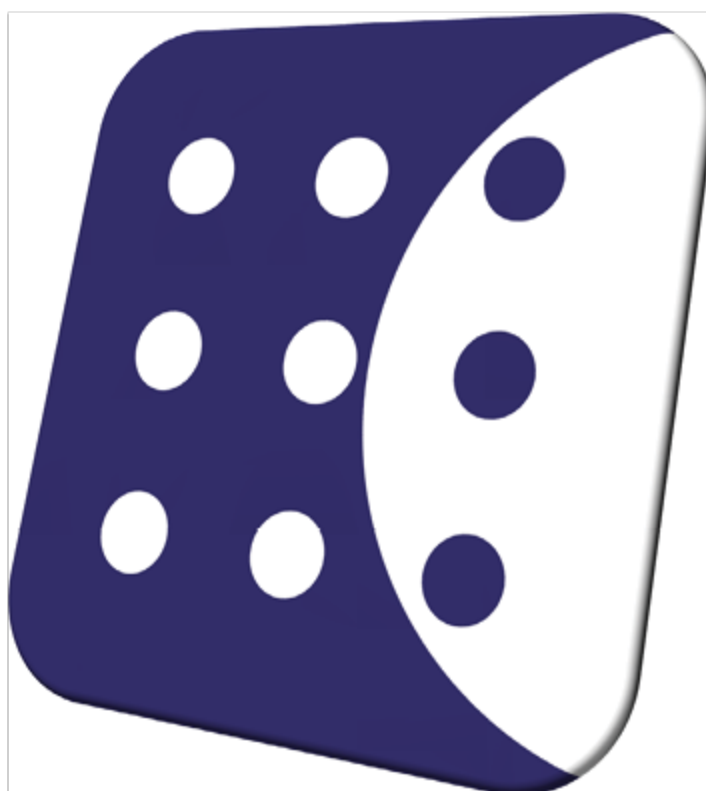


TA Select 4

User Manual

EN

February 2013



Pressurisation & Water Quality › Balancing & Control › Thermostatic Control

ENGINEERING ADVANTAGE

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What's New

January 2013

New Features

- › Support of both **direct return** and **reverse return** circuits to integrate existing older reverse return circuits.
See [Hydronic Circuit Description](#).
- › Optional addition of a **diversity factor** on the selected part of the plant to optimise and lower the requirements. *TA Select 4* takes into account the practical fact that the installation is never required to work at full load.
See [Diversity Factor](#).
- › New **injection circuit** configurations to include circuits integrating pump and mixer.
See [Hydronic Circuit Description](#).
- › Optional insertion of **pending circuits** in the plant to take into account future plant extensions.
See [Hydronic Circuit Description](#).
- › Support of new **TA Fusion** components. Direct access to the **User Manual** from the software interface.
See [Individual Selection](#) and [TA Fusion](#).

Enhanced Features

- › New organization of the **advanced technical parameters** to clearly separate general purpose and hydronic calculation related parameters.
See [Advanced Technical Parameters](#).
- › Direct access to the **User Manual** from the software interface.
See [The Information Group](#)

1. Introduction

TA Hydronics

TA Hydronics is the leading global provider and expert in hydronic distribution systems and room temperature control, with experience in more than 100,000 projects worldwide.

TA Select 4

TA Select 4 is a computer program that helps you to control your hydronic system from design stage throughout the building's lifetime.

It makes it easy to determine the right valve size, pre-setting values and several other characteristics of your plant circuits. And, together with our balancing instrument TA-SCOPE, it helps you to obtain *the most economical hydronic design*.

2. How to Use this Manual

This *TA Select 4* User Manual is organized around the main operations you need to perform.

So if you want to know...

› **How to select individual products:**

- Go to the [Individual Selection](#) chapter.
- Read the [How to Select a Valve](#) topic that presents the different steps to follow.

› **How to calculate a complete hydronic project:**

- Go to the [Hydronic Project Calculation](#) chapter.
- Read the [Hydronic Circuit Description](#) topic that explains the principles used for the project entry, if this is your first project.
- Read the [How to Calculate a Hydronic Project](#) topic that presents the different steps to follow.

› **How to connect to your TA-SCOPE or your TA-CBI:**

- Go to the [TA-SCOPE and TA-CBI Communication](#) chapter.

› **How to process your logged data:**

- Go to the [Logged Data Processing](#) chapter.

In addition to these main operations, if you want to know further ...

› **How to edit and output your results:**

- Go to the [Results Management](#) chapter.
- Read the [Selection Results Edition](#) topic to edit your results.
- Read the [Results Output](#) topic to export or print your results.

› **How to configure your system:**

- Go to the [System Configuration](#) chapter for advance configuration of your system.

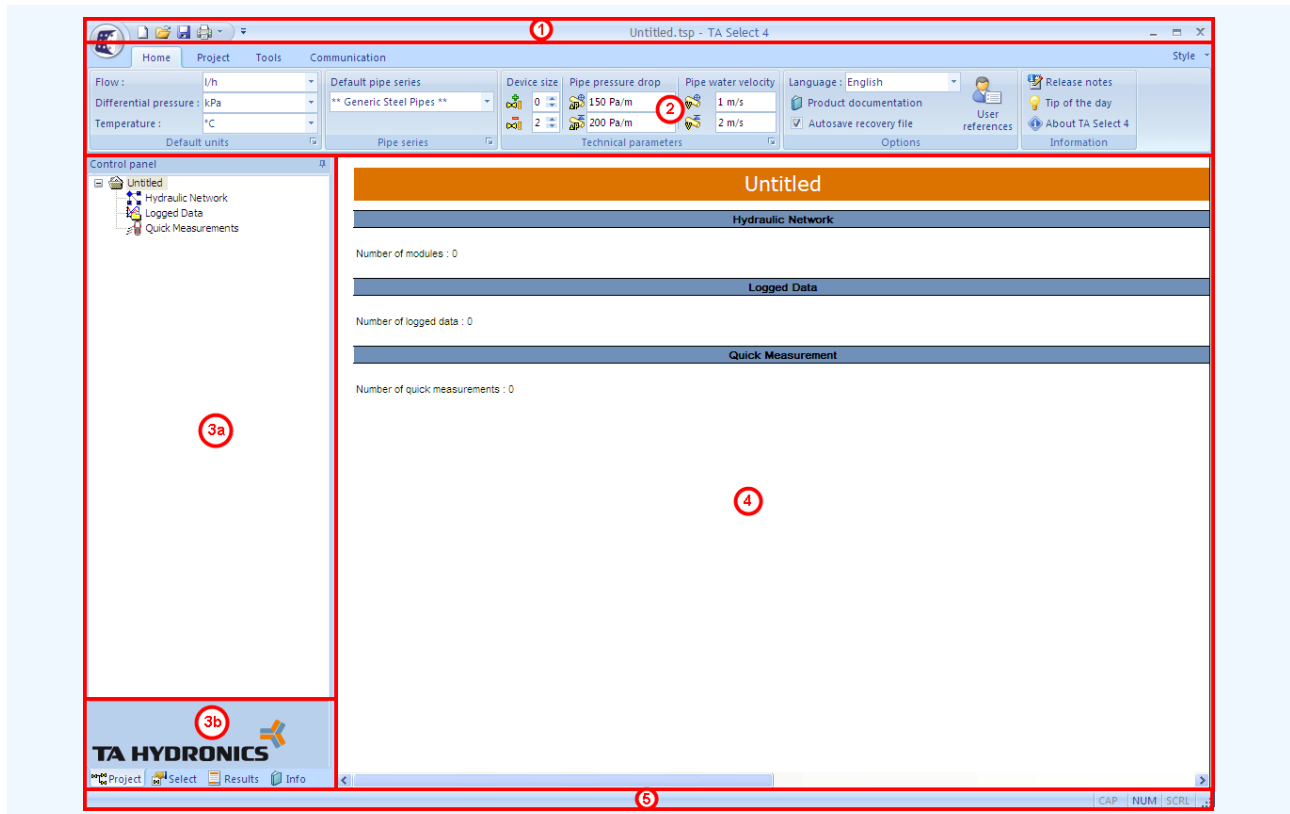
› **How to calculate or convert your hydronic data:**

- Go to the [Additional Tools](#) chapter.
- Look for the tool that will perform your calculation or conversion among the different available tools.

3. Software Interface

3.1. Interface Overview

TA Select 4 is a software developed by **TA Hydronics**. Its main interface is illustrated hereunder.



TA Select 4 main interface

The interface can be divided in five parts:

1. The top menu bar
2. The ribbon
3. The control panel (a) and its bottom menu (b)
4. The main window
5. The status bar

The Top Menu Bar

This menu bar displays the project files name (tsp format file) and the usual quick buttons to create a new project, to open an existing project, to save the current project, to print the document and to manage the window size (minimise, maximise and close buttons).

The application button opens the application menu which allows the same operations as the quick buttons and also to import or export data.

The Ribbon

This part of the interface is composed of several tabs whose number depends on what task you are performing.

There are four standard tabs: **Home**, **Project**, **Tools** and **Communication**.

This part of the interface is described in details in [The Ribbon Tabs](#) section.

The Control Panel

This part of the interface display depends on the tab selected in the bottom menu.

The bottom menu allows the selection between four tabs:

- › The **Project** tab is the default tab and is the place where data transferred to and/or from TA CBI or TA-SCOPE are structured. It is described in the [Hydronic Project Calculation](#) chapter.
- › The **Select** tab allows the input of the selection parameters for individual product selection. It is described in the [Individual Selection](#) chapter.
- › The **Results** tab allows the specification of the document layout preferences. It is described in the [Selection Results Management](#) chapter.
- › The **Information** tab displays the product documentation table of content and allows browsing through the documentation. It is described in the [Catalogue](#) section.

The Main Window

This part of the interface display depends what task you are performing and on the tab selected in the control panel bottom menu.

The information displayed can be the data, the results of product selection, the hydraulic network, the documentation,...

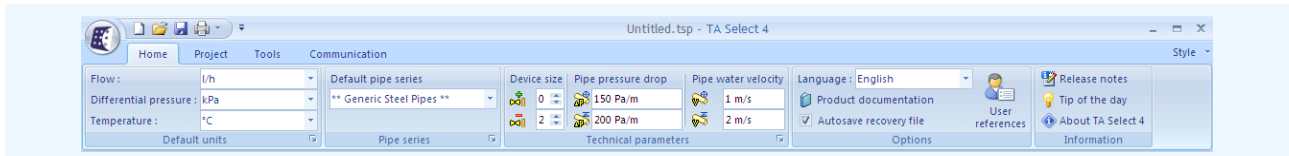
The Status Bar

This part of the interface displays in its left part the task status and short information from menu selection and its right part the keyboards indicators (CAP for Cap Lock / Shift Lock , NUM for Num Lock) and SCRL for Scroll Lock).

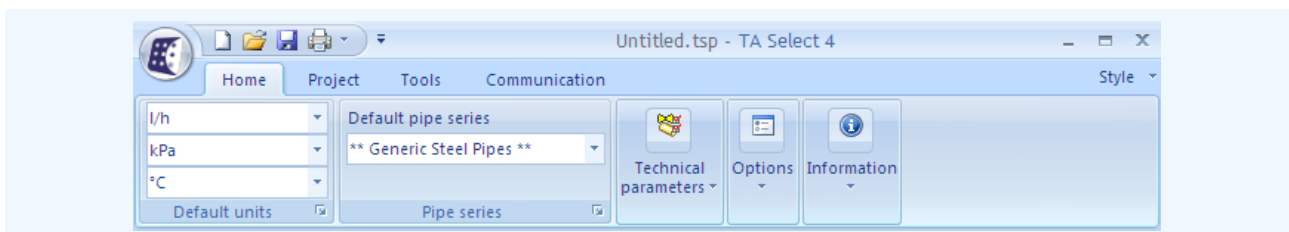
3.2. Interface Management

The Ribbon

The display of the ribbon can change depending on the size of your application window. The whole ribbon and a shortened ribbon are illustrated hereunder.

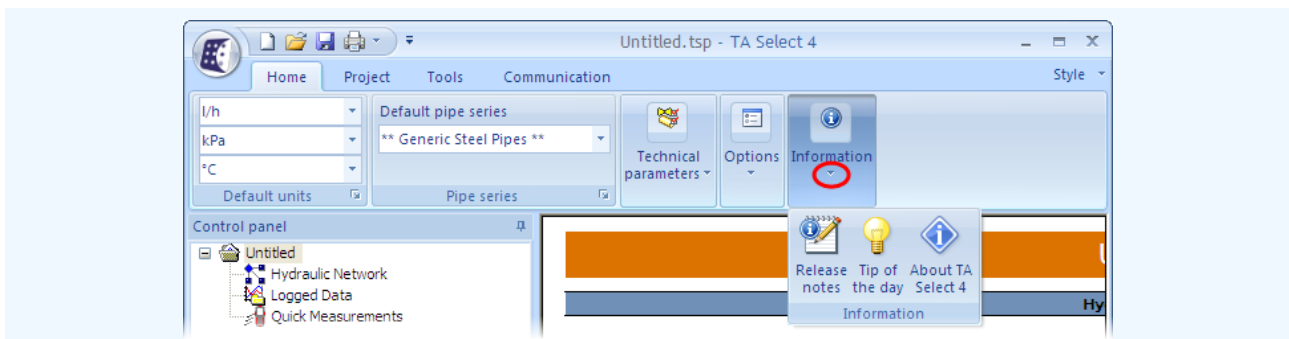


Interface management - Whole ribbon



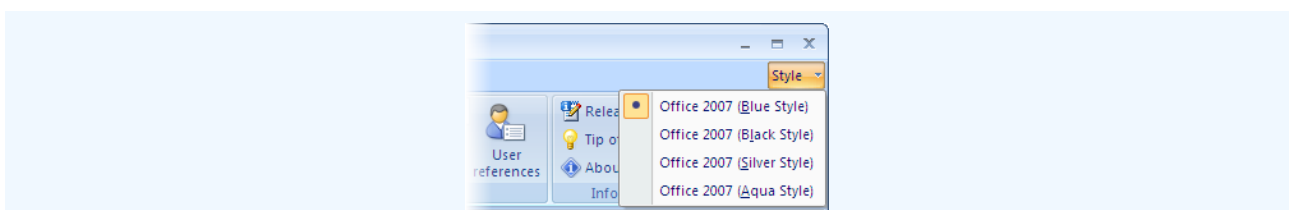
Interface management - Shortened ribbon

In a shortened ribbon you can always access to the whole content of the menus by clicking on the arrow located at their bottom as illustrated below.



Interface management - Shortened ribbon - Extended display

The Style menu on the right side of the ribbon allows you to modify the visual style of the application by selecting one of the Office 2007 themes.

