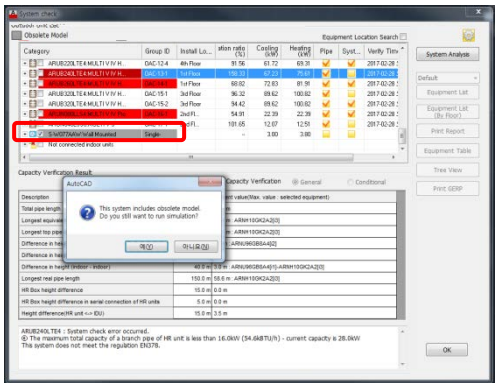
6.1 After system analysis, It shows which system is met the regulation EN378

6.2 It shows value of EN379 equation. If the system is not met, value is shown red.



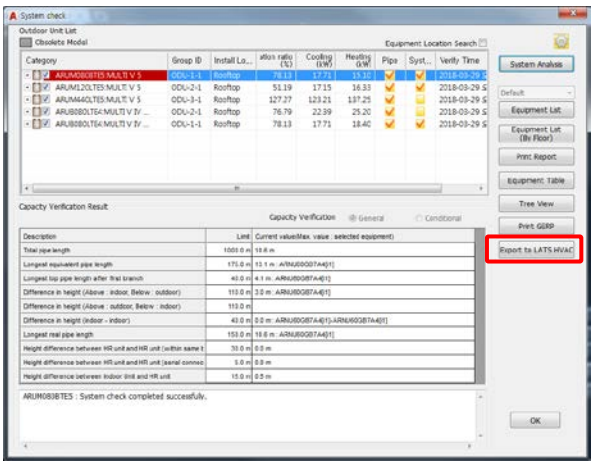
7. Obsolete Model

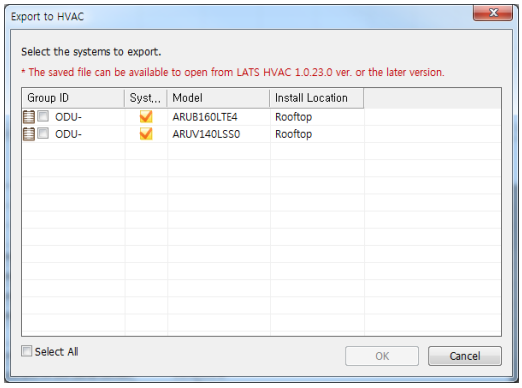
Obsolete Model (gray): When you open the old project including obsolete model, check the model.



8. Export to LATS HVAC

The Systems which are drawn on the project can export to LATS HVAC to check more detail.





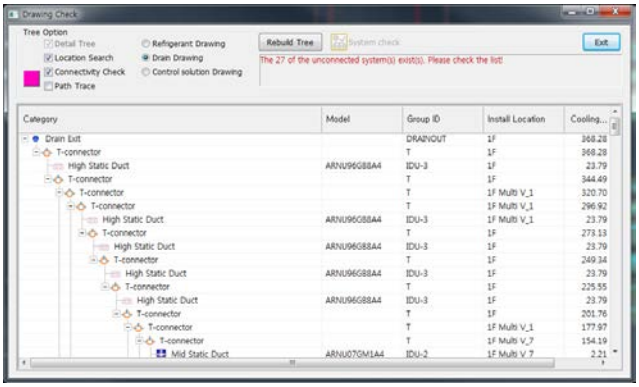
* The saved file can be available to open from LATS HVAC 1.0.23.0 ver. or the later version.

** The saved file can be available to open from LATS HVAC 1.5.2.0 ver.(N.America) or the later version.

Checking Drain Validation (Drain Check)

1. Check the Drain Pipe connection by structure, to select the pipe diameter to create the result value in the drawing.

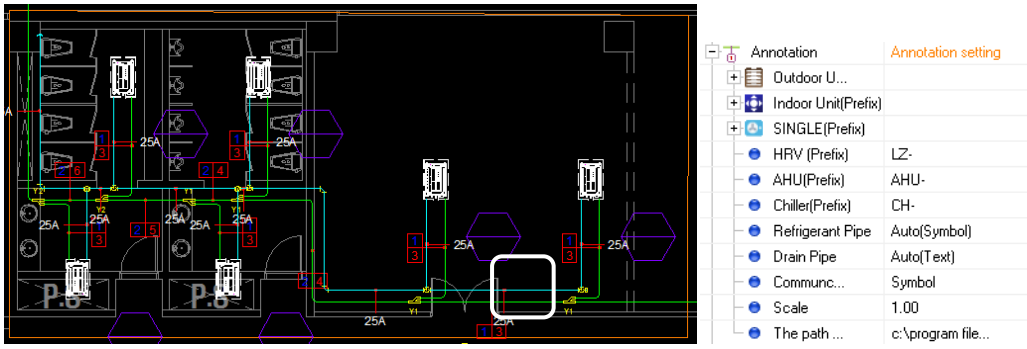
2. It shows the connection structure based on Drain Exit or Discharge Riser Hole.



Caution! 'Drain Exit' or "Drain Riser Hole' Symbol must be connected to the last exit part of the Drain Pipe to create the structure.

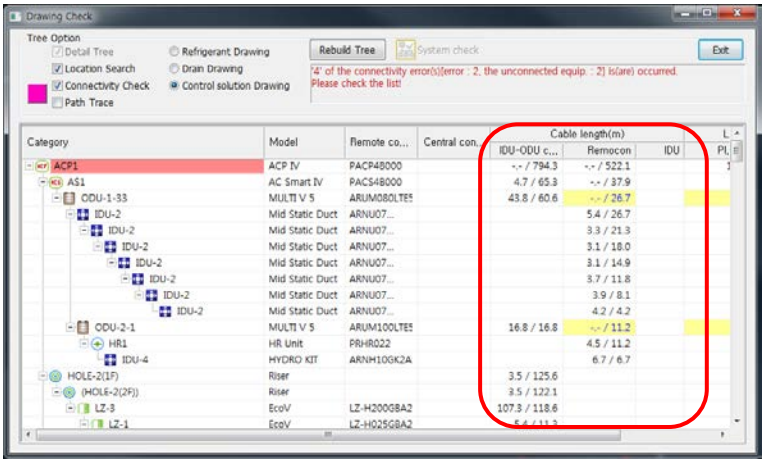
3. Drain Pipe Diameter is automatically created in the drawing.

- When Annotation is set as Manual, it is not displayed. It is input by the user through Equipment and Pipe Index of Symbol Menu, Or change the setting on Annotation setting



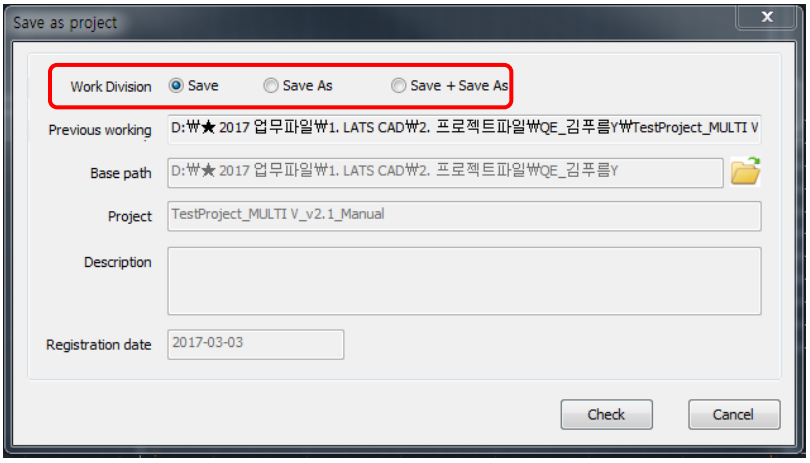
Checking Communication Line Validation (Control Check)

1. Based on the Central Control Line, it verifies the Cable length, the number of Indoor Units connected to Controller, and the number of PI.485 Points.



Project Save AS

Entire Project contents may be saved, be saved as a different name, or both



Function Description for Each Tab of Pallet Menu

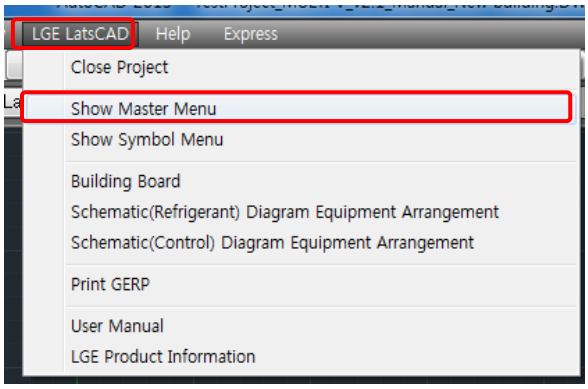
This capture describes which operations are done in the functions in each Menu, and it is the explanation page based on the conditions and the exceptional cases to use the functions.

Master Menu and Symbol Menu

Menu has 2 types as Master Menu at left of window and Symbol Menu at right of window. Master Menu has 2 Tabs of Master Tab and Layer Tab. And Symbol Menu has 6 Tabs of Indoor Unit Tab, Outdoor Unit Tab, Pipe Material Tab, Control Solution Tab, Material Index Tab and User Define Symbol Tab.

1. Showing Master Menu

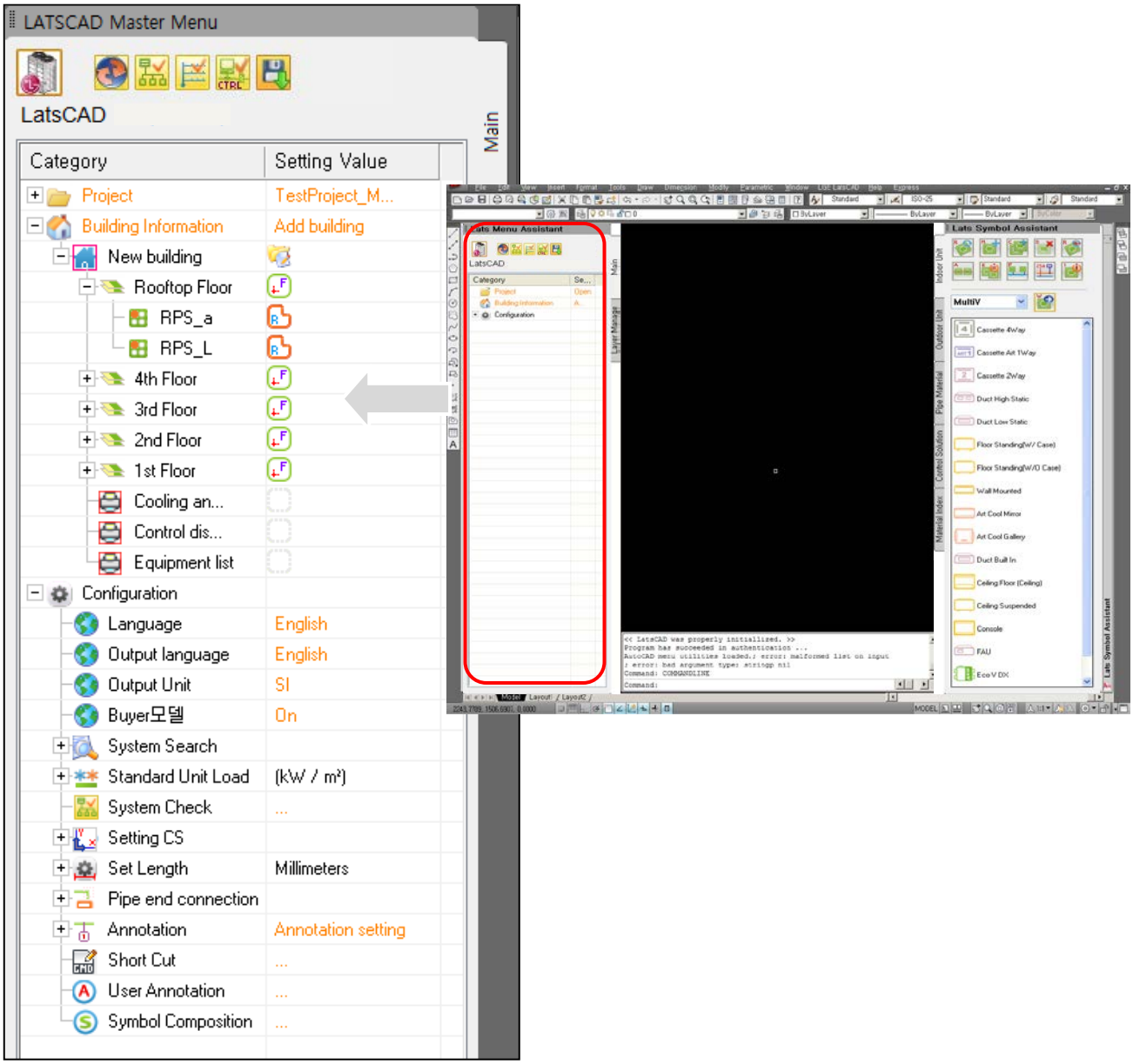
- Utilize LGE LATSCAD → Show Master Menu/Show Symbol Menu in Pull Down Menu



Main Tab (Master Menu)

Main Tab is in Master Menu.

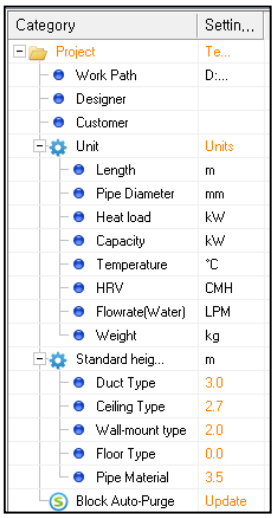
Project Information, Building Information, and Environment Setting Information can be viewed.



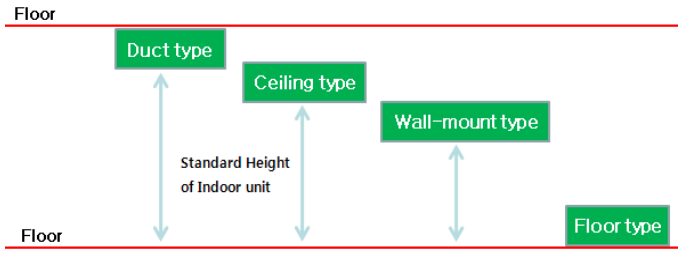
Environment Setting (Project and Configuration)

It can set the environment of the project.

1. Project

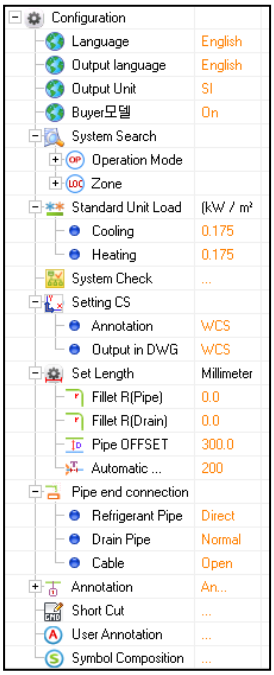


- Unit: Units of Length, Pipe Diameter, Load / Capacity, and Temperature
- Standard Height Indoor Unit: Apply the height from the floor for each indoor unit type



- Block Auto-Purge: If blocks are updated more than the blocks in the current drawing, it automatically changes the blocks.

2. Configuration



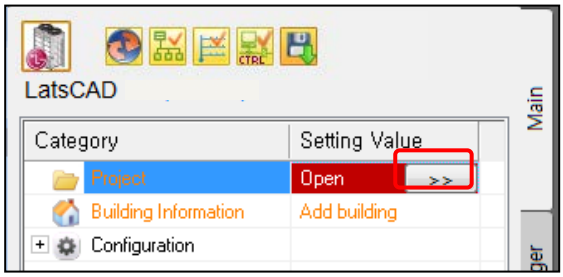
- Language: Korean, English, French, Spanish, Italian, German, Turkish, Portuguese, Russian, Chinese, Hungarian and Thai
  (CAD needs to be started again if changed)
- Output language: Korean, English, French, Spanish, Italian, German, Turkish, Portuguese, Russian, Chinese, Hungarian and Thai
  (Change Output or Remarks Data)
- Output Units: SI, IP
- Buyer Model: Show model name by buyer model name or factory model name
- System Search
  → Operation Mode: Heat Pump (contained Heat Recovery), Cooling Only
  → Zone: Change Model lineup according to the selected region

  Caution! Check Zone of System Search to change Model lineup according to the selected region.
- Standard Unit Load: Calculate automatically Room Load by Standard Unit Load
- System Check: Change the setting of System Check(Pipe / Diversity / Hydrokit)
- Setting CS: When UCS and WCS are different CS(Co-ordinate Systems),
  It can set Annotation and output's CS.
- Set Length
  → Fillet Radius: Radius of the automatic round of Refrigerant Pipe and Drain Pipe
  → Pipe OFFSET: Offset Distance of Refrigerant Pipe during Parallel Path Piping
  → Automatic Connection Tolerance: Tolerance Setting for Automatic Connection with Port
- Pipe End Connection: Pipe End Part Treatment Option for Smart Wiring and Offset wiring
  → Refrigerant Pipe
  *Normal: Insert Branching Pipe from Main Pipe to connect the last Indoor Unit
  *Direct: Directly connect to the last Indoor Unit Main Pipe without using Branching Pipe
  → Drain Pipe: *Normal, Elbow, T+Cap
  → Cable: *Open, Close
- Annotation: Select Auto or Manual for the input of Refrigerant Pipe and Drain Pipe Notes
- Shortcut : Define shortcut of LATS functions.
- User annotation : Define user define annotation.
- Symbol Composition : Define symbols' ports

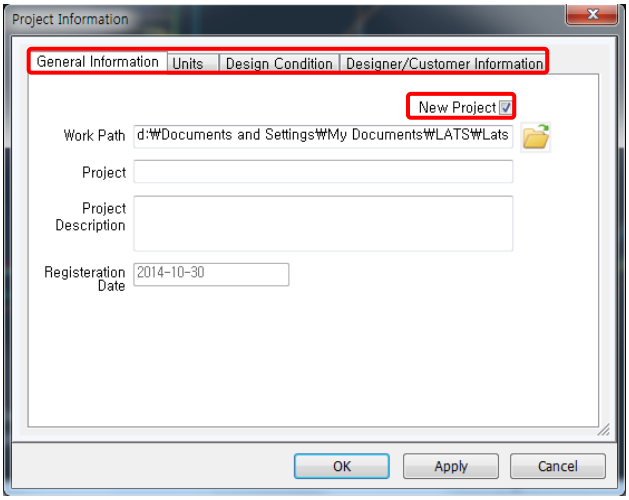
Project Information

Create New Project or open Project.

1. Select "Open" of Project in Master Menu.



2. Select New Project and input Various Information

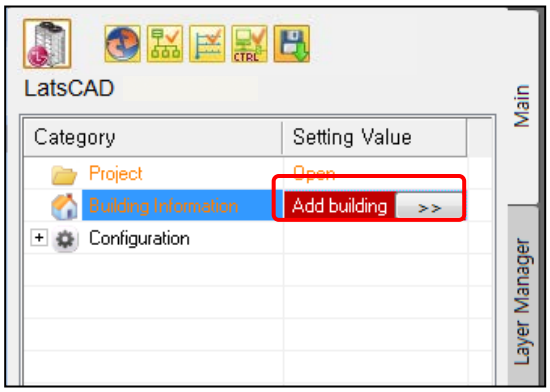


Space Information

Create Building Space Information, Buildings, Floors, and Rooms, and manage Information.

1. Create Buildings

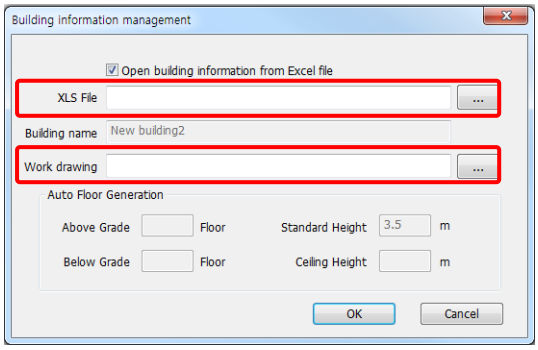
1.1 Create Buildings (By Excel)



1.1.1 Select “Add buildings” in Building Information in Master Menu.

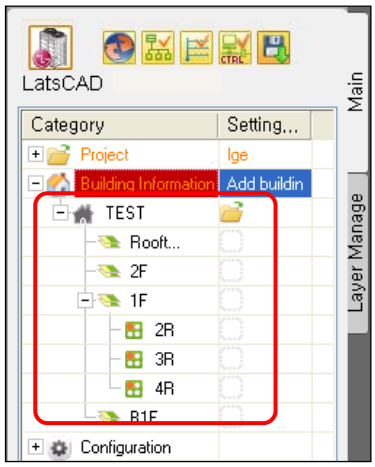
1.1.2 Select “Open building information from Excel file” in “Building Information Management”

1.1.3 Select the Excel File (File with Building Information input in the template) and drawing



1.1.4 The Building Information input in the Excel File is applied

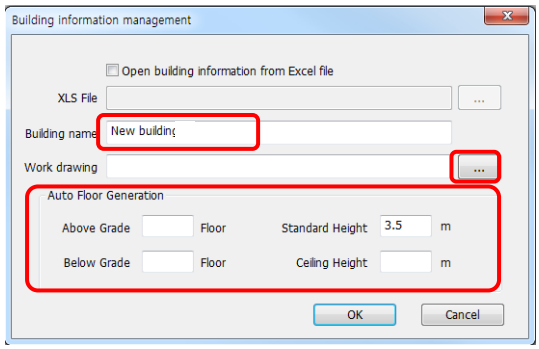
- Test Building is created, and if Room Information is input in the Excel File, Room Information is also applied.



