

User Guide



autofluid v2009



If needed, download Acrobat Reader (version 9 minimum)



This icon is the symbol of a video, click to launch
These videos contain audio check your sound configuration.

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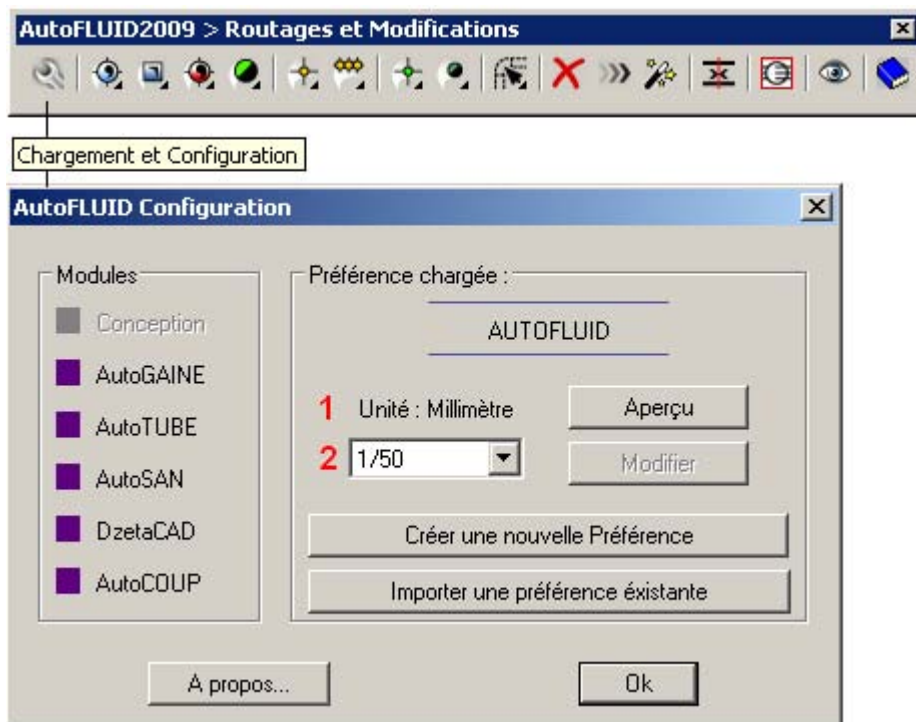
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Basic settings

Set up AutoFLUID for the floor plan you are going to work on.

Two values must be set first:



1 - The working unit of the architect's drawing

To find this value you can measure a simple door with the command "dist" in AutoCAD.

If the value reads approximately :

0.80 then the unit is METER

80.0 then the unit is CENTIMETER

800.0 then the unit is MILLIMETER

2. The scale of the drawing

This is the scale that you will specify in the title block of your plan.

Thanks to these 2 values AutoFLUID can adjust for example:

- The size of texts
- The appearance of dimensioning
- The appearance of frames and leader lines
- The calculation of levels

And more things...

Other values can be set up.

For instance:

- The list of layers
- Colors, types of lines and thicknesses
- The graphic style of the network
- Texts
- Units
- Etc.

To change these options you must create a new preference file.

The preference file contains all the settings which run the AutoFLUID package.

The file extension is ".PREF" settings. You will use these as a basis to create your OWN preference
AutoFLUID runs with default file.

Click on  and name the new file

Change it according to your needs by navigating the preference settings.

Once the changes are made the file can be imported by other users.

It is possible to come back and modify your preferences further at a later stage.

Changes made on a ".PREF" file are not automatically updated in the file.



Create a new preference file



Change the list of layers

Calculation of air network pipe sizes (likewise for water networks)

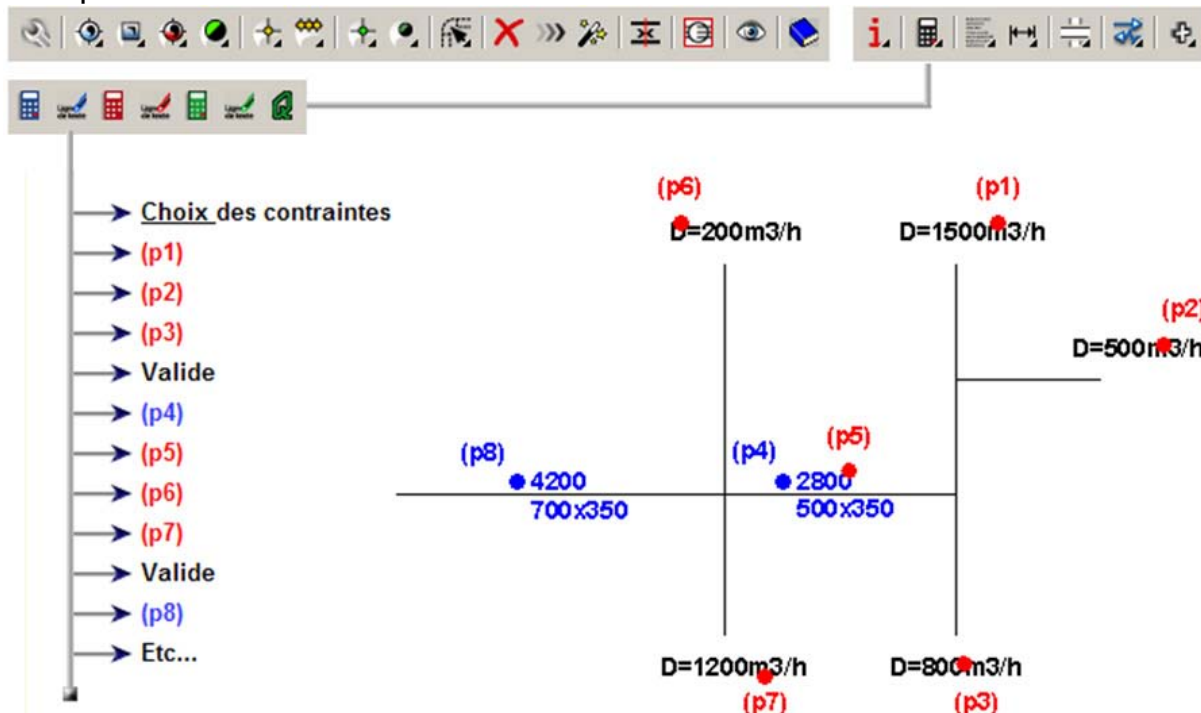
Step 1

Draw the skeleton of your network
Place the text indicating the flow

Step 2

Click on the flow(s)
Confirm and place the text containing the selected added of Flows and the pipe sizes.

Example:



Air networks computation worksheet

Calculation of sanitary network pipe sizes

Step 1

Draw the skeleton of your network

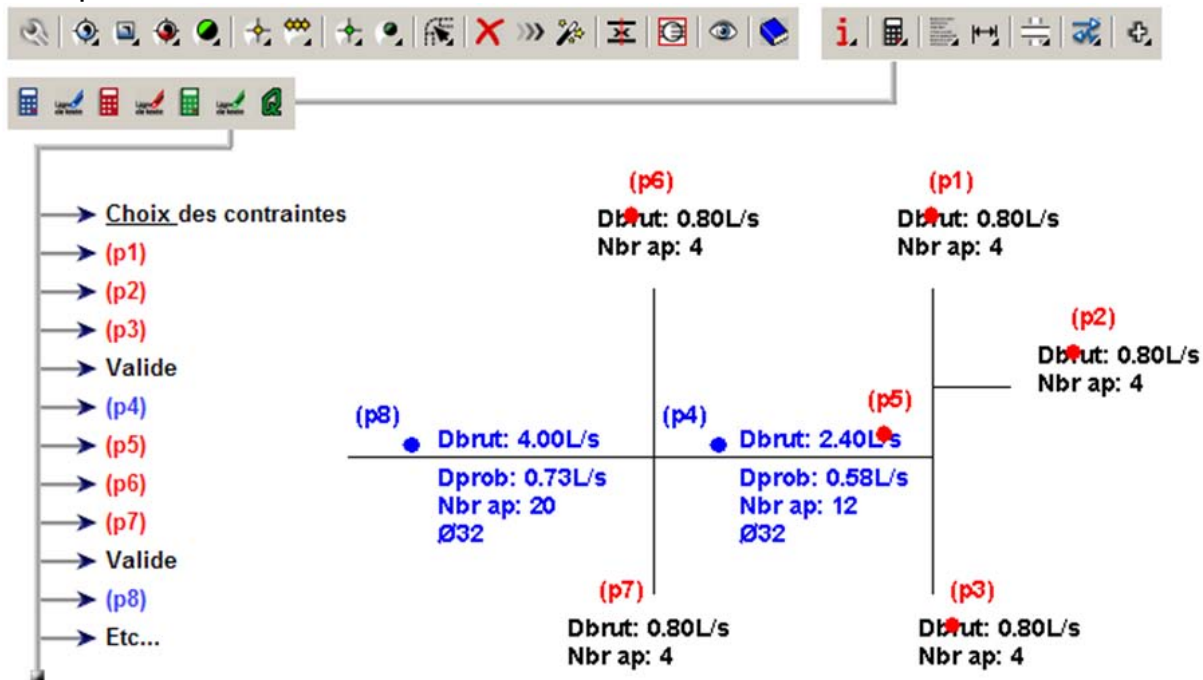
Place your flows using the command "calculation of typical flows"

Step 2

Select the flow(s)

Confirm and place the text containing the selected added flows and the pipe sizes.

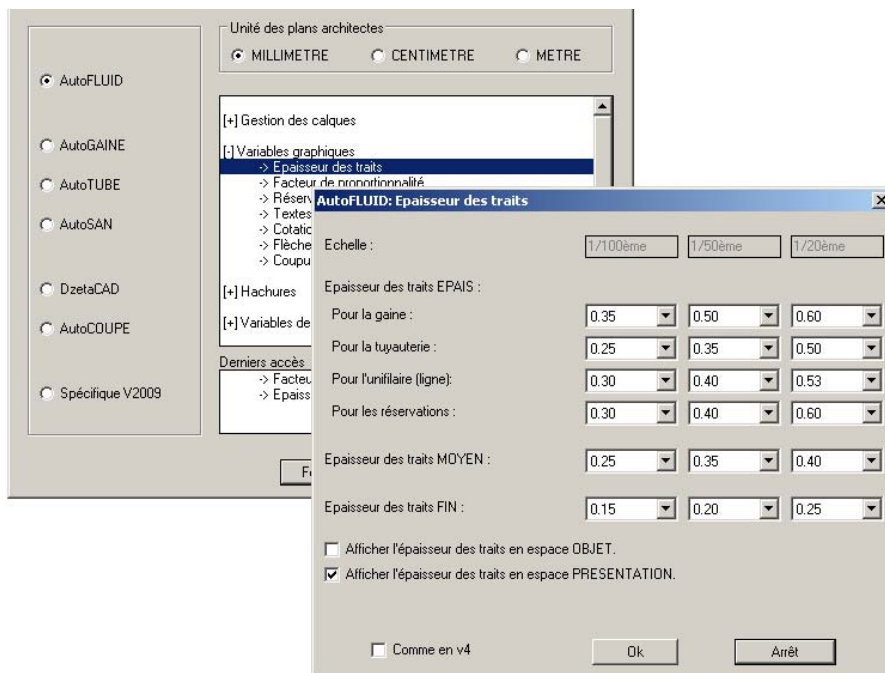
Example:



Sanitary networks computation worksheet

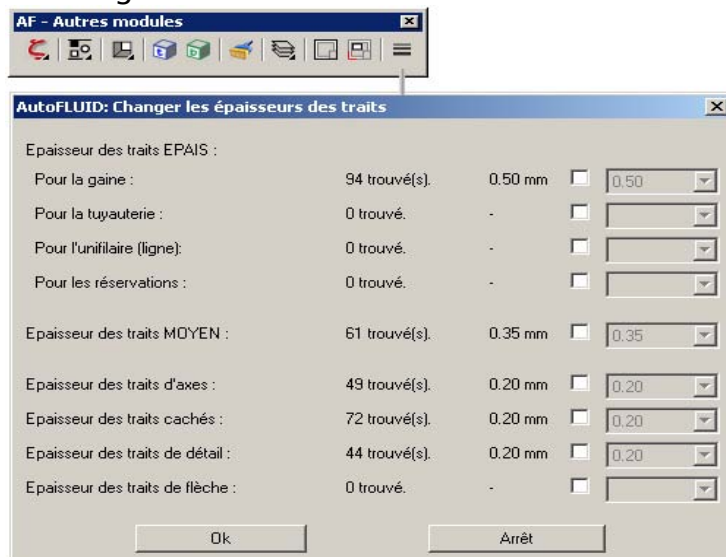
Handling Thicknesses

The thickness of each entity drafted with AutoFLUID 2009 is automatically managed to be compatible with basic CTB files (acad.ctb or monochrome.ctb.) Whether in colour or not, the relief of your drawing will be preserved.



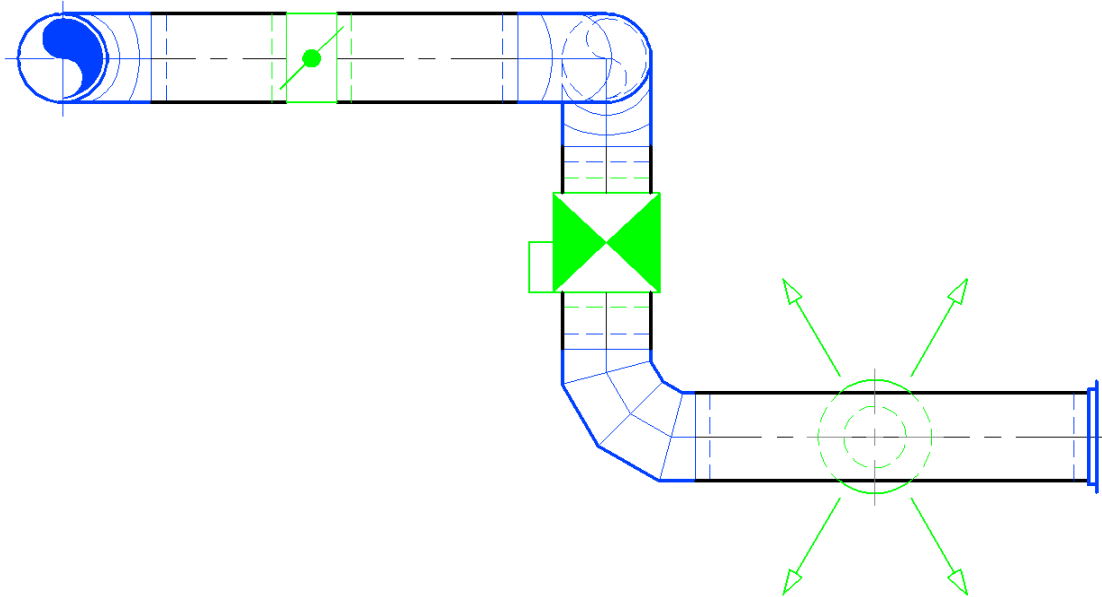
The above settings must be adjusted BEFORE drawing.