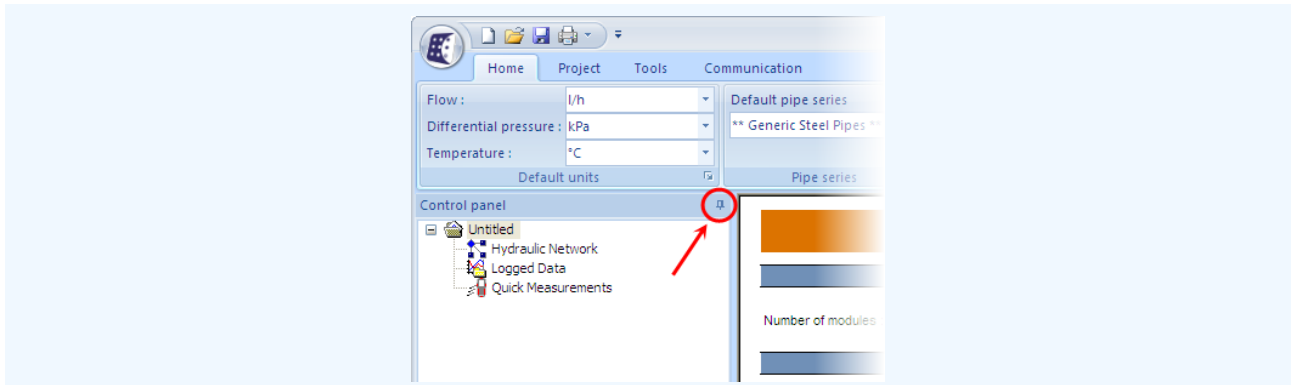


Interface management - Style selection

The Control Panel

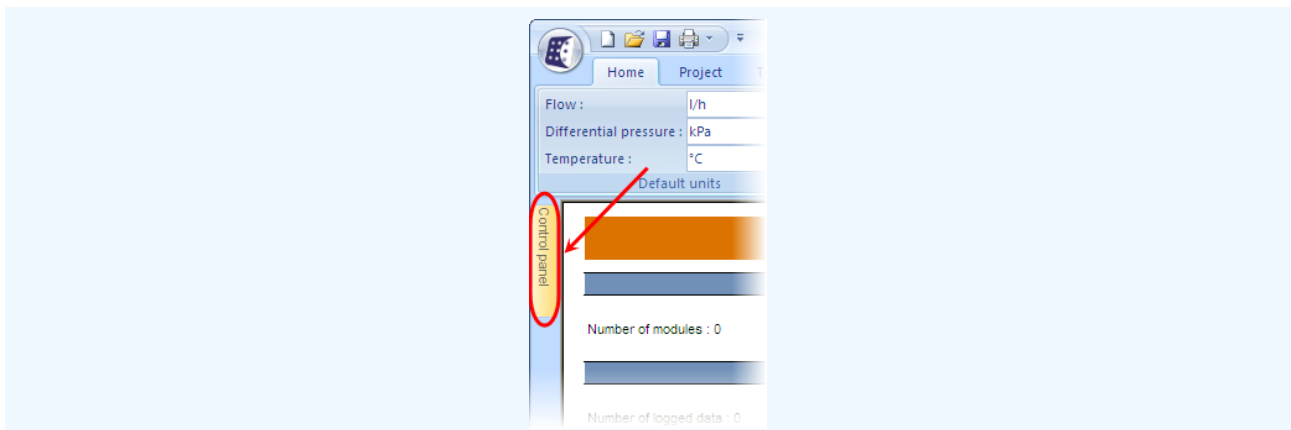
You can hide the **Control Panel** by clicking on the pin located in its top right corner as illustrated below.

 By default the **Control Panel** is in "always show" mode.



Interface Management - Control Panel - "Always show" mode

The **Control Panel** is then in "auto hide" mode and appears as a vertical tab to the left of the interface when not used.



Interface Management - Control Panel - "Auto hide" mode

When the **Control Panel** is in "auto hide" mode, you can make it appear again by moving the mouse over the vertical tab. The **Control Panel** will then be displayed, will allow to use it and will hide again when you move the mouse to another area of the interface.

To bring the Control Panel back to the "always show" mode, you have to click on the pin located in its top right corner.

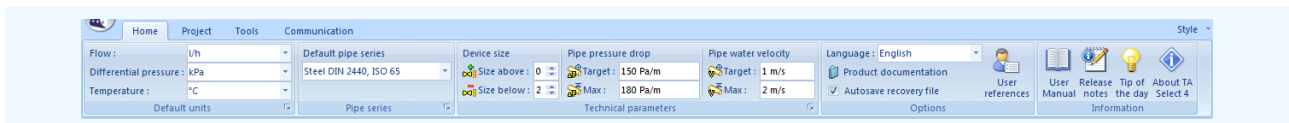
 The pin is vertical () when the **Control Panel** is in always show mode and horizontal () when in auto hide mode.

3.3. The Ribbon Tabs

The ribbon is composed of several tabs whose number depends on what task you are performing.

- › There are four standard tabs: **Home**, **Project**, **Tools** and **Communication** described hereunder.
- › The **Style** menu is explained in the [Interface Management](#) section.

The Home tab



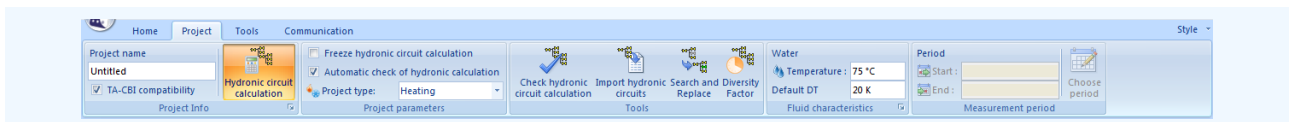
The ribbon - Home tab

The tab is divided in the following five parts:

1. [The Default Units Group](#)
2. [The Pipe Series Group](#)
3. [The Technical Parameters Group](#)
4. [The Options Group](#)
5. [The Information Group](#)

The Project tab

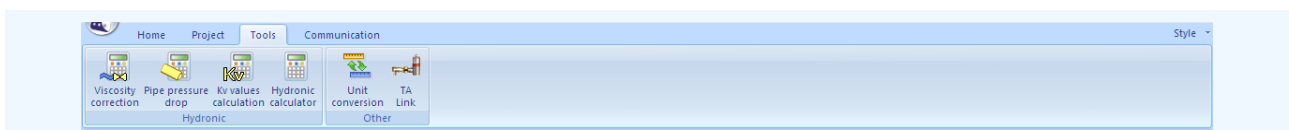
The **Project** tab is illustrated hereunder and its use is detailed in [Hydronic Project Calculation](#).



The ribbon - Project tab

The Tools tab

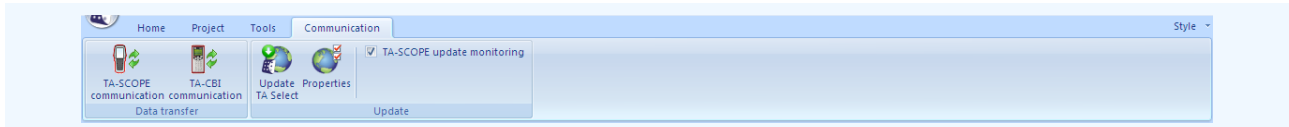
The **Tools** tab is illustrated hereunder and its use is detailed in [Additional Tools](#).



The ribbon - Tools tab

The Communication tab

The **Communication** tab is illustrated hereunder and its use is detailed in [TA Scope Communication](#).



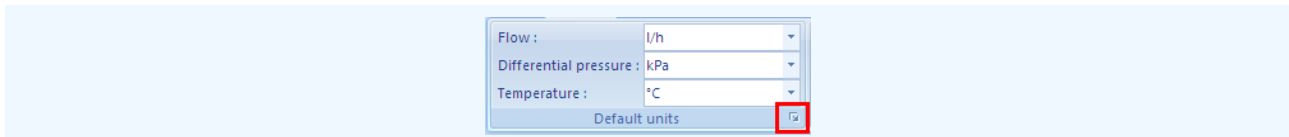
The ribbon - **Communication** tab

3.4. The Home Tab

3.4.1. The Default Units Group

This group is part of the **Home** tab and allows you to select the defaults units for the application.

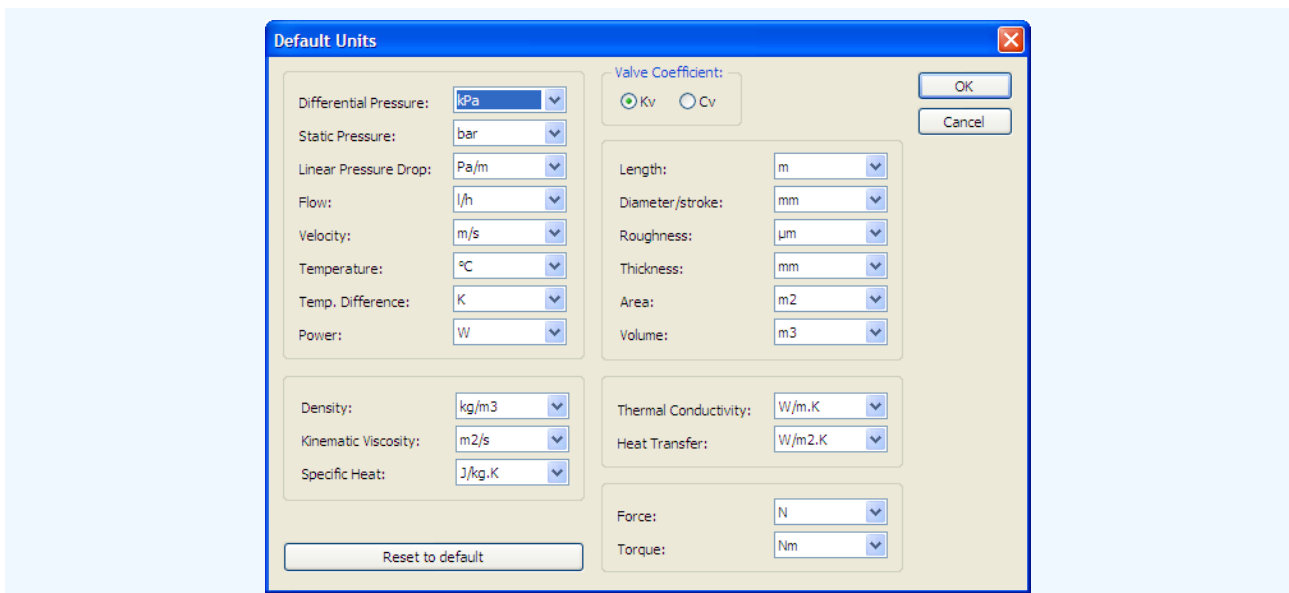
Both the SI units and the imperial units are available.



The ribbon - **Home** tab - **Default units** group

You can select the desire units for **Flow**, **Differential pressure** and **Temperature** by navigating in the drop-down combo boxes. If you wants to see or modify other type of units, click on the small arrow at the right bottom to display the window with all the available types of units as illustrated below.

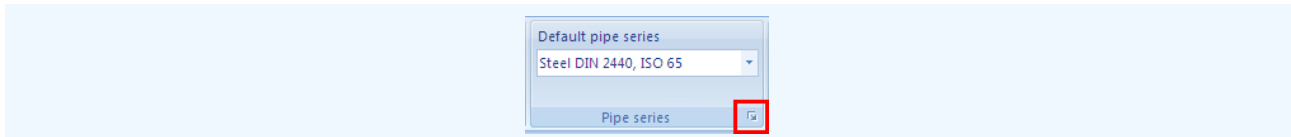
The defaults units used in your software depends on the localized version of TA Select 4 you are using.



The international version **Defaults units** window

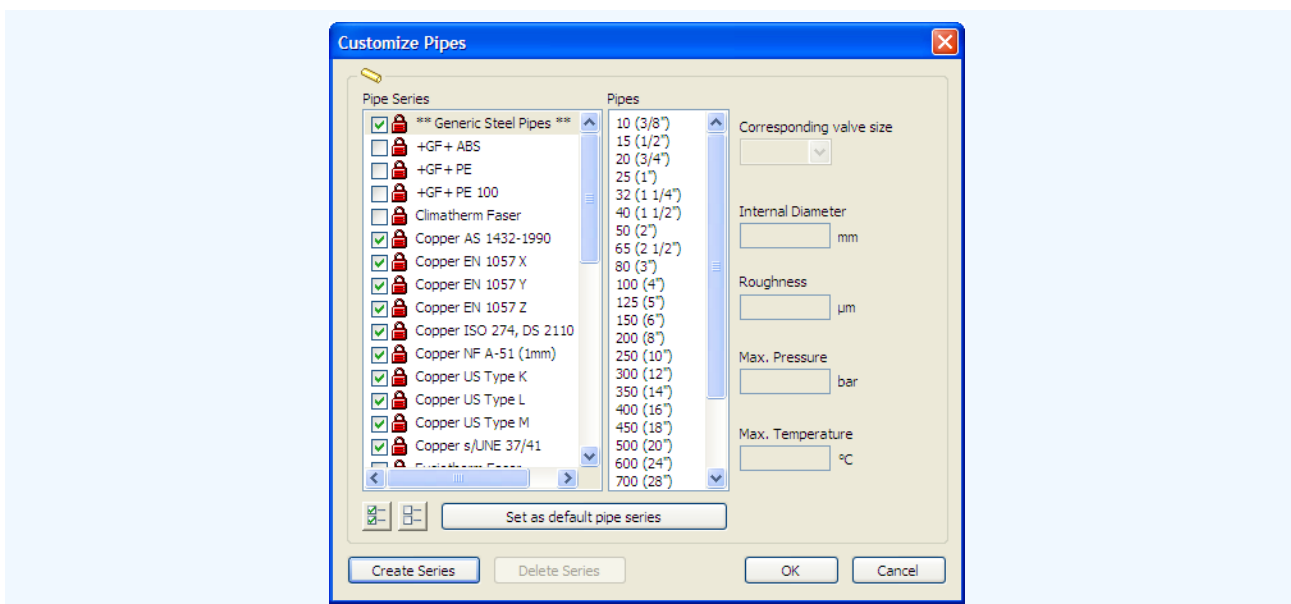
3.4.2. The Pipe Series Group

This group is part of the **Home** tab and allows you to select the pipe series used by default for individual selection and for hydronic circuit calculation.



*The ribbon - **Home** tab - **Pipe series** group*

If you want to access a more complete list of pipe types and sizes along with corresponding specifications, click on the small arrow at the right bottom to display the window illustrated below.



***Customize pipes** window*

The **Customize Pipes** window displays all pipe types available in the system database. The pipe type and size selected will lead to pipe pressure drop calculations relevant to system operation. In this window the user can select the common pipes to be quickly selected from the **Pipe series** group.

The different pipe series listed have the icons  or  in front of their name to show if they are respectively locked or unlocked. All locked pipes are part of **TA Select 4** initial database and can never be deleted nor modified. All unlocked pipes are user input pipes that can be deleted at any time if it's not used in an opened project.

This window contains the following buttons and fields:

- › The button  allows to select all the pipe series with one click while the  button allows to unselect all the pipe series.
- › The **Set as default pipe series** button allows you to set the selected pipe series as default. The result is the same as selecting the default pipe directly in the **Pipe series** group.

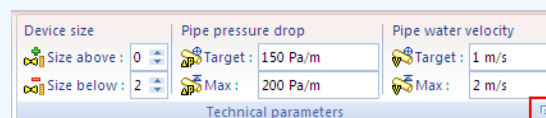
- The **Create series** button allows you to create a new series if the required pipe of the system is not available in *TA Select 4*. Left-click once on the new pipe series name in order to rename it.

When you select a pipe amongst the pipes list of an user input pipe series, the **Create series** button becomes **Create pipe** and allows you to create a new pipe in the pipe series. Left-click once on the new pipe name in order to rename it.