1.2. Create Buildings (By Manual)

1.2.1 Input Building Name, Floor, and Standard Floor Height, and designate the drawing.

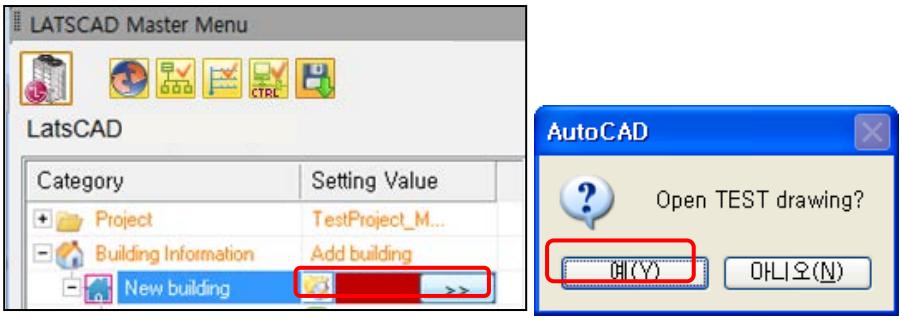
1.2.2 Drawing name is saved as Project Name_Building Name.dwg, and is copied to Project folder.



Caution! When ceiling concealed duct type Indoor Unit is selected, and it designates the ceil height. Don't have to be input the other case.

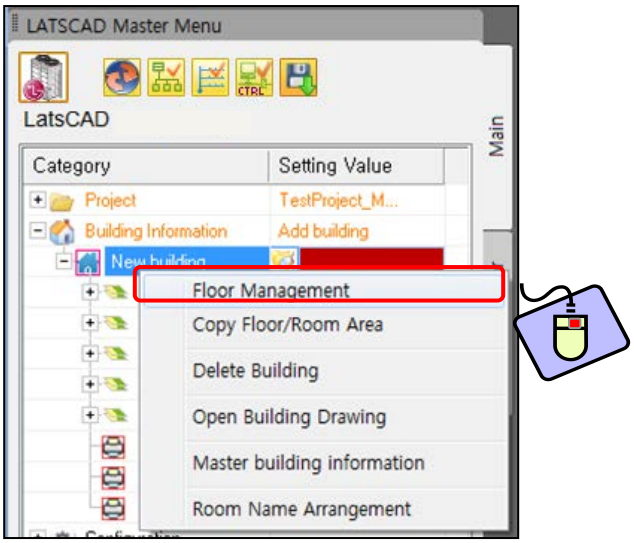
1.2.3 Building Information is created as the same in "Open Building Information from Excel File".

1.2.4 Opening Building Drawing (Select Building Information and Open the Drawing)

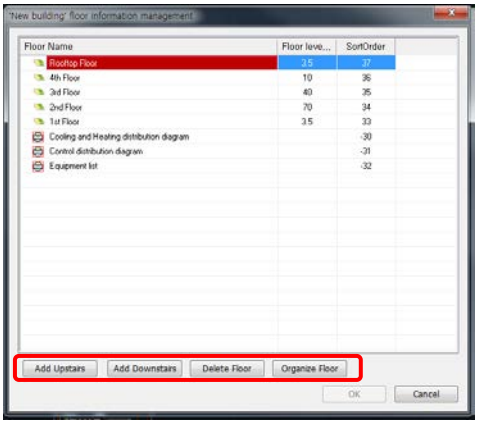


2. Building Management (Mouse right Button on Building)

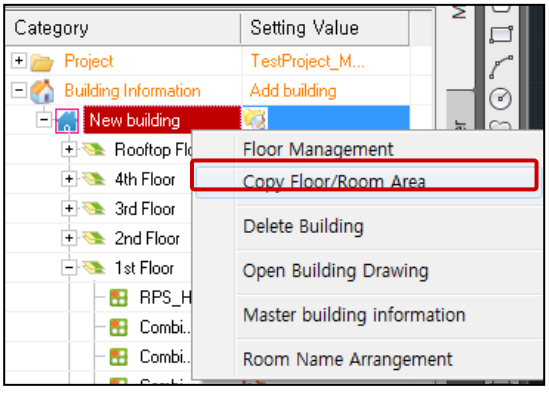
2.1 Floor Management



2.2 Floors may be added or deleted, and floor name and floor height information may be input for the corresponding building.



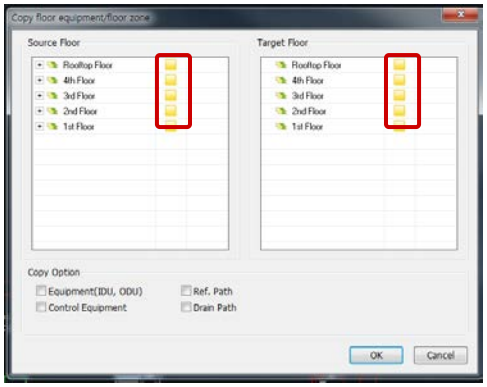
2.3 Copy Floor Equipment.

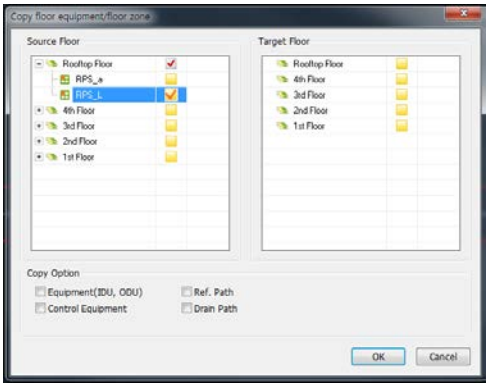


2.3.1 Select Source Floor/Room and Target Floor.

2.3.2 Equipment and Pipe Information are copied exactly. (Reference Point for Copy is the reference point of the Floor.)

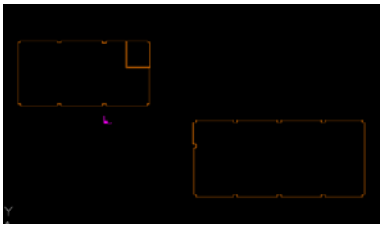
2.3.3 Check "Copy pipe, drain and Control (Except Indoor/Outdoor Unit)", to copy only pipe, drain and control.

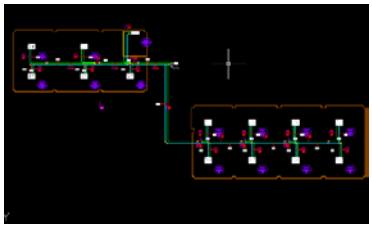




Example) For the 1st and 3rd floor with the same drawing, equipment positioning, and Pipe connection, design only the 1st floor and execute Floor Copy.

Example) 1st Floor





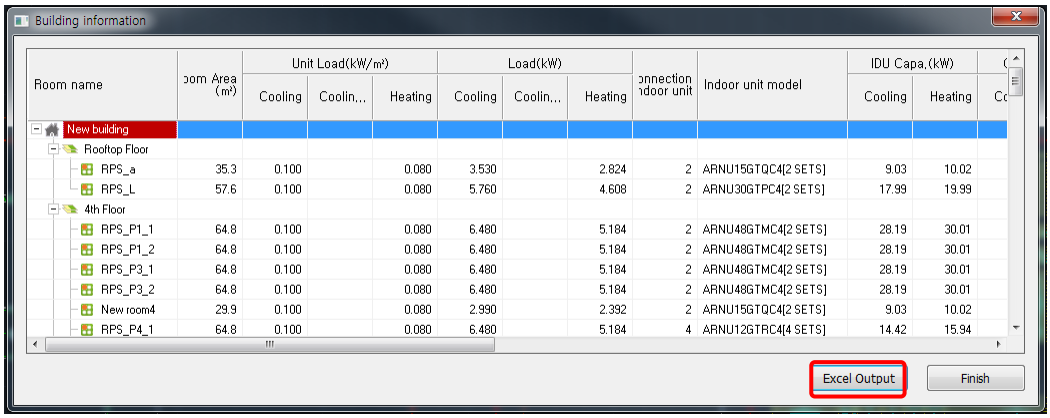
Example) 3rd Floor before/after

2.4 Open Building Drawing: It opens the drawing connected to the building.

(For the existing Project File, Drawing is also automatically opened when the Project is opened.)

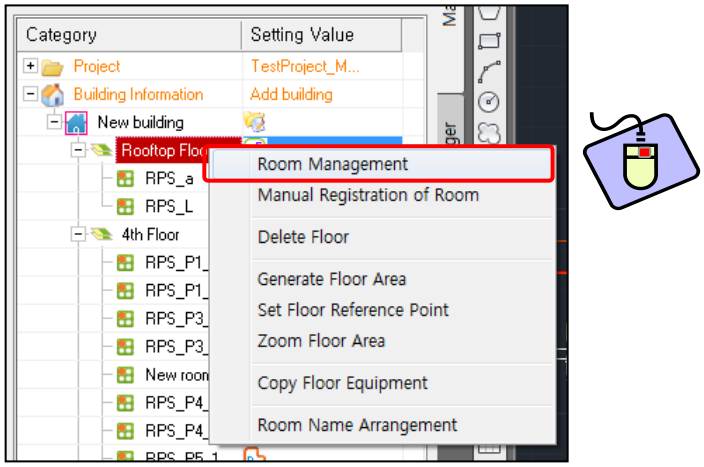
2.5 Master Building Information: Information for equipments positioned in the drawing may be verified and output to Excel.

(Load value for each Type may be verified)



3. Floor Management (Mouse right Button on Floor)

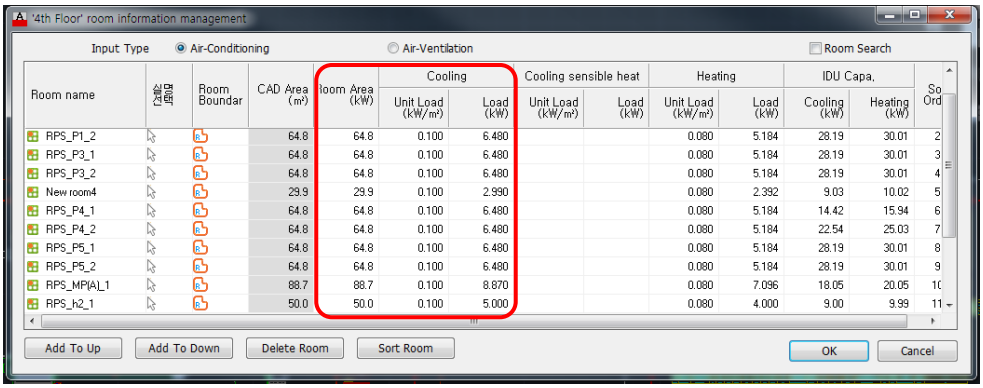
3.1 Room Management (While the floor is selected, Mouse right button)



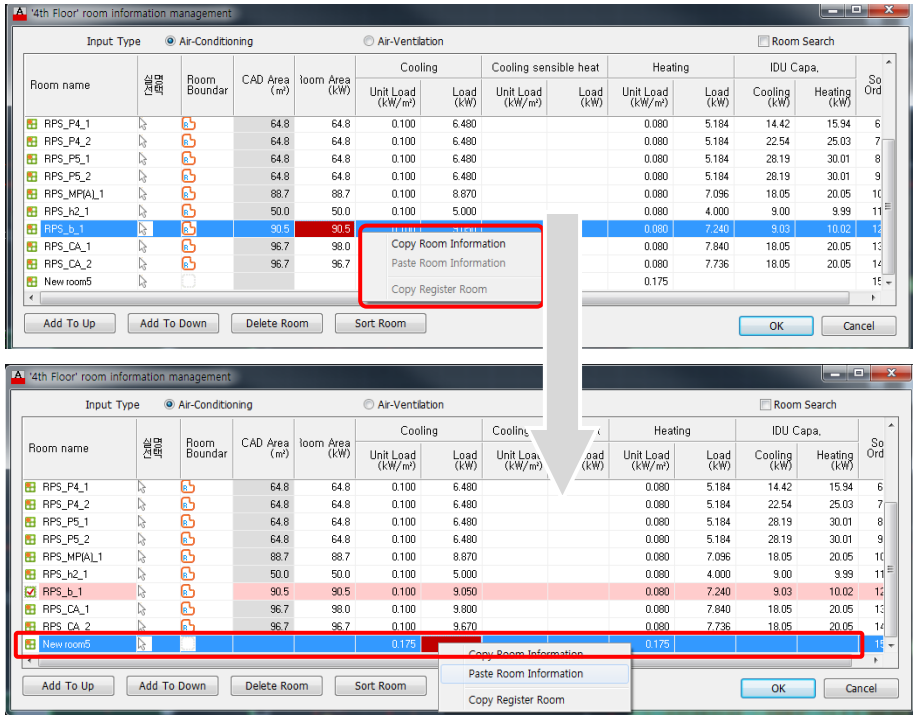
3.1.1 Room Management: Rooms may be added or deleted, and load and area values may be input.

- If load value is already input, apply the load value.

- If load value is not input, decide the load value by the unit load value.



3.1.2 Room Copy: After selecting the Room to copy, select Copy Room



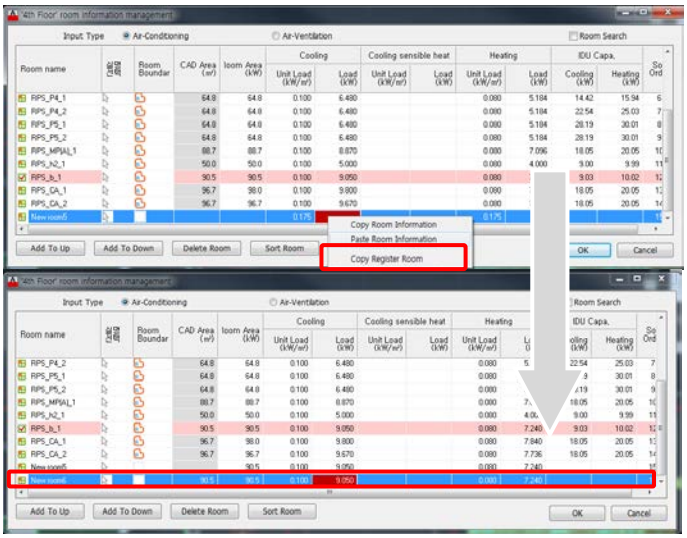
3.1.3 Paste Room: Select the existing Room to change after Copy Room, and select Paste Room of Mouse right button → Only Property Information is copied

Caution! This Paste Room function is only available, when select Paste Room of Mouse right button at existing Room. If you want to paste room in new room, use Copy Register Room function.

2.6.3 Copy Register Room: After Copy Room, Select Copy Register Room of Mouse right button at a room desired placing new room.

- A new Room is created under selecting room, and the Property Information is also copied.

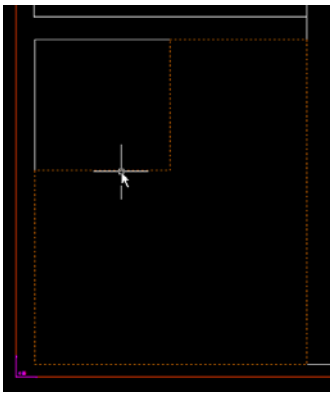
Example) Restaurant room data Copy and, select Copy Register Room at President Office.



3.2 Manual Registration of Room

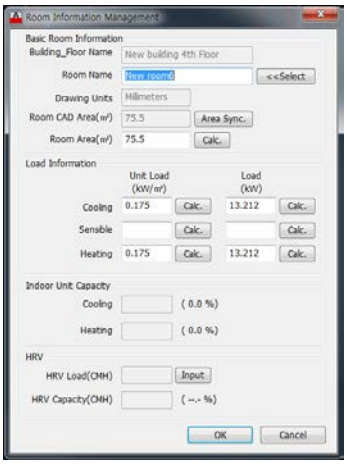
Manual Registration of Room is run in the order of Generate Room Area, Modify Room Information, and Auto-arrange Indoor Unit.

3.2.1 Draw the Room Area or Select Room Area in the drawing.



[[Select start point] or [Select previous area(S)] :

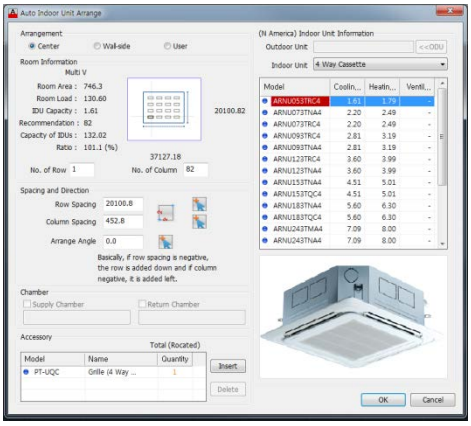
3.2.2 Input Room Information Management



Caution! After change the values (Room Area, Unit Load, and Load), Please click the "Calc."

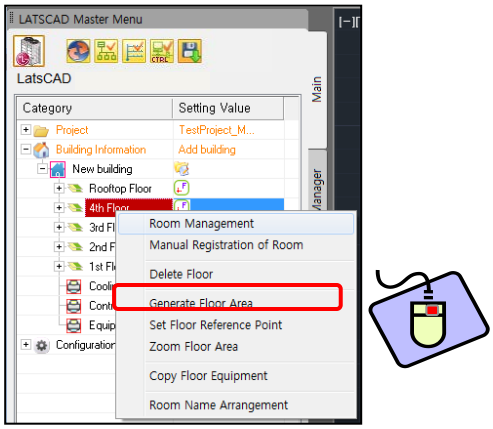
3.2.3 Auto-arrange Indoor Unit: Select Indoor Unit in the room automatically.

Please check "Auto-arrange Indoor unit" in "Function Description of Each Icons".

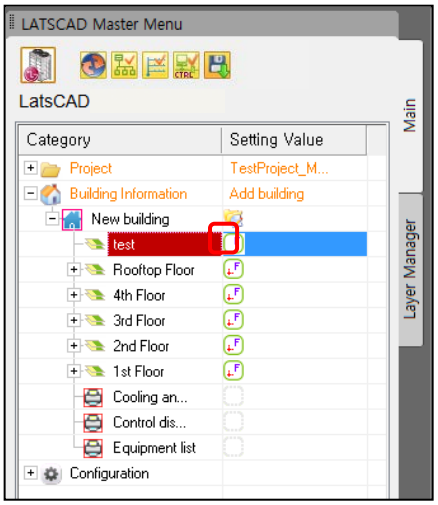


3.3 Delete Floor: It deletes the corresponding floor completely.

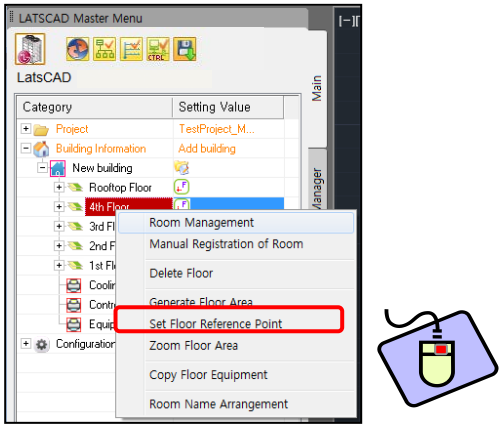
3.4. Generate Floor Area



- Designate Floor Area using rectangle or poly line, or designate certain area as the Floor Area using Boundary Selection.