If you would like to change thicknesses AFTER drawing you can modify them by using the following command :



Introduction to double line drawing

Graphic structure of a network drafted with AutoFLUID 2009



Each entity created belongs to only one object.

There are 3 types of objects

- Conduits (coloured black)
- Parts (coloured blue)
- Equipment (coloured green)

Each object contains information serving the following purposes :

Intérêt des informations :

- Modifications to networks
- Modifications to text
- Network bill
- Calculation of pressure drops

Each part must be created using the appropriate command.

Otherwise the part may seem right graphically but the bill will be wrong and the commands for quick modifications may not work correctly.



Structure of a network

Structure of a conduit:

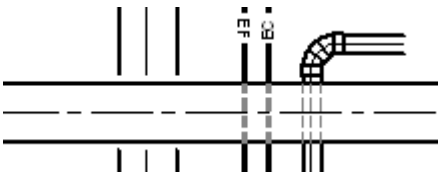
There are 3 types of conduit:

- | | |
|---------------------|-------------------------|
| 3 lines with 1 axis | (circular duct or tube) |
| 2 lines | (rectangular duct) |
| 1 line or polyline | (single line) |

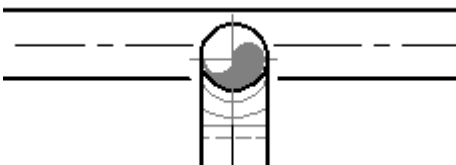
With no additional information a circular conduit is only composed of 3 independent lines. With the 2009 version of AutoFLUID each line of the conduit acknowledges the 2 others. For this reason all conduits must be properly structured.

Factors that can alter the structure of a conduit:

- Crossings

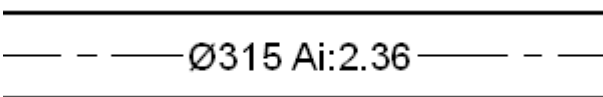


- The 'Adjust' and the 'Break' commands in AutoCAD



A partially cut conduit (2 out of 3 lines) will generate 2 conduits compcommand in AutoCAD then

- Text on one line



If only the centre line of a conduit is cut with the "Break" command in AutoCAD then AutoFLUID2009 will generate 2 conduits composed of 3 lines.



Structure of a conduit

Operations on conduits

Re-build a conduit out of 2 parts:



Select two conduits with a similar size and form one out of the two.

Previewing the structure of a conduit:



This allows all the conduits to turn into one colour and all the parts into another colour. If a conduit contains wrong information or if it is badly structured then it will turn red. When this happens you must re-structure the conduit.

Re-structuring a conduit:



Select the lines that form the conduit and specify the pipe size. This information will be updated and the conduit will be acknowledged by all the commands.





Operations on conduits

Double line drafting air networks

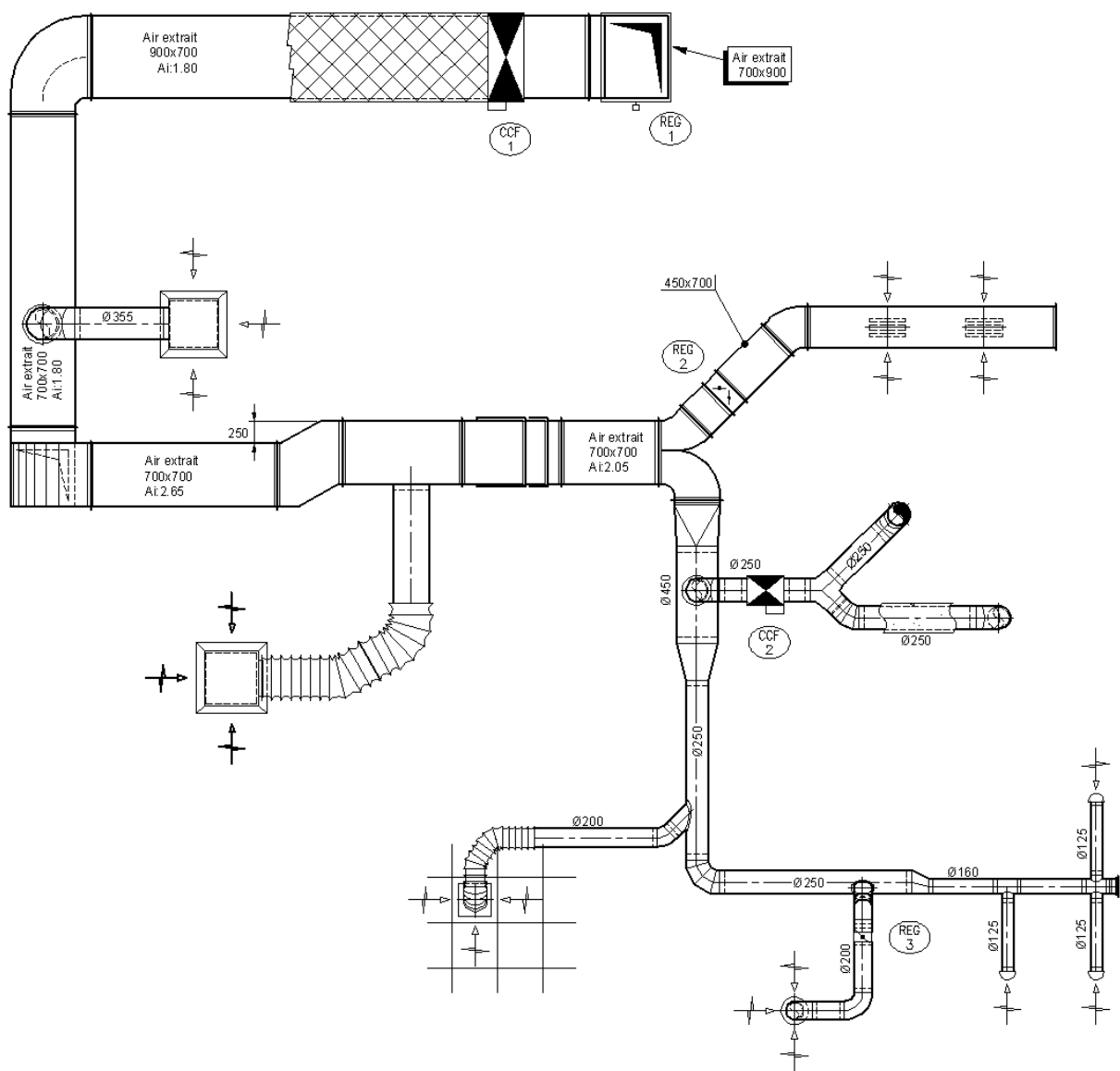
Let's use the example of a circular duct.



There are 3 types of commands in this tool bar:

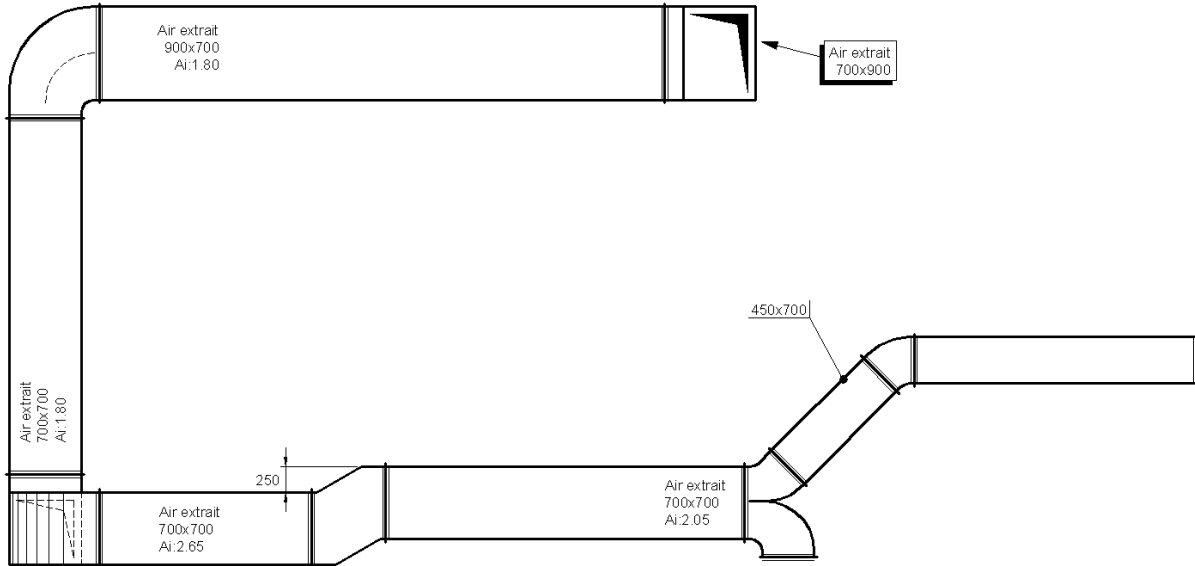
1. **The routing command**  lets you draft circular ducts whatever the shape of the network. It contains many options (elbows, reducers, etc.) to model ducts while building them. The command also takes into account layer management when drafting and allows the insertion of text relating to the drawing.
2. **Pick up commands.**  These allow you to "hook" onto a pipe you've already drawn and then continue building on it.
3. **All the other commands** are intermittent or dressing commands
For instance: Elbow, tee, break...
Damper, insulation, fire protection...

The duct below can be drafted in 4 steps:



STEP 1:

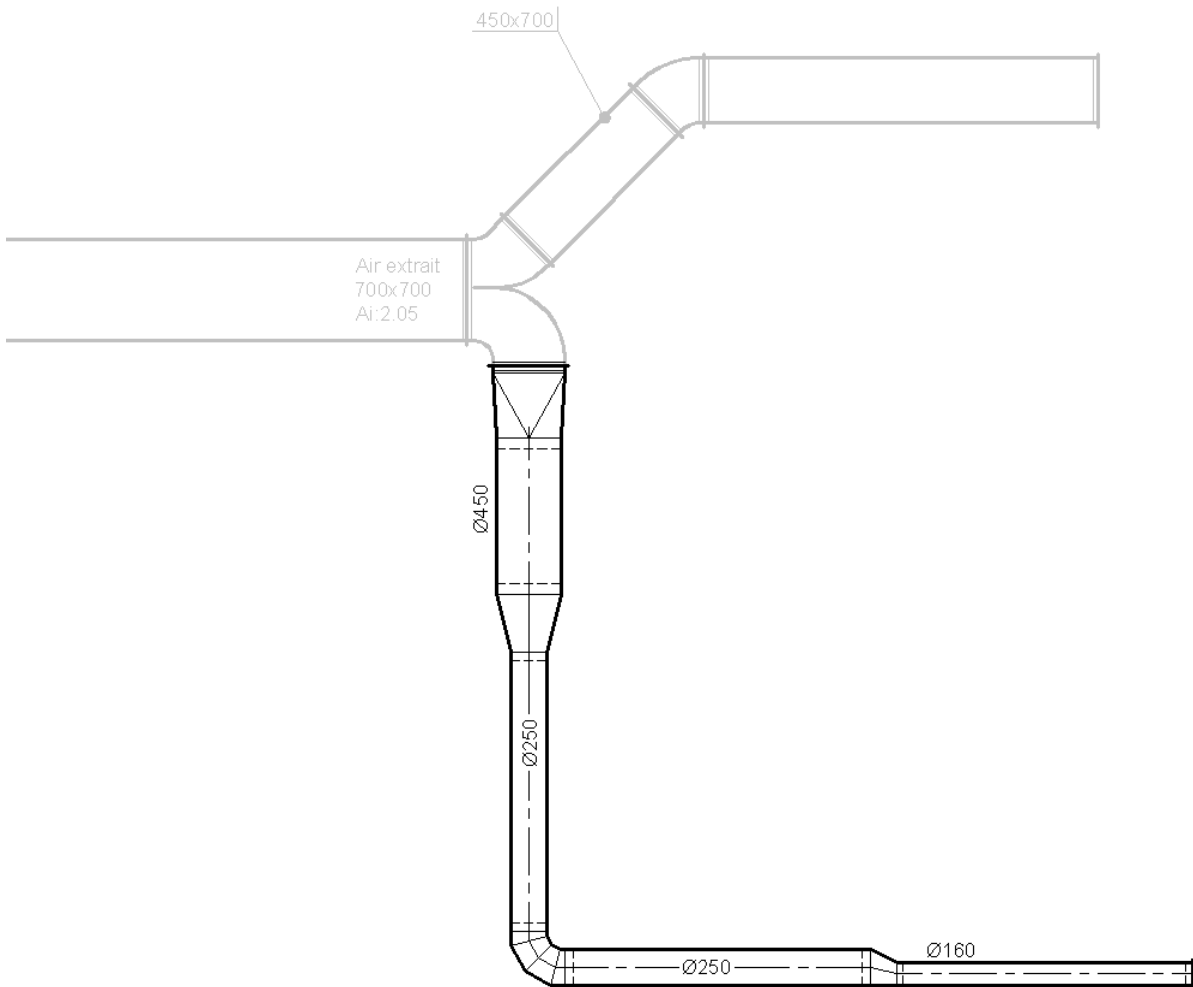
Start with the longest section and continue to the end of a branch (All the way to the cap).



AE step 1

STEP 2:

Pick up again from a diverging piece and as in part 1, continue until the end of the branch.