When creating a new pipe, you can input relevant specifications to pipe pressure drop:

- Corresponding valve size:** designer can input nominal valve size related to pipe specifications. *TA Select 4* allows Device size, in the Technical Parameters group, to be made greater than or less than piping diameter depending on allowance of design engineer.
 - Internal diameter:** the measured inside diameter of the pipe. It will give a basis for pipe pressure drop calculations.
 - Roughness:** the roughness of the pipe affects the pipe pressure drop, so it also must be defined.
 - Max. Pressure:** in order for *TA Select 4* to make a proper pipe selection and, thus, pipe pressure drop estimation, there needs to be a maximum operating pressure for the pipe in order to avoid underrated piping used in calculations.
 - Max. Temperature:** similar to the pressure specification of the piping, the maximum temperature needs to be defined in order to avoid using underrated piping in the pipe pressure drop calculations.
- The **Delete Series** button allows you to delete the highlighted unlocked pipe series. As with the **Create Series** button, the **Delete Series** button becomes **Delete Pipe** if you have selected and highlighted a pipe in an user input pipe series. The **Delete Pipe** button allows you to delete the highlighted pipe from the highlighted user input pipe series.

3.4.3. The Technical Parameters Group



Technical parameters

This group is part of the **Home** tab and allows you to enter the information concerning pressures, pressure drops, and fluid velocity in your system.

Device size

- Size above:** select the number of sizes above the selected pipe size to be considered for valve selection (value = 0 to 4 / default = 0).
- Size below:** select the number of sizes below the selected pipe size to be considered for valve selection (value = 0 to 4 / default = 2).

*If the **Pipe size** is set to **25 (1")**, and using the default values for the **Size above** and **Size below**, *TA Select 4* will list relevant products designed for **25 (1")** pipes but also for **20 (3/4")** and **15 (1/2")**.*

Pipe pressure drop

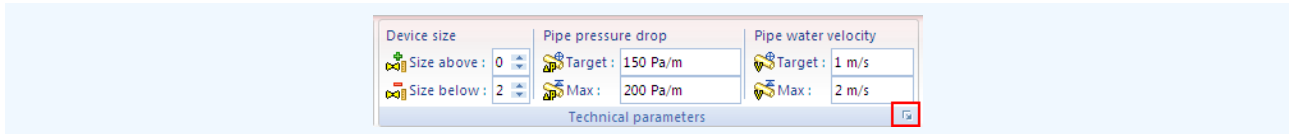
- Target:** set the target linear pressure drop in the selected pipe (default = 150 Pa/m).
- Max:** set the maximum linear pressure drop accepted in the selected pipe (default = 200 Pa/m).

Pipe water velocity

- Target:** set the target fluid velocity in the selected pipe (default = 1 m/s).
- Max:** set the maximum fluid velocity accepted in the selected pipe (default = 2 m/s).

Dialogue box launcher

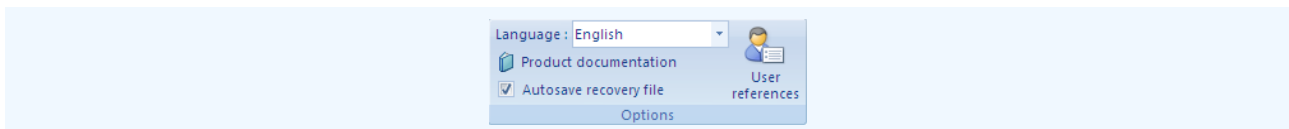
These parameters as well as more detailed ones can be also configured in the [Advanced Technical Parameters](#) window by clicking on the dialogue box launcher as illustrated hereunder.



*The **Technical parameters** dialogue box launcher*

3.4.4. The Options Group

This group is part of the **Home** tab and is illustrated hereunder.

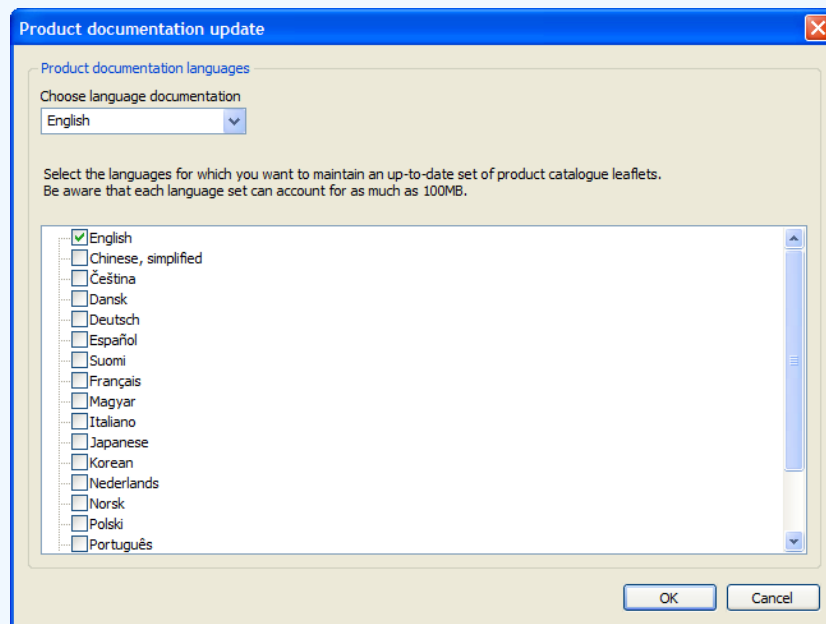


*The ribbon - **Home** tab - **Options** group*

This group contains the following buttons and fields:

- › **Language:** click on the arrow to the left on this field to select the application language you want. Please note that you will have to restart the application after changing the language.
- › **Product documentation:** click on this button to display the window illustrated below. In this window, you can:
 - Choose the language used when opening documentation and catalogue files (if available).
 - Select the languages for which you want to maintain an up-to-date set of product catalogue leaflets and this User Manual.
 - We highly recommend that you always select **English** in addition to your language(s) to guarantee a complete and updated set of documentation on your computer. If a file is not available in your language it will be displayed in English providing English is selected in the list.

 *Each language set can account for as much as 100 MB and if no language is selected, there will be no product documentation updates.*



Options group - Product documentation update

- › **Autosave recovery file:** check this field box to activate the autosave of the current project data in a separate recovery file. The project will then be regularly (every 10 minutes) saved. The saved file can be accessed via your computer in the following folder:

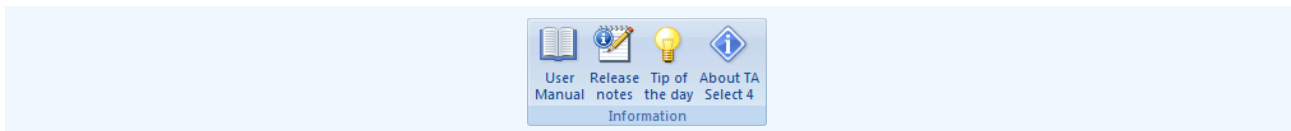
Documents\TA Select 4\[localised version]\Projects\Autosave

- › **User references:** click on this button to display the window illustrated below. This window allows you to input your relevant data (name, company...). These data can be later retrieved to automatically fill a new project information.

Options group - User references

3.4.5. The Information Group

This group is part of the **Home** tab and is illustrated hereunder.



*The ribbon - **Home** tab - **Information** group*

This group contains the following buttons:

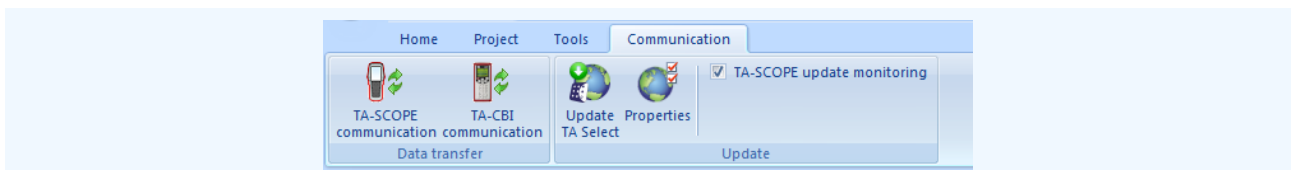
- › **User Manual**: click on this button to open this manual.
- › **Release notes**: click on this button to display the release notes of the program.
- › **Tip of the day**: click on this button to display the tip of the day window.
- › **About TA Select 4**: click on this button to display program information, version number and copyright.

 *You need the information from that window when you ask for a license.*

3.5. Software Update

TA Select 4 is a software that evolves quite frequently both because new functionalities are added and because additional new products are supported. Thus, the update operation is quite important.

The update functions are available in the **Communication** ribbon, illustrated hereunder, in the **Update** group.



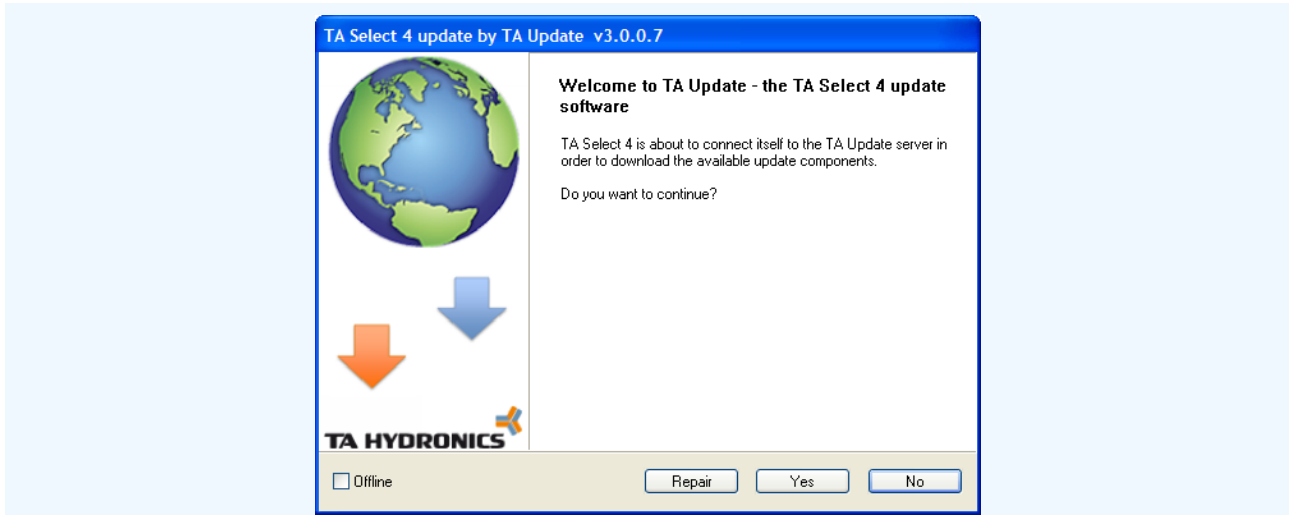
*The **Communication** ribbon*

In this group, the following commands are available:

- › **Update TA Select**: to update your software as described below.
- › **Properties**: to configure the automatic update of your software as described below.
- › **TA-SCOPE update monitoring**: to keep your TA-SCOPE, if you are using one, updated when you connect it to your computer as explained in the [TA-SCOPE Communication](#) section.

Update TA Select

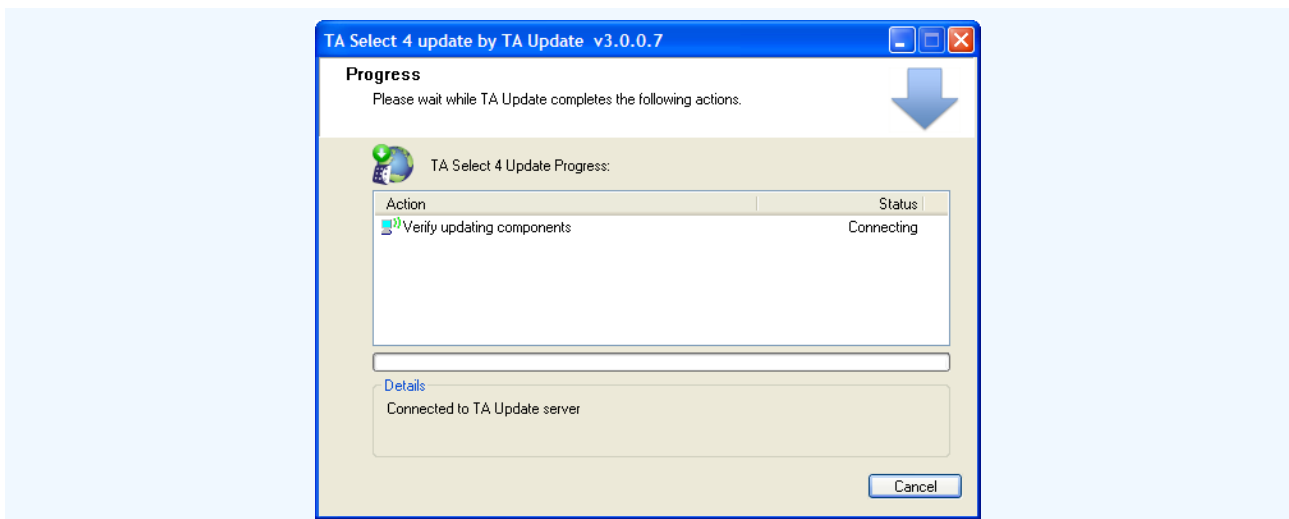
The **Update TA Select** button opens the following window.



The TA Select 4 update window

Click on the **Repair** button to repair your software installation in case it has been corrupted or click on the **Yes** button to launch the update process and open the following window.

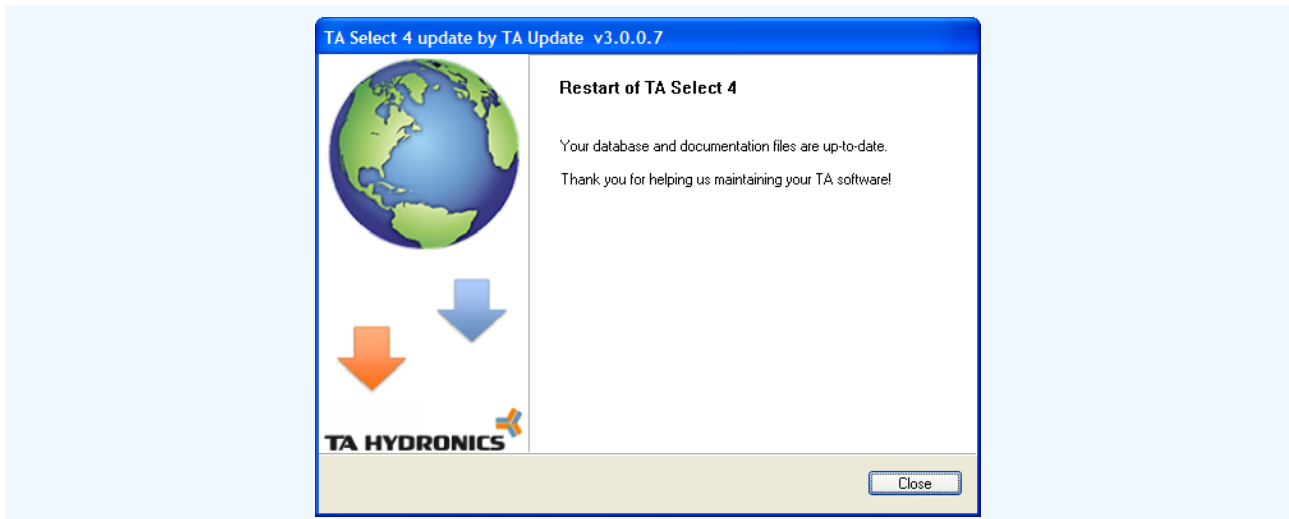
 *Your computer should be connected to the Internet to be able to update.*



The update progress

Follow the window instructions if any. The download and update process is displayed in this window.

Once the update is complete, the following window is displayed. After you click on the **Close** button, *TA Select 4* will restart (the application only, not your Windows operating system) then it will be again ready for use.