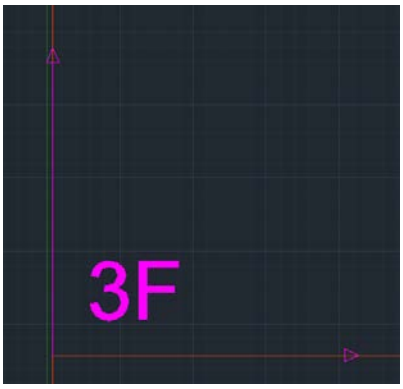


3.5 Set Floor Reference Point

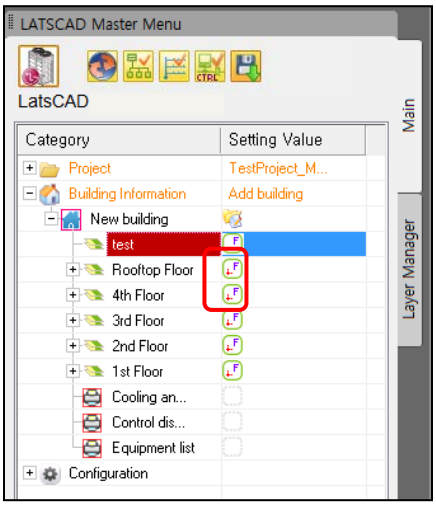


- After Floor Area is designated, designate the Reference Point of the floor.

- Set the point being the base of each floor as the Reference Point.

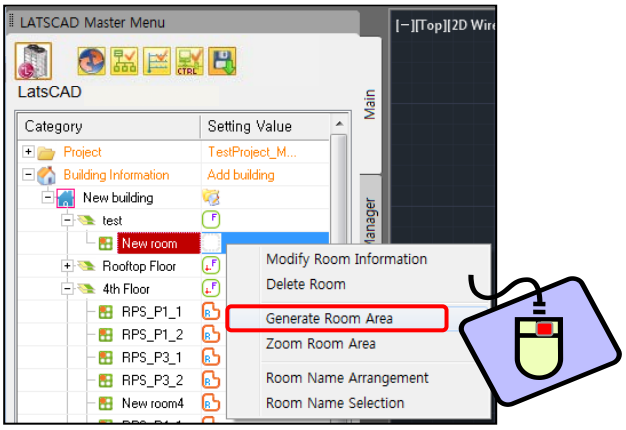


- When the Designation of Floor Area and the Setting of Floor Reference Point are completed, the Floor Icon is updated in Master Menu.

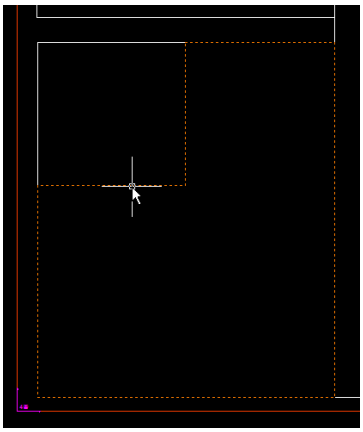


4. Room Management (Mouse right Button on Room)

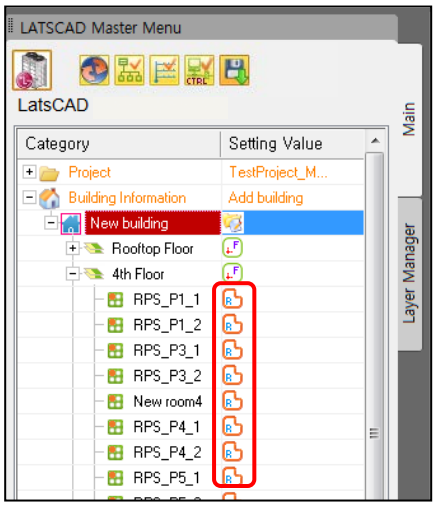
4.1 Generate Room Area



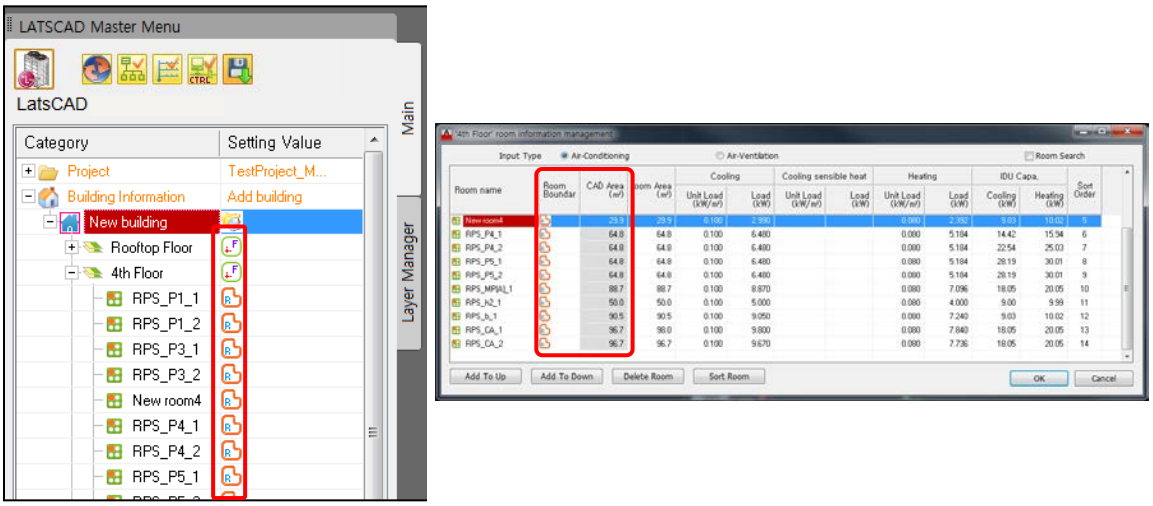
- Designate Room Area using rectangle and poly line, or designate certain area as the Room Area using Boundary Selection.



- When Floor and Room Area are designated, Room Icon is updated in Master Menu.



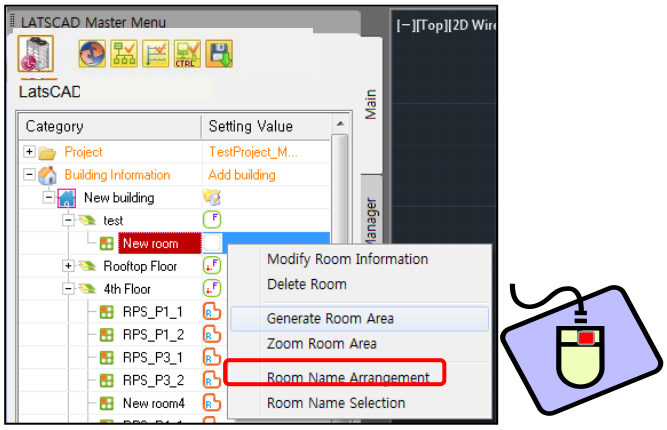
- When the designation of Floor Area/Floor Reference Point/Room Area is completed, all icons in Master Menu are updated, and the area for each room is recognized in CAD.



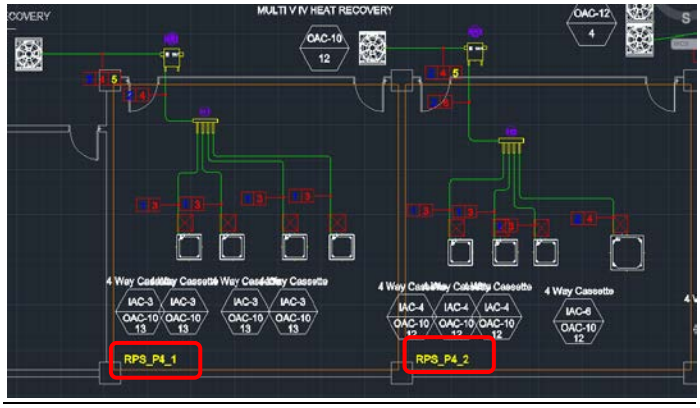
- Area for each Room/Floor may be Expanded/Deleted through Other Area Expansion/Deletion function

4.2 Zoom Floor Area: Expand and show the corresponding floor in the screen.

4.3 Room Name Arrangement



4.3.1 It arranges the Room name in drawings.

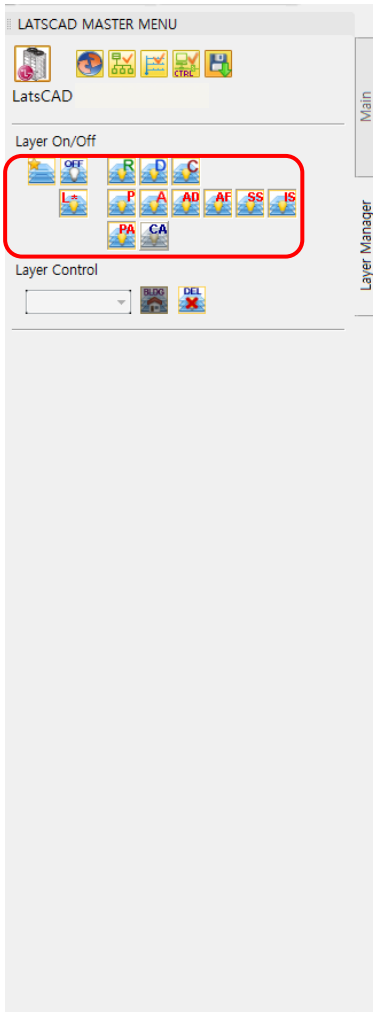


Layer Tab (Master Menu)

Layer Tab is in Master Menu.

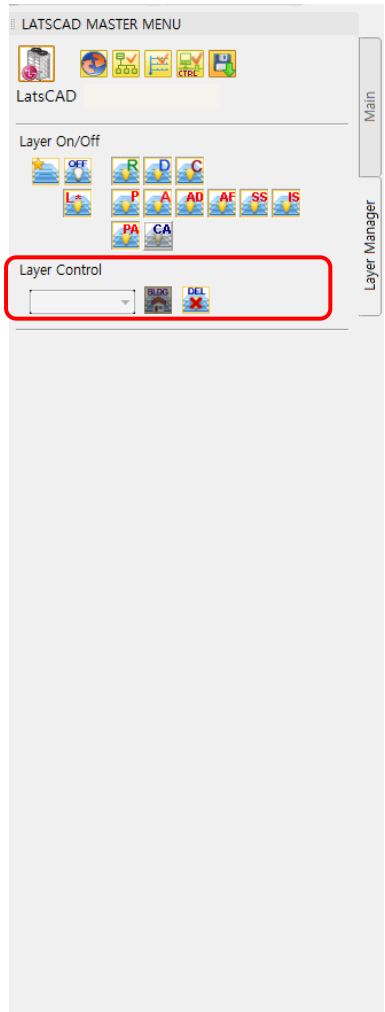
Layer change and delete, and On/Off functions may be used.

Layer On/Off

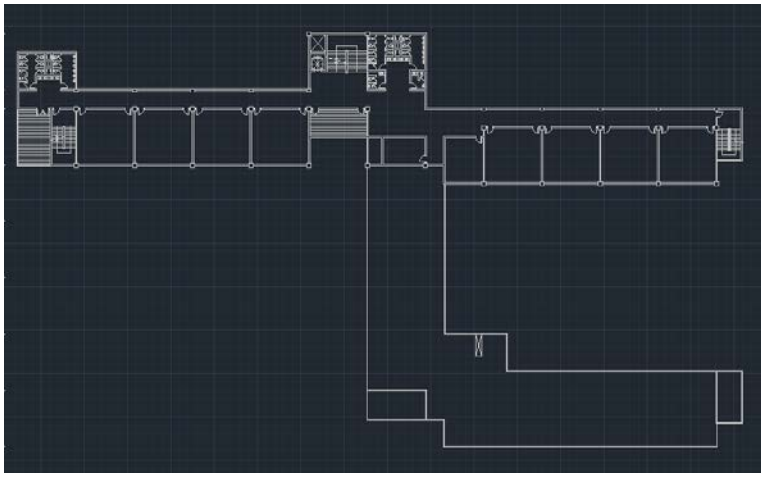


- Show layer dialog: It can change the setting by layers. (Layer Properties Manager)
- Selected entity layer off: The layers of which equipments or materials are selected are on/off.
- All Layer(patterned by LATS_*) off: The all layer patterned by LATS_* are on/off
- Refrigerant layer: The Refrigerant pipe and material's layers are on/off.
- Drain layer: The Drain pipe and material's layers are on/off.
- Control layer: The Control wire, equipment and material's layers are on/off.
- Duct layer: The Control material's layers are on/off.
- Floor Reference Layer: The Floor Reference layers are on/off.
- Floor/Room boundary layer: The Floor/Room boundary layers are on/off.
- Air direction Layer: The air direction layer of IDU are on/off
- Air flow type Layer: The air flow type layer of duct type models are on/off
- Service space Layer: The service space layer are on/off
- Installation space Layer: The installation space layer are on/off
- Cassette panel Layer/Cassette Layer: The cassette panel layer and cassette layer is switched each other in cassette model symbol.

Layer Control



- Move selected entity to LG-Arch layer: The selected entities are changed to LG-Arch layer. Then the entities cannot delete by LATS CAD's delete function ( ). And the entities' color also change to gray.



- Delete selected entity: The selected entities are deleted.

Indoor Unit Tab (Symbol Menu)

Indoor Unit Tab is in Symbol Menu.

Indoor Units may be positioned in the drawing.

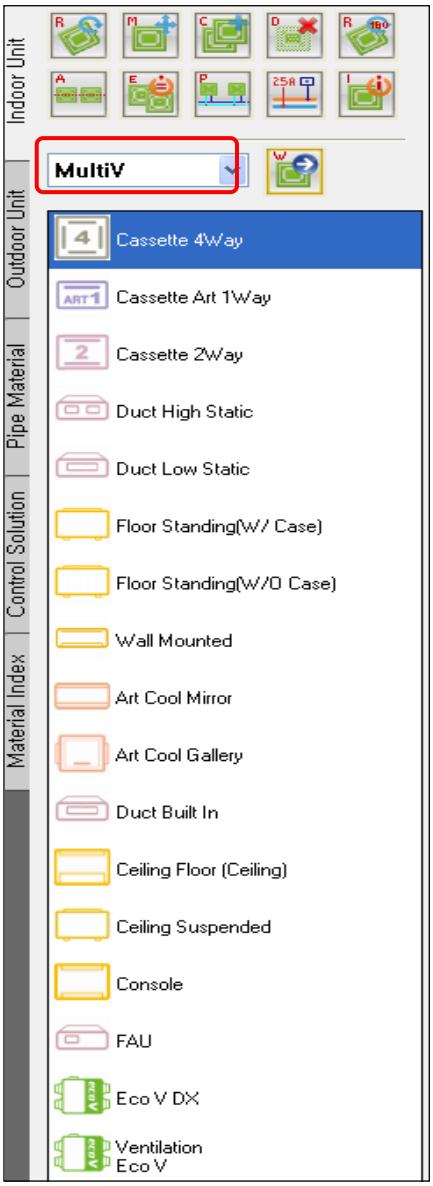
1. Select Indoor Unit Type in the Indoor Unit tab of Symbol Menu. (For Single, when the Indoor Unit is positioned, Outdoor Unit is immediately referenced and positioned.)

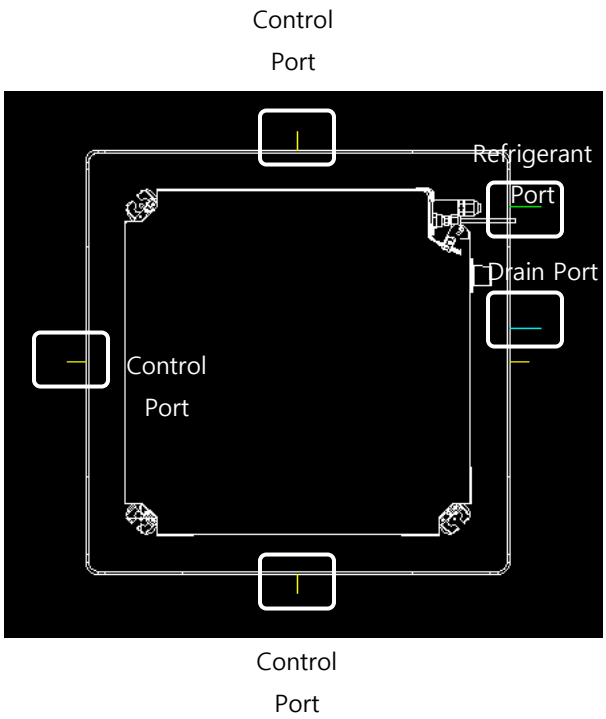
2. Double click the desired Indoor Unit Type.

3. Select the desired Indoor Unit Model, and press Enter.

4. Click at desired position in the drawing, and select direction of refrigerant port and drain port.

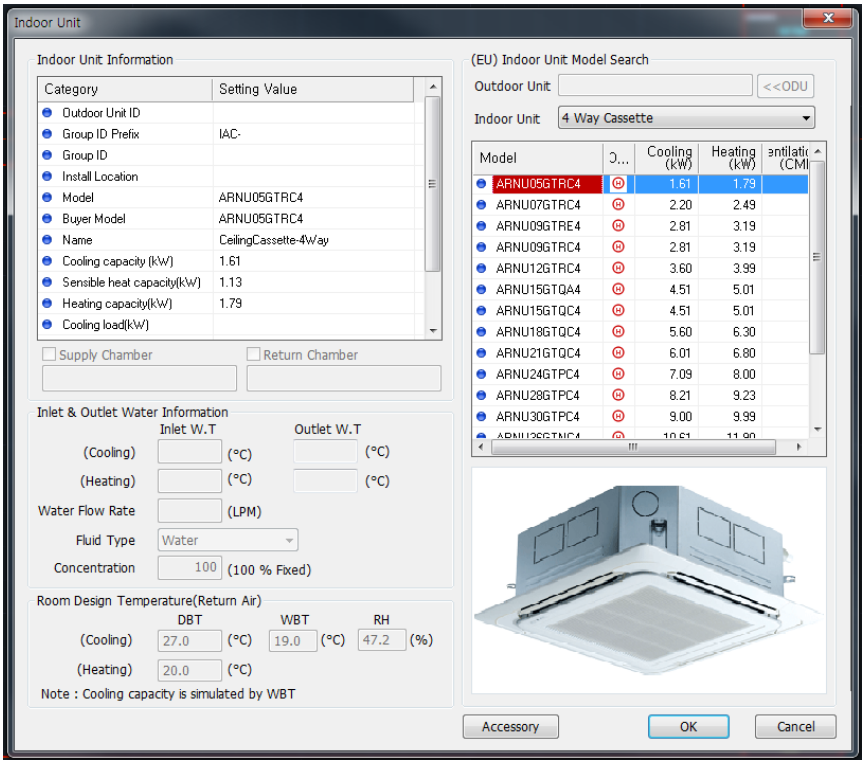
5. Press Enter to finish.





Indoor Unit Information

If Double click the desired Indoor Unit Type, It is able to check Indoor Unit Information.



1. Indoor Unit Information

- Outdoor Unit ID: the connected Outdoor Unit ID. (Assigned automatically when insert the Equipment table)

- Group ID Prefix (Assigned automatically when insert the Equipment table)

- Group ID: Indoor Unit Group ID. (Assigned automatically when insert the Equipment table)

- Installation Location: Indoor Unit's Installation Location.

- Model: Indoor Unit Model Name.

- Name: Indoor Unit Type

- Cooling Capacity (KW): Cooling Capacity.

- Sensible Heat Capacity (KW): Sensible Heating Capacity.

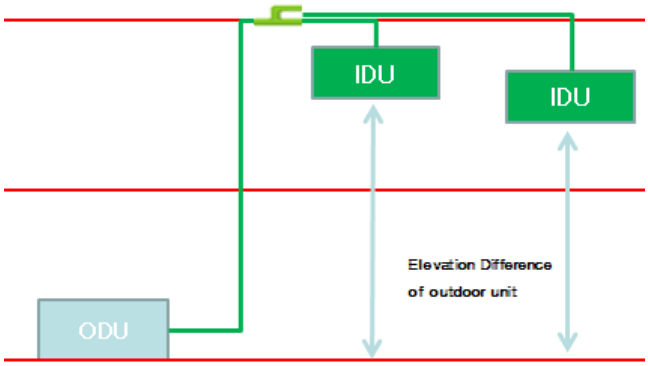
- Heating Capacity (KW): Heating Capacity.

- Cooling Load (KW): Cooling Load of the positioned room.

- Heating Load (KW): Heating Load of the positioned room.