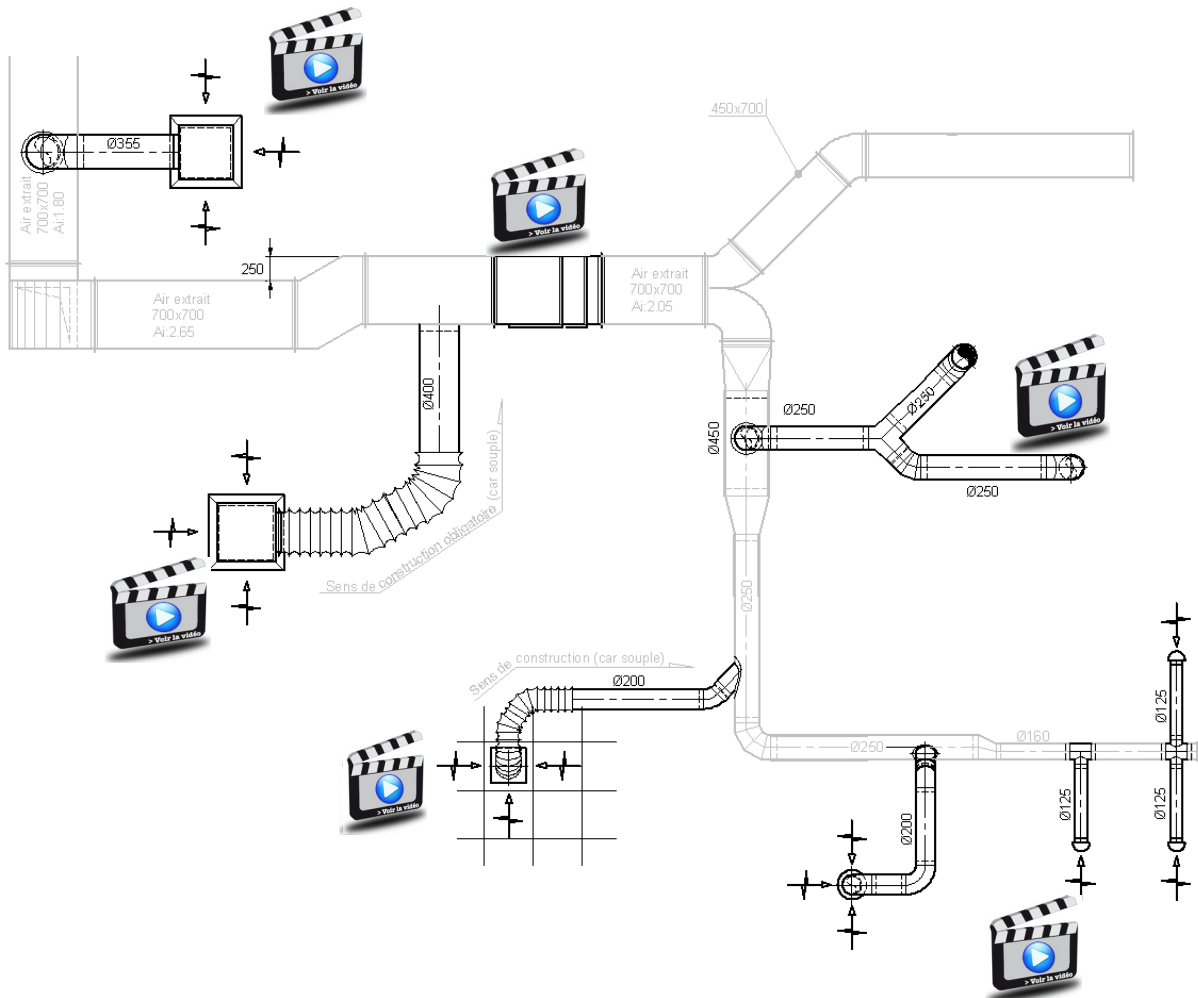
AE step 2

STEP 3:

Create each of the branches.

This can be done in 2 ways:

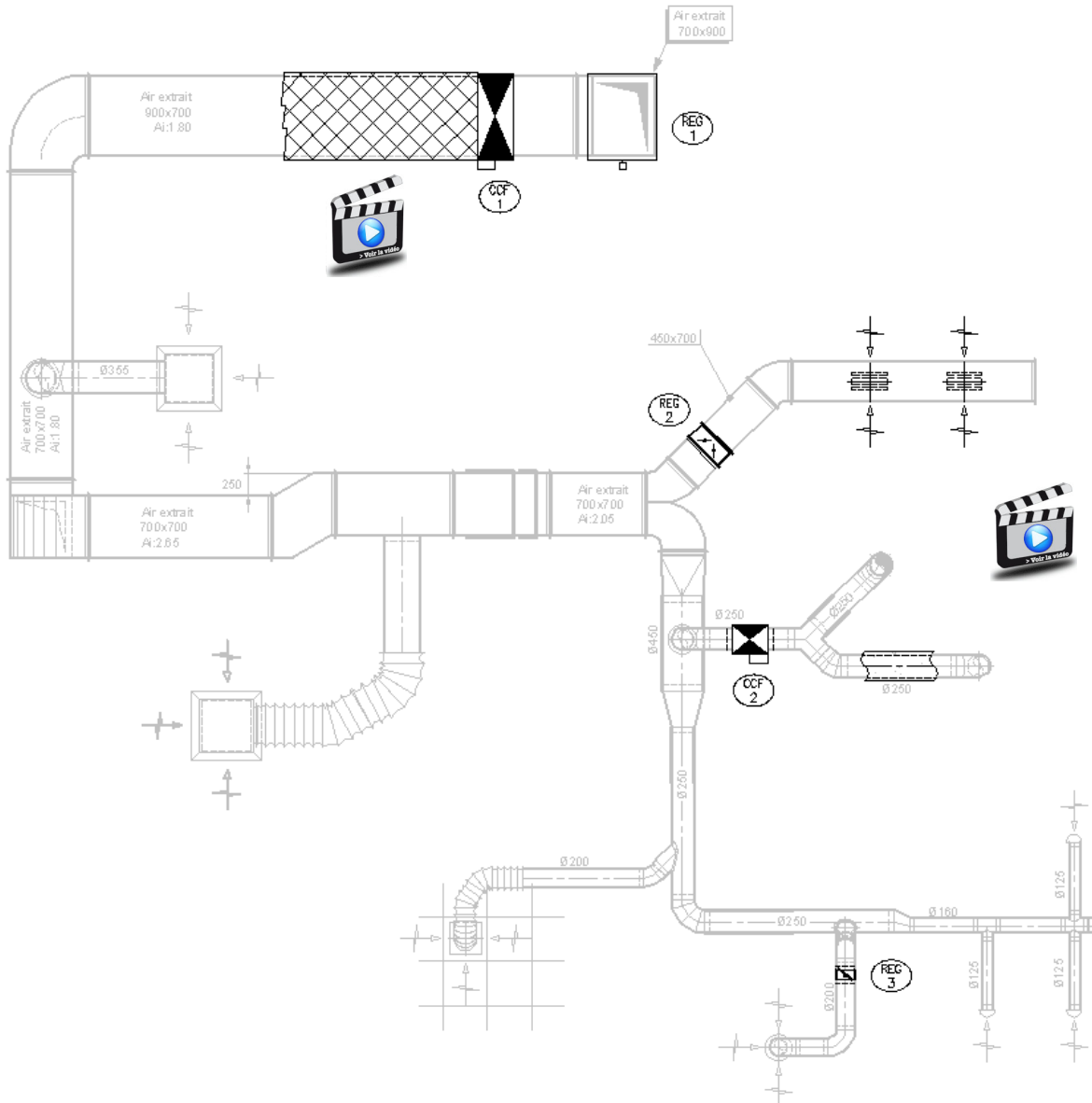
1. Start from the register and go towards the main duct.
(Compulsory in the case of a flexible duct)
2. Start from the main duct and go towards the register.



STEP 4:

Dress the duct with equipment



Valve, damper, fire proofing, registers on networks...



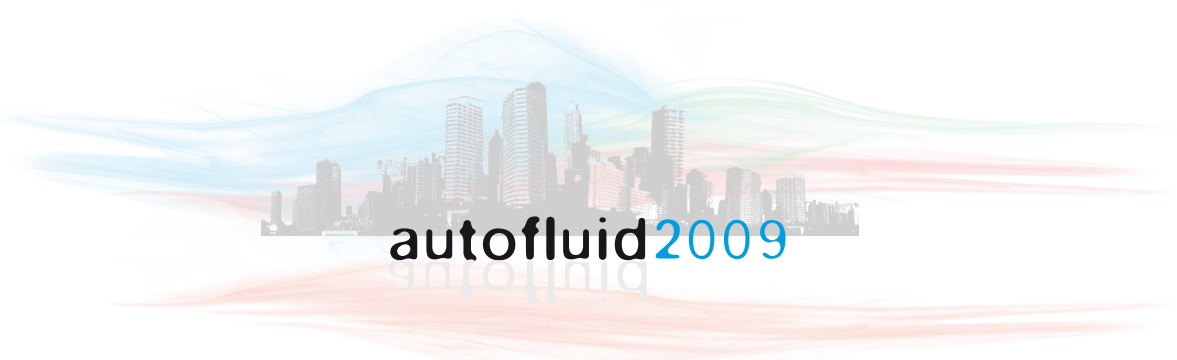
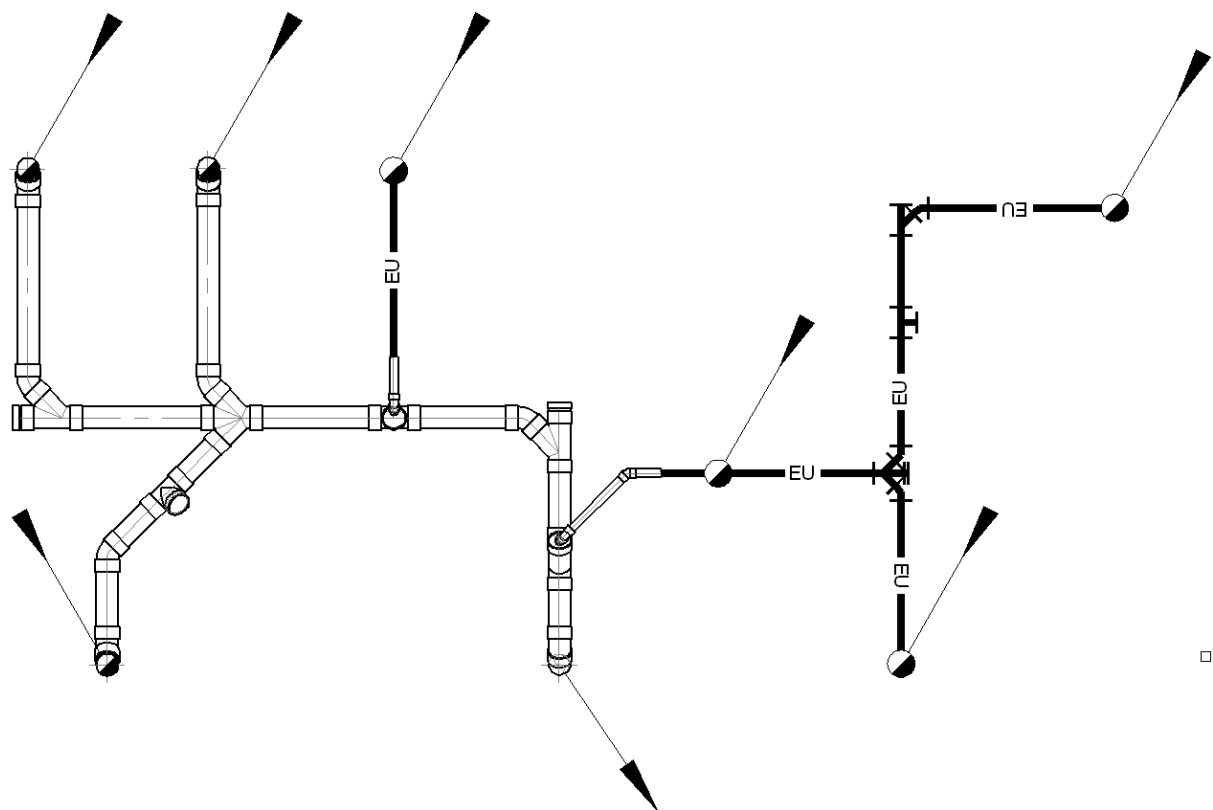
Double line drawing and single line drain drawing



There are 3 types of commands in this toolbar:

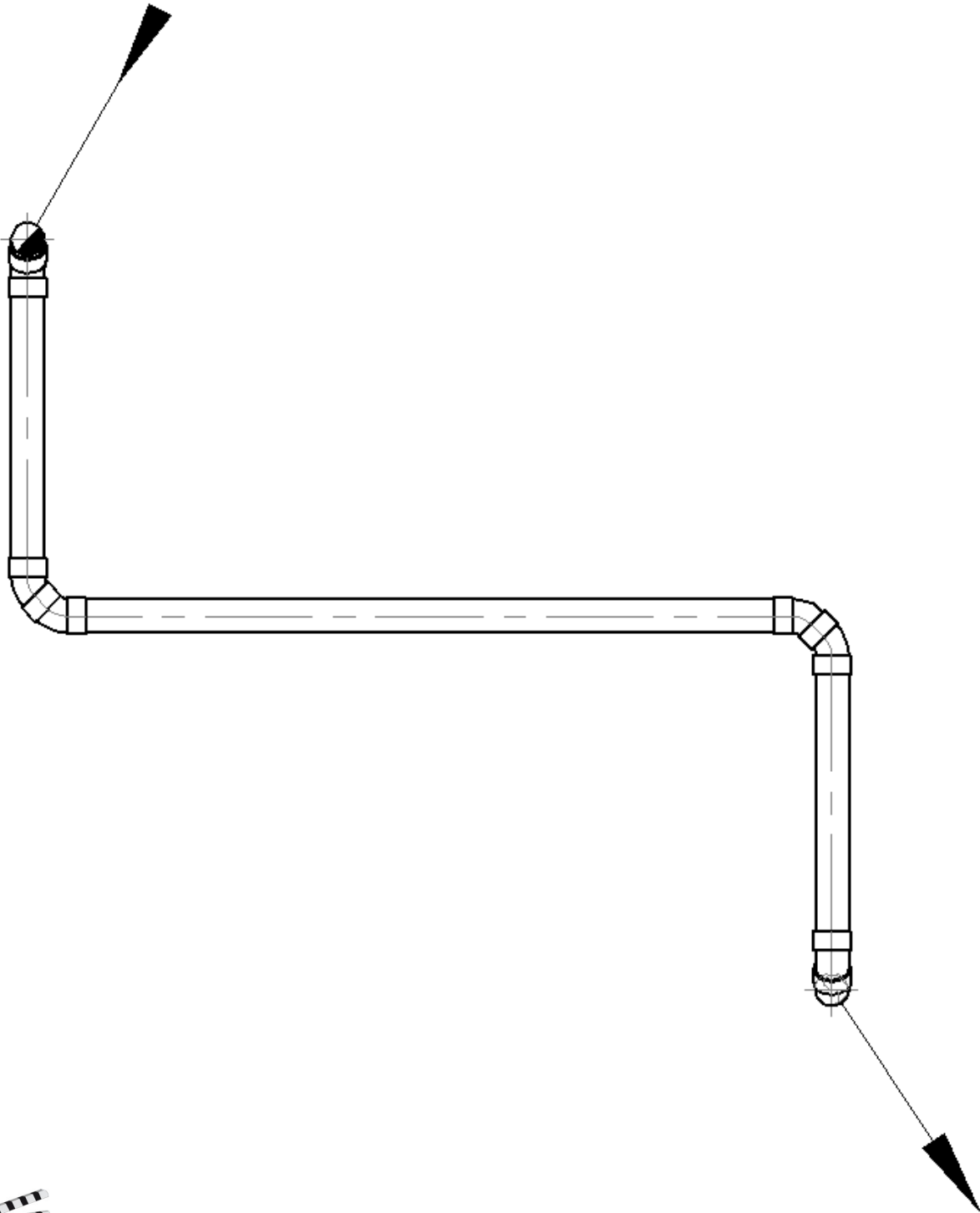
1. **The routing command**  lets you draft circular ducts whatever the shape of the network. It contains many options (elbows, reducers, etc.) to model ducts while building them. The command also takes into account layer management when drafting and allows the insertion of text relating to the drawing.
2. **Pick up commands.**  These allow you to "hook" onto a pipe you've already drawn and then continue building on it.
3. **All the other commands** are intermittent or dressing commands. For instance: Elbow, reducer, inspection plug...