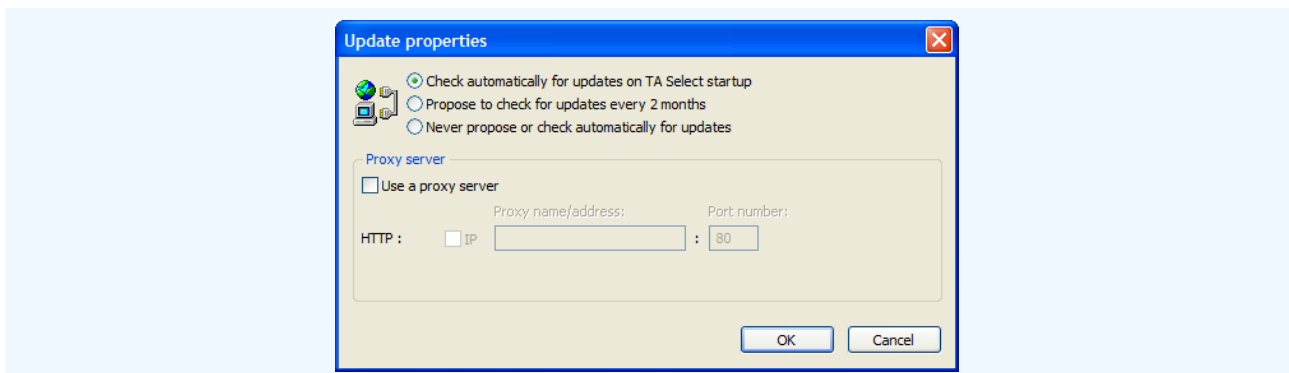


The update complete window

Properties

The **Properties** button open the following window.

In this window, select the update scheme you want to apply either automatic each time you start the application, on a regular basic, or no automatic check of availability of updates.



The Properties window

4. Individual Selection

4.1. How to Select a Valve

One of the main functions of *TA Select 4* is to help you to select TA Hydronics products and valves.

Selection methods

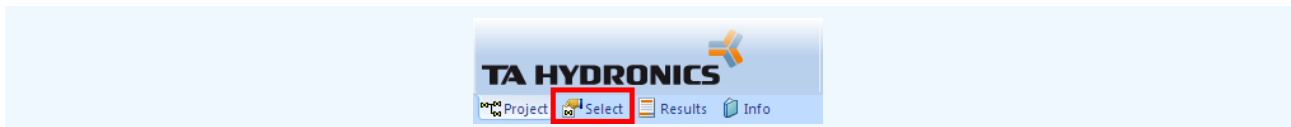
Two ways are proposed to help you in selecting the best suited products according to your needs:

- › A selection based on technical parameters: this search will display a list of products corresponding to your search parameters and highlight the recommended ones.
- › A direct search in TA Hydronics database: this way you have direct access to TA Hydronics catalogue and datasheets.

Selection environment

To perform a product selection:

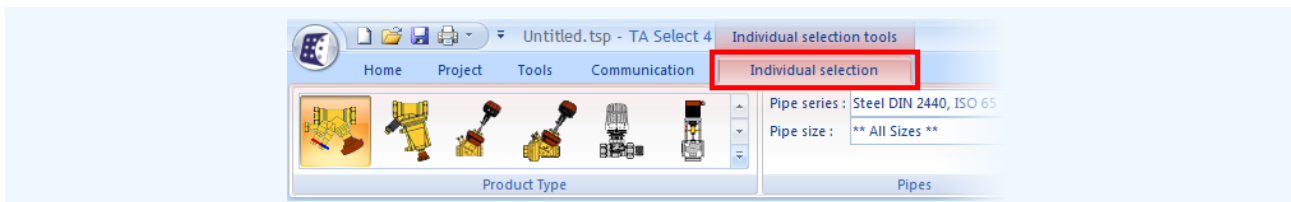
1. Go to the **Select** Control Panel Bottom Menu view as illustrated hereunder:



*The **Select** view selection at the **Control panel** bottom*

2. Make sure that the **Individual selection** tab and ribbon are selected:

 *This tab is only available in the **Select** view.*



*The **Individual selection** tab*

3. According to the type of search, follow instructions detailed in:

- [Parameterised Selection](#) > [Selection Steps](#)
- [Direct Selection](#)

4.2. Parameterised Selection

4.2.1. Selection Steps

To select a valve or a controller, perform the following steps to enter your system and preference parameters. These steps are detailed in this chapter.

 Please note that for a basic search, you can use the default values for most parameters.

1. Select or enter your preferred values for the different selection parameters:
 - Select the [Product Types](#) you are looking for (balancing, control, or radiator valve, Dp controller...).
 - Select the [Pipes Parameters](#) such as the type and the size of your installation pipes.
 - Set the [Technical Parameters](#) with more detailed technical parameters about your system.
 - Set the [Fluid Characteristics](#) such as the temperature and the type of fluid used in your system.
2. Select, in the [Control Panel](#), the high-level parameters of your system and filter the products resulting from the selection based on mechanical data such as valve type, family, connection...

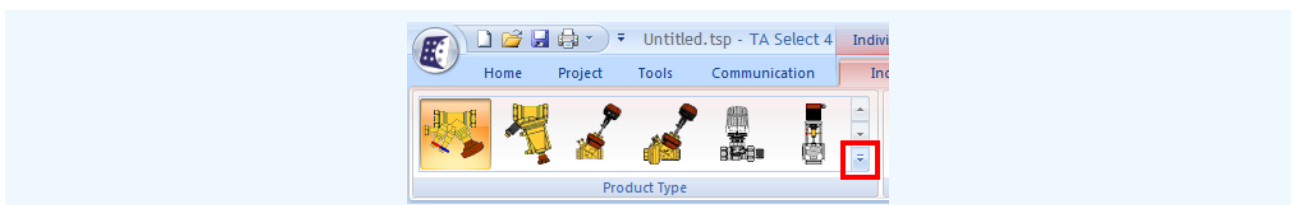
Once you have selected the products you are looking for, you can generate a list of these products, review or change them, generate and export a bill of material, etc. as described in the following sections:

3. Launch the automatic selection and get the [Suggest Results](#) once you have defined your parameters.
4. Make your own [Selection](#) of products among the automatically proposed list.
5. Output the resulting bill of material as described in [Results Management](#).

 TA Select 4 will propose only products compatible with your parameters selection. In order to let you refine your search using only some parameters without specifying some others, most selectable parameters have a default "don't mind" value. This value is the first one in the drop-down list and appears as a generic name enclosed in ** signs such as **** All Sizes ****, **** All Families ****...

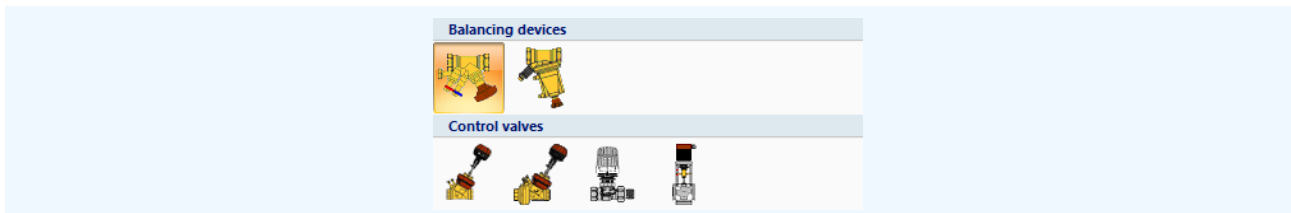
4.2.2. Product Types

In the **Product Type** group in the **Individual selection** tab of the ribbon, select the type of product your are looking for.



*The **Product Type** group*

There are 6 types of products. If all those types do not appear in your ribbon, click on the highlighted drop-down arrow in the above illustration to display the complete list as illustrated hereunder.



*The **Product Type** group in the drop-down view*

According to the selected type, the Control panel will be different and will allow you to select and narrow further the products you are looking for.

Balancing devices



Manual balancing valves: valves dedicated to balancing the flows in a system. These valves are set manually by a field engineer.



Dp controllers: valves dedicated to stabilising the differential pressure in a system.

Control valves



Balancing and control valves: valves used to balance and control the flows in a system.



Press.-Indep. control valves: valves used to control the flows in a system. These valves are pressure independent.



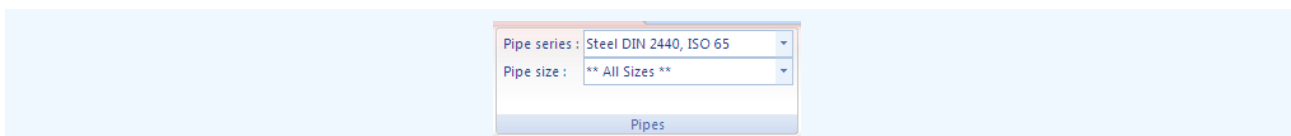
Radiator valves: valves dedicated to control the flows through radiators.



Control valves: valves dedicated to control the flows in a system.

4.2.3. Pipes Parameters

In the **Pipes** group in the **Individual selection** tab of the ribbon, enter the information concerning the pipes used in your system.



*The **Pipes** group*

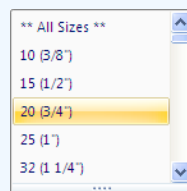
Pipes

- Pipe series:** select the material of the pipes used, among several kinds of copper, steel, PEX, etc. according to various standards. If you do not know the type of pipes to be used or do not mind, use the default **** Generic Steel Pipes ****.



*Example of available values for **Pipe series***

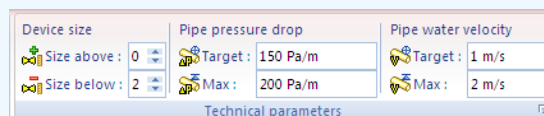
- Pipe size:** select the size of the pipes used. If you do not know the diameter of your pipes or do not want to restrict it, use the default **** All Sizes ****.



*Example of available values for **Pipe size***

4.2.4. Technical Parameters

In the **Technical parameters** group in the **Individual selection** tab of the ribbon, enter the information concerning pressures, pressure drops, and fluid velocity in your system.



*The **Technical parameters** group*

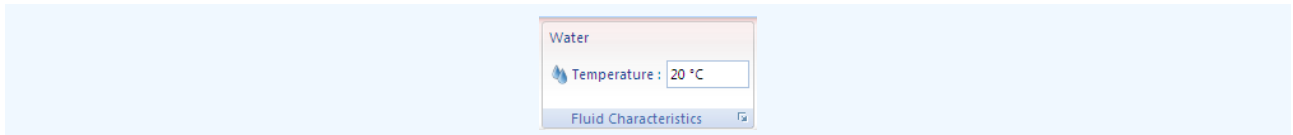
This group allows you to enter the information concerning pressures, pressure drops, and fluid velocity in your system.

For more details about this group, see [The Technical Parameters Group](#) in [The Home Tab](#) section.

Click on the small arrow at the right bottom to open the Technical Parameters window and to access to more technical parameters and to modify them. That window is explained with more details in the [Advanced Technical Parameters](#) section.

4.2.5. Fluid Characteristics

In the **Fluid Characteristics** group in the **Individual selection** tab of the ribbon, enter the information concerning the fluid used in your system.



The **Fluid Characteristics** group

Define the fluid (water and additive) used in your system. The fluid characteristics will be automatically computed and used in the calculation made during the project calculation.

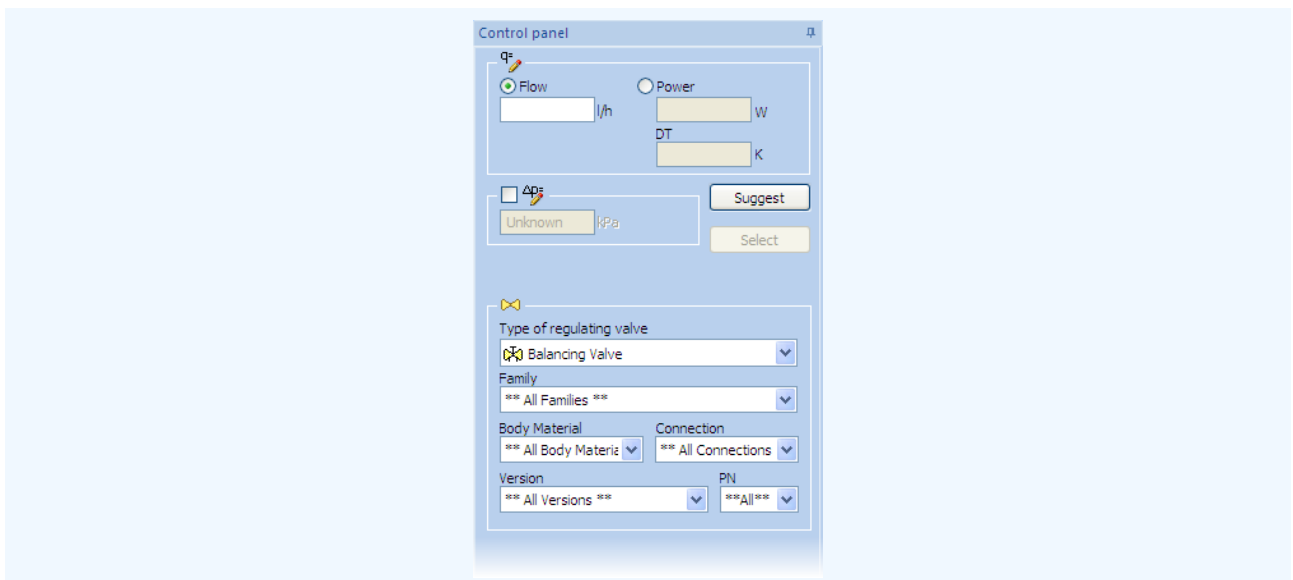
The **Water Characteristics** window is described in the [Fluid Characteristics](#) section.

i Please note that the **Fluid Characteristics** you enter when performing different operations such as individual selection, hydronic calculation, or using the additional tools are independent from one another. If you change the fluid or its temperature here, these values will NOT be changed in other TA Select 4 parts.

4.2.6. Control Panel

4.2.6.1. Overview

The control panel is displayed in the left pane of the **TA Select 4** window as illustrated hereunder. The available parameters depend on the product you have selected and allow you to filter further your research by selecting mechanical characteristics.



Example of **Control panel**

Some parameters are common to all or most products types while some are specific. There are described in the following sections, for each product types.

- › [Manual balancing valves](#)
- › [Dp controllers](#)
- › [Balancing and control valves](#)
- › [Pressure Independent Control valves](#)
- › [Radiator valves](#)
- › [Control valves](#)

Once you have set these parameters, click on the **Suggest** button to generate a list with the products that best suit your requests and preferences. These results are described in the [Selection Results](#) section.

4.2.6.2. Manual balancing valves



: The control panel for manual balancing valves is illustrated hereunder:

Control panel for **Manual balancing valves**

The minimal parameters to enter are the **Flow** value, or the two **Power** and **Dt** values (in W and K) for instance.

Enter or select a value for the following parameters before performing a search in the products database:

Mandatory parameters:

- › Select and check a parameter set between **Flow** and **Power + DT** as these are exclusive. Then enter a value for the corresponding parameters:
- › **Flow**: enter the supported liquid flow through the valve.
- › **Power**: enter the power that goes through the valve.
- › **DT**: enter the supported temperature difference supported by the valve.
- › **Type of regulating valve**: select the type of valve you are looking for such as **Balancing Valve**, **Double Regulating Valve**, **Fixed Orifice**...

Optional parameters:

Enter a value for some or all of these parameters if you want to further filter the proposed list of products.