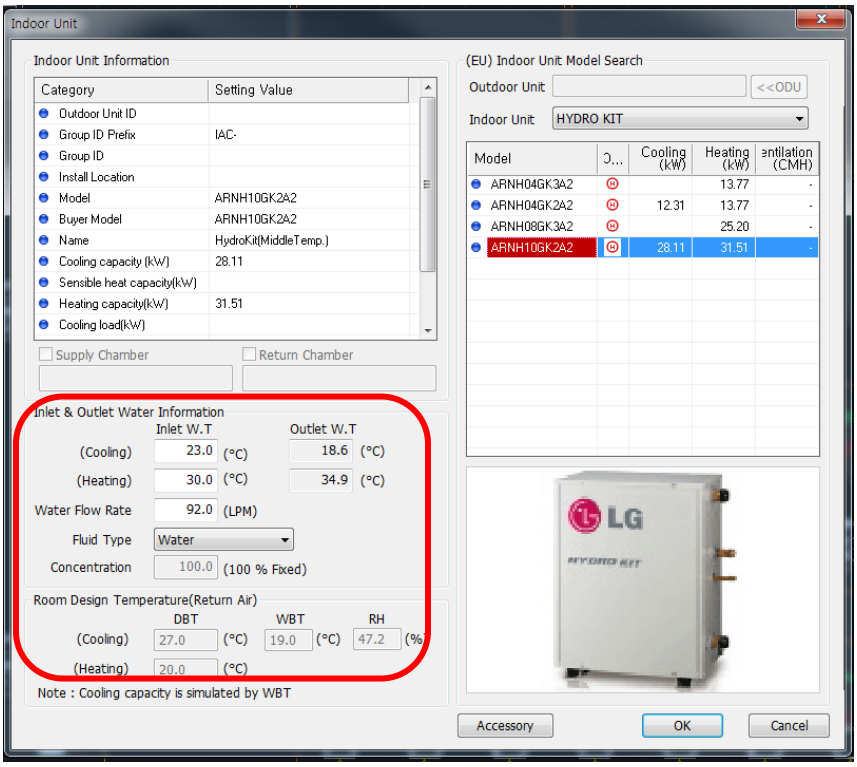
- Sensible Heating Load (KW): Sensible Heating Load of the positioned room.

- Elevation Difference of outdoor unit (m): Height Difference with the connected Outdoor Unit.(Calculate automatically)



2. Inlet & Outlet Water Information.

- It is setting for Water Products.



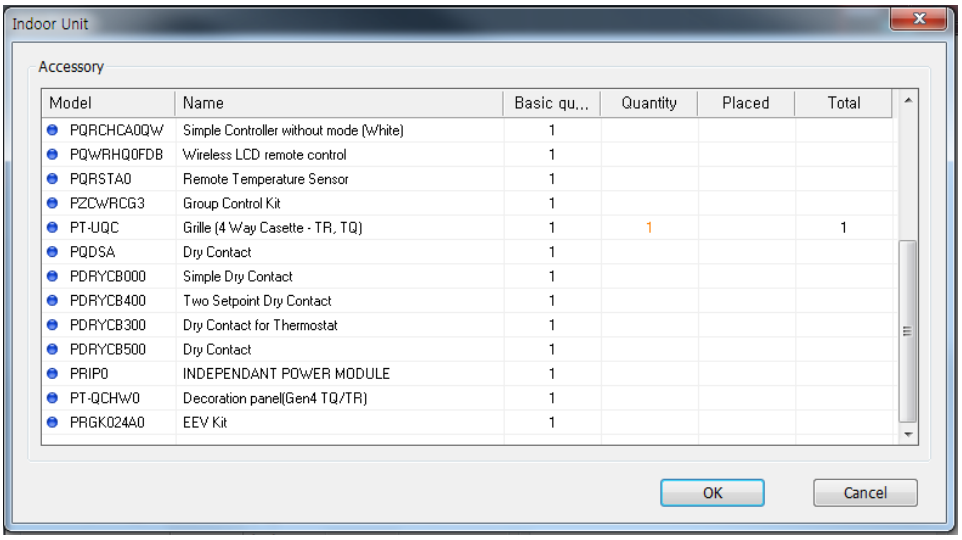
2.1 Input the value of Inlet water temp. and Select the Fluid Type.

3. Accessory

- List of the accessories added to Indoor Unit.

2.1 Add Accessory

2.1.1 Input the number in the accessories list, and click "OK".



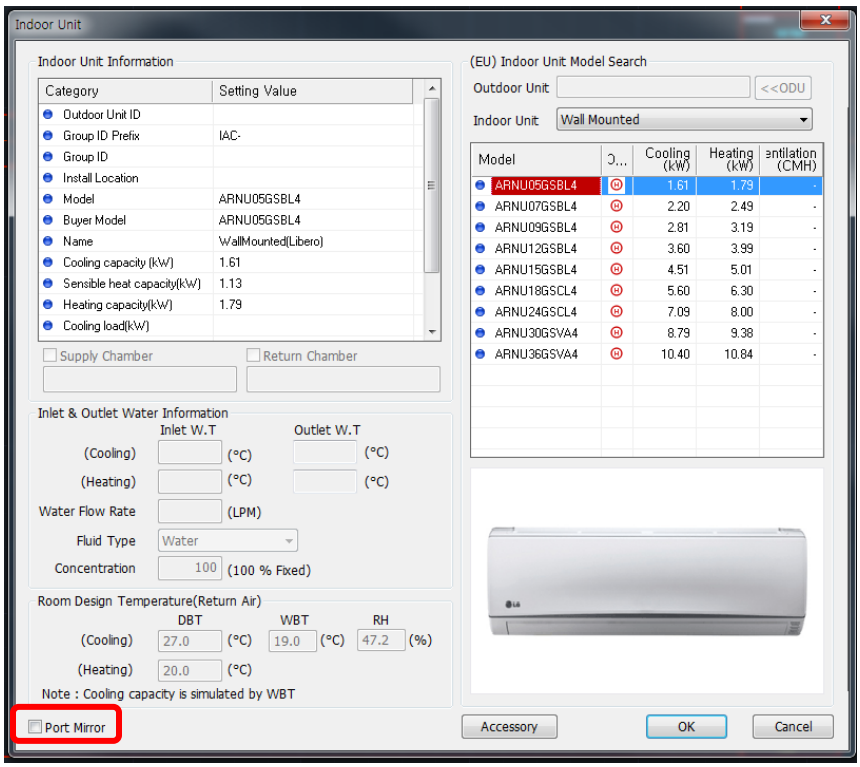
4. Indoor Unit Model Search.

- Indoor Unit may be selected by filtering with Outdoor Unit type and Indoor Unit type.

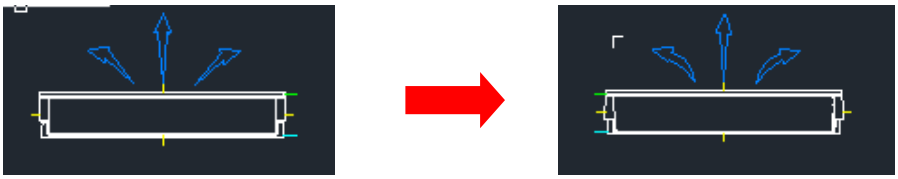
5. Port / Symbol Mirror

- Some indoor unit can change port direct. (wall-mounted, floor stand, convertible type etc.)

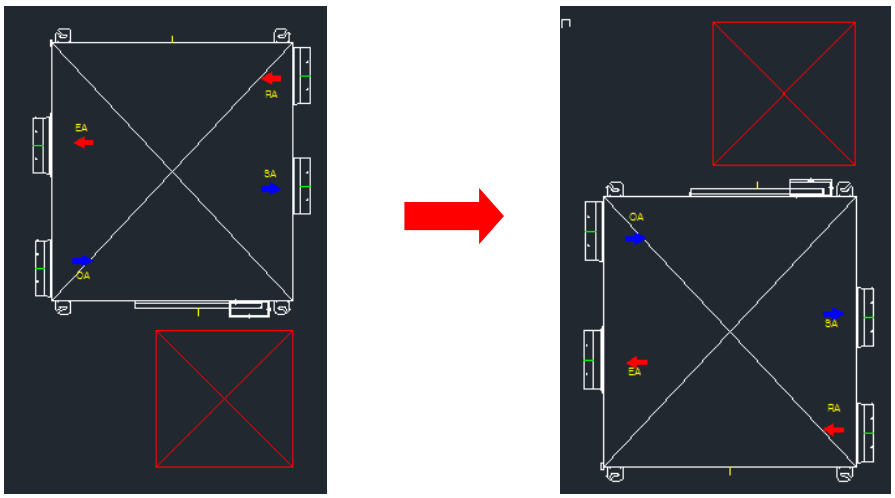
And some ventilation unit can reverse up-down. If you check "port mirror", it will be changed.



Port mirror:

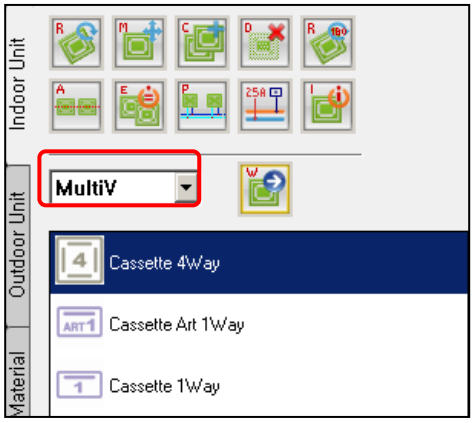


Symbol mirror (reverse up-down):



Positioning for each Product Type

1. MultiV and Multi



1.1 Select Indoor Unit tab in Symbol Menu

1.2 Select Product Type

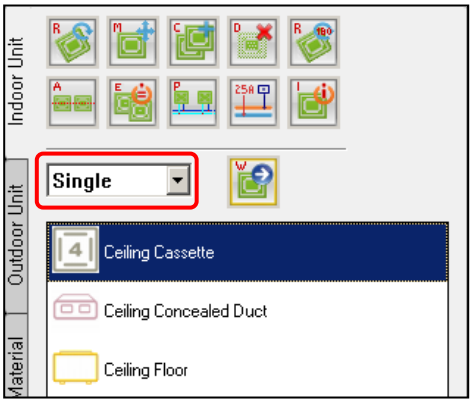
1.3 Select the desired Product Model, and press Enter

1.4 Click at desired position in the drawing, and select direction of refrigerant port and drain port

1.5 Press Enter to finish

Caution! For Multi Product, select and position Outdoor Unit first and then select Indoor Unit.

2. Single



2.1 Select Indoor Unit tab in Symbol Menu

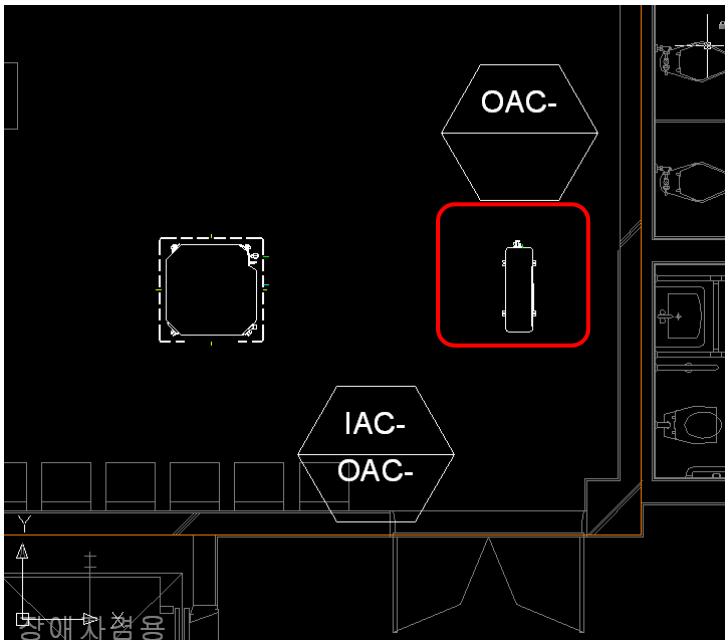
2.2 Select Product Type (Single)

2.3 Select the desired Product Model, and press Enter

2.4 Click at desired position in the drawing, and select direction of refrigerant port and drain port

- After positioning Indoor Unit, position Outdoor Unit by referring to the location of the positioned Indoor Unit

2.5 Press Enter to finish



Caution! Single Type is positioned from Indoor Unit Positioning stage to Outdoor Unit at once.

Outdoor Unit Tab (Symbol Menu)

Outdoor Unit Tab is in Symbol Menu.

Outdoor Unit may be positioned in the drawing.

1. Select Product Type in the Outdoor Unit Tab of Symbol Menu.

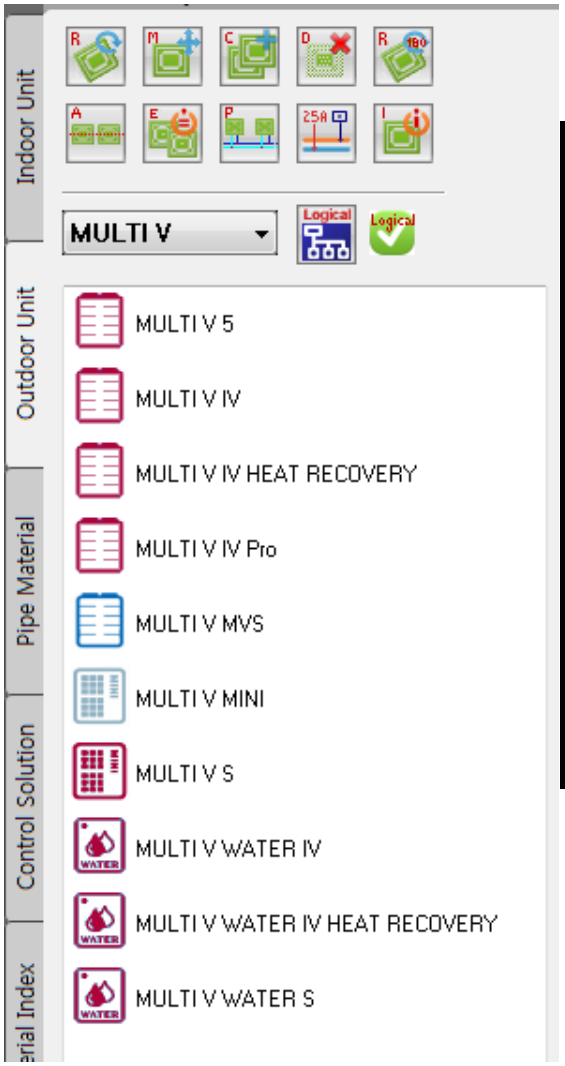
(For Single, there is no Outdoor Unit Type to be selected separately.)

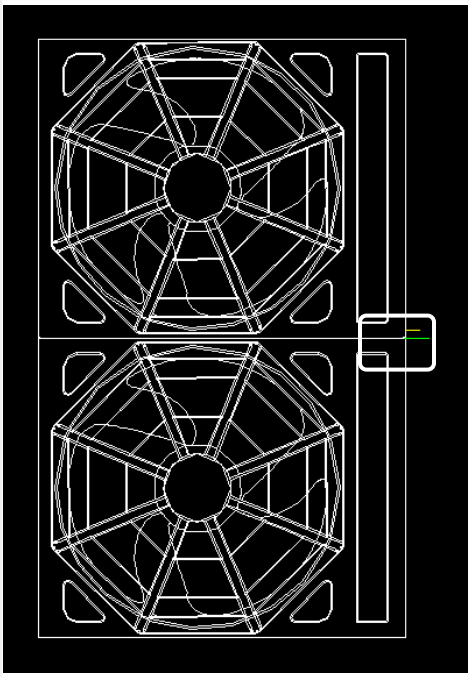
2. Double click the desired Outdoor Unit Type, and press Enter.

3. Select the desired Outdoor Unit Model.

4. Click at desired position in the drawing, and select direction of refrigerant port

5. Press Enter to finish.





Refrigerant and Control Port

IDU Logical Relationship

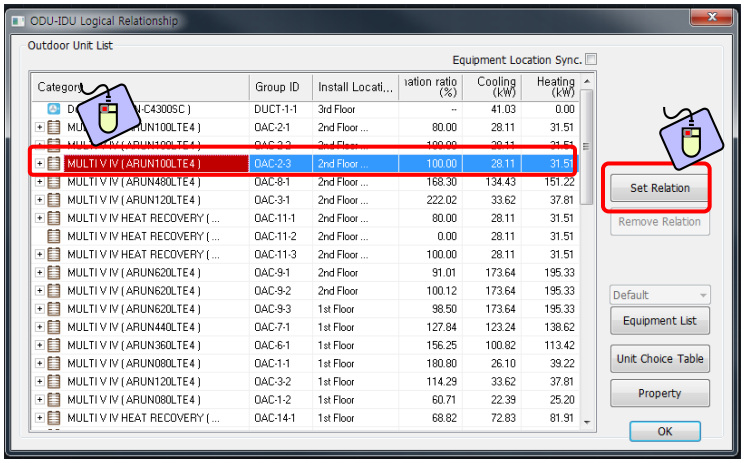
1. Select the IDU Logical Relationship Menu in Outdoor Unit Tab of Symbol Menu.

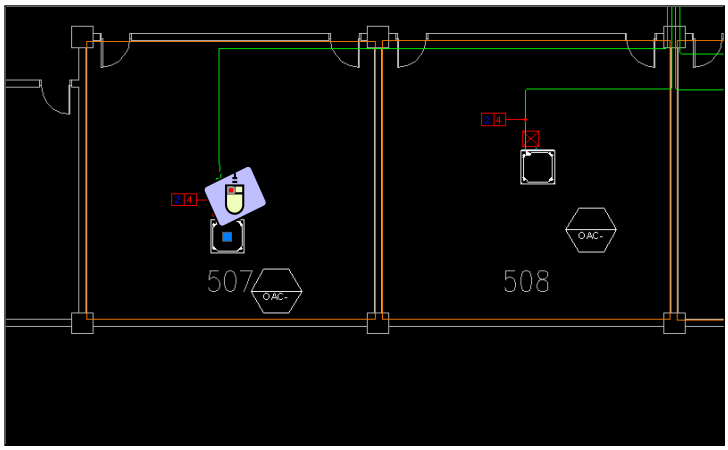
2. The ODU to set relation is selected in Category, and click Set Relation Button.

3. Select the IDU in drawing, and press Enter.

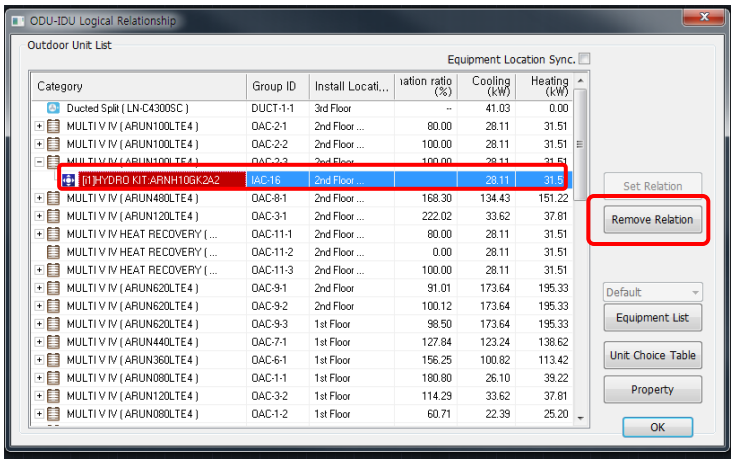
   Caution! When click Set Relation Button, IDU Logical Relationship window is closed temporarily.

4. Connect the IDU low lank selected ODU.

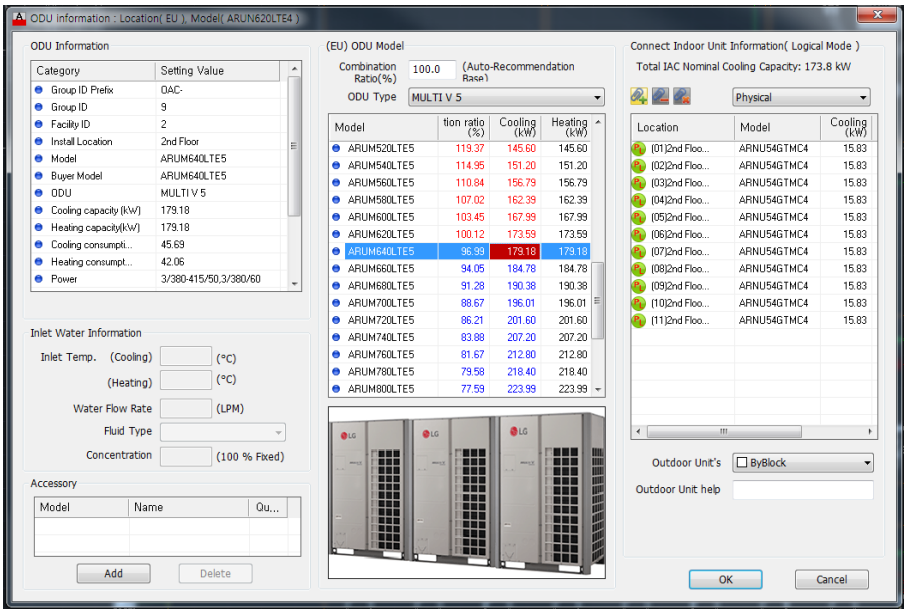




5. When click Remove Relation with selecting IDU in Category, can cancel Relation with ODU



Outdoor Unit Information



1. Outdoor Unit Information

- Group ID Prefix: Group ID Prefix value Setting (Assigned automatically when insert the Equipment table)
- Group ID: Group ID for each Model. (Assigned automatically when insert the Equipment table)
- Facility ID: Facility ID for each Group. (Assigned automatically when insert the Equipment table)
- Installation Location: Location where Outdoor Unit is installed.
- Model: Model Name
- Outdoor Unit Type: Outdoor Unit Type Information

- Cooling Capacity (KW): Cooling Capacity

- Heating Capacity (KW): Heating Capacity

- Cooling Power Consumption (KW): Cooling Power Consumption

- Heating Power Consumption (KW): Heating Power Consumption

- Power: Outdoor Unit Power.