Several steps are necessary to draw the network below:



STEP 1

Start from the furthest point and continue towards the end of the network.



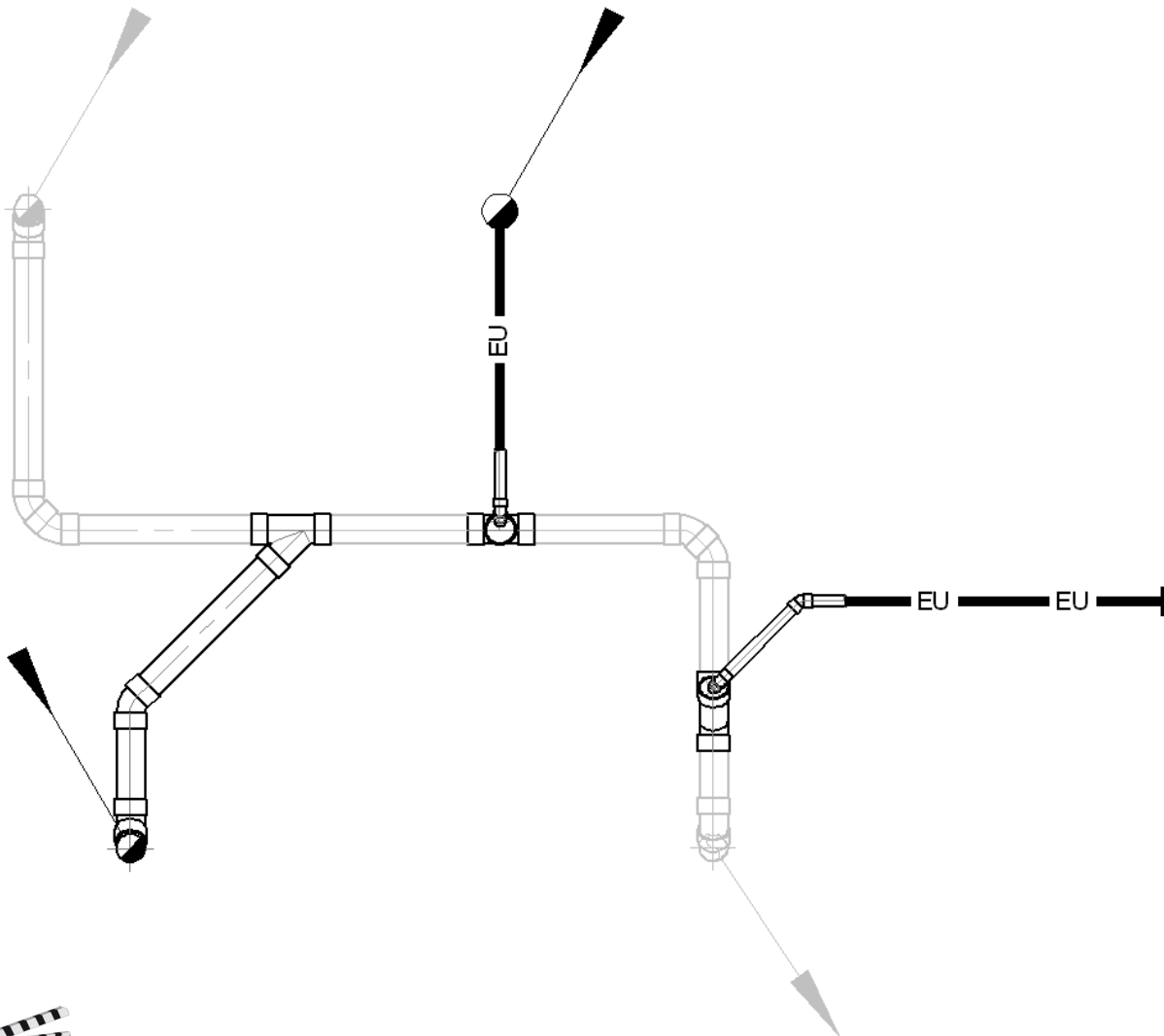
SAN Step 1

STEP 2

Make each connection.

This can be done in 2 ways:

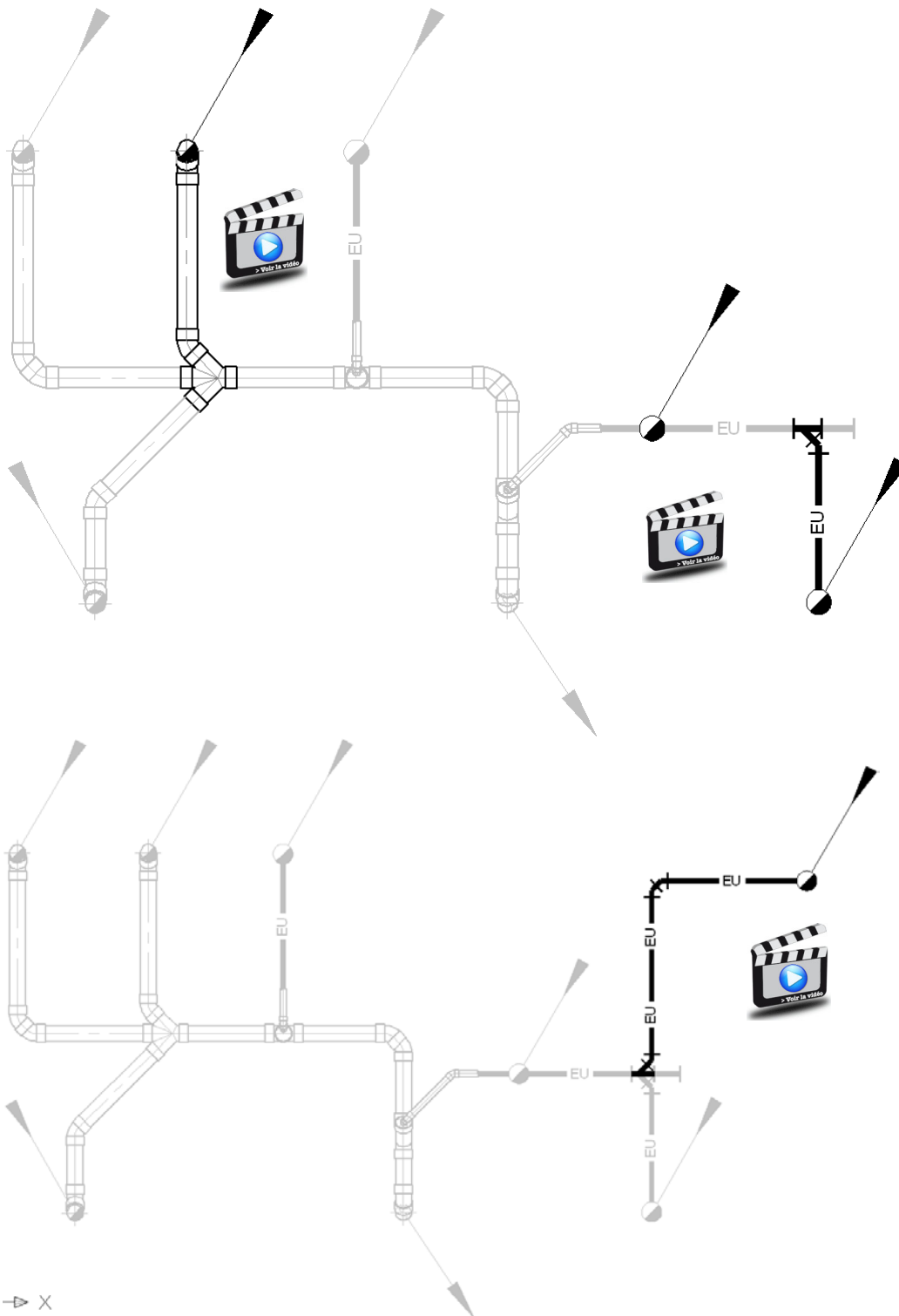
1. Start from a symbol and continue towards the main sewer.
2. Start from the main sewer and continue towards the symbol.



SAN step 2

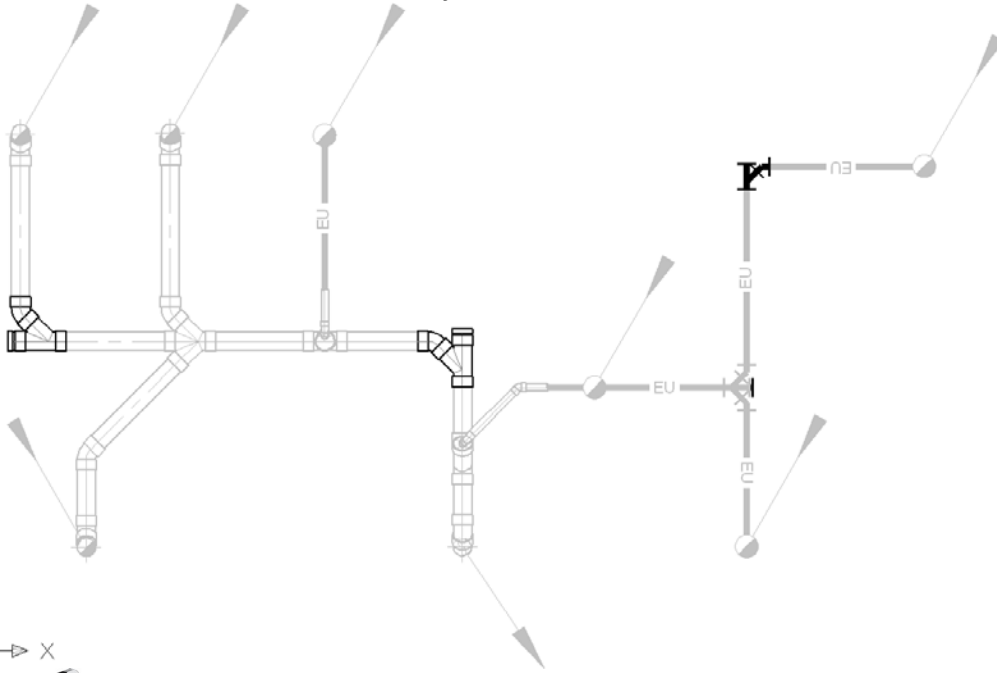
STEP 3

Add the other connections.



STEP 4

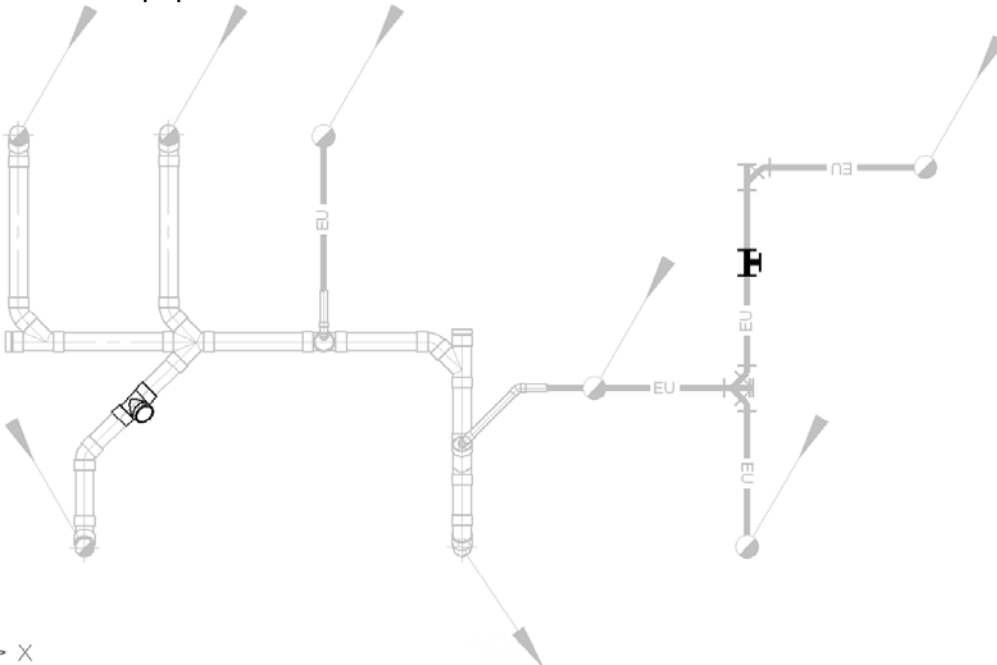
Use the MODIFY command to adjust the network.



SAN step 4

STEP 5

Add the equipment.





SAN step 5

Drawing a single line set of pipes

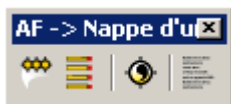


This toolbar helps you draw several single line networks side by side simultaneously. These commands produce the same graphics and information as the one contained in the tool bar below.