- › **Dp:** check and enter a value to define a pressure difference over the valve.
- › **Family:** select the family of valves such as **STAD**, **TBV**, **MD 01**... within the valve type selected before.
- › **Body Material:** select the material of the valve, such as **Ametal**, **Bronze**, **Cast iron**, **Stainless steel**...
- › **Connection:** select the connection and fitting type, such as **Thread**, **Flange**, **Solder**...
- › **Version:** select the valve version, such as **Without drain**, **With drain 1/2"**, **High temp**...
- › **PN:** select the pressure class.

 You can leave these parameters with their default value, launch a first suggestion, and, according to the results, narrow your search by using more parameters.

Search results

Then, press the **ENTER** key or click on the **Suggest** button to get a list of proposed products as detailed in the [Selection Results](#) section.

4.2.6.3. Dp controllers



: The control panel for Dp controllers is illustrated hereunder:

Control panel for **Dp controllers**

Enter or select a value for the following parameters before performing a search in the products database:

Mandatory parameters:

- › **Dp stabilized on:** choose between the stabilization on the **branch** or the **control valve**.
- › **DpC location:** choose if the controller is placed in the **supply** or the **return** path.
- › **Measuring valve in:** choose if the measuring is made on the **primary** or the **secondary** side.
- › Select and check a parameter set between **Flow** and **Power + DT** as these are exclusive. Then enter a value for the corresponding parameters:

- › **Flow:** enter the supported liquid flow through the valve.
- › **Power:** enter the power that goes through the valve.
- › **DT:** enter the supported temperature difference supported by the valve.

Optional parameters:

Enter a value for some or all of these parameters if you want to further filter the proposed list of products.

 Depending on previous mandatory parameters settings, some of the following ones may propose only one value and thus cannot be changed.

- › **Show DpC connection scheme:** check this option to display a diagram of the valve connection in the circuit as illustrated below.
- › **Type:** select the valve type, such as **DpC-Std HVAC** or **DpC-High Dp**.
- › **Family:** select the family of valves such as **STAP**, **DA 50**, **DAF 50...** within the valve type selected before.
- › **Body Material:** select the material of the valve, such as **Ametal**, **Bronze**, **Cast iron**, **Stainless steel...**
- › **Connection:** select the connection and fitting type, such as **Thread**, **Flange**, **Solder...**
- › **Version:** select the valve version, such as **Standard**, **PT 90...**
- › **PN:** select the pressure class.
- › **Select Dp control set:** check this option to propose only complete kit, including the controller and its accessories.

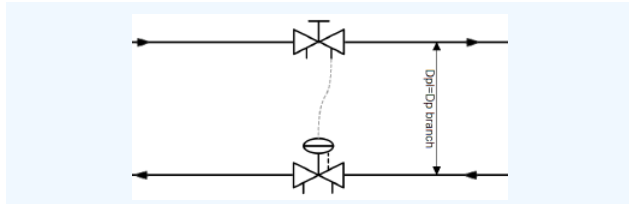
 You can leave these parameters with their default value, launch a first suggestion, and, according to the results, narrow your search by using more parameters.

Search results

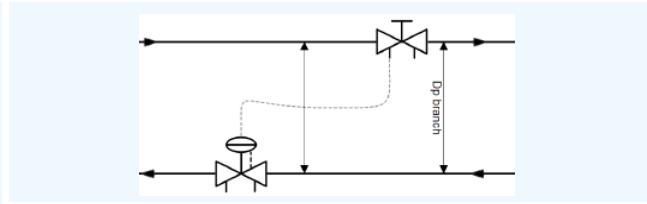
Then, press the **ENTER** key or click on the **Suggest** button to get a list of proposed products as detailed in the [Selection Results](#) section.

DpC connection schemes

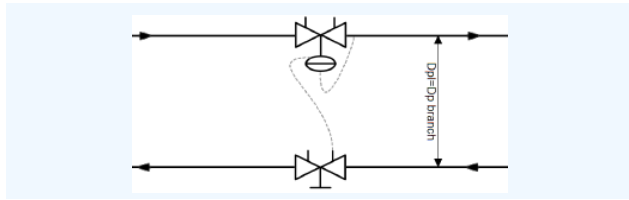
The following connections schemes are available for Dp controllers:



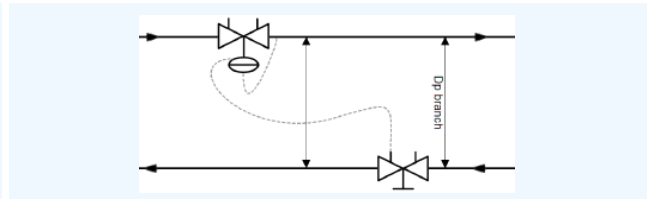
branch - return - primary



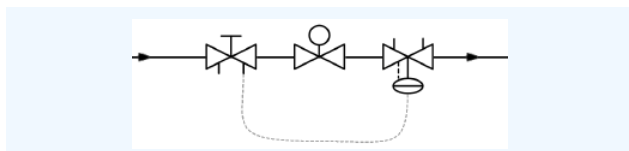
branch - return - secondary



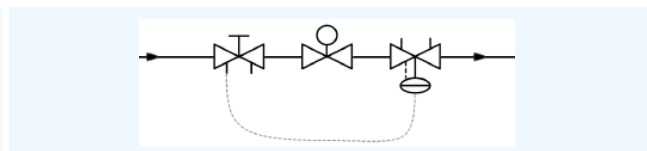
branch - supply - primary



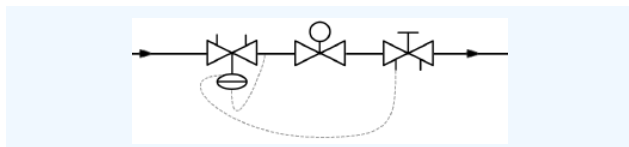
branch - supply - secondary



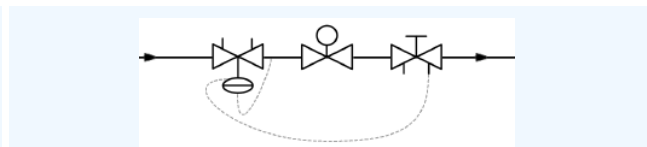
control valve - return - primary



control valve - return - secondary



control valve - supply - primary



control valve - supply - secondary

4.2.6.4. Balancing and control valves



: The control panel for balancing and control valves is illustrated hereunder:

The screenshot shows a software interface titled 'Control panel'. It contains several input fields and dropdown menus for configuring a valve. The 'Flow' section has radio buttons for 'Flow' (selected) and 'Power', with corresponding input fields for 'l/h', 'W', and 'DT' in 'K'. The 'Δp' section has a checkbox and a dropdown for 'Unknown' in 'kPa'. The '2w-3w' section has a dropdown for '2-way'. The 'Ctrl Type' section has a dropdown for 'Proportional'. The 'Family' section has a dropdown for '** All Families **'. The 'Body Material' and 'Connection' sections have dropdowns for '** All Body Material **' and '** All Connections **'. The 'Version' section has a dropdown for 'Standard', and the 'PN' section has a dropdown for '** All **'. The 'Power supply' and 'Input signal' sections have dropdowns for '** All power supply **' and '** All input signal **'. The 'Fail safe' section has a dropdown for 'None'. At the bottom, there is a checkbox labeled 'Select control set' which is checked.

Control panel for **Balancing and control valves**

The minimal parameters to enter are the **Flow** value, or the two **Power** and **DT** values (in W and K) for instance.

Enter or select a value for the following parameters before performing a search in the products database:

Mandatory parameters:

- › Select and check a parameter set between **Flow** and **Power** + **DT** as these are exclusive. Then enter a value for the corresponding parameters:
- › **Flow**: enter the supported liquid flow through the valve.
- › **Power**: enter the power that goes through the valve.

- › **DT**: enter the supported temperature difference supported by the valve.
- › **2w-3w**: select if you are looking for a **2-way** or **3-way** valve.
- › **Ctrl type**: select the type of control you are looking for such as **Proportional**, **3-point**, **On-Off...**

Optional parameters:

Enter a value for some or all of these parameters if you want to further filter the proposed list of products.

- › **Dp**: check and enter a value to define a pressure difference over the valve.
- › **Family**: select the family of valves such as **TBV-C**, **TA-FUSION-C...** within the valve type selected before.
- › **Body Material**: select the material of the valve, such as **Ametal**, **Ductile iron...**
- › **Connection**: select the connection and fitting type, such as **Thread**, **Flange**, **Solder...**
- › **Version**: select the valve version, such as **3-way**, **4-way...**
- › **PN**: select the pressure class.
- › **Power supply**: select the type of power supply, such as **24 VAC**, **24 VDC**, **230 VDC...**
- › **Input signal**: select the type of input signal, such as **0-10 V**, **On-off**, **3-point...**
- › **Fail safe**: select the type of fail safe, such as **None**, **Extending**, **Retracting...**
- › **Select control set**: check this option to propose only complete kit, including the controller and its accessories.

 You can leave these parameters with their default value, launch a first suggestion, and, according to the results, narrow your search by using more parameters.

Search results

Then, press the **ENTER** key or click on the **Suggest** button to get a list of proposed products as detailed in the [Selection Results](#) section.

New [TA Fusion](#) valves and kits are available from this search windows.

4.2.6.5. Pressure Independent Control valves



: The control panel for pressure independent control valves is illustrated hereunder:

The screenshot shows a software interface titled "Control panel" for selecting pressure-independent control valves. It features several sections with input fields and dropdown menus. At the top, there are radio buttons for "Flow" (selected) and "Power". Below "Flow" is a text box for "l/h". Below "Power" are text boxes for "W" and "DT" with a unit "K". A "Suggest" button is next to the "Type" dropdown, which is currently set to "PICV-Std HVAC". Below "Type" is a "Ctrl Type" dropdown set to "Proportional". A section for "Family" has a dropdown set to "** All Families **". Below this are "Body Material" and "Connection" dropdowns, both set to "** All Body Materiz **" and "** All Connections **" respectively. "Version" is set to "Standard" and "PN" is set to "**All**". "Power supply" and "Input signal" are both set to "** All power supply **" and "** All input signal **" respectively. "Fail safe" is set to "None". At the bottom, there is a checked checkbox for "Select control set".

Control panel for **Pressure independent control valves**

i The minimal parameters to enter are the **Flow** value, or the two **Power** and **DT** values (in W and K) for instance.

Enter or select a value for the following parameters before performing a search in the products database:

Mandatory parameters:

- › Select and check a parameter set between **Flow** and **Power + DT** as these are exclusive. Then enter a value for the corresponding parameters:
- › **Flow**: enter the supported liquid flow through the valve.
- › **Power**: enter the power that goes through the valve.
- › **DT**: enter the supported temperature difference supported by the valve.
- › **Type**: select the type of valve you are looking for such as **Classical**, **PICV-High Dp**, **PICV-Std HVAC...**
- › **Ctrl type**: select the type of control you are looking for such as **Proportional**, **3-point**, **On-Off...**

Optional parameters:

Enter a value for some or all of these parameters if you want to further filter the proposed list of products.

- › **Family:** select the family of valves such as **TBV-CMP**, **TA-FUSION-P**... within the valve type selected before.
- › **Body Material:** select the material of the valve, such as **Ametal**, **Ductile iron**...
- › **Connection:** select the connection and fitting type, such as **Thread**, **Flange**...
- › **Version:** select the valve version, such as **Standard**, **PT 90**...
- › **PN:** select the pressure class.
- › **Power supply:** select the type of power supply, such as **24 VAC**, **24 VDC**, **230 VDC**...
- › **Input signal:** select the type of input signal, such as **0-10 V**, **On-off**, **3-point**...
- › **Fail safe:** select the type of fail safe, such as **None**, **Extending**, **Retracting**...
- › **Select control set:** check this option to propose only complete kit, including the controller and its accessories.

 You can leave these parameters with their default value, launch a first suggestion, and, according to the results, narrow your search by using more parameters.

Search results

Then, press the **ENTER** key or click on the **Suggest** button to get a list of proposed products as detailed in the [Selection Results](#) section.

New [TA Fusion](#) valves and kits are available from this search windows.

4.2.6.6. Radiator valves



The control panel for radiator valves is illustrated hereunder:

Control panel

$q =$ l/h 

☐ $\Delta p =$ Unknown kPa



☐ Radiator with integrated valves

Supply valve:

Return valve:

Connection:

Connection:

Version:

Version:



Work with:

☒ Thermostatic head

☐ Electro actuator

Type :

Family :

Version :

Control panel for **Radiator valves**

 The minimal parameter to enter is the **Flow** value (in l/h).

Enter or select a value for the following parameters before performing a search in the products database:

Mandatory parameters:

-  **q**: enter the supported liquid flow through the valve.

Optional parameters:

Enter a value for some or all of these parameters if you want to further filter the proposed list of products.

- › **Dp:** check and enter a value to define a pressure difference over the valve.
- › **Radiator with integrated valves:** check if you are looking for radiator with integrated valves.
- › **Supply valve:** select the type of supply valve, such as **V-exact II**, **Standard**, **LowRes...**
- › **Return valve:** select the type of return valve, such as **TRIM**, **STK**, **Regutec...**
- › **Connection:** select the connection and fitting type of the supply valve (such as **Rad. union/Thread**, **Rad. elbow/Thread**, **Flat sealing...**) and of the return valve (such as **Thread**, **Thread male/Thread**, **Rad. union/Thread...**).
- › **Version:** select the valve version of the supply valve (such as **Straight**, **Angle**, **Reverse angle...**) and of the return valve (such as **Straight**, **Angle...**).
- › **Thermostatic head and Electro actuator:** check the corresponding box if you are looking for a radiator valve with a thermostatic head or with an electro actuator.
- › **Type:** select the type of radiator valve, such as **Built-in sensor**, **Remote sensor**, **Thermo-electric...**
- › **Family:** select the family of radiator valves such as **K-Head (built-in)**, **DX Head**, **B Head...** within the valve type selected before.
- › **Version:** select the radiator valve version, such as **Standard**, **Public buildings**, **Indoor swimming pools...**

 You can leave these parameters with their default value, launch a first suggestion, and, according to the results, narrow your search by using more parameters.

Search results

Then, press the **ENTER** key or click on the **Suggest** button to get a list of proposed products as detailed in the [Selection Results](#) section

4.2.6.7. Control valves

: The control panel for control valves is illustrated hereunder:

Control panel for **Control valves**

 The minimal parameters to enter are the **Flow** value, or the two **Power** and **DT** values (in W and K) for instance.

Enter or select a value for the following parameters before performing a search in the products database:

Mandatory parameters:

- › Select and check a parameter set between **Flow** and **Power** + **DT** as these are exclusive. Then enter a value for the corresponding parameters:
- › **Flow**: enter the supported liquid flow through the valve.
- › **Power**: enter the power that goes through the valve.
- › **DT**: enter the supported temperature difference supported by the valve.

Optional parameters:

Enter a value for some or all of these parameters if you want to further filter the proposed list of products.

- › **Kvs:** check and select a value to define a flow factor over the valve.
- › **2w-3w-4w:** select if you are looking for a 2-way or 3-way valve.
- › **Type:** select the valve type, such as **Global valve (HVAC)**, **Global valve (Industrial)**, **Butterfly valve...**
- › **Ctrl type:** select the type of control you are looking for such as **Proportional**, **3-point**, **On-Off...**
- › **Dp:** check and enter a value to define a pressure difference over the valve.
- › **Family:** select the family of valves such as **CV 216 MV**, **CV 306 GG**, **CV 316 MZ...** within the valve type selected before.
- › **Body Material:** select the material of the valve, such as **Bronze**, **Brass**, **Cast iron...**
- › **Connection:** select the connection and fitting type, such as **Thread**, **Flange...**
- › **Version:** select the valve version, such as **Standard**, **3-way**, **4-way...**
- › **PN:** select the pressure class.