- Combination Ratio (%): Combination Ratio with the connected Indoor Unit.

- Additional Refrigerant Amount: Refrigerant Amount to be added (assigned at System Checking)

- Total Pipe Length (m): The length of all the Pipes connected to Outdoor Unit.

- IDU: The number of Indoor Units connected to the corresponding Outdoor Unit.

2. Outdoor Unit Model Search.

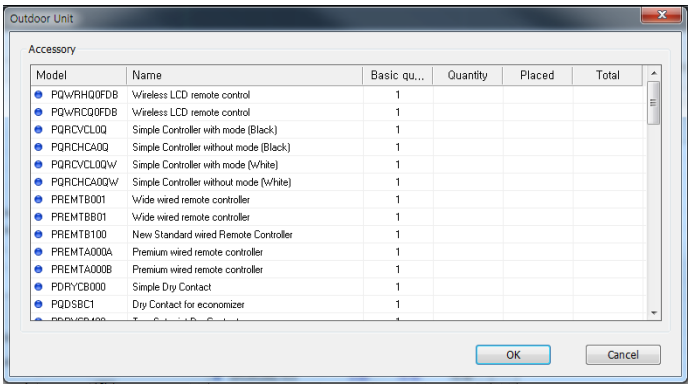
- Combination Ratio: Combination Ratio based on Automatic Recommendation (The value closest to the standard combination ratio comes up to the top of the blue color)

3. Connect Indoor Unit Information (Logical Mode).

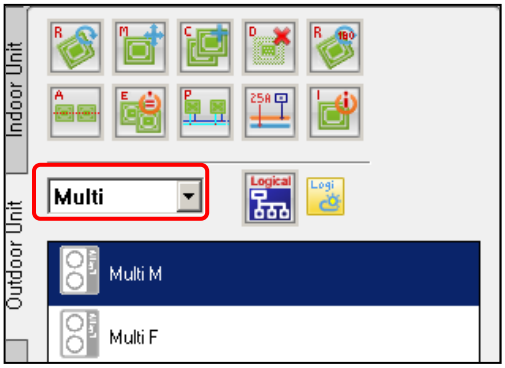
- It shows the location, Model name, and Capacity of the connected Indoor Unit.

4. Accessory

- It shows the list of the accessories added.



Multi Type Equipment Positioning

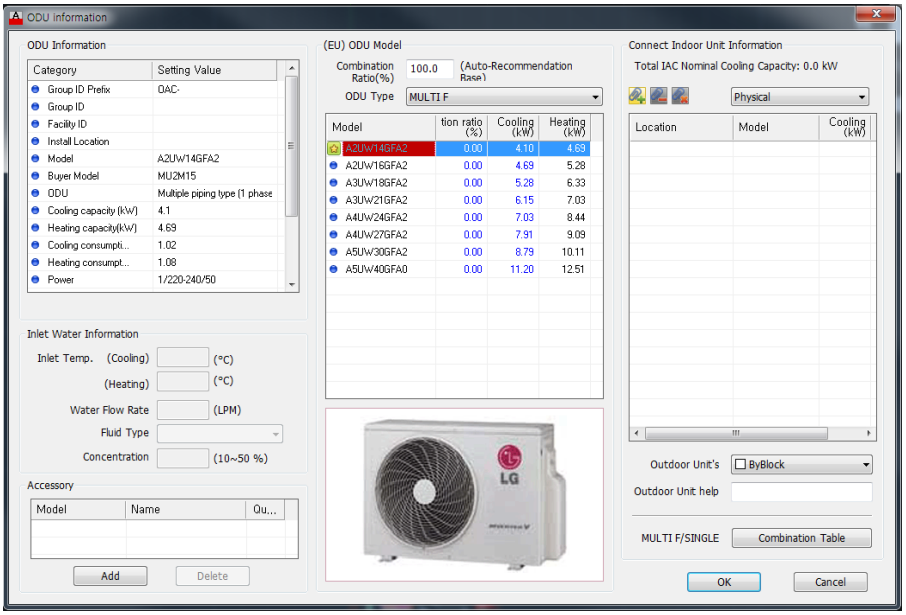


1. Select Outdoor Unit tab in Symbol Menu.

2. Select Product Type (Multi or Multi F(for N.America))

3. Select the desired Indoor unit to be connected. (If the Indoor unit is not positioned, just click Enter Key)

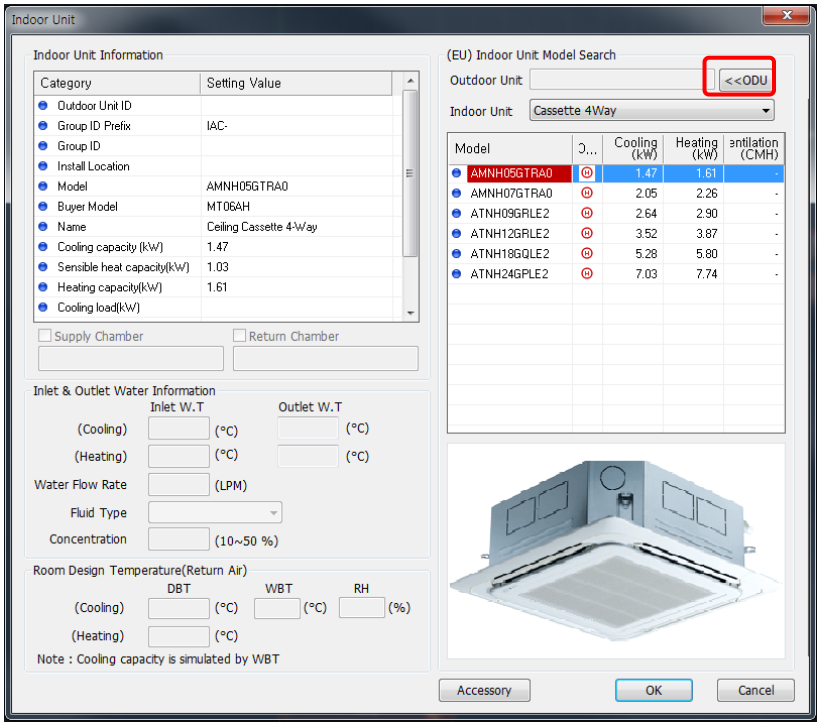
4. Select the desired Product format and Model.



5. Position them in the drawing.

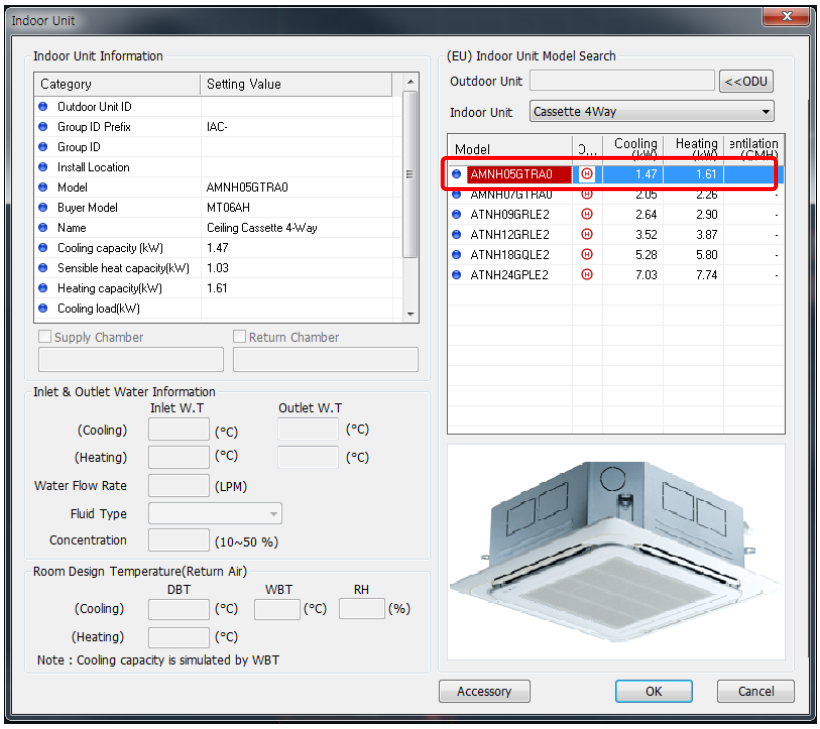
6. After selecting Multi of Indoor Unit tab, select the desired Indoor Unit Model.

7. Select ODU in Indoor Unit Model search categories.

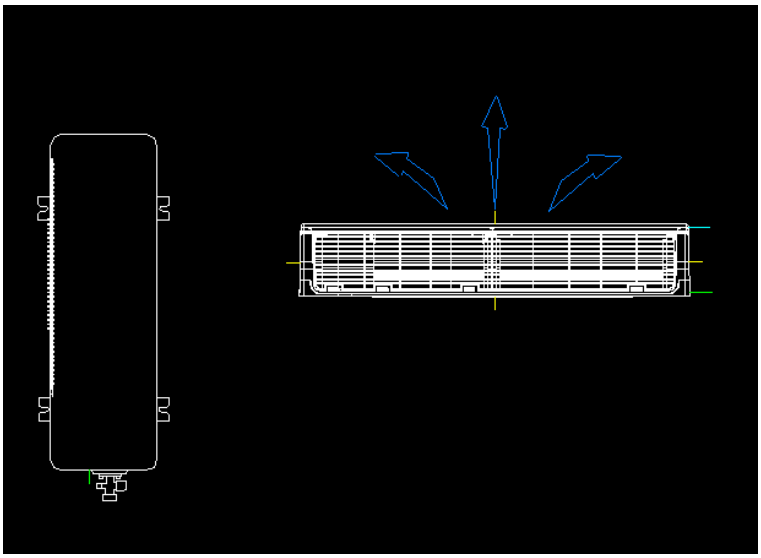


8. Select Outdoor Unit of Multi Type already positioned in the drawing.

9. Only the equipments that can be applied to the selected Outdoor Unit are sorted according to each Indoor Unit format

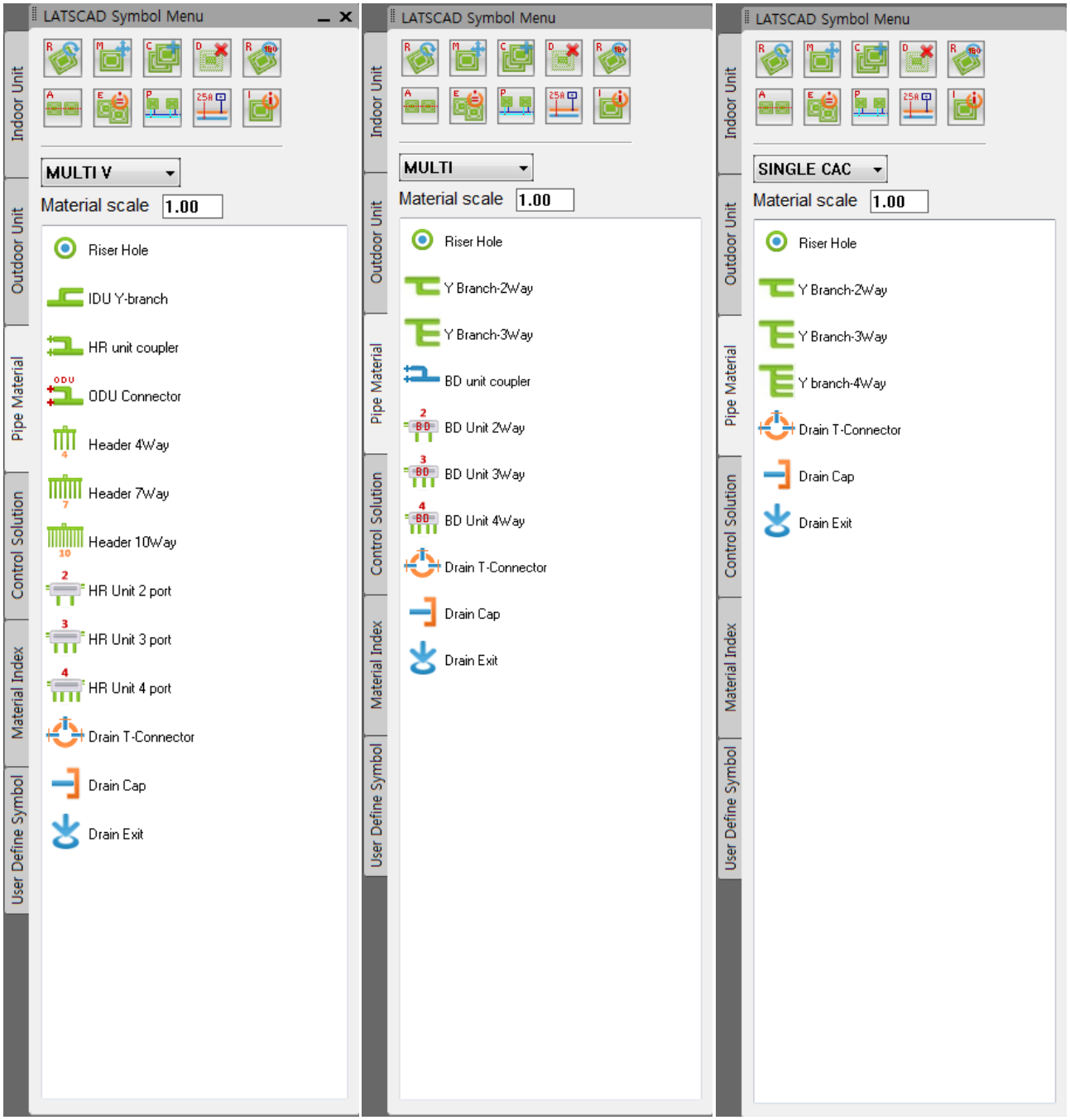


9. Select the desired Models among the sorted Indoor Unit equipments, and position them in the drawing.



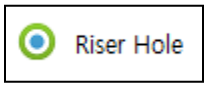
Pipe Material Tab (Symbol Menu)

Riser Hole, Down Hole, and Pipe Material may be positioned in the drawing.

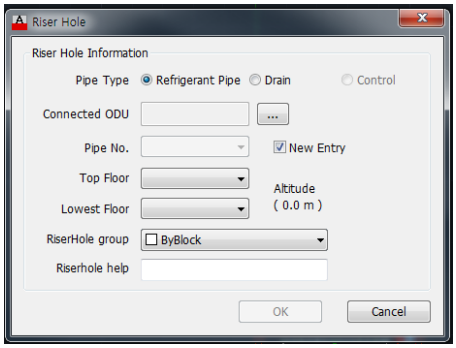


Riser Hole

1. select Riser Hole in Pipe Material of Symbol Menu.



2. Set Riser Hole Type.



- Pipe Type: Select the classifications of Refrigerant Pipe, Drain Pipe, and Control Line.

- Connected ODU: Connected Outdoor Units are displayed.

- Pipe No.: For new creation, check in the New Entry check box, and if extending the already positioned Riser Hole, select the corresponding Riser Hole.

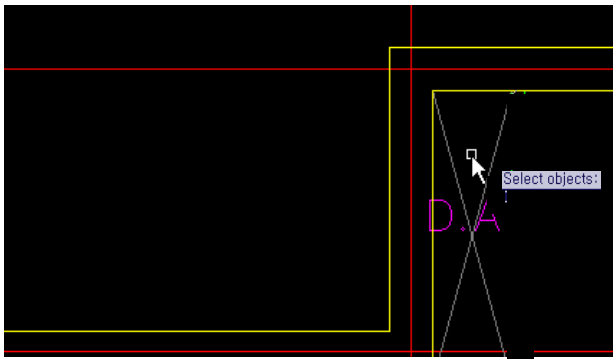
- Top Floor: Designate the highest floor.

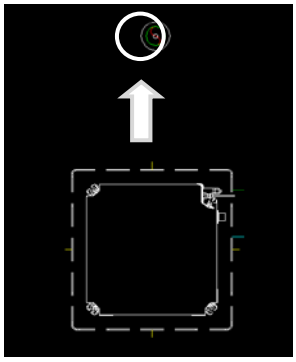
- Lowest Floor: Designates the lowest floor.

3. When reference positioning is selected

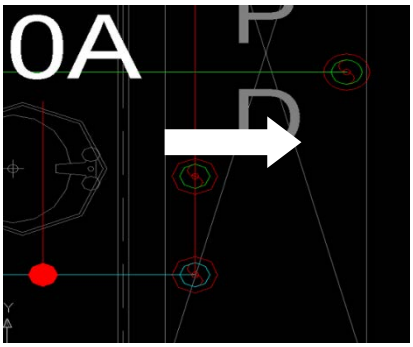
```
Select objects:
Assign the install location :
```

4. Select the desired location in the drawing and insert Riser Hole. Position it by selecting the equipment for the reference positioning.(Input the coordinates or drag)



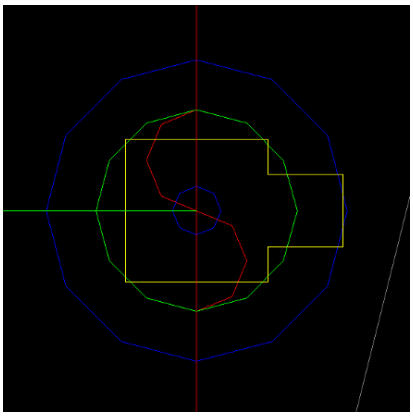


- Move Riser Hole: When it is moved, the Riser Holes in all the floors are moved the same. (They are equally deleted when it is deleted)



Example) For the Riser Hole connected from the 1st floor to the 5th floor,
If the Riser Hole in the 2nd floor is moved, the positions of the Riser Holes in all the floors are equally moved.

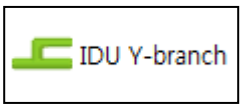
- Change of Riser Hole symbol branched vertically (after Drawing Check)



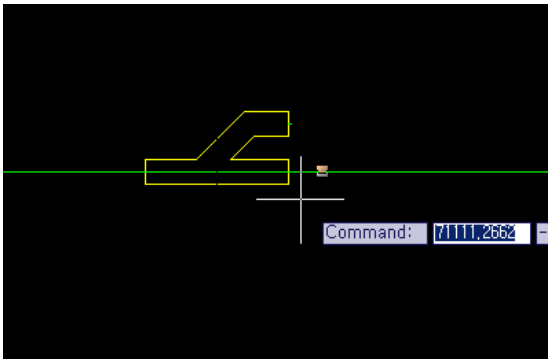
Y-Branched Pipe

Y-Branched Pipe can use divide to Refrigerant Pipe.

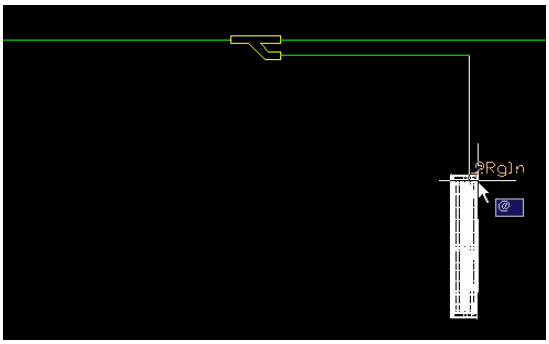
1. Select Y Branched Pipe in Pipe Material of Symbol Menu.