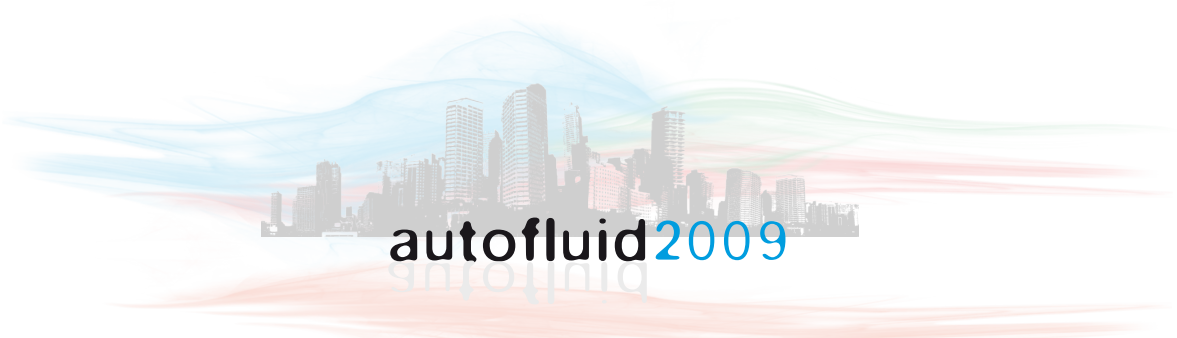
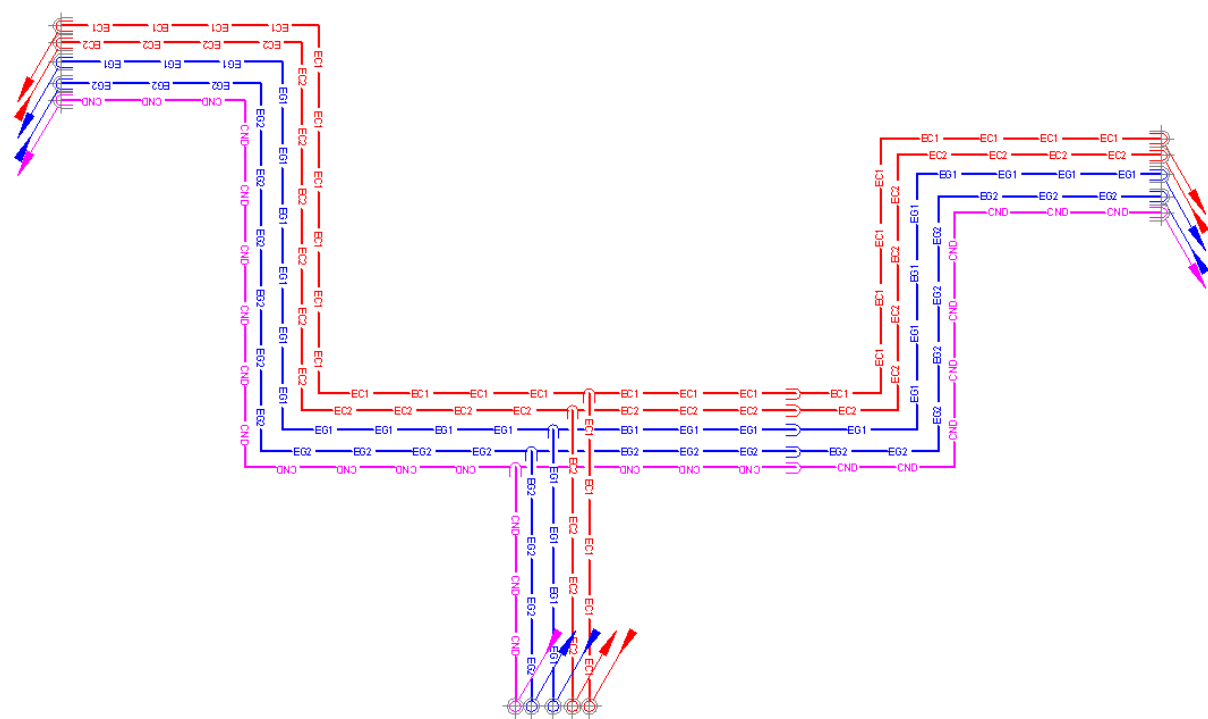


1. **The routing command**  lets you draft circular ducts whatever the shape of the network. It contains many options (elbows, reducers, etc.) to model ducts while building them. The command also takes into account layer management when drafting and allows the insertion of text relating to the drawing.
2. **Pick up commands** . These allow you to "hook" onto a pipe you've already drawn and then continue building on it.
3. **All the other commands** are intermittent or dressing commands. For instance: Elbow, reducer... Gates, thermometers...

These commands are intermittent and are used to dress the drawing generated by the Set of pipes command.



Several steps are necessary to draw the set of pipes below:



STEP 1

Define the set of pipes

AutoFLUID: Définition d'une nappe d'unifilaires

Choix des calques : ☒ Calque 1 ☐ Calque 2 ☐ Calque 3 Ajouter/Modifier

>>----- Sens du tracé ----->

Tube 1
☒ 0 Eau chaude n°1 ACIER 40 Ep. 30

Tube 2
☒ 0 Eau chaude n°2 ACIER 50 Ep. 30

Tube 3
☒ 0 Eau glacée N°1 ACIER 80 Ep. 45

Tube 4
☒ 0 Eau glacée N°2 ACIER 100 Ep. 45

Tube 5
☒ 0 Condensats ACIER 125 Ep.

Tube 6
☐ 0 Eau chaude n°1 ACIER 150 Ep.

Distance de Calo. à Calo. [mm] 50

De 1 à 2	De 2 à 3	De 3 à 4	De 4 à 5	De 5 à 6
164	200	242	222	204

Entre-axes symboliques minimum conseillé: 240

Ok

You must specify:

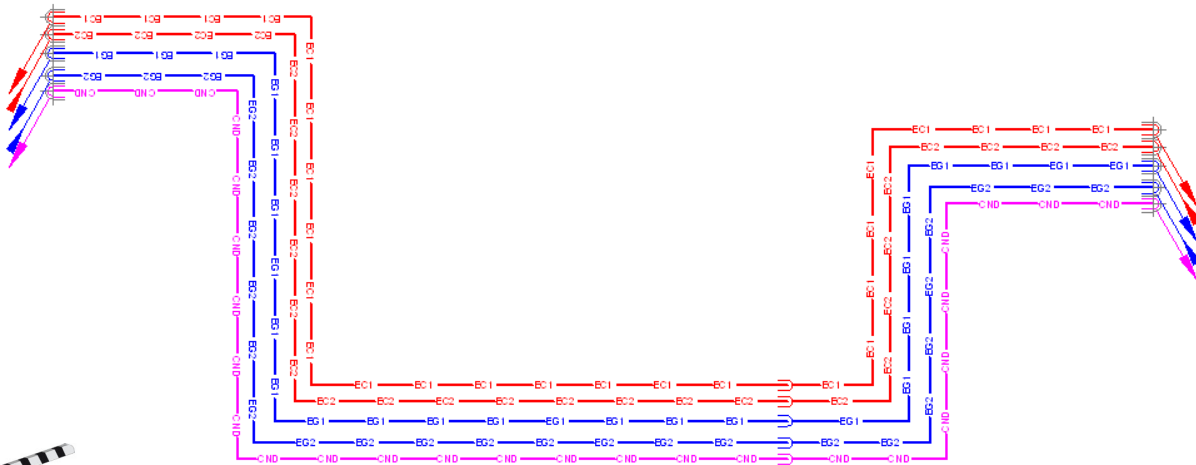
1. The number of tubes
2. And for each tube:
 - the name of the network (layer)
 - the specification
 - the pipe size
 - the thickness of insulation (if applicable)
3. The distance between each tube



Set of pipes Step 1

STEP 2

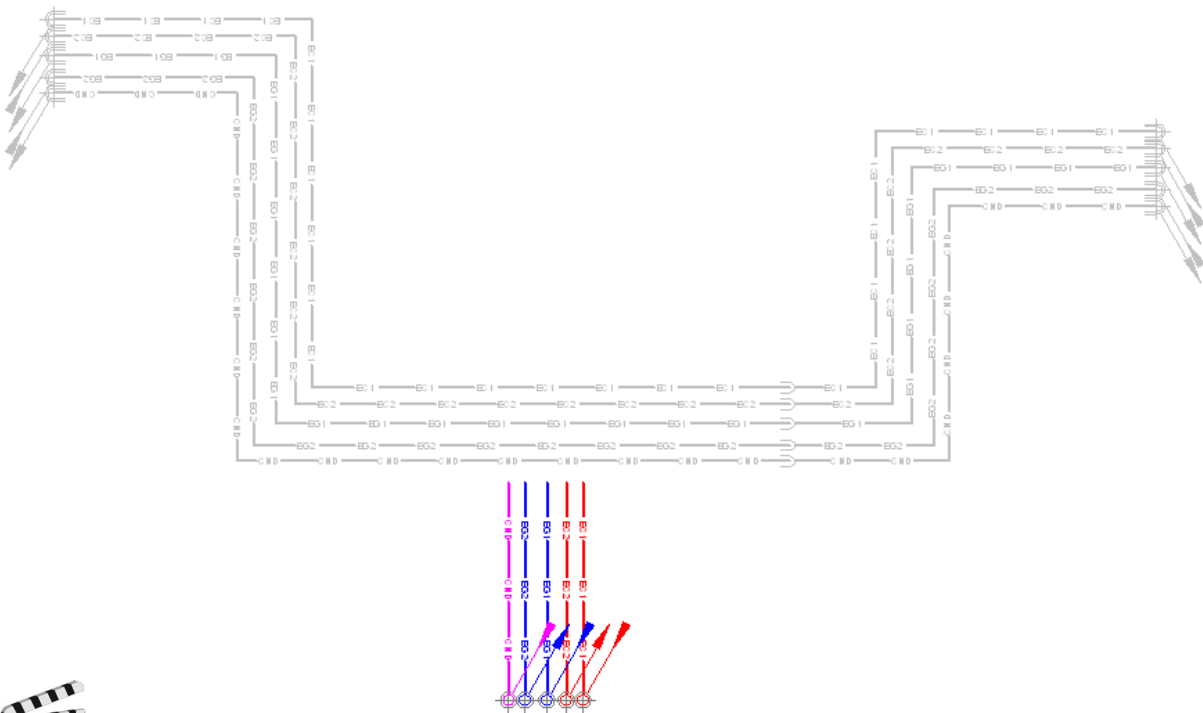
Layout the main path.



Set of pipes Step 2

STEP 3

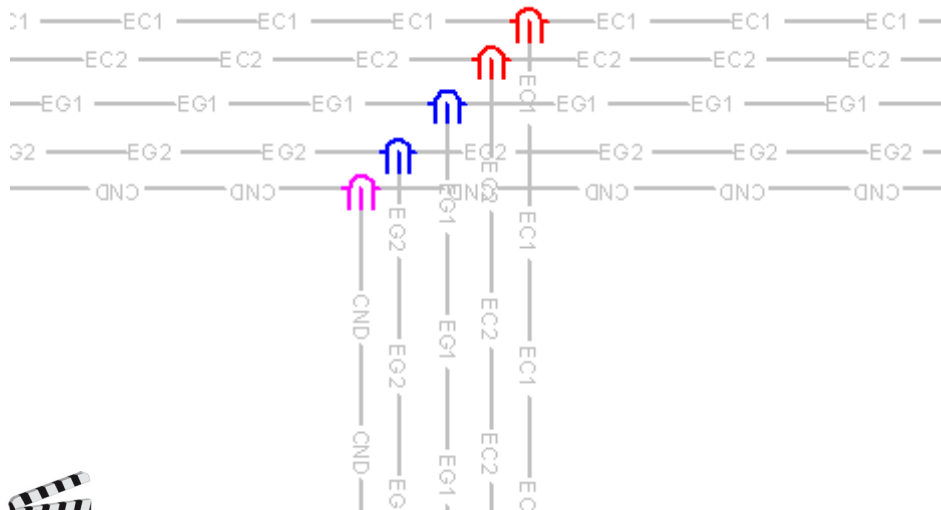
Add the additional branch without creating a connection.



Set of pipes Step 3

STEP 4

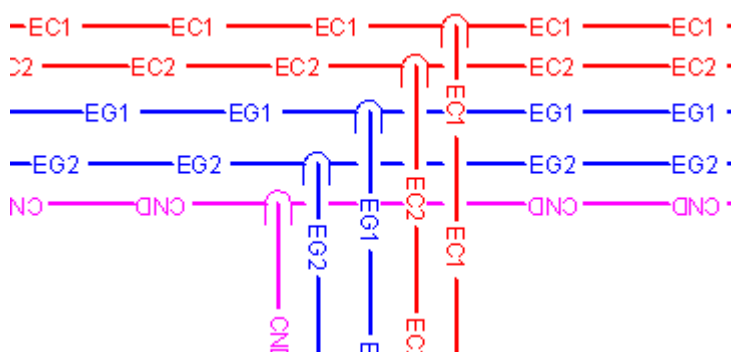
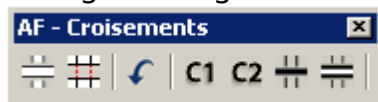
Create intermittent connections using commands in the toolbar "single line"



Set of pipes Step 4

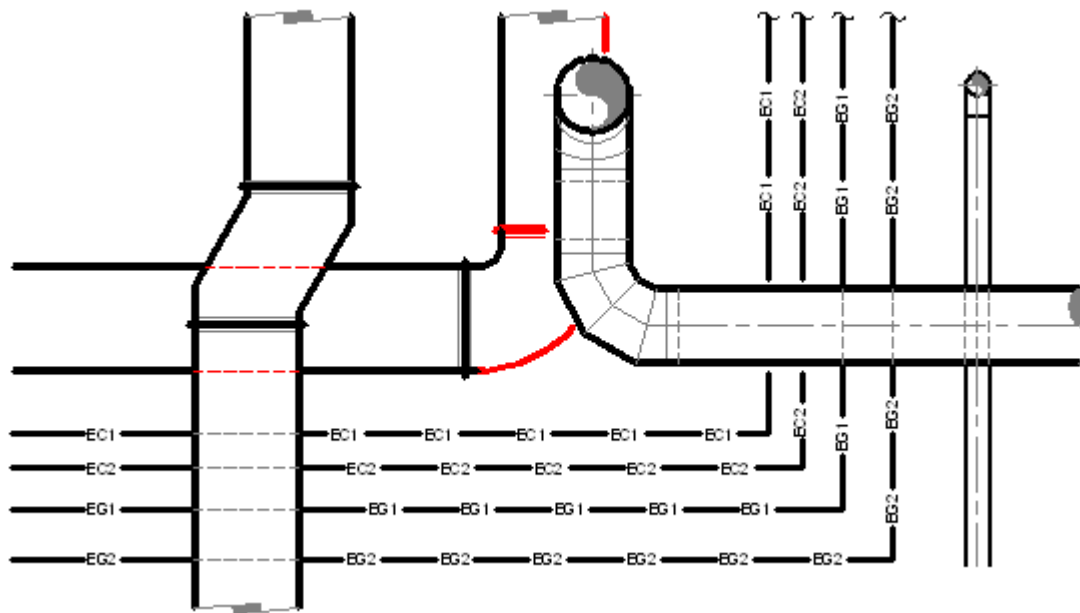
STEP 5

Manage crossings.