 You can leave these parameters with their default value, launch a first suggestion, and, according to the results, narrow your search by using more parameters.

Search results

Then, press the **ENTER** key or click on the **Suggest** button to get a list of proposed products as detailed in the [Selection Results](#) section.

4.2.7. Suggest Results

A Suggest launch display a list of products compliant with your requests such as the one illustrated hereunder:

Manual Balancing											Steel DIN 2440, ISO 65		
Name	Body Material	Connection	Version	PN	Size	Presetting turns/pos.	Dp kPa	Dp 100% kPa	Dp 50% kPa	Temp range °C	Size	Linear Dp Pa/m	v m/s
STAD 3/4"	Ametal(tm)	Union/Thread NPT	Without drain	20	20 (3/4")	2,54	3	0,772	6,92	-20/120	20	118	0,379
STAD 20	Ametal(tm)	Thread	With drain 3/4"	20	20 (3/4")	2,54	3	0,772	6,92	-20/120			
STAD 20	Ametal(tm)	Thread	With drain 1/2"	20	20 (3/4")	2,54	3	0,772	6,92	-20/120			
STAD 20	Ametal(tm)	Thread	Without drain	20	20 (3/4")	2,54	3	0,772	6,92	-20/120			
STAD 1/2"	Ametal(tm)	Union/Thread NPT	Without drain	20	15 (1/2")	4,00*	3,93	3,93	75,9	-20/120			
STAD 15/14	Ametal(tm)	Thread	With drain 3/4"	20	15 (1/2")	4,00*	3,93	3,93	75,9	-20/120			
STAD 15/14	Ametal(tm)	Thread	With drain 1/2"	20	15 (1/2")	4,00*	3,93	3,93	75,9	-20/120			
STAD 15/14	Ametal(tm)	Thread	Without drain	20	15 (1/2")	4,00*	3,93	3,93	75,9	-20/120			
STAD 10/09	Ametal(tm)	Thread	With drain 3/4"	20	10 (3/8")	4,00*	11,5	11,5	361	-20/120			
STAD 10/09	Ametal(tm)	Thread	With drain 1/2"	20	10 (3/8")	4,00*	11,5	11,5	361	-20/120			
STAD 10/09	Ametal(tm)	Thread	Without drain	20	10 (3/8")	4,00*	11,5	11,5	361	-20/120	20	118	0,379
STAD 20	Ametal(tm)	Smooth ends	With drain 3/4"	20	20 (3/4")	2,54	3	0,772	6,92	-20/120			
STAD 20	Ametal(tm)	Smooth ends	With drain 1/2"	20	20 (3/4")	2,54	3	0,772	6,92	-20/120			
STAD 20	Ametal(tm)	Smooth ends	Without drain	20	20 (3/4")	2,54	3	0,772	6,92	-20/120			
STAD 3/4"	Ametal(tm)	Thread NPT	Without drain	20	20 (3/4")	2,54	3	0,772	6,92	-20/120			
STAD 15/14	Ametal(tm)	Smooth ends	With drain 3/4"	20	15 (1/2")	4,00*	3,93	3,93	75,9	-20/120			
STAD 15/14	Ametal(tm)	Smooth ends	With drain 1/2"	20	15 (1/2")	4,00*	3,93	3,93	75,9	-20/120			
STAD 15/14	Ametal(tm)	Smooth ends	Without drain	20	15 (1/2")	4,00*	3,93	3,93	75,9	-20/120			
STAD 1/2"	Ametal(tm)	Thread NPT	Without drain	20	15 (1/2")	4,00*	3,93	3,93	75,9	-20/120			
STAD 10/09	Ametal(tm)	Smooth ends	With drain 3/4"	20	10 (3/8")	4,00*	11,5	11,5	361	-20/120			
STAD 10/09	Ametal(tm)	Smooth ends	With drain 1/2"	20	10 (3/8")	4,00*	11,5	11,5	361	-20/120			
STAD 10/09	Ametal(tm)	Smooth ends	Without drain	20	10 (3/8")	4,00*	11,5	11,5	361	-20/120			

* full opening

Suggest result list

 If no products are found a message will be displayed as well as a window to enable you to change your search settings.

The results list is divided in 2 parts:

- › The upper part displays preferred products.
- › The lower part, that you can expand or hide using the  or  button, displays additional compatible products.
- › In the lower part, click on the  icon to collapse the table and keep only the selected line and the  icon to expand the table again.

 You can adjust any column size by clicking and dragging the column separator in the table header line.

As it is not always possible to fully comply with your settings, or the proposed product will not be used in an optimal configuration, several indications, such as colours or notes, are added and visible in this list:

- › **Green** text indicates the optimal recommended products according to your settings.
- › **Red** text indicates exceeding low or high flow, possible laminar flow regime or destructive flow properties.
- › **Orange** text indicates properties that are outside the range specified in the technical parameters.
- › Additional notes indicate, for example, that the valve will be used in a fully open position and thus cannot be adjusted again later if needed...

Product selection

Click on a product in the list to highlight it.

If accessories are available for this product, an additional table is displayed at the bottom of the results list with these accessories as illustrated hereunder. You can check some of these accessories to include them in your bill of material. In this case, they will be linked with the selected product for easy reading.

Manual Balancing											Steel DIN 2440, ISO 65					
Name	Body Material	Connection	Version	PN	Size	Presetting turns/pos.	Dp kPa	Dp 100% kPa	Dp 50% kPa	Temp range °C	Size	Linear Dp Pa/m	v m/s			
STAD 3/4"	Ametal(tm)	Union/Thread NPT	Without drain	20	20 (3/4")	2,54	3	0,772	6,92	-20/120	20	118	0,379			
STAD 20	Ametal(tm)	Thread	With drain 3/4"	20	20 (3/4")	2,54	3	0,772	6,92	-20/120						
STAD 20	Ametal(tm)	Thread	With drain 1/2"	20	20 (3/4")	2,54	3	0,772	6,92	-20/120						
STAD 20	Ametal(tm)	Thread	Without drain	20	20 (3/4")	2,54	3	0,772	6,92	-20/120						
STAD 1/2"	Ametal(tm)	Union/Thread NPT	Without drain	20	15 (1/2")	4,00*	3,93	3,93	75,9	-20/120						
STAD 15/14	Ametal(tm)	Thread	With drain 3/4"	20	15 (1/2")	4,00*	3,93	3,93	75,9	-20/120						
STAD 15/14	Ametal(tm)	Thread	With drain 1/2"	20	15 (1/2")	4,00*	3,93	3,93	75,9	-20/120						
STAD 15/14	Ametal(tm)	Thread	Without drain	20	15 (1/2")	4,00*	3,93	3,93	75,9	-20/120						
STAD 10/09	Ametal(tm)	Thread	With drain 3/4"	20	10 (3/8")	4,00*	11,5	11,5	361	-20/120						
STAD 10/09	Ametal(tm)	Thread	With drain 1/2"	20	10 (3/8")	4,00*	11,5	11,5	361	-20/120						
STAD 10/09	Ametal(tm)	Thread	Without drain	20	10 (3/8")	4,00*	11,5	11,5	361	-20/120						
* full opening																
Accessories on Valve																
☒ Draining kit 1/2" Can be installed during system operation.							☐ Draining kit 3/4" Can be installed during system operation.									
☒ Extension for measuring point M14x1 Length 71 mm. Suitable when insulation is used.							☐ Self-sealing measuring point extension Length 60 mm. Can be installed without draining of the system.									

Product highlighted and available accessories

Right-click on the highlighted product to open the contextual menu with the following commands:

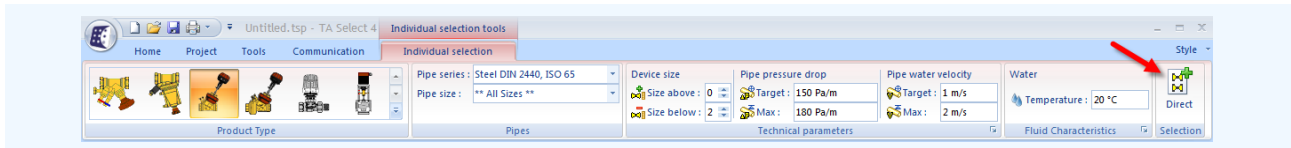
- › **Select**: select the product and add it to your list as described in the [Results](#) section.
- › **Quick reference sheet**: open the pdf quick reference sheet for this product (see [Catalogue Consulting](#)).
- › **Full catalogue sheet**: open the pdf catalogue sheet for this product (see [Catalogue Consulting](#)).

 Some commands will be greyed if the corresponding documents are not available.

4.3. Direct Selection

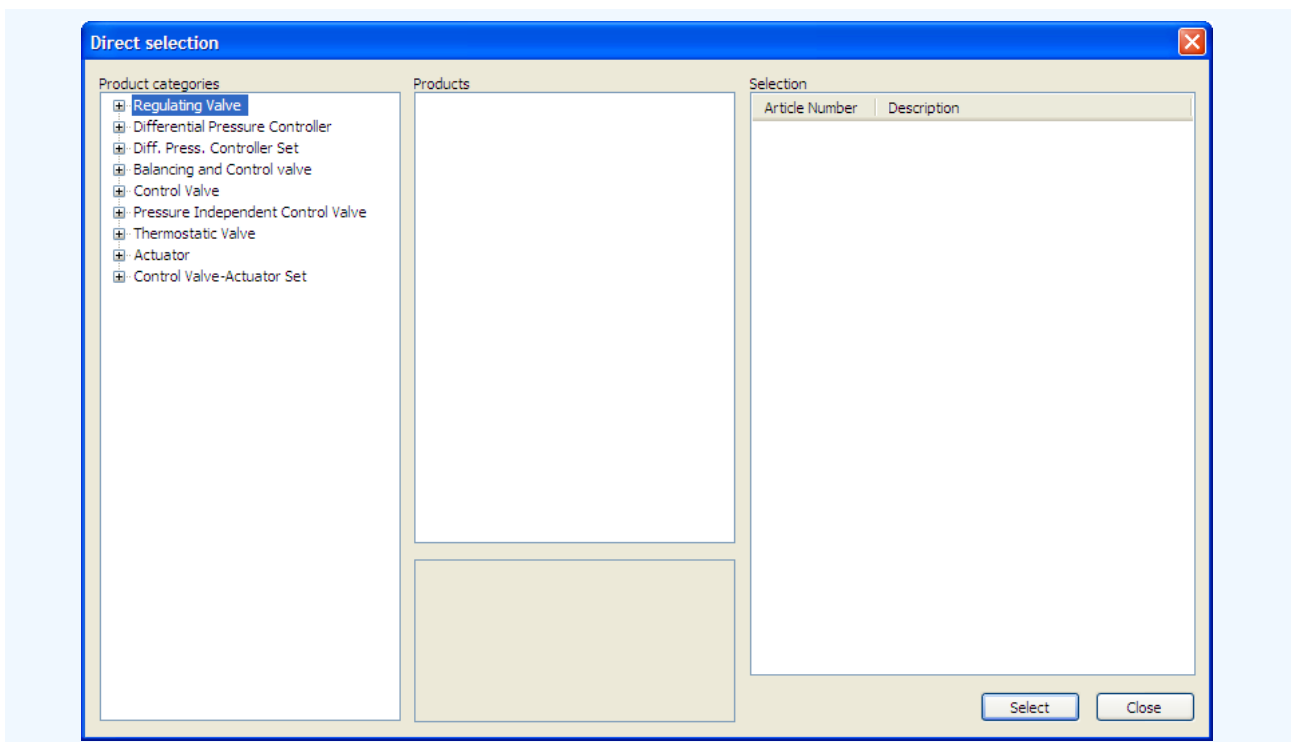
In this second mode, you can make a selection directly amongst the products available in the whole TA Hydronics catalogue.

1. In the **Individual selection** tab, click on the **Direct** rightmost button as illustrated:



*The **Direct** selection button*

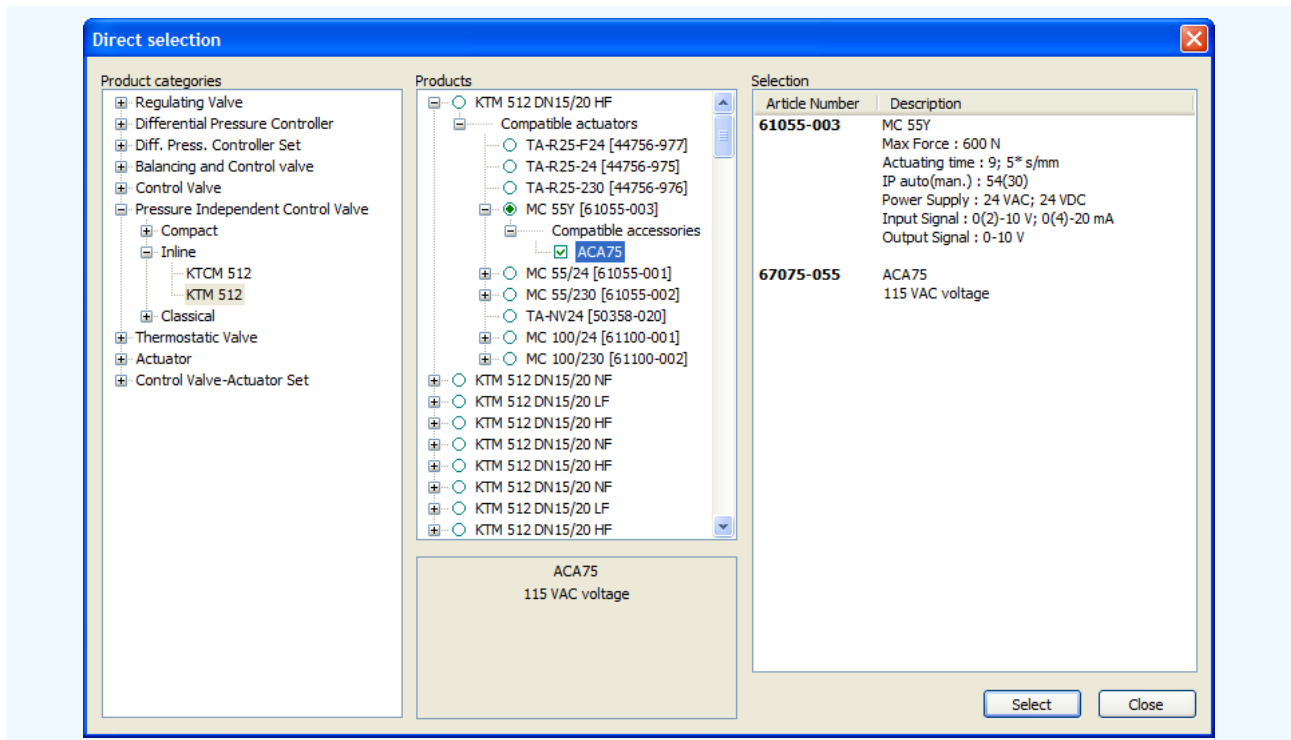
2. The **Direct Selection** window opens as illustrated:



*The **Direct selection** window*

3. Select, in each column of the window, one of the following items:

- **Product categories:** click on the + signs to open and display the available sub-categories.
- **Products:** click on the product you want to select and on the corresponding + signs to display the list of available compatible accessories if any (depending on the selected category).