2. Place Branched Pipe insertion point above Refrigerant Pipe, and select the branching direction.

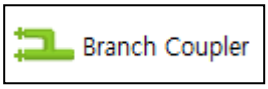


3. Connect from Branched Pipe to Indoor Unit Refrigerant Pipe Port using Piping Equipment Menu in Symbol Menu.

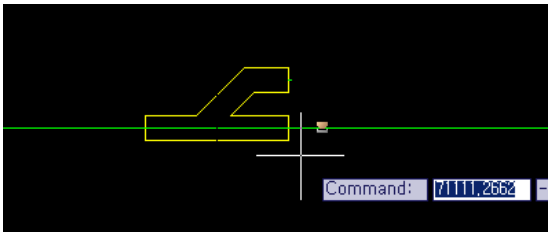


Branch Coupler

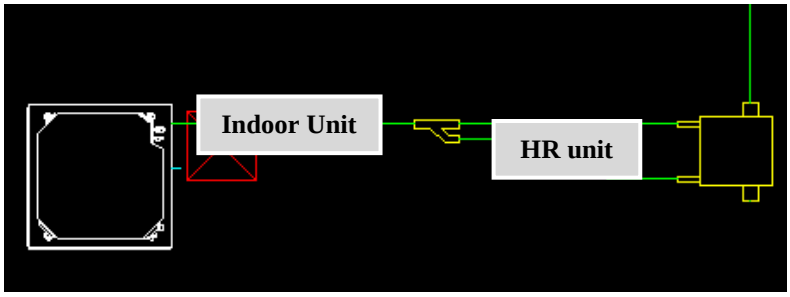
1. Select Branch Coupler in Pipe Material of Symbol Menu.



2. Place Branch Coupler insertion point above Refrigerant Pipe, and select the branching direction.

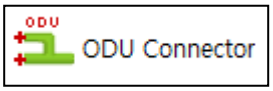


3. Connect from Branch Coupler to Indoor Unit Refrigerant Pipe Port and HR unit Port using Piping Equipment Menu in Symbol Menu.

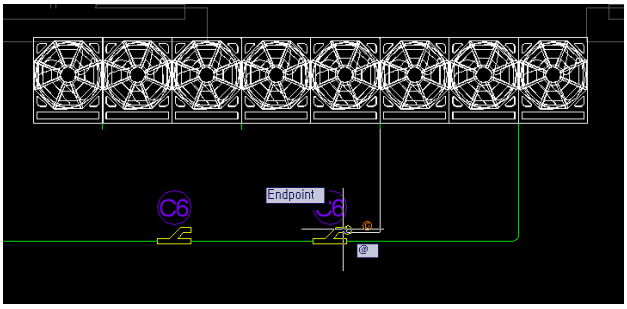


ODU Connector

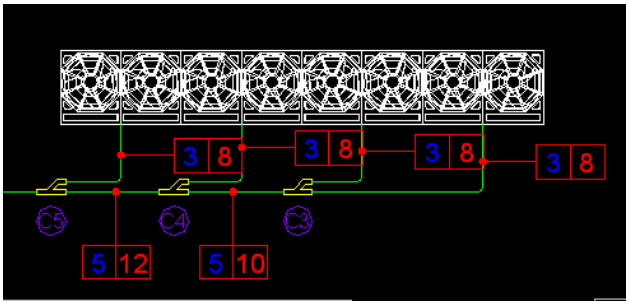
1. Select ODU Connector in Pipe Material of Symbol Menu.



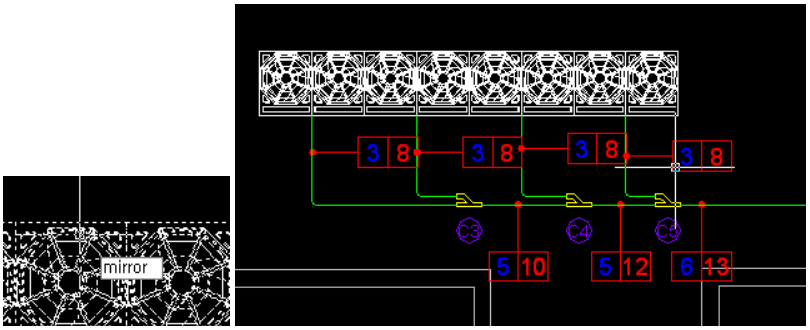
2. Place ODU Connector insertion point above Refrigerant Pipe, and select the branching direction.



3. Connect from ODU Connector to Outdoor Unit using Piping Equipment Menu in Symbol Menu.

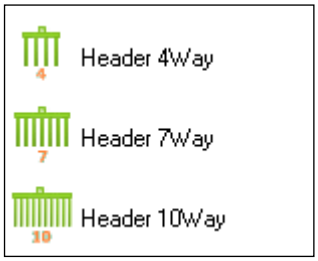


Caution! ODU Connector's direction is mandatory for connect to only left side. If you want connect to right side, reverse the ODU equipment Using AutoCAD function "mirror".

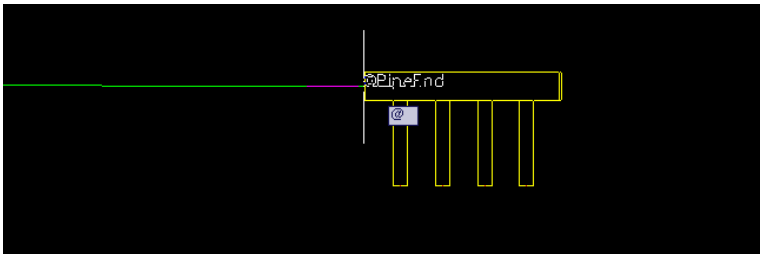


Header

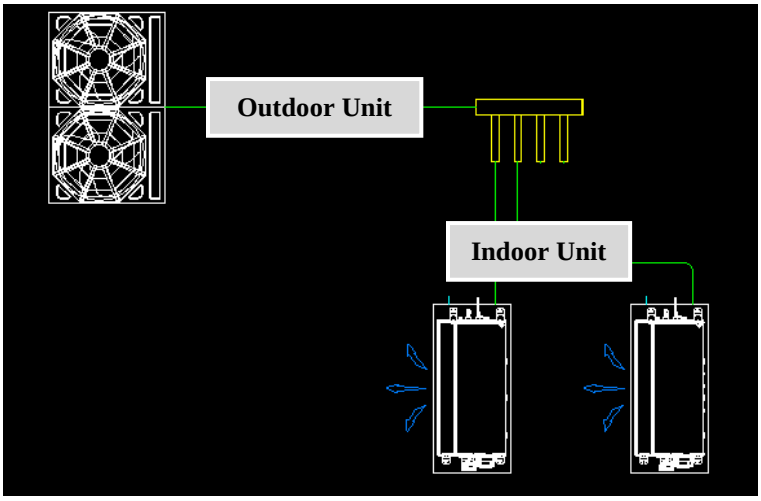
1. Select Header in Pipe Material of Symbol Menu.



2. Place Header at the end of Refrigerant Pipe, and select the branching direction.



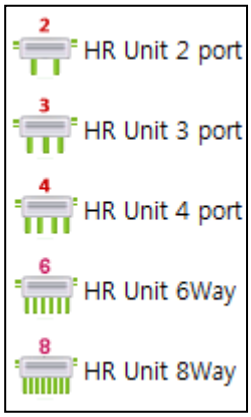
3. Connect from Header to Indoor Unit Refrigerant Pipe Port using Piping Equipment Menu in Symbol Menu.



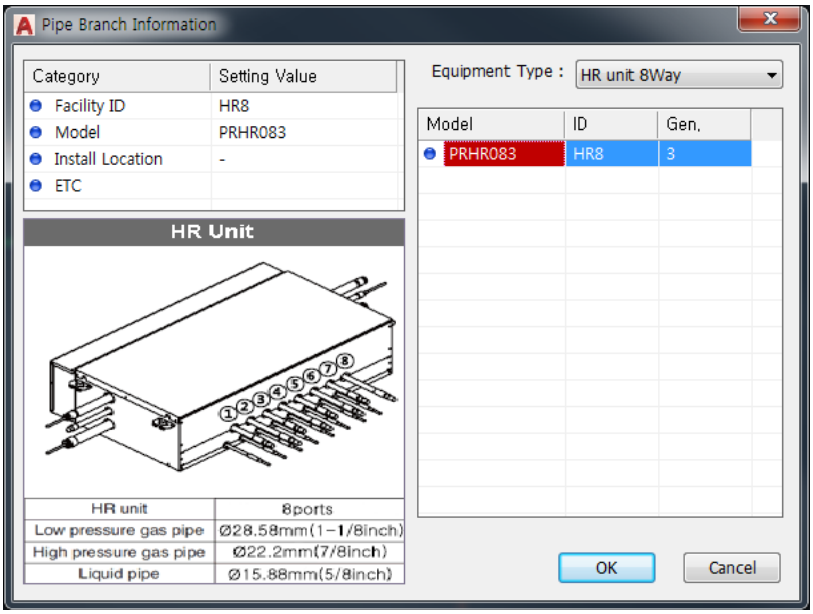
- Position Header 7Way and Header 10Way in the same way.
- Leave Connection that is unnecessary for piping as it is.

HR Unit

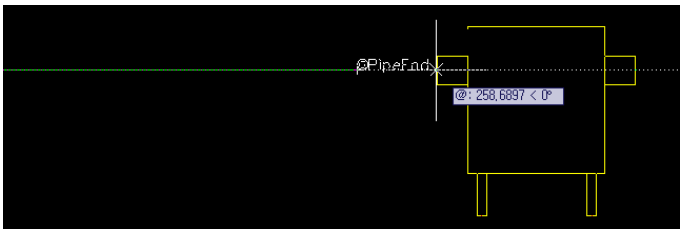
1. Select HR Unit Type in Pipe Material of Symbol Menu.



2. Select the HR unit model in pipe branch information window.

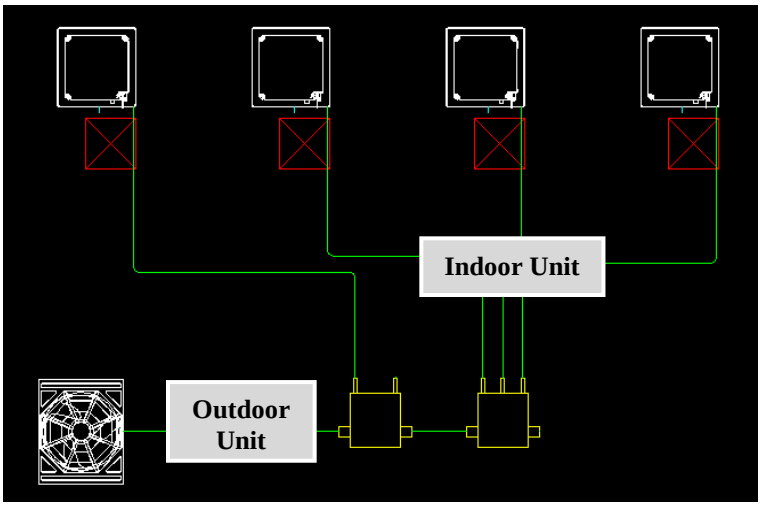


3. Place HR Unit at the end of Refrigerant Pipe, and select the branching direction.



Caution! HR unit has in-out port. The In port is Left port and the out port is Right port..

4. Connect from HR unit to Indoor Unit Refrigerant Pipe Port using Piping Equipment Menu in Symbol Menu.

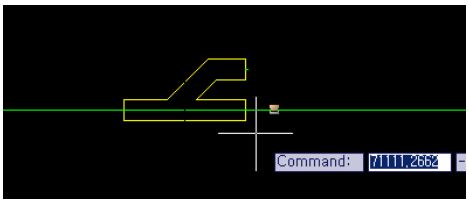


- Position HR Unit 3Way and HR Unit 4Way in the same way.
- Leave Connection that is unnecessary for piping as it is.

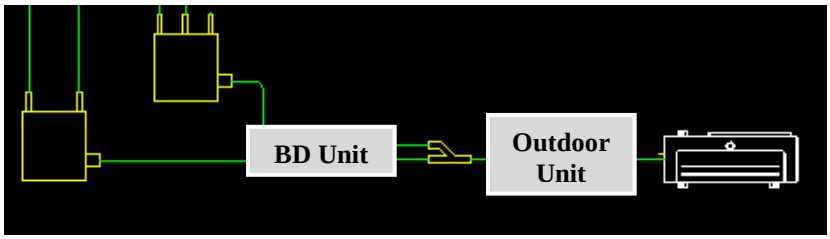
BD [Y Branch]

1. Select BD [Y Branch] in Pipe Material of Symbol Menu.

2. Place BD Unit at the end of Refrigerant Pipe, and select the branching direction.

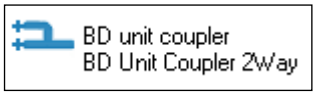


3. Connect from BD [Y Branch] to BD unit Port using Piping Equipment Menu in Symbol Menu.



BD unit Coupler

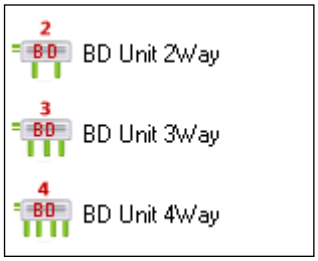
1. Select BD unit Coupler in Pipe Material of Symbol Menu.



2. Place BD Unit Coupler at the end of Refrigerant Pipe, and select the branching direction.

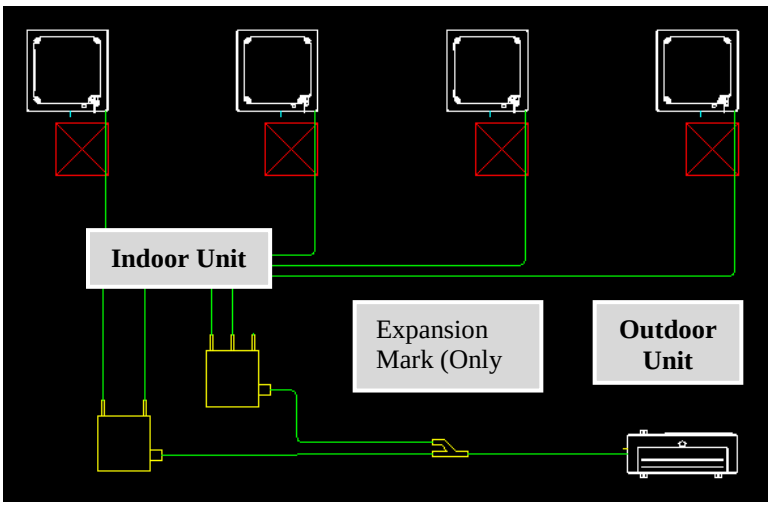
BD Unit

1. Select BD unit in Pipe Material of Symbol Menu.



2. Place BD Unit at the end of Refrigerant Pipe, and select the branching direction.

3. Connect from BD unit to Indoor Unit Refrigerant Pipe Port using Piping Equipment Menu in Symbol Menu.

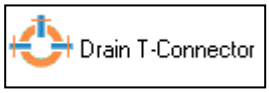


- Position BD Unit 3Way and BD Unit 4Way in the same way.

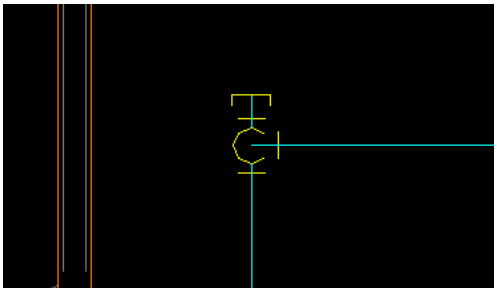
- Leave Connection that is unnecessary for piping as it is.

Drain T

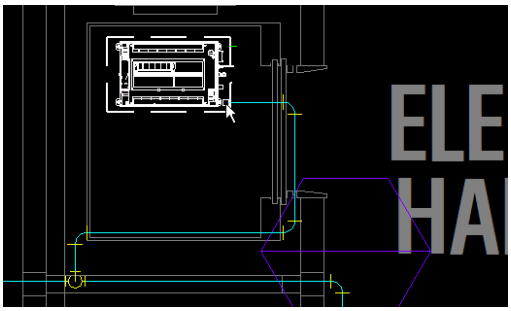
1. Select Drain T in Pipe Material of Symbol Menu.



2. Place Drain T insertion point above Drain Pipe, and select the branching direction.



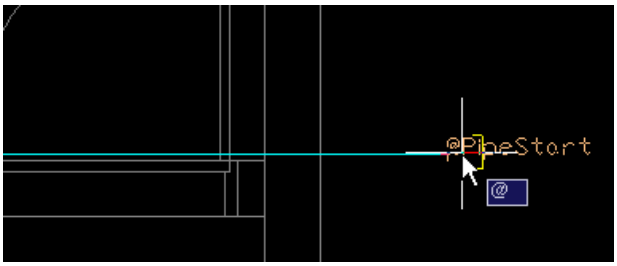
3. Connect to Indoor Unit Port using Piping Equipment Menu in Symbol Menu.



Drain Cap

1. Select Drain Cap in Pipe Material of Symbol Menu.

2. Insert Cap at the end of Drain Pipe.

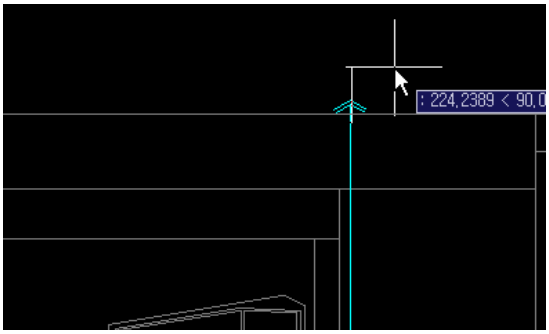


Drain Exit

1. Select Drain Exit in Pipe Material of Symbol Menu.

2. Insert Drain Exit at the last exit of Drain Pipe.

   - When Drain Exit or Drain Riser Hole is inserted, Drain Pipe Diameter can be automatically selected.



Control Solution (Symbol Menu)

Controller may be positioned in the drawing.

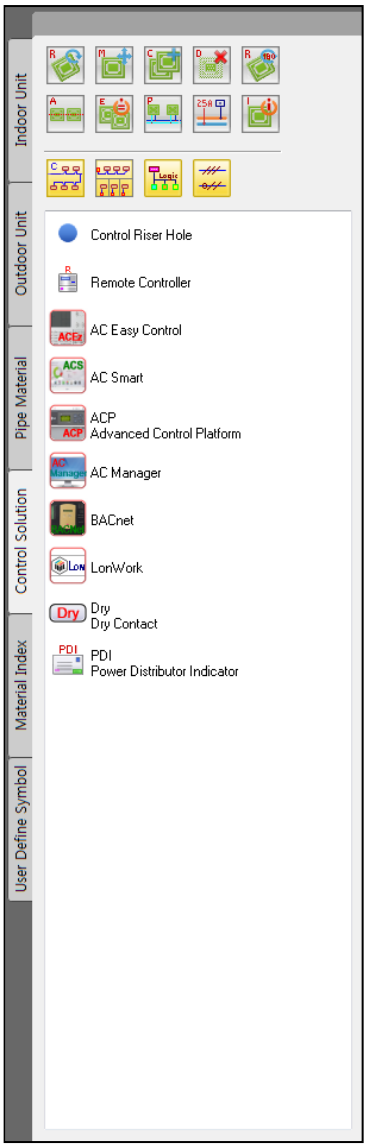
1. Double click the desired Controller Type.

2. Select the equipment to connect to calculate the minimum number of Controllers.

   - Refer to the maximum number of Indoor Units that can be connected to each Controller.

3. Position the Controller in the drawing.

4. Compose the logical connection relations between the positioned Controller and the equipments.

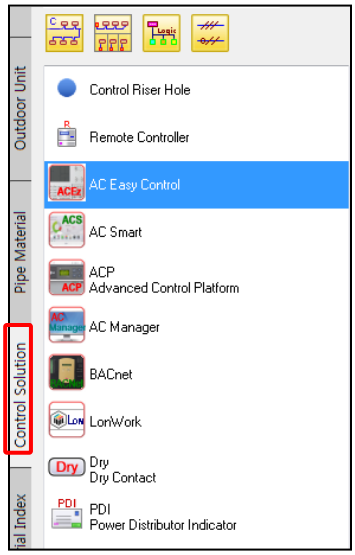


Control Port

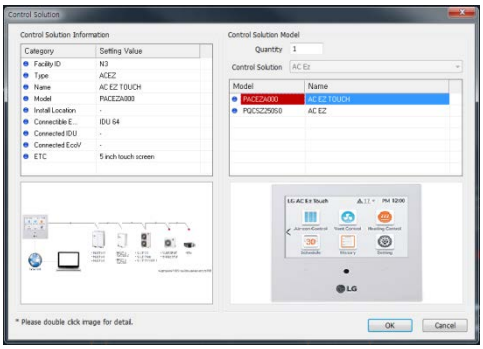
Controller Positioning

1. Select the Controller Solution tab in Symbol Menu.

2. Double click the controller icon to position in Controller Solution tab.

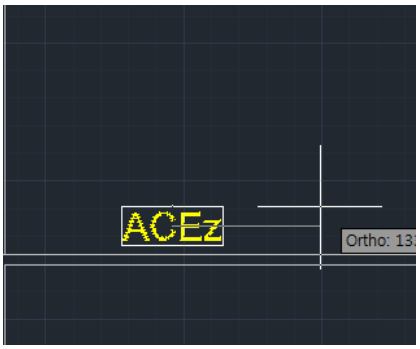


3. Select the Controller Model, and click OK button.



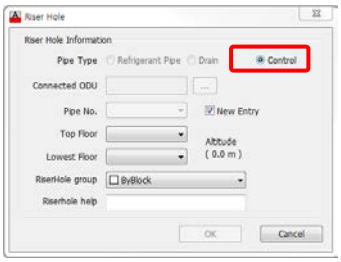
4. Designate Controller Insertion Position

- If there is a Controller to position as a reference, click reference equipment, or press Enter.