Set of pipes Step 5

Network crossing



- There are 2 possible modes:
 - With dotted lines
 - Cuts with gaps

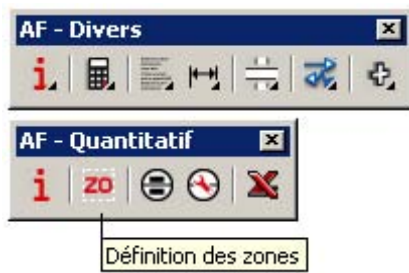
- There are 2 ways to operate (regardless of the chosen mode):
 - Simple case: one conduit crosses another
 1. Select the conduit to modify (the one below).
 2. Select the boundary conduit (the one above).
 - Other cases (coloured red)
 1. Select the conduit to modify (the one below).
 2. Confirm (to alter the selected entity).
 3. Point at the 1st and 2nd intersection.



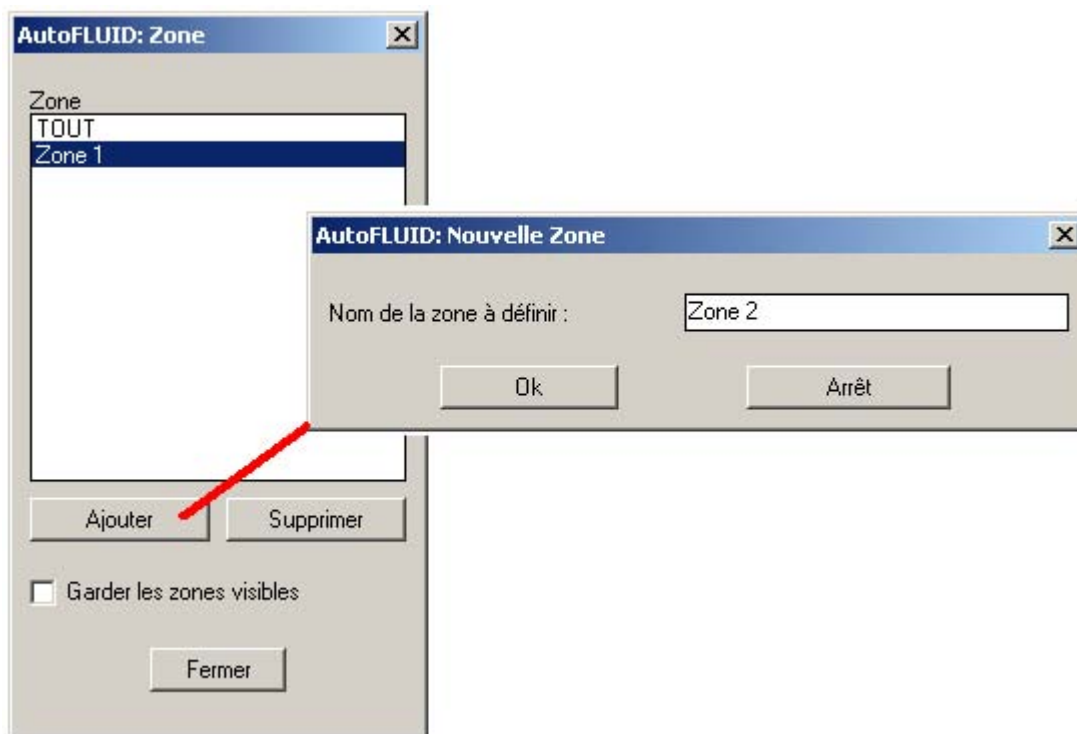
Crossings

Defining Zones

Zones are used for network bills and equipment bills.
Bills can be based on layers (frozen or not) and zones.



To create a zone:

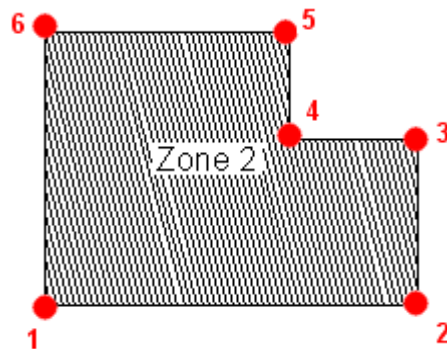


Once the new zone is named, select the points tagging the outline of this zone.

If the last point clicked is different to the first, then the zone will close automatically.



Zones



Network Bills



The principle:

Objects drawn on frozen layers won't be taken into account.

You can create a bill based on zones or networks (via layers).

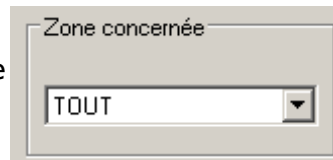
Once the drawing is complete you can create a table listing all the different objects created in the "Modelspace".

Click on 

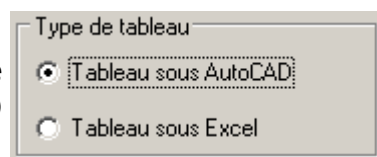
Tick



Choose the appropriate zone



Then choose the type of table
(in the presentation field in AutoCAD or in Excel)



Click OK and place the table.

The table will not update automatically if you make additional modifications to your drawing. If you have made further changes to your drawing then you should delete the table and create a new one after the changes are made.



Network bills

Equipment bills

The principle:

To create an equipment bill (registers, valves, dampers, etc.) you must tag the equipment first. In order to do this you need to use assigned blocks.

A few ready-made assigned blocks come with AutoFLUID. You can use them as they are or use them as a basis to create new ones.

To tag equipment while drawing you must assign blocks to equipment pieces

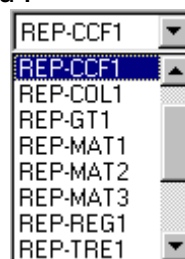


Gestion des blocs attribués



Tags

Select the assigned block with which to tag the equipment, using the drop down menu :



If the box ☒ is ticked, then the tag will be inserted whilst the equipment is added to the drawing.

The button  lets you insert blocks once the equipment has been added to the drawing

When the equipment has been tagged it can be listed into a table.



Export vers Excel ou AutoCAD



Equipment bills

Tick the equipment you wish to list.

Choose the zone affected and the type of table.

Then click OK and place your table.

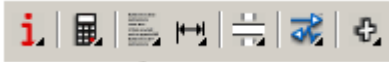
Objects drawn onto a frozen layer will not be taken into account.

Therefore you can create a bill according to zones and networks (via layers).

The table will not automatically update with new changes to your drawing.

If you have to make amends to your drawing, delete the existing table and create a new one.

Text



Select the relevant entity (in this example a circular duct)

The dialogue box below opens. It is pre-populated with the information already available.

Choose texts to write

- Tick the box beside the text you would like to include

Choose the text appearance

- Height and justification
- Type of frame
- Type of leader line
- Number of lines

Choose options of presentation

- Text only
- Framed title
- Underlined text with leader line
- Framed text with leader line



Text

THINGS TO KNOW

When calculating one level in relation to another level and according to the pipe size, check the level's unit in the preferences panel (calculation variables) to ensure the calculation is right.

Types of default values and values that can be changed in the preferences panel (or by clicking

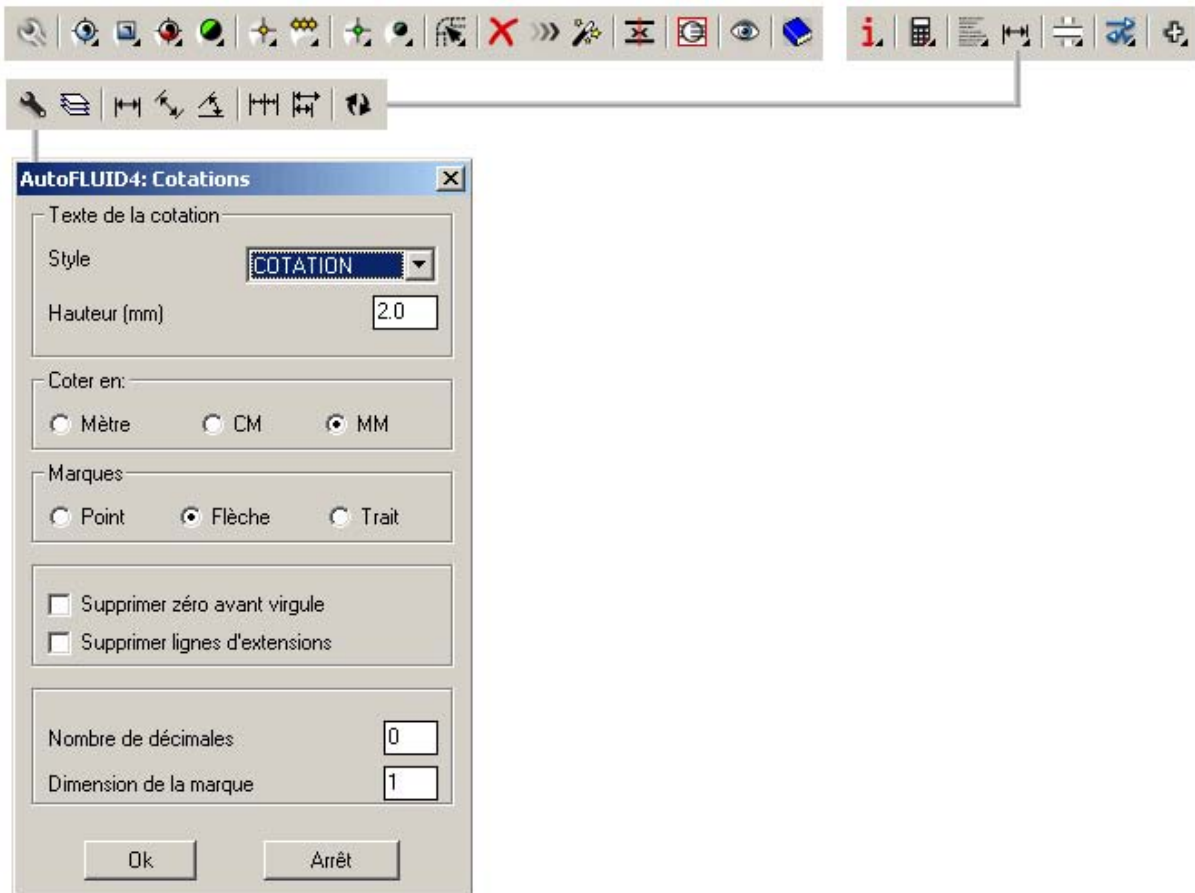
) :

- Text style
- Type of text (simple or paragraph)
- Height and justification
- Pipe size format
- Prefixes and suffixes
- Type of frame



Text variables

Dimensioning



AutoFLUID is compatible with most of AutoCAD's dimensioning variables.

The following variables can be changed:

- Style of dimensioning text
- Height of text
- Unit of dimensioning text
- Appearance of tags
- The dimensions of tags
- The zero before a decimal point
- The display of extension lines

N.B.

To add a new style to the list simply creates a new style with the command "style" in autoCAD. (Height must be 0).

The height of the text will stay the same on screen as on the printed drawing since it is related to the unit and the scale of the drawing.

Modification commands

The MODIFY command



- To swap one object with another
- Changing pipe sizes
 - On a duct
 - On a part
- Modify texts
 - Change text with automatic update of the frame and/or the leader line
 - Move text with automatic update of the leader line
 - Move a leader line

DELETE command



- Deletes an object (elbow, conduit or valve) and adjusts surrounding graphics

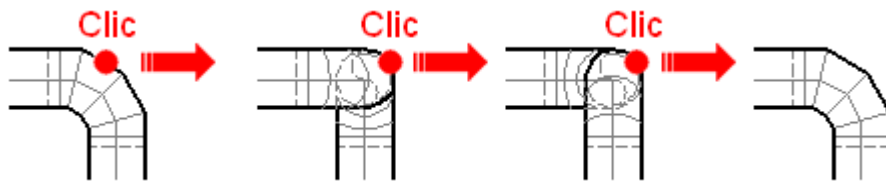
MOVE command



- Moves an object on a conduit (valve, reducer, insulation...) and adjusts surrounding graphics
- Moves a conduit between two objects and adjusts surrounding graphics

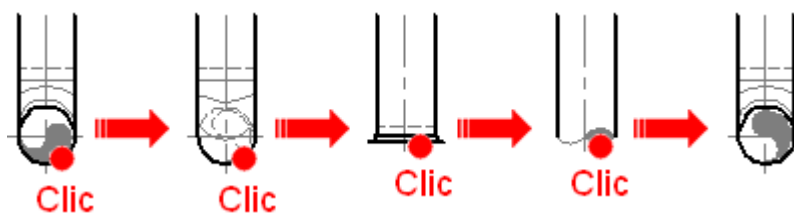


Swap one object with another



Click on :	It will change into:
An elbow	A descent
A descent	An ascent
An ascent	An elbow

Other examples



Click on :	It will change into:
An elbow going upward	An elbow going downward
A elbow going downward	A cap
A cap	An end
An end	An elbow going upward

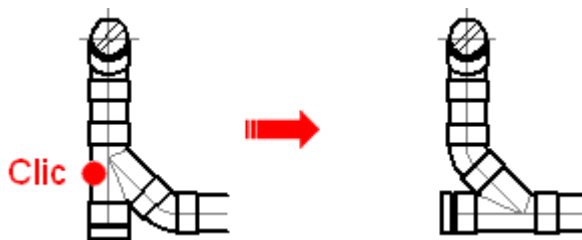
This command works on a wide range of AutoFLUID objects and on all types of routing commands (circular, rectangular, tube, drain, as well as single line drawings).

It operates in two ways:

In loop or via drop down menus



In this particular case the tee has a wrong angle. Simply click on it to change its direction.