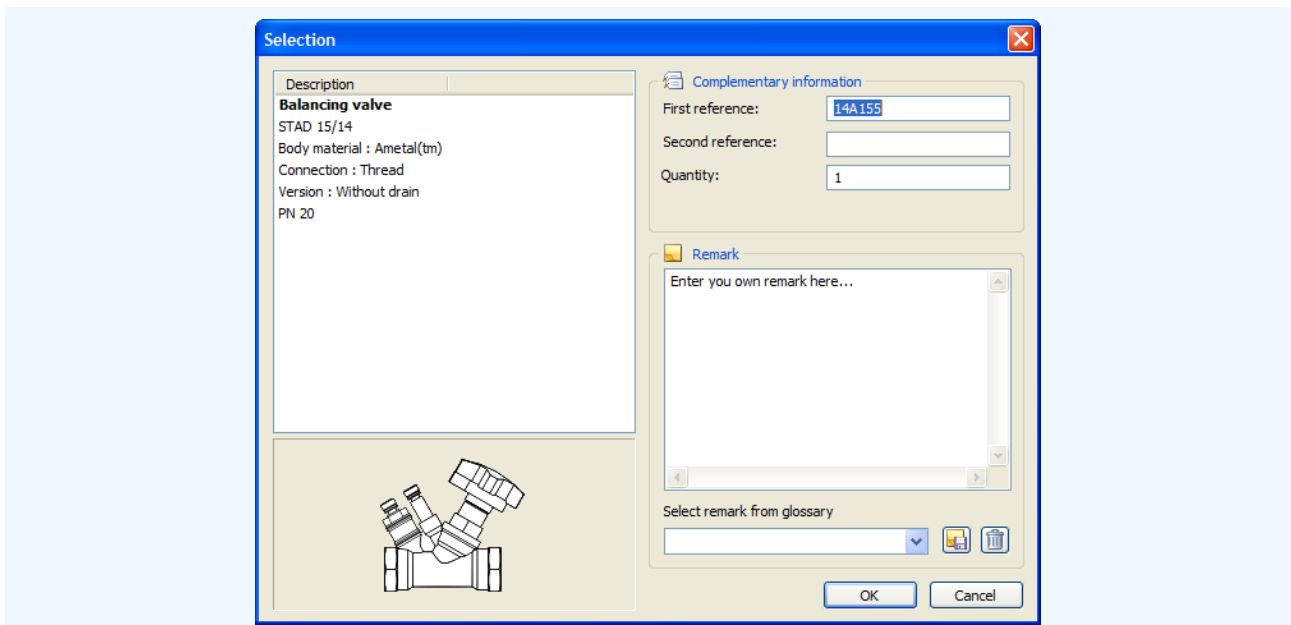


Example of open **Product categories** and a selected **Product** with its compatible accessories

4. Check the accessories you want to select, if any.
5. The selected product and its accessories are listed in the **Selection** column.
6. Click the **Select** button to select these items and add them to your **Results** table as described in the [Selection](#) section.

4.4. Selection

Once you have selected a product, either by a direct or a parameterised selection, the following window opens.



The Selection window

The following information is displayed:

- › **Description:** a list of main characteristics of the product and a drawing if available.
- › **Complementary information:** enter your own First reference and Second reference as well as the quantity of products required. These information will be added on your result list.
- › **Remark:** enter a remark, as free text, that will also appear on the result list.
- › **Glossary management:**
 - Enter your text in the **Remark** text area.
 - If you want to keep this text and reuse it easily later, enter a name for it in the **Select remark from glossary** box and click on the save button next to it.
 - If you want to reuse an existing text, select it in the **Select remark from glossary** drop-down list. the text will automatically be inserted in the **Remark** text area.

Click **OK** to confirm the selection or **Cancel** to return to the previous window.

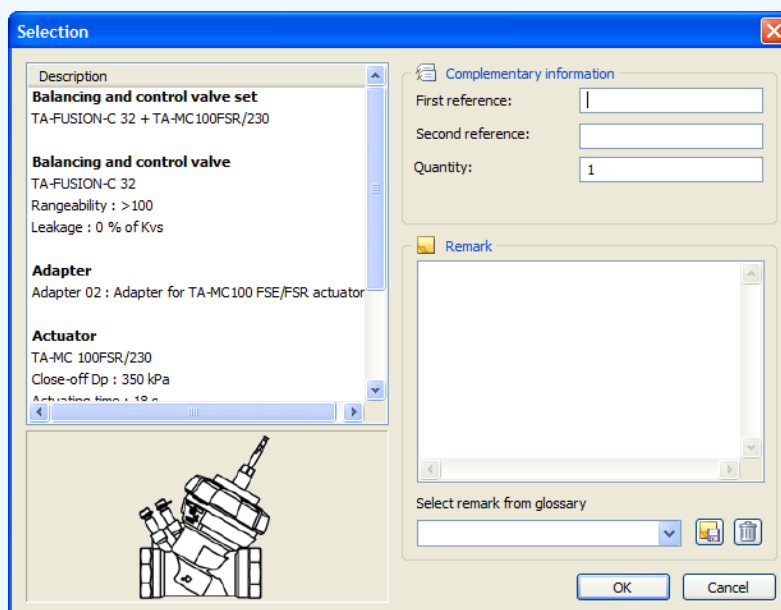
4.5. TA Fusion

TA Select 4 supports and proposes in its selection, the TA Fusion components as well as complete sets including a balancing valve, an actuator, and all relevant accessories.



Examples of TA Fusion valves

- › These innovative pressure independent control and balancing valves for heating and cooling systems combine the key hydronic functions of control and balancing in one valve.
- › Adjustable maximum flow and inherent independent EQM characteristics allow correct valve sizing and optimum system controllability.
- › The measuring points enable accurate measurement of flow, differential pressure, temperature and available differential pressure.



*A TA Fusion kit as displayed in the **Selection** window*

5. Hydronic Project Calculation

5.1. How to Calculate a Hydronic Project

One of the main functions of *TA Select 4* is to select the best suited components of a complete hydronic circuit based on a minimum of information while taking into account most parameters including fluid characteristics.

TA Select 4 will also output the characteristics, operating condition, and settings of each individual valve and controller. Additionally it will enable interfacing with TA-SCOPE and TA-CBI to transfer the plant and retrieve the on-site measurements.

Hydronic project calculation steps

To calculate a complete hydronic project, you should perform the following steps detailed in this chapter:

1. Configure your project basic parameters as described in [Project Configuration](#).
2. Enter your plant and circuits as described in [Hydronic Circuit Entry](#) following the rules and principles described in [Hydronic Circuit Description](#).

Once the whole circuit architecture and all the components have been entered, you get the calculation results in the *TA Select 4* interface main area:

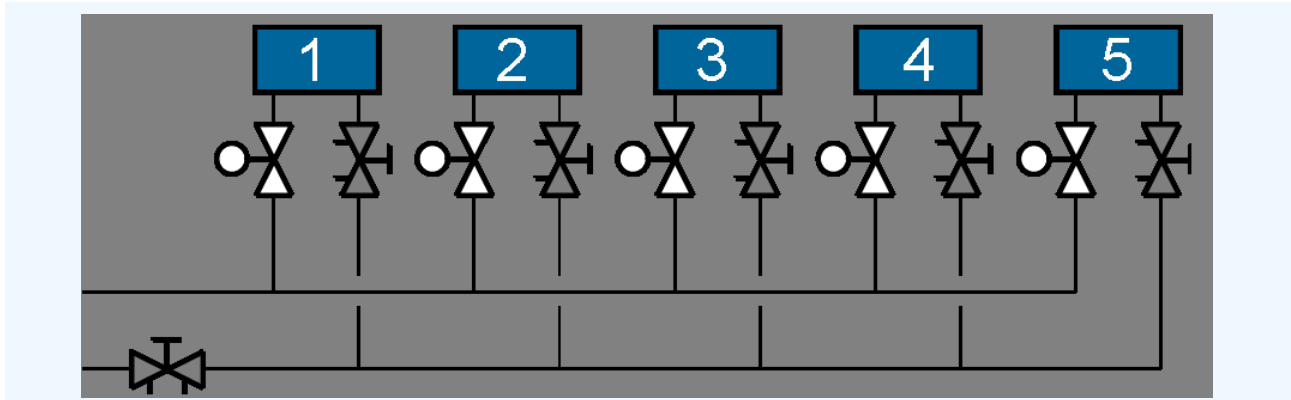
3. Analyse the results and, if required, adjust some parameters to optimise your system as described in [Distribution and Circuits](#). Two or three tabs are available:
 - The **Distribution** tab displays the flow distribution through all circuits and components.
 - The **Circuits** tab displays the components automatically selected by the software.
 - The **Measurements** tab (if available) displays the measurements performed with a TA-CBI or TA-SCOPE. This tab is described in the [TA Scope Data Processing](#) dedicated chapter.
4. Output the resulting bill of material as described in [Results Management](#).

5.2. Hydronic Circuit Description

In order to balance a plant with *TA Select 4*, you should decompose your whole plant in elementary hydronic modules. This hydronic module structure will also be used to send balancing valve settings to the TA-SCOPE or TA-CBI.

Hydronic modules

A hydronic module is made of several circuits connected in parallel as illustrated hereunder.



Example of a hydronic module (direct return configuration)

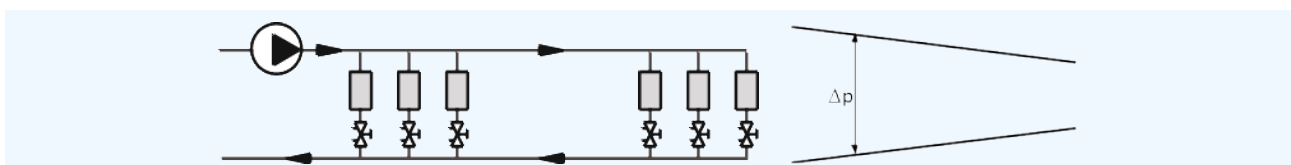
The hydronic module and its circuits should follow these conditions:

- › Each circuit is connected in the same configuration, either all in direct return or all in reverse return.
- › Each circuit is fitted with a balancing valve.
- › The module is fitted with a general valve that regulates the total flow of the module (this valve is called a "partner valve").

In a hydronic module, each circuit can be a terminal unit, as in the previous illustration, or another hydronic module, as in the plant illustration below.

 The different circuits in a module must be numbered incrementally, the first circuit being the one nearest the flow entry.

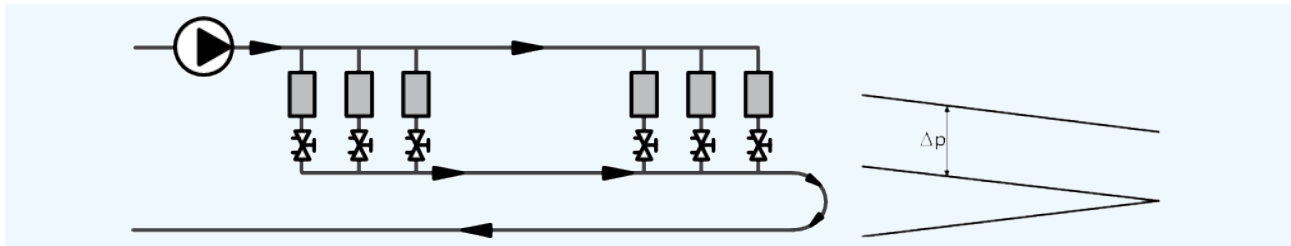
Direct return configuration



Direct return configuration and Dp distribution

- › A direct return system has a flow proportionality property that reverse return systems do not have.
- › A decreasing differential pressure is applied on circuits so balancing can be done using balancing valves.
- › This configuration is much more flexible than a reverse configuration and better suited for buildings where reallocation occurs often.

Reverse return configuration

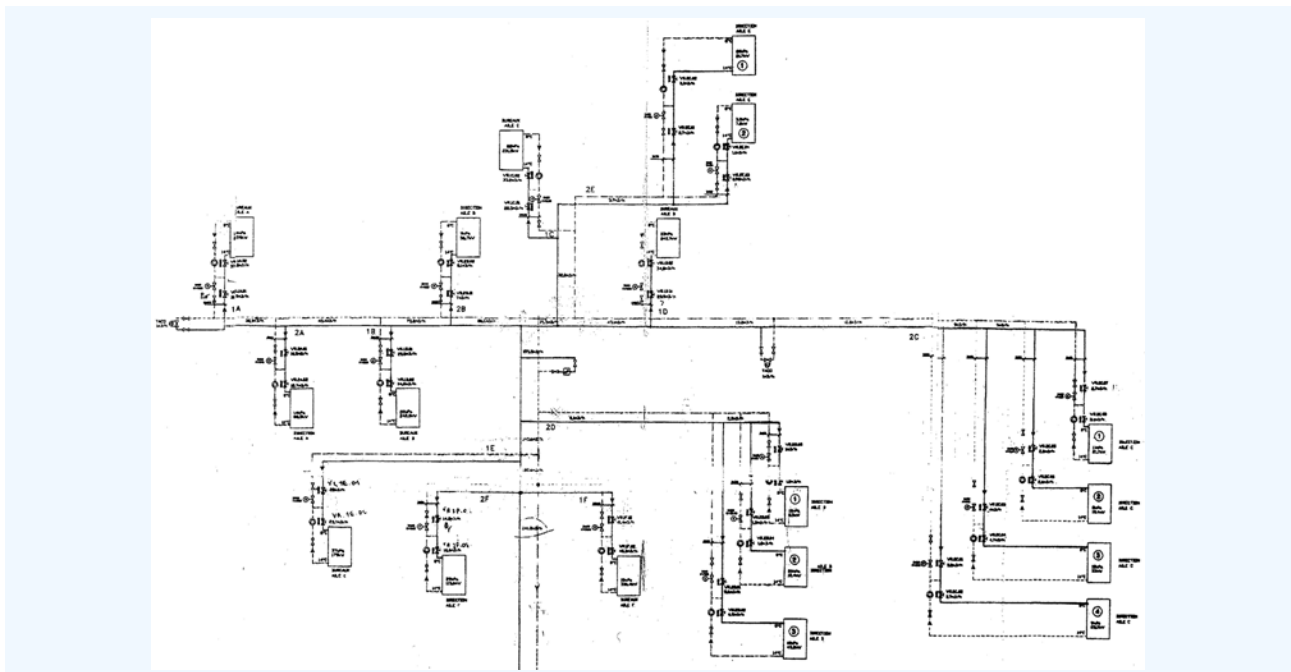


Reverse return configuration and Dp distribution

- › In theory, the differential pressure is equal across all branch but the same Dp cannot be obtained in all pipe segments.
- › In practice, a reduced differential pressure is obtained in different circuits inside the branch.
- › In theory, self-balancing is assumed to happen based on design calculations but there is no possibility for actual corrections.
- › Issue: there is NO systematic balancing method that applies to reverse return systems.
- › One way to mitigate the issue of large Dp variations with reverse return systems is to use Dp control. However, this does not solve the intrinsic flow distribution distortion issue that happens with reverse return when units do not work in simultaneity