Control Riser Hole Positioning

1. Select Control Riser Hole in Control Solution tab in Symbol Menu.



2. After setting Floor Information, position in the desired location.

3. The types of the Control Lines starting from Control Riser Hole are decided by the type of the connected equipment (Control, Indoor Unit, Outdoor Unit, ventilation).

Material Remarks (Symbol Menu)

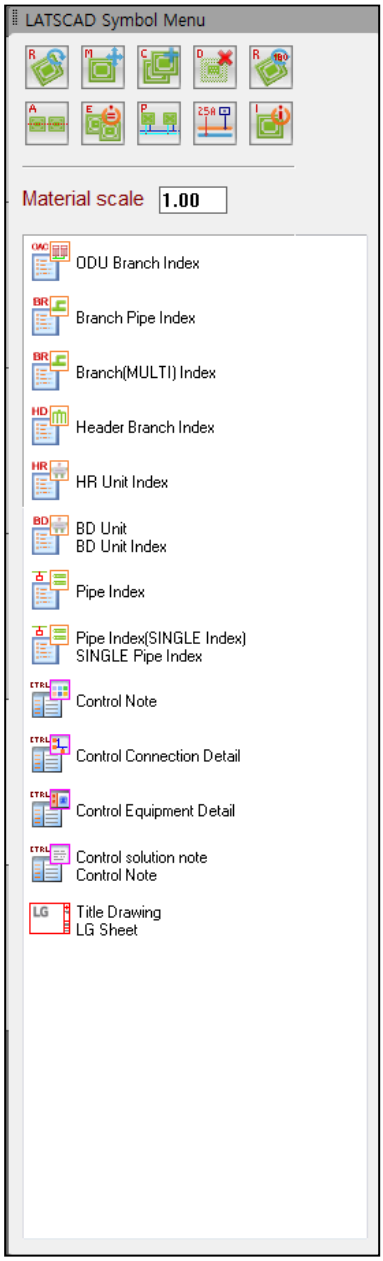
Material Remarks may be positioned in the drawing.

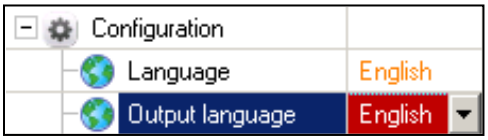
1. Double click the desired remarks and the detail diagram.

2. Insert in the desired location in the drawing.

 - A separate table exists according to the set output language condition.

(Korean, English, French, Spanish, Italian, German, Turkish, Portuguese, Russian, Chinese, Hungarian and Thai)





Branching Pipes connecting between Outdoor Units

▣ Connection of Liquid & Gas pipe in Outdoor Units

INDEX	Connection of Liquid & Gas pipe in Outdoor Units
C1	ARCNN20
C2	ARCNN30
C3	ARCNN21
C4	ARCNN31
C5	ARCNN41
C6	ARCNB20
C7	ARCNB30
C8	ARCNB21
C9	ARCNB31
C10	ARCNB41

Branching Pipes

▣ Y Branch

INDEX	Y Branch
Y1	ARBLN01621
Y2	ARBLN03321
Y3	ARBLN07121
Y4	ARBLN14521
Y5	ARBLN23220
Y6	ARBLB01621
Y7	ARBLB03321
Y8	ARBLB07121
Y9	ARBLB14521
Y10	ARBLB23220

Branching Pipes (Multi)

Y Branch(MULTI)

INDEX	Y Branch
MY1	PMBL3620
MY2	PMBL5620
MY3	PMBL1203F0

Header Branching Pipes

HEADER

INDEX	HEADER
H1	ARBL054
H2	ARBL057
H3	ARBL104
H4	ARBL107
H5	ARBL1010
H6	ARBL2010

HR Unit

HR UNIT

INDEX	HR UNIT
HR1	PRHR022
HR2	PRHR032
HR3	PRHR042
HR4	PRHR023
HR5	PRHR033
HR6	PRHR043
HR7	PRHR063
HR8	PRHR083

BD Unit

BD UNIT

INDEX	BD UNIT
BD1	PMBD3620
BD2	PMBD3630
BD3	PMBD3640
BD4	PMBD7220
BD5	PMBD7230
BD6	PMBD5420L
BD7	PMBD5430L
BD8	PMBD5440L

Pipe Notes & Pipe Notes(Single Index)

Refrigerant pipe diameter from branch to branch

INDEX	Connecting Pipes [mm(Inch)]
1	6.35 (1/4)
2	9.52 (3/8)
3	12.7 (1/2)
4	15.88 (5/8)
5	19.05 (3/4)
6	22.2 (7/8)
7	25.4 (1)
8	28.58 (1 1/8)
9	31.8 (1 1/4)
10	34.9 (1 3/8)
11	38.1 (1 1/2)
12	41.3 (1 5/8)
13	44.5 (1 3/4)
14	50.8 (2)
15	53.98 (2 1/8)

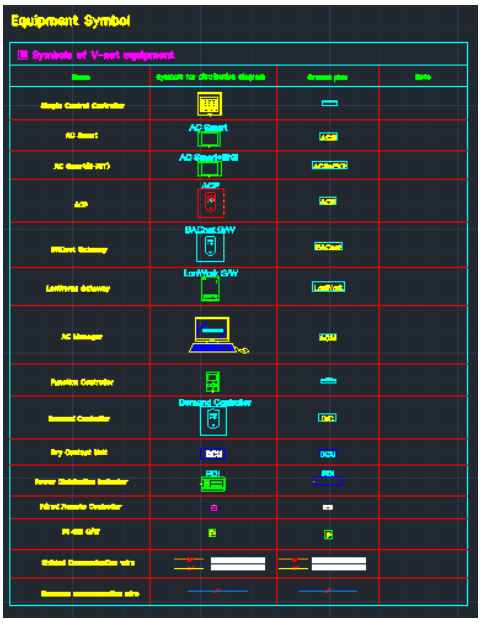
Blue : Liquid pipe,
Red : Gas pipe,
Yellow : Low Gas pipe

Refrigerant Pipe

Type	(Diameter, mm)
1	6.35:12.7
2	9.52:12.7:15.88
3	9.52:15.88
4	9.52:15.88:19.05
5	9.52:19.05
6	9.52:19.05:22.2
7	9.52:22.2
8	12.7:12.7:19.05
9	12.7:15.88:19.05
10	12.7:28.58
11	15.88:22.2:28.58
12	15.88:28.58
13	15.88:28.58:34.9
14	15.88:34.9
15	19.05:28.58:34.9
16	19.05:34.9
17	19.05:41.3
18	22.2:44.5

Liquid:Gas:Low Pressure

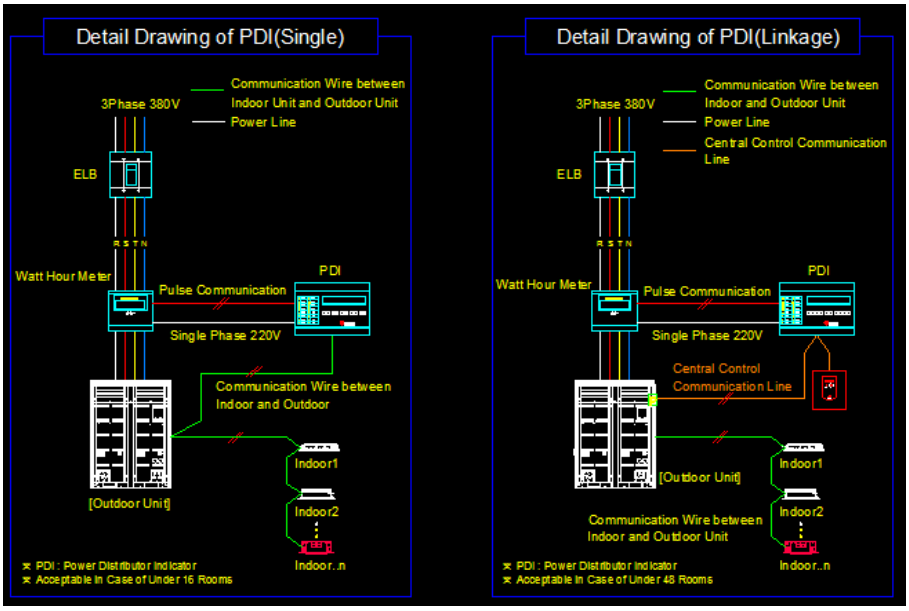
Control Note



Control Connection Detail Diagram

After inserting in the drawing, delete unnecessary connection detail diagrams.

For overseas, DC is not used, and there is no connection detail diagram.



Control Product Detail Diagram

After inserting in the drawing, delete unnecessary product detail diagrams.

Control Solution note

● Note

· Cable Standard

- Wired Remote Controller : AWG 22*3C(Less than 100m)
- PC~HUB~ ACP : UTP cable (Above CAT.5)
- ACP ~ ODU : Shielded wire thicker than 1.0mm2 (AWG 17 or above) * 2C
- ODU ~ ODU : Shielded wire thicker than 1.0mm2 (AWG 17 or above) * 2C
- ODU ~ IDU to IDU : Shielded wire thicker than 1.0mm2 (AWG 17 or above) * 2C
- W.H.M (Watt hour meter) ~ PDI : Shielded wire thicker than 1.0mm2 (AWG 17 or above)*2C

· Limitation of cable length

- S.C.C ~ Function Controller : Less than 1m
- Total 485 comm. Cable length : Less than 1000m
- IDU ~ Wired Remote Controller : Less than 50m
- ACP ~ HUB (UTP cable length) : Less than 80m

Total number of 485devices(central controller, PDI and PI485) should be fewer than 32ea
One PI485 can supply electric power up to two S.C.Cs
(required extra two core cable),
In case of power supplying more than two S.C.Cs, use other PI485 or adapter (SMPS)

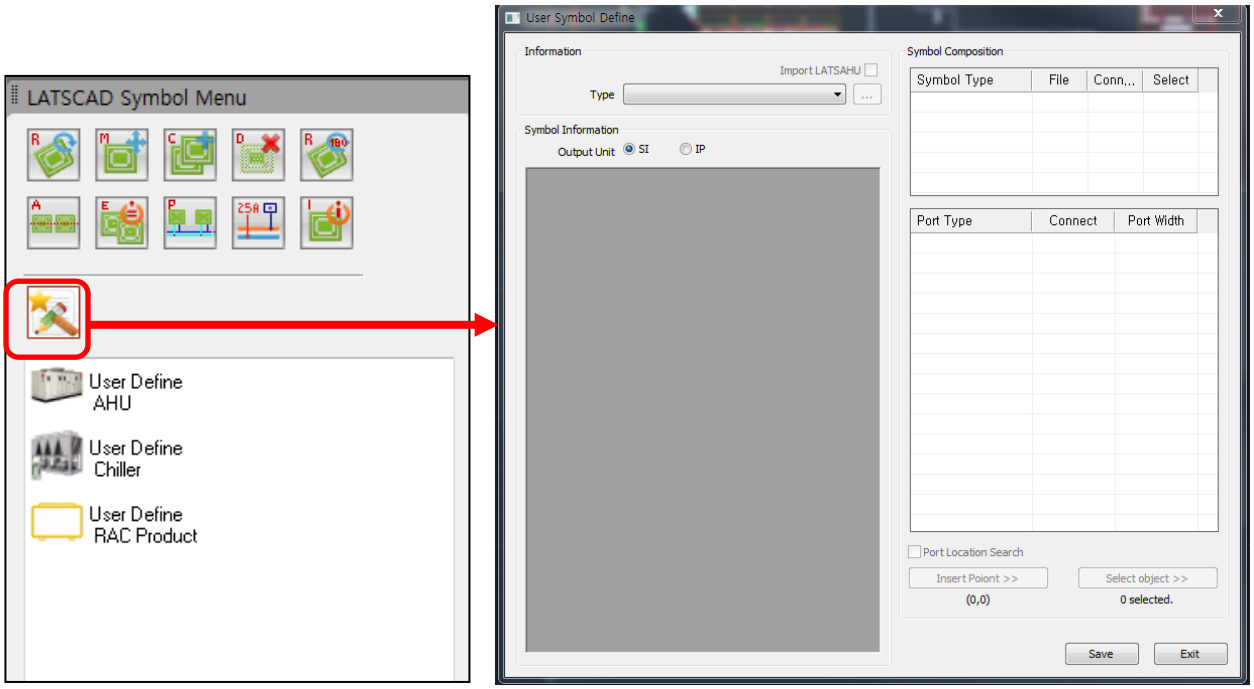
User Symbol Define Function (Symbol Menu)

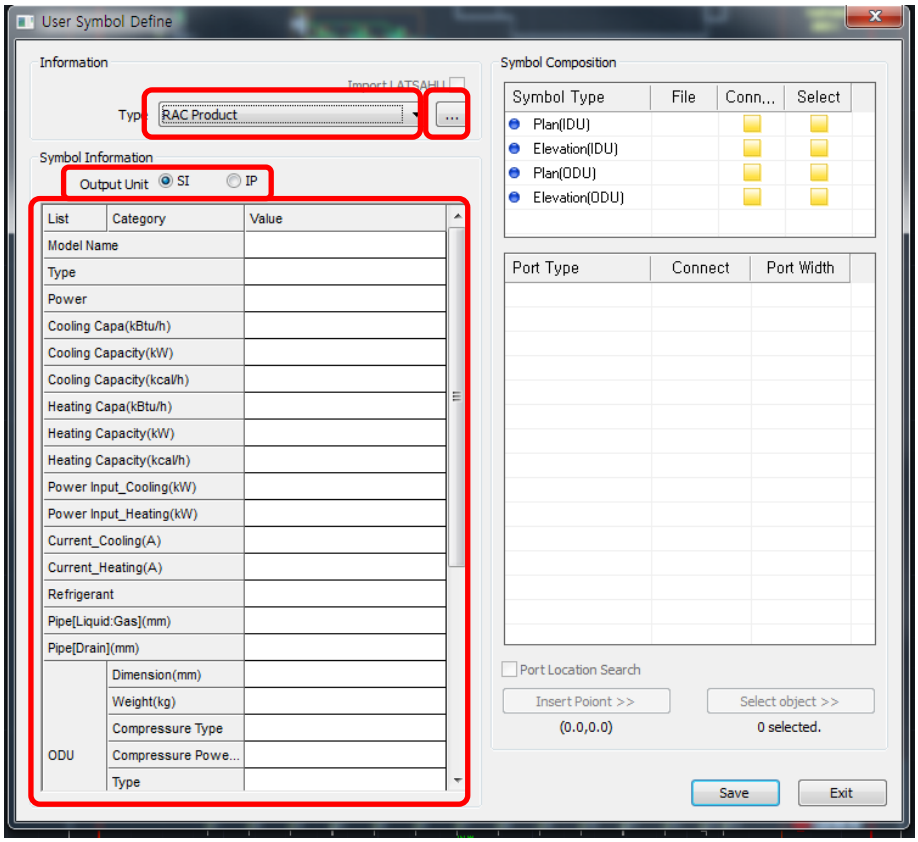
If you want to make new model (RAC, AHU, Chiller) that is not in LATS CAD's model lineup, Please Use User Symbol Define Function. And the symbol

The user defined symbol can reporting, making equipment table.

Make the new model as user symbol define function

Click the "User Symbol Define Icon".





2. Information :

-. Select the Product type (RAC Product, AHU, Chiller)

3. Symbol Information:

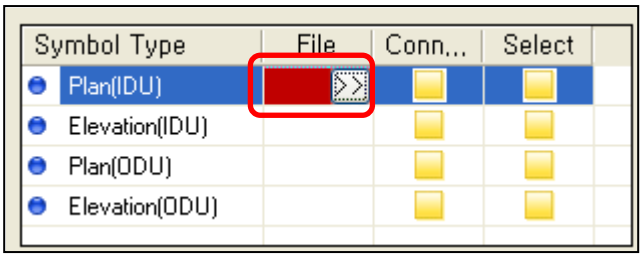
-. If you have already the user symbol, you can modify as open the previous xml file.

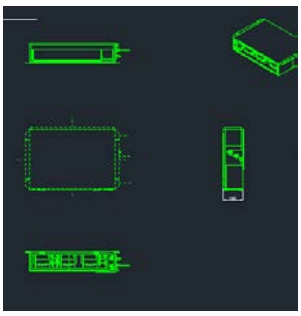
-. Output unit: Select the output unit.(SI or IP)

-. Insert Product Information.

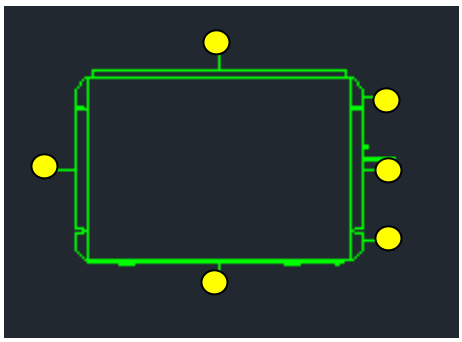
4. Symbol Composition:

-. Open the dwg file to make Plan block.



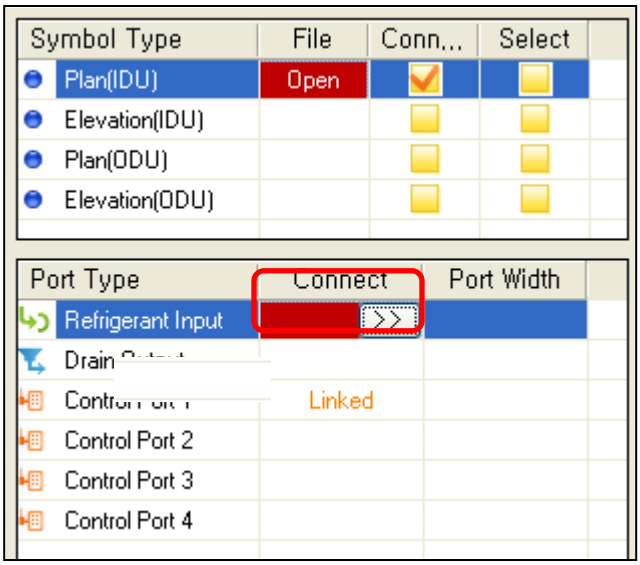


-. Draw the port in the block.

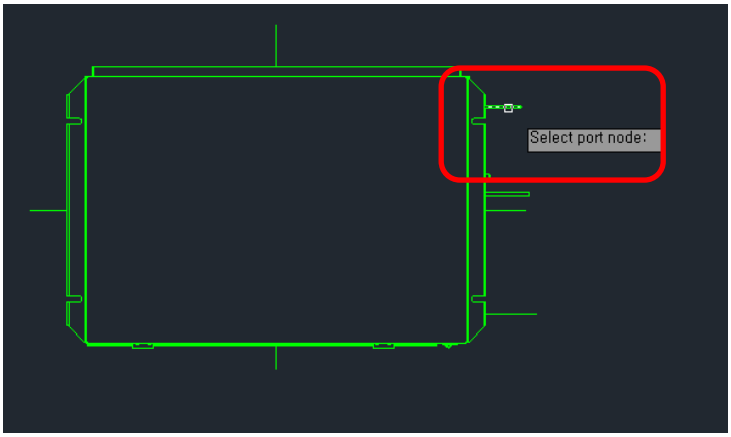


Ex) RAC Product Plan[IDU] : It need to 6 lines (Refrigerant Input, Drain Output, Control Port 1,2,3,4)

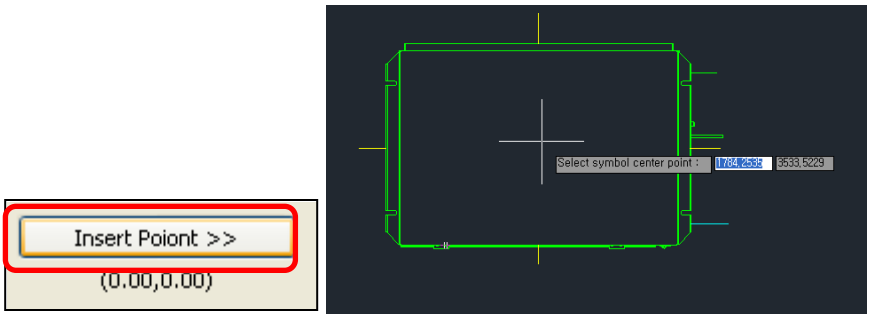
-. Click "connect" button.