Another example



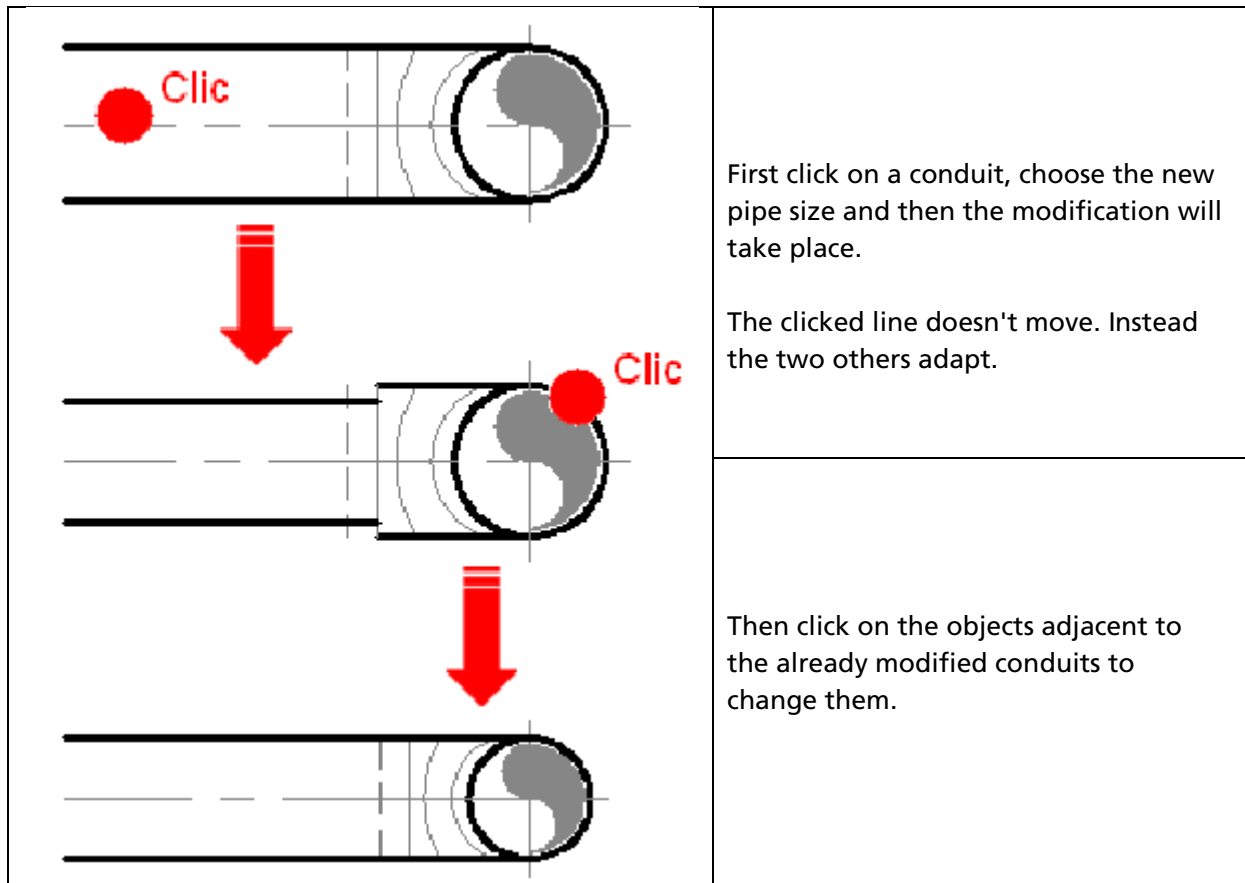
Modify 1



Modify pipe sizes

Change a pipe sizes directly on the conduit. The parts will then adapt to it.

It is not possible to change the pipe size of a part directly without changing the size of the conduit.



Modify 2



Modify text

Depending on where you click, suitable actions will be triggered.

	Amend the text with the modify command in AutoCAD then adjust the frame and the leader line.
	Vertical edge of the frame. Lets you drag the whole. (Text, frame, leader line).
	Horizontal edge of the frame. Lets you drag the text and frame. The leader line adjusts automatically.
	Lets you move the start of the leader line without changing the other segments.
	Lets you move the intersection of the two segments of the leader line without changing neither the start nor the tip.
	Allows you to move the tip of the leader line without changing the other segments.



Modify 3

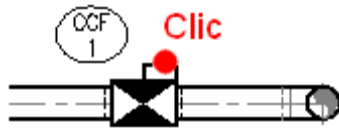


Deleting an object

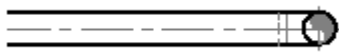
Allows you to delete an **AutoFLUID** object by clicking on just one of the entities that forms the object. Depending on the case the object will update.

With update:

Before



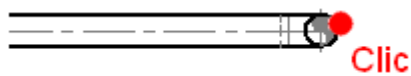
After



Erases all the entities of the valve and then closes the conduit.

Without update:

Before



After

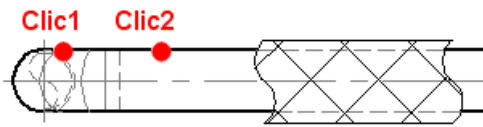


Delete

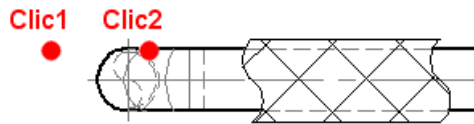


Move an object on a conduit

Before

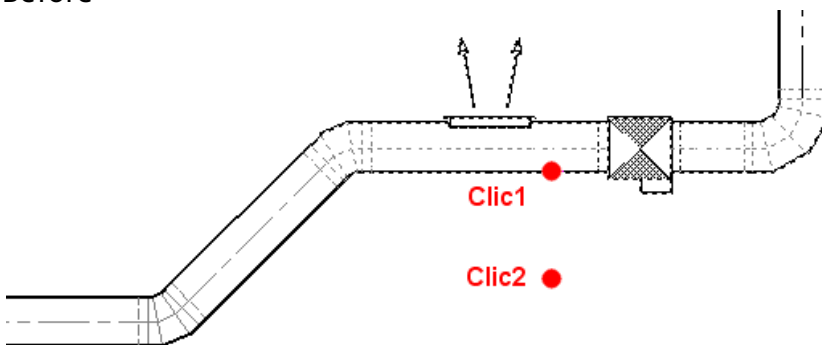


After

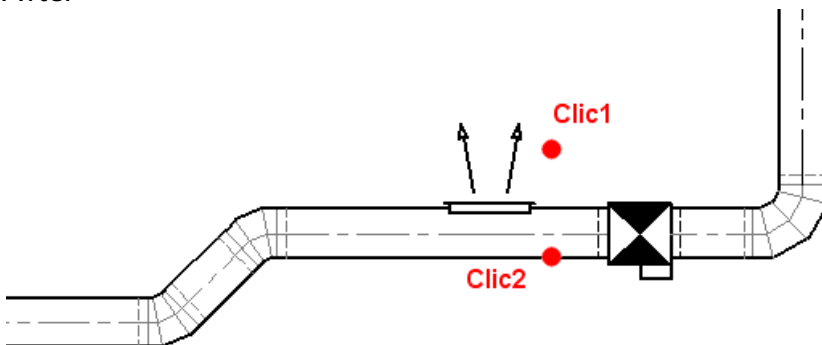


Move a conduit between two objects

Before

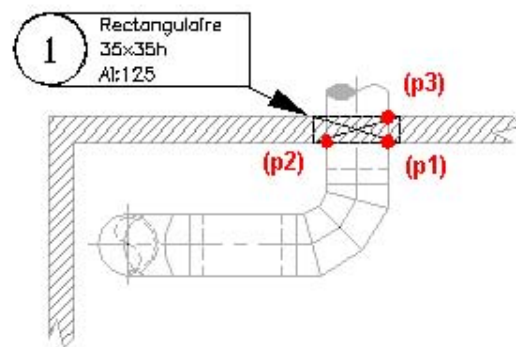
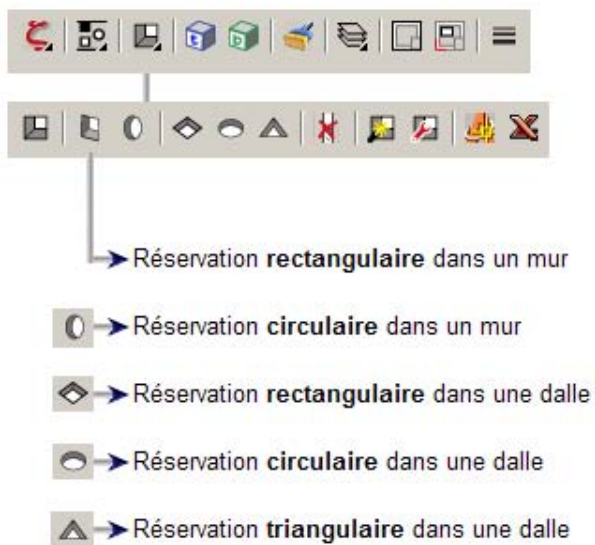


After



Move

Openings (with networks)



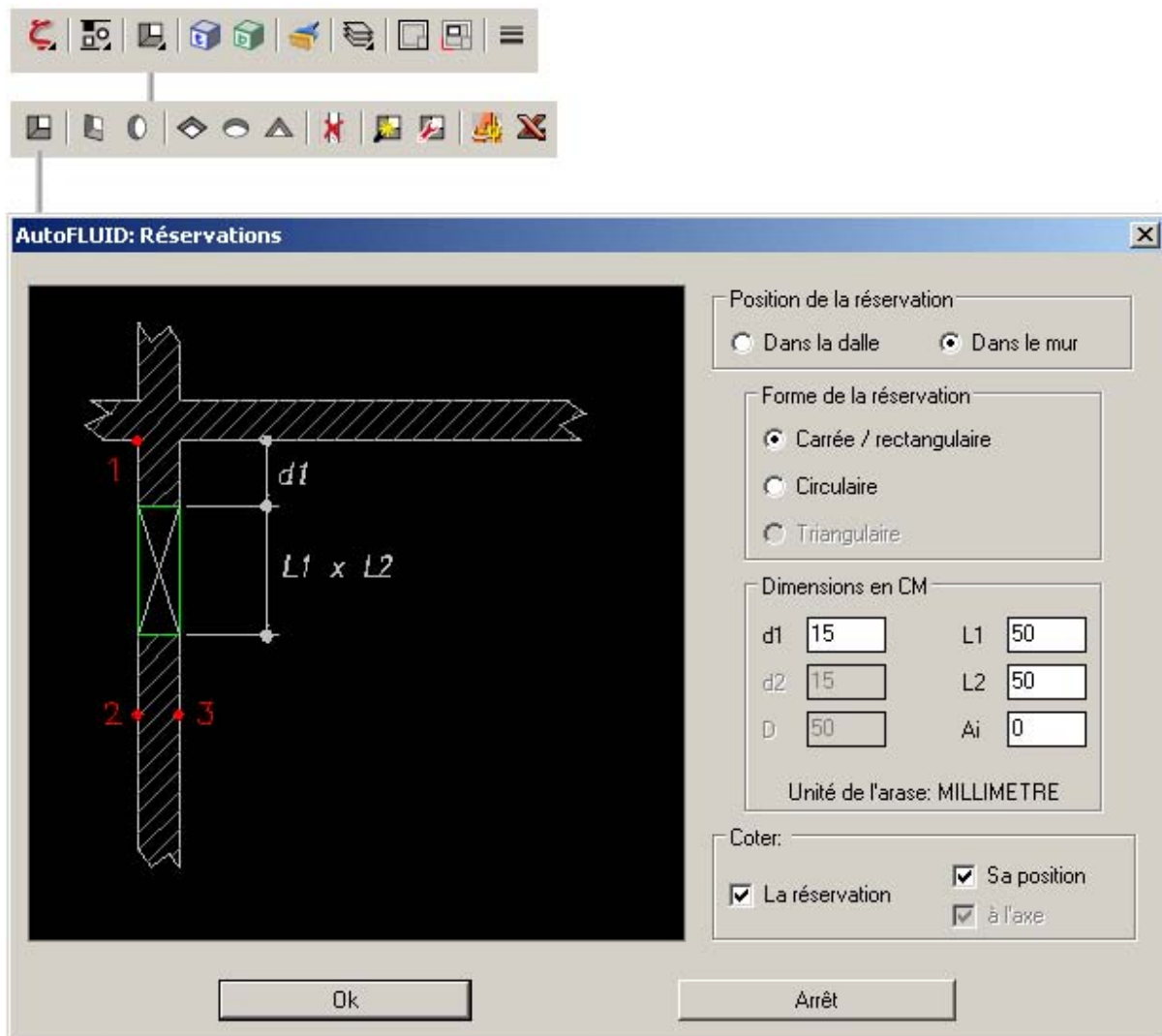
First define the distance between the conduit and the edge of the opening (in the preferences panel). Then simply select 3 points that belong to the conduit and the wall for the command to calculate the dimensions of the opening draw it and tag it.

Tagging allows you to list the openings in an Excel or AutoCAD table.



Openings with networks

Openings (without networks)



This opening is drafted and tagged like openings with networks. Tagging allows you to list the openings in an Excel or AutoCAD table.



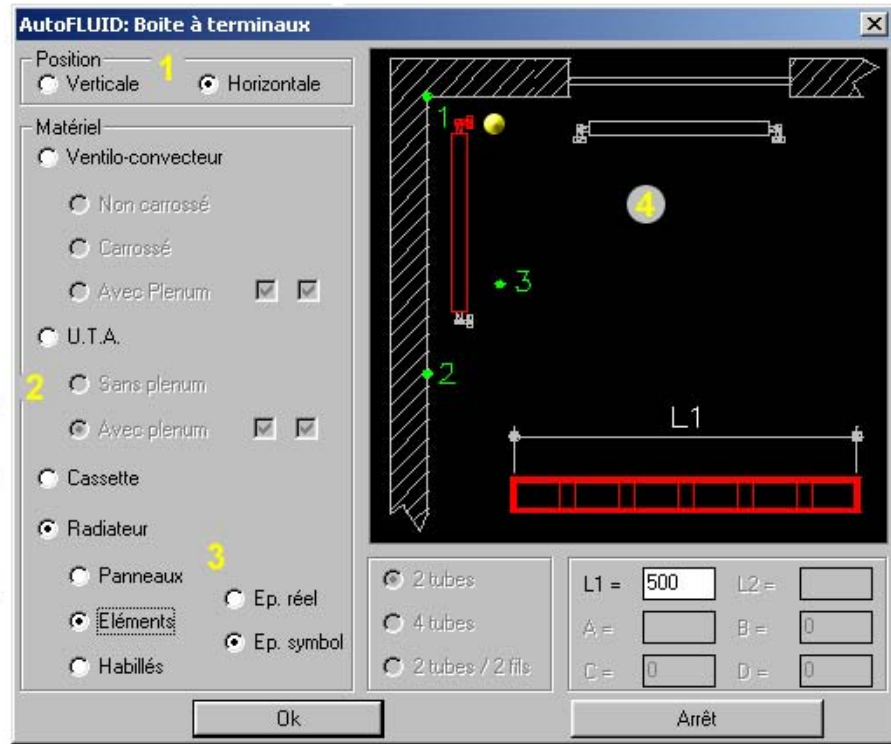
Openings without networks

Terminals



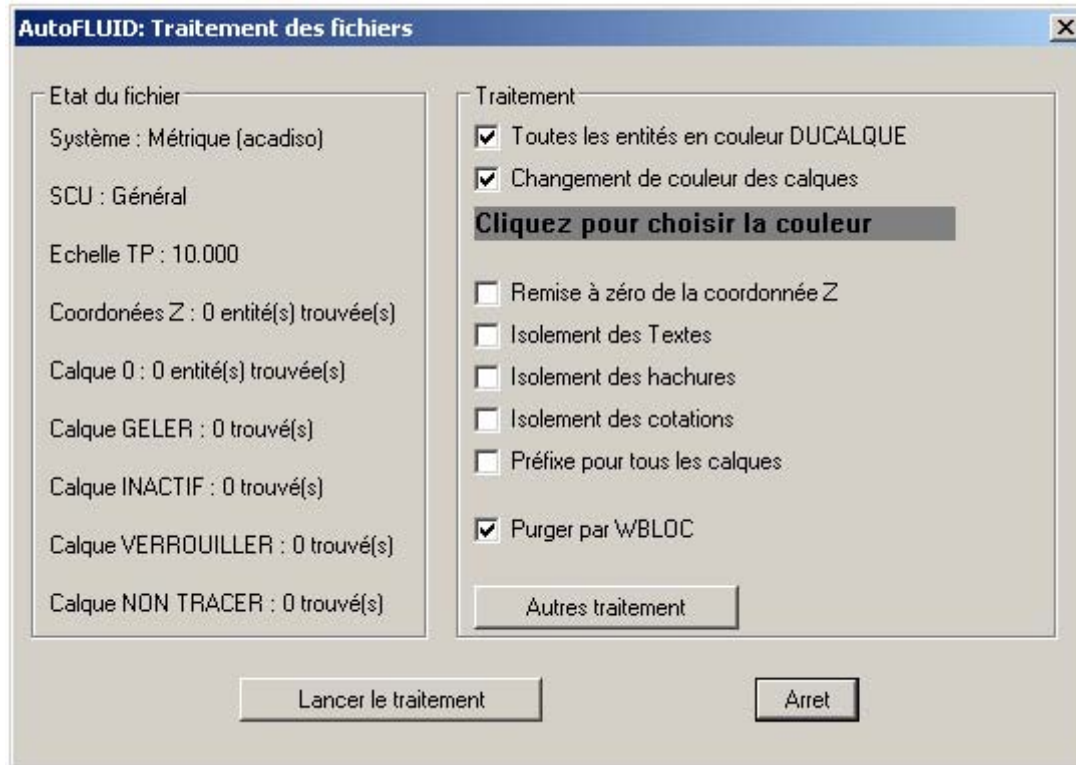
Après avoir indiqué le matériel, sa position, et ses dimensions;

cliquez sur l'image pour positionner le robinet ce qui indiquera du même coup la position de l'objet (centré entre 2 points ou dans un angle) et vous guidera sur les 3 points à cliquer.



Terminals

Treatment of architectural files



This module allows you to amend the structure of a file.

It is possible to change colours, to handle the Z coordinate of entities, to isolate texts, hatches, dimensioning, etc.

Example :

File to work on: c:\archi\niveau3.dwg



File Treatment

Operation :

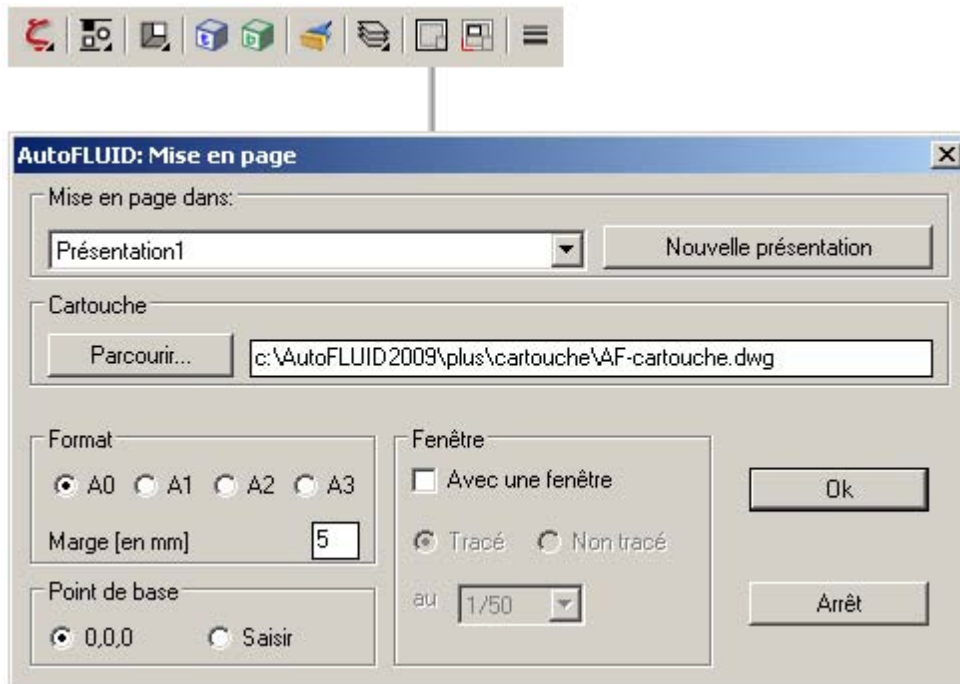
1. Open the file to treat. "c:\archi\level3.dwg " (It will not be modified.)
2. Launch the command
3. Choose options
4. Launch treatment

AutoFLUID 2009 will create a directory c:\archi\treated by autofluid.

At the end of the operation:

- The file "c:\archi\treated by autofluid\level3.dwg" will open
- The original file "c:\archi\level3.dwg" stays open. (You can quit without saving.)

Layout



Choose a presentation or create a new one.

Choose a format.

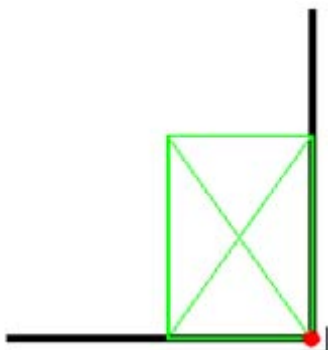
Choose "to print" "or not print" the window (on a layer that won't print).

You can create a quick layout with the following settings:

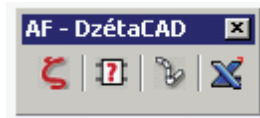
- double frame
- window (automatic scaling)
- title block (if the name is specified)

N.B. The title block has to be made as a block.

The **bottom right hand corner** of the outer frame of the title block must have the coordinates (0,0). This point will overlap the bottom right hand corner of the inner frame of the page.



Calculation of pressure drops in a network



Working principles of DzétaCAD.

4 steps are needed :



General principle



Annotate the tees, grids ...



Limits of the software
(tips to get round them)

1. Check the connections

- 1.1. Save your file under a new name
- 1.2. Isolate the network that you would like to compute
- 1.3. Check the connections
 - 1.3.1. Check the conduits (colored white). If they appear in red then re-build them.
 - 1.3.2. Rebuild the conduits that might have been cut for display reasons.
 - 1.3.3. Delete flocking and insulation.

2. Annotate the network

After having drafted the network you must add any missing information:

2.1. Flow rate

Click on any element of a branch (duct, elbow,...).
BEFORE clicking on an intersection (tee, cross, wye) all adjacent branches must be informed.

2.2. Flow direction

In intersections
in reductions, transformations

2.3. Vertical duct lengths

For descents, through floors, or in topside and underside connections.

2.4. The manufacturer data for the equipment

Valves, dampers ...

3. Describe the parts of the network to compute

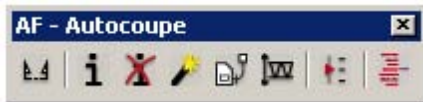
Select the network branch by branch from the terminal to the source or in the opposite direction.
A check up table lets you highlight any missing part in the previous step.
You can name your network in this table.
The described network will be redrawn in a presentation of the same name.

4. Exporting to Excel

Export the calculations to Excel from the presentation.
If Excel requests that you activate macros when it starts automatically, please do so.
The macro will run an automatic formatting of the table.
You will then be able to edit all the parts of this file as if you had created it yourself.



Creating a cross section



Four steps are necessary to draw a cross section from a plan view:

1. Place the cutting plane
2. Annotate the cutting plane
3. Annotate the elements of the plan view
4. Build and place the cross section

STEP 1



This is the line (linking the 2 arrows) which contains all the information in Step 2.
The length of this line defines the length of the cross section.



STEP 2



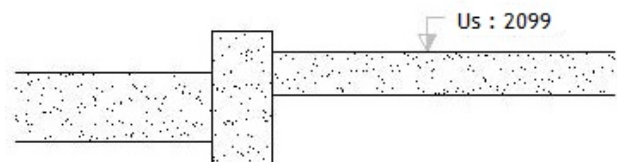
→ In this dialog box you will set the horizontal elements of your background :

- The upper slab
- The false ceiling
- The technical floor
- The lower slab

Levels and thicknesses have to be set for each object.

If there are several levels, define the most common one.

The setting can be refined afterwards.



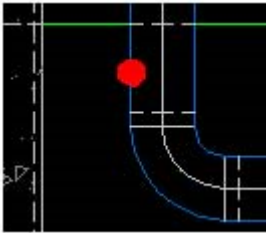
STEP 3



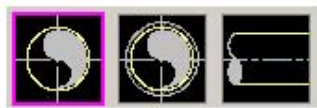
In this dialog box you will define each object's size and position by selecting only one part of this object.

Example on a circular duct

Click on one of the three lines



Choose the corresponding image



Set the size

Click on one of the grey dots:

it will turn red

The dot shows two elements:

1. The line you have selected
2. The level you will have to specify

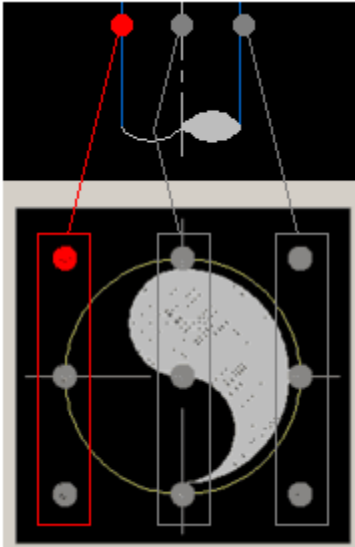
Set the level

Choose the texts to write

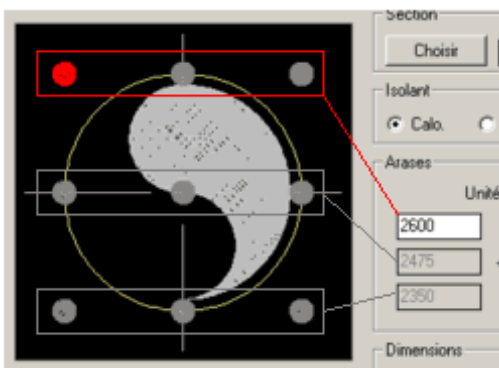
Repeat these operations for each object that should appear in the cross-sectional view.

Principle of the red dot.

It shows the positioning.



It shows the level you wish to specify.



STEP 4

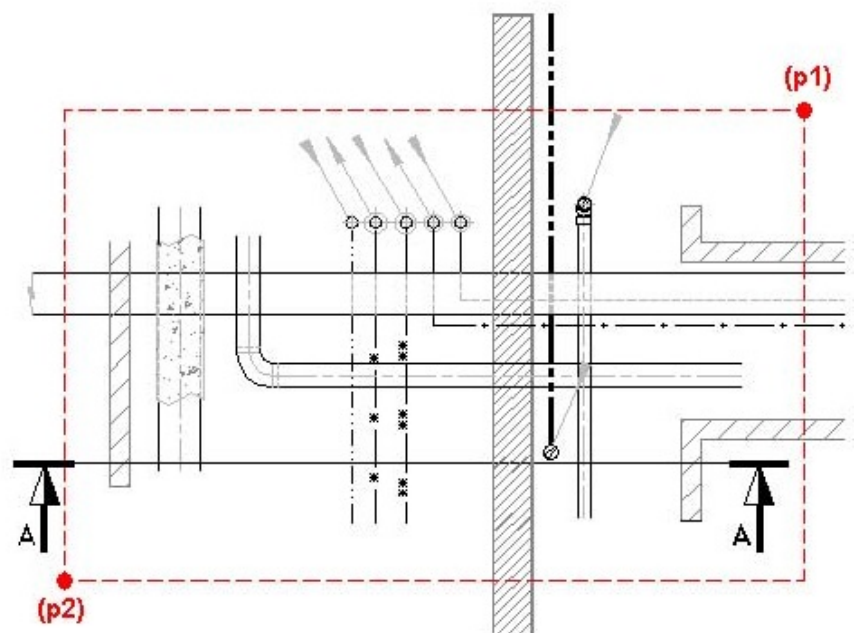


To build the section: make a simple capture of the predefined elements and of the section line's letter. You can verify the objects' lateral position by hovering your mouse over the top view.

→ (p1)

→ (p2) To get this overview of your cross section, slowly hover your mouse from top to bottom, and vice versa.

→ (p3) or **Enter** and the cross section will disappear.



A cross section **block** is created. It is named **AF-COUPÉ-A**.

You can then zoom on the plan zone dedicated to cross-sectional views,

And use this command →  to position the cross-section drawing.

End of the command.

WARNING: You must only select the elements of section A. It may happen that an element from section B is in your selection field: do not select it.