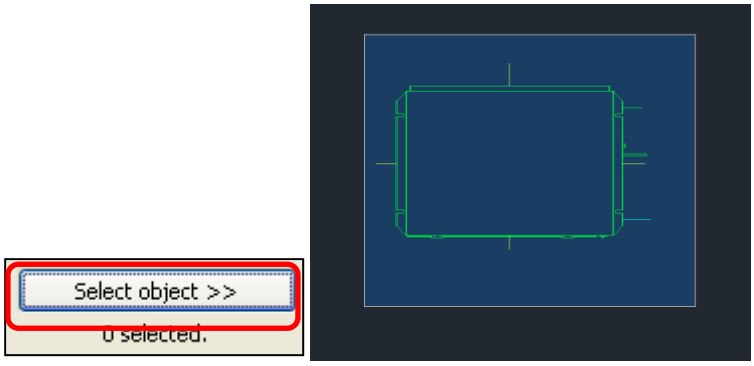
-. Select the line.



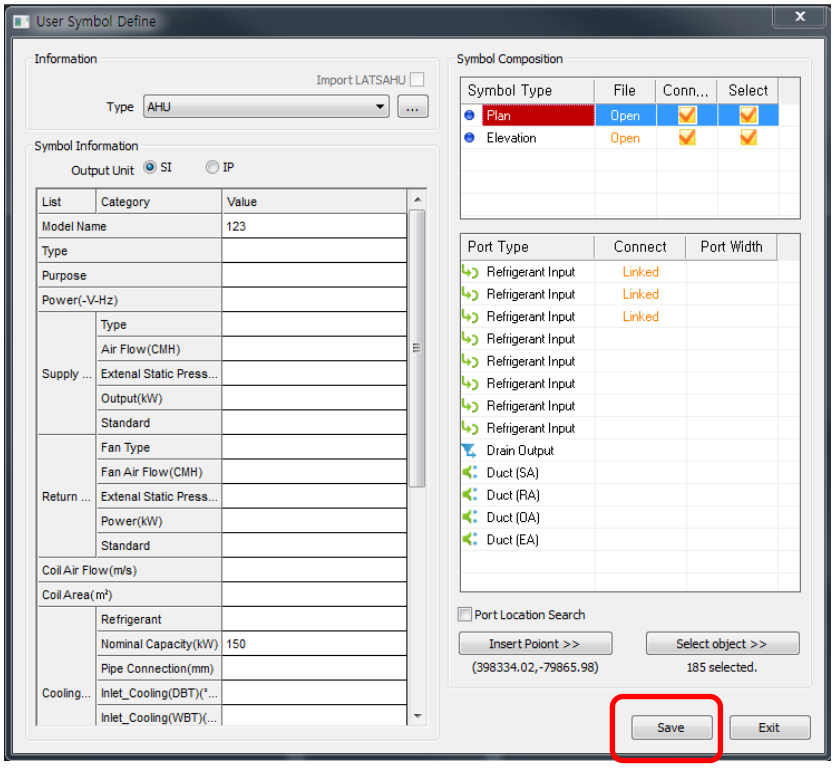
-. Select Symbol conter point.



-. Select object.

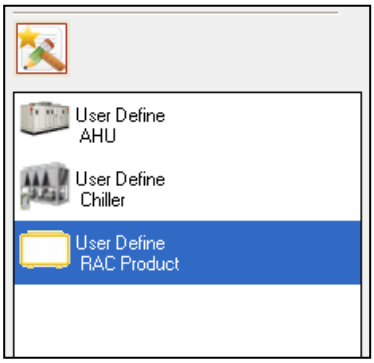


-. If you insert the product data and block port, save it.



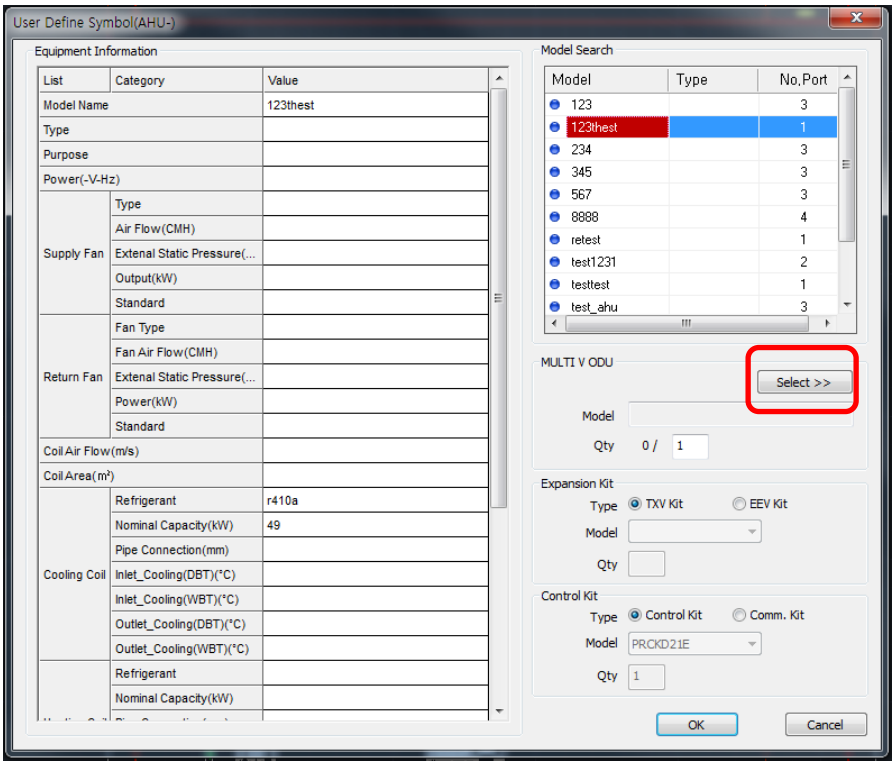
Add the user defined symbol model in project

1. Click the product type

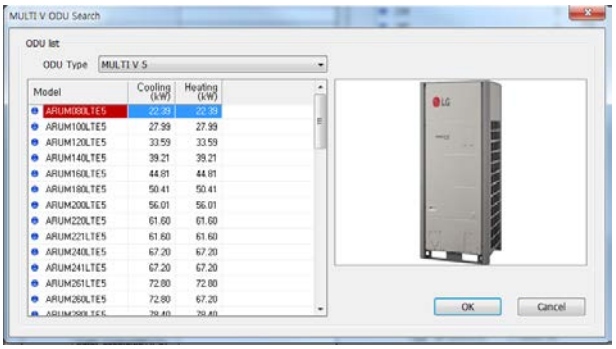


2 AHU:

2.1. AHU Model selects



2.2 The MultiV ODU model selects.



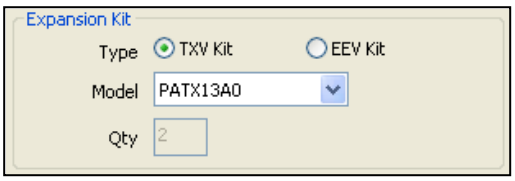
2.2.1 Select "ODU Type".

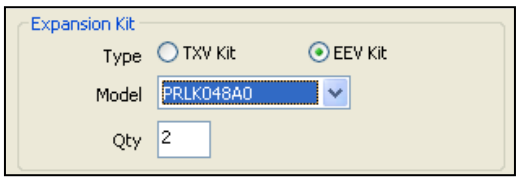
2.2.2 Select ODU Model.

2.23 OK.

* The default of ODU quantity is determined by AHU's No. port. And it can modify.

2.3 The Expansion model selects.



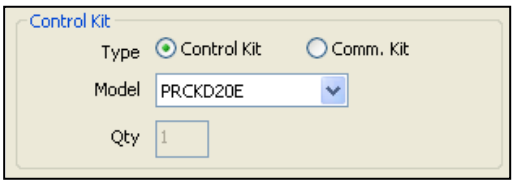


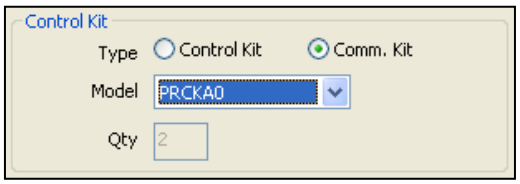
(TXV kit) (EEV kit)

2.3.1 TXV kit: The model name is determined automatically by ODU total capacity.

2.3.2 EEV kit: if you select the model name, the equipment's quantity is determined automatically.

2.4. The Control model selects.





(Control kit) (Comm. kit)

2.4.1 TXV kit: The model name is determined automatically by ODU total capacity.

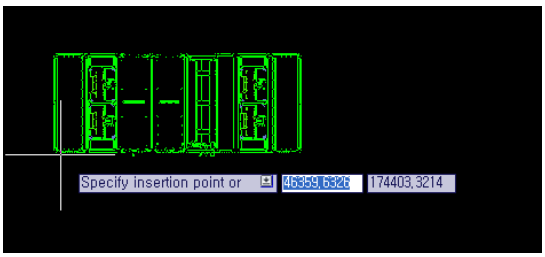
2.4.2 EEV kit: if you select the model name, the equipment's quantity is determined automatically.

*When Select the EEV kit, It cannot select "Control kit" .

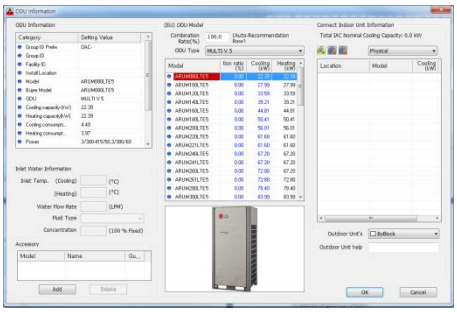
2.5. Click the "OK".

2.6. Positioning AHU&ODU

2.6.1 AHU is positioned.

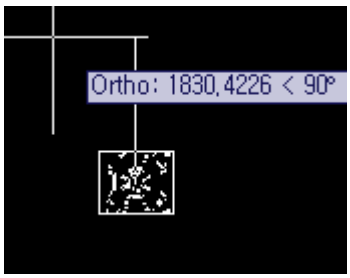


2.6.2 Check the ODU model. (Click the "OK")

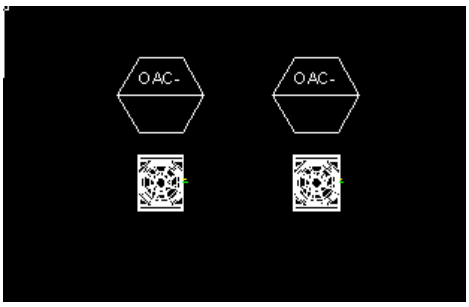


2.6.3 The first ODU is positioned.

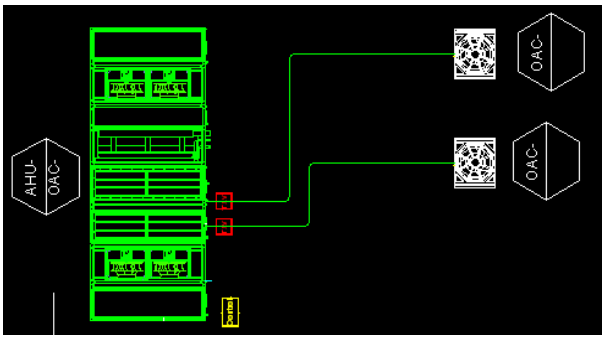
2.6.4 Select the refrigerant port direction.



2.6.5 If ODU quantity over to 2, next ODU is positioned.

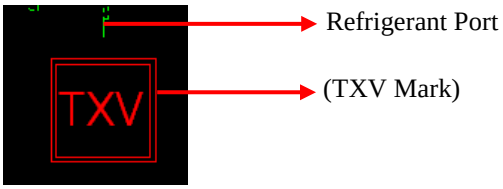


2.6.6 Connect the AHU model and ODU.

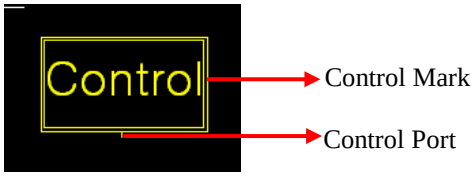


2.7. Kind of Connect Port

2.7.1 Refrigerant Port: It is selected making AHU symbol. When AHU is positioned, Expansion mark is positioned.

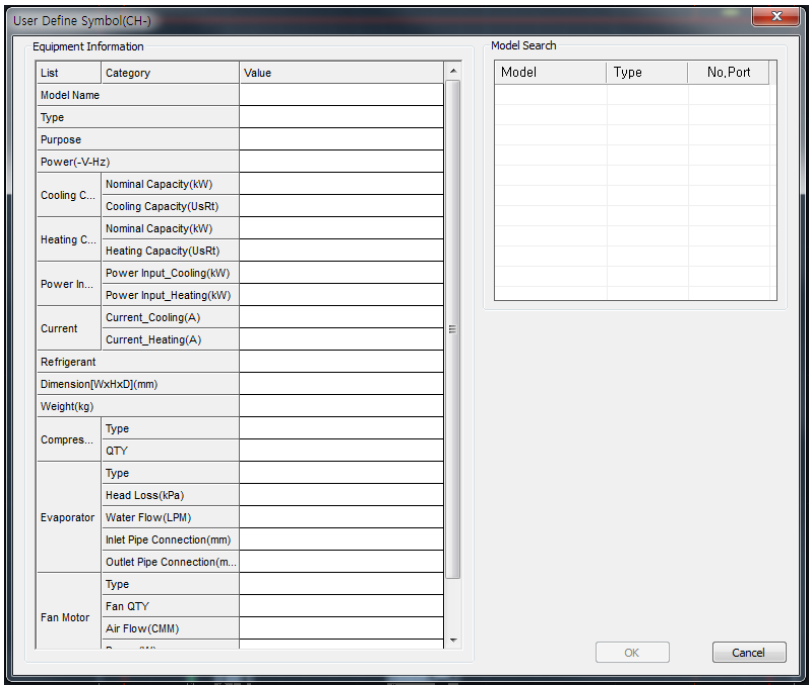


2.7.2 Control Port: When AHU is positioned, Control mark & port are positioned.



3. Chiller

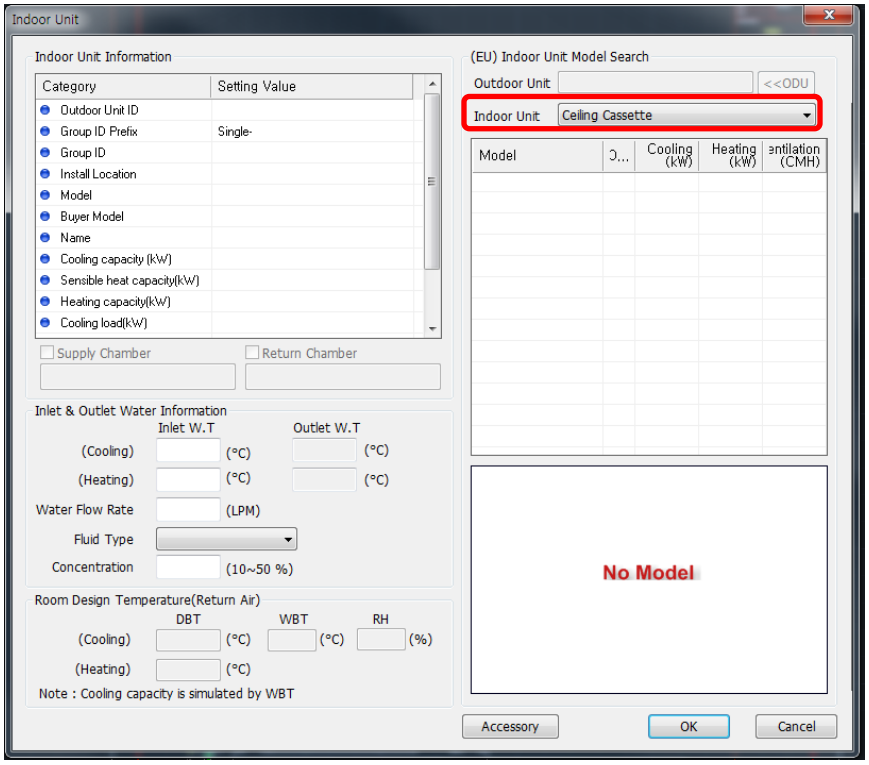
3.1 Select Chiller Model. (LATS CAD don't support water pipe design yet)



4 .RAC Product :

4.1 Select the Indoor unit type.

4.2 It is same with Single product

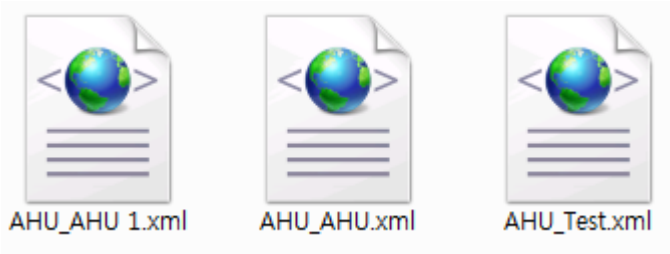


Precautions

1. To send the project files with User define Symbol in system, user must send project files with xml files.

2. For example, when user sends the project file with AHU in the system, user must send the project file with AHU xml file.

3. If user don`t have the AHU xml files, LATS CAD cannot calculate the AHU simulation



Others

This chapter is written about explanation of useful function in using LATS CAD.

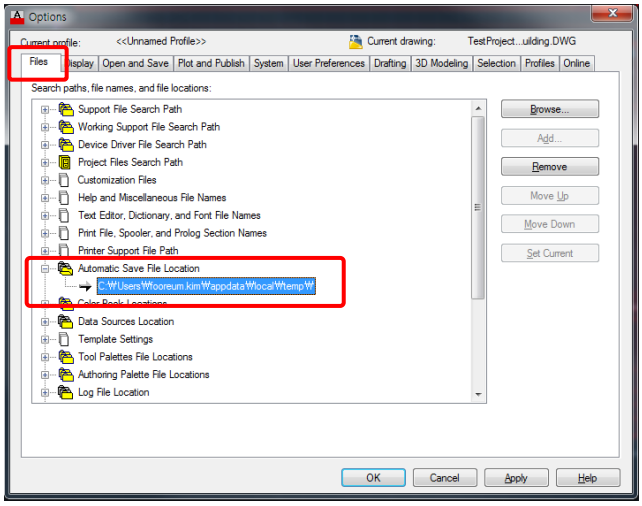
Utilizing Automatic Save Function

Drawing is automatically saved using the Automatic Save function of AutoCAD.

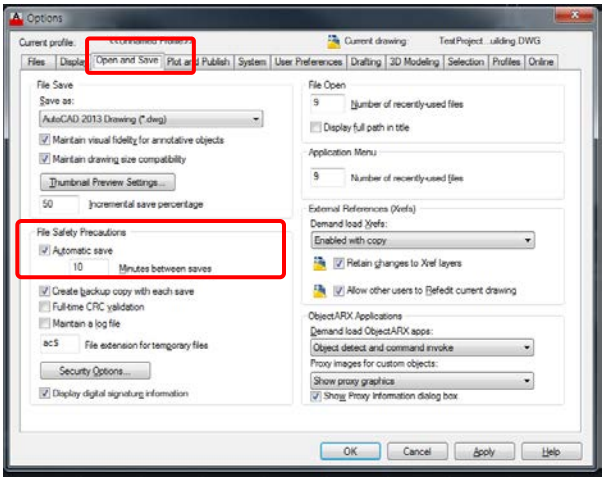
1. Input AutoCAD Command Options.

2. Verify the automatic save location in File tab.

2.1 It is automatically saved in the folder of the corresponding path, and the path may be changed.



2.2 Automatic Save Period may be set in Open and Save tab.



3. It is saved with the extension sv$ File format, and it can be converted and used as dwg File format if necessary.

4. During the File recovery, use it by pasting the File converted from sv$ to dwg in the corresponding Project folder.