Plant decomposition

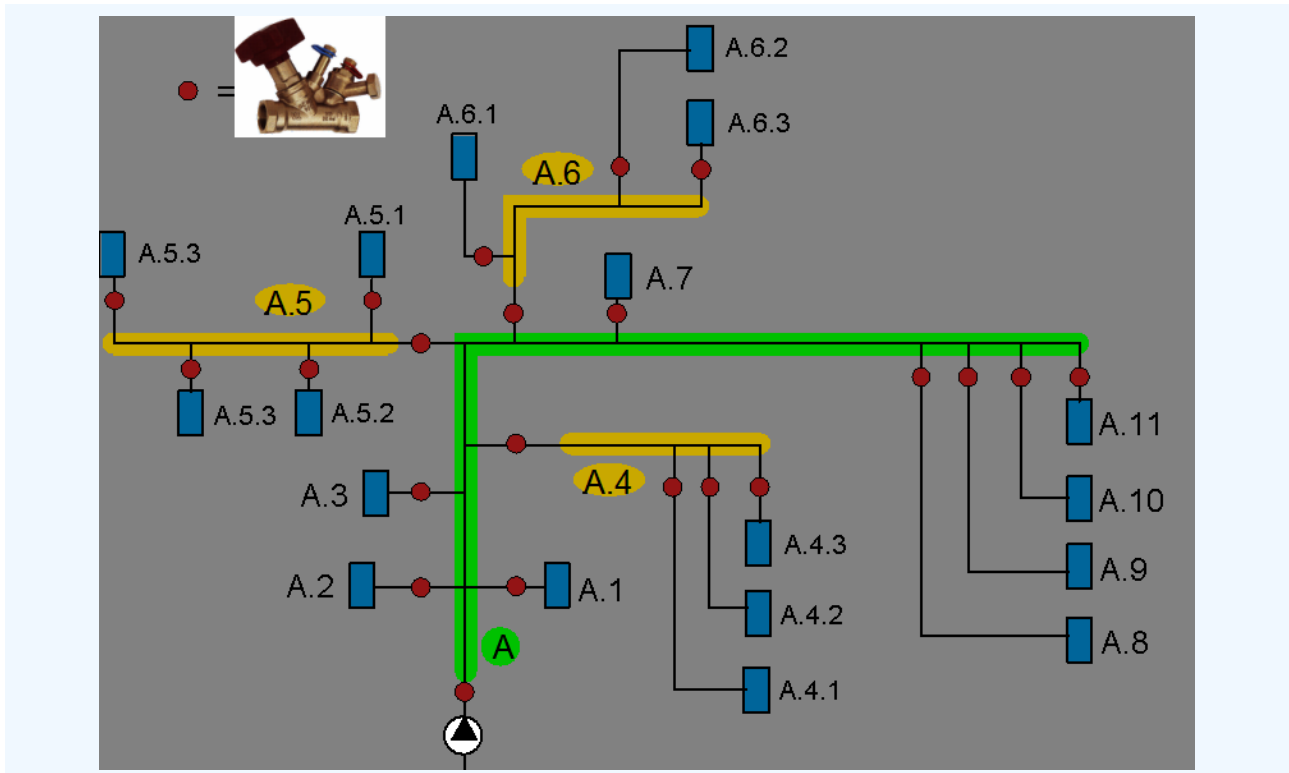
The following figure illustrates a plant example.



Example of a plant

This plant is hierarchically decomposed in several hydronic modules as follows:

- › A: main hydronic module.
- › A.1, A.2, A.3, A.7 to A.11: terminal units directly connected to the main hydronic module.
- › A.4, A.5, A.6: hydronic (sub-)modules.
- › A.4.1 to A.4.3: terminal units connected to the A.4 hydronic module.
- › A.5.1 to A.5.4: terminal units connected to the A.5 hydronic module.
- › A.6.1 to A.6.3: terminal units connected to the A.6 hydronic module.



Example of a plant and its decomposition in hydronic modules

Pending circuits

Projects are often designed with possible future extensions in order to manage the staging of investments. This means that the hydronic calculation should be sized based on these future extensions and that the valves should be configured according to the current situation.

During circuit design, *TA Select 4* enables you to insert what is called a **pending circuit**, that is a single circuit that will represent the future extension. This circuit will be taken into account for the components and pipes sizing but will not be considered for the initial valves configuration.

After commissioning a future extension, *TA Select 4* will recalculate the settings of some of these valves to cope with the new plant configuration. At that time, as the components have been selected based on the complete plant, no replacement will be necessary and you will only need to perform some adjustments of already installed valves.

Of course, you can add several pending circuits in different places in your plant according to your specific configuration and future developments.

Injection circuits

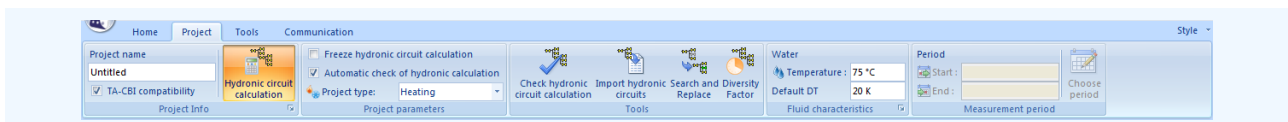
TA Select 4 supports injection circuits. These circuits include a pump device and are used for circuits that require:

- › A temperature regime different from the plant temperature regime (for ex. for floor heating, cooling ceiling, chilled beams...)
- › Circuits with a supply water temperature adjusted according to specific conditions such as the outdoor temperature (for ex. radiator branches, floor heating...).

These injection circuits require specific parameters that are explained in the circuit design section.

5.3. Project Configuration

When you create a new project, some setup is required via the different groups of the **Project** ribbon.



*The **Project** ribbon*

The basic configuration in the following groups is described hereunder:

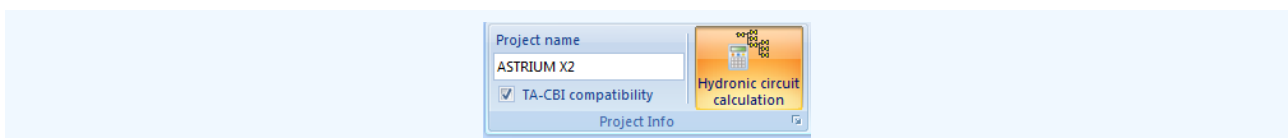
- › **Project Info**: enter the project, plant, and customer information.
- › **Project parameters**: select some project high level parameters.

The [Advanced Project Configuration](#) in the following groups is described at the end of this chapter:

- › **Tools**: launch some additional tools for circuit import, search and replace, and diversity factor setup.
- › **Fluid characteristics**: enter the characteristics of the fluid used in your circuit.
- › **Measurement period**: enter the measurement period when using a TA Scope.

 Please note that to start your project you can use the default values for most parameters and adjust them at a later stage.

Project Info



*The **Project** ribbon - **Project Info** group*

In this group, enter:

- › **Project name**: the name of the project.
- › **TA-CBI compatibility**: check this option so that TA Select 4 ensures that the names of the project, the hydronic modules, the circuits, and the valves follow the TA-CBI restricted character set.

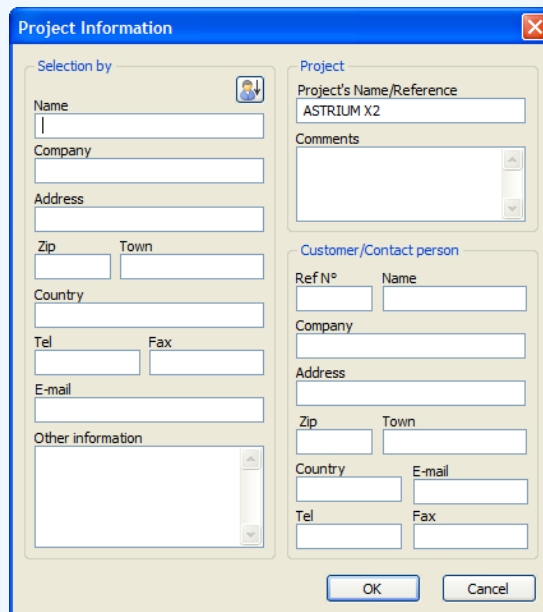
 A project that is not TA-CBI compatible cannot be uploaded to a TA-CBI.

- › **Hydronic circuit calculation:** activate or deactivate the calculation mode.

 *The hydronic circuit calculation mode requires an activation key delivered by TA Hydronics.*

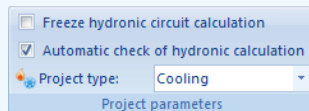
- › **Project Info** group: opens the following window to enter the project designer and customer information.

In this window, use the  icon to automatically retrieve the **User references** data entered in the ribbon **Home** tab.



*The **Project Information** window*

Project Parameters



*The **Project ribbon - Project parameters** group*

In this group, enter:

- › **Freeze hydronic circuit calculation:**
 - Check this option to freeze the circuit and allow to transfer the project without modification. This is especially useful when several people are working on the same project on different computers (an existing project is frozen at opening).
 - Uncheck this option to enable editing and recalculation of the project.
- › **Automatic check of hydronic calculation:**
 - Activate this option to check the results of the automatic calculation performed on your circuit after any significant change. This option guarantees that the new results comply with the technical parameters. It may slow down the application for large circuits.
 - Uncheck this option to disable automatic results check.

- › **Project type:** select the type of your circuit; either **Cooling** or **Heating**.

 The **Safety factor for pipe pressure drops** parameter that was available here in previous versions of TA Select 4 is now available in the **Pipes** section of the [Advanced Technical Parameters](#).

 The **Show old deleted valves** parameter that was available here in previous versions of TA Select 4 is now only available in the **General** section of the [Advanced Technical Parameters](#).

5.4. Hydronic Circuit Entry

5.4.1. How to Add a New Circuit

 The project must be set as follows prior to using this function:
- **Hydronic circuit calculation** activated.
- **Freeze hydronic circuit calculation** unchecked.

By default, when you start a new project, *TA Select 4* creates an empty structure and names the first module "A". On this module, you can add and build the hierarchical structure of circuits and terminal units corresponding to you plant.

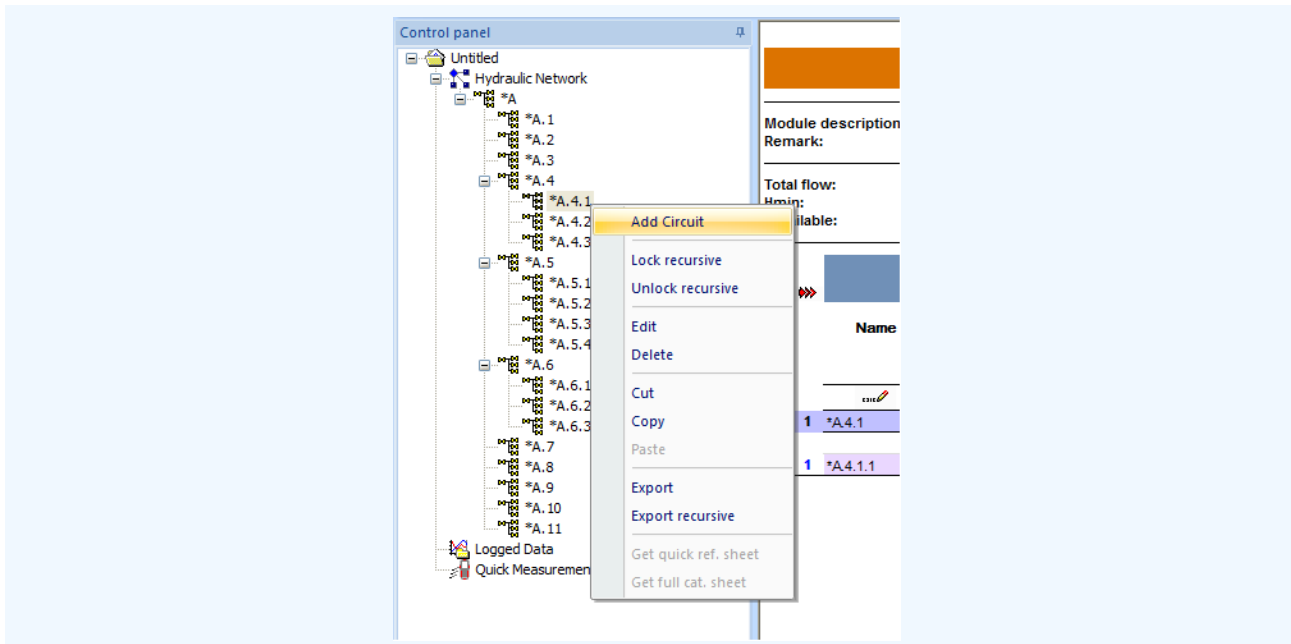
There are 3 ways to add a circuit:

- › Add a circuit as detailed hereunder.
- › Copy and paste an existing circuit using the circuit tree context menu.
- › Import and reuse an existing circuit or parts of circuit as described in the **Search and Replace** function available in the ribbon [Tools](#) group.

Adding a new circuit

To add a new circuit, follow these steps:

1. Right click in the left pane circuit tree, at the place you want to add this circuit.
2. Select the **Add Circuit** command in the context menu as illustrated hereunder.



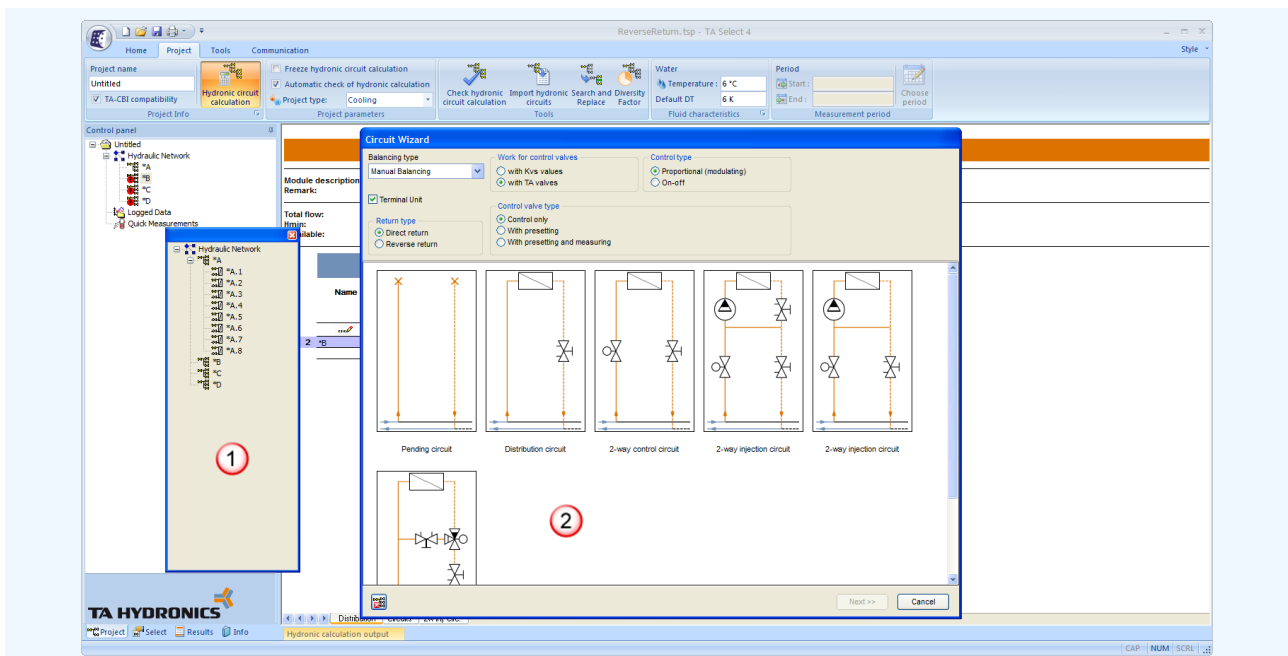
The circuit tree context menu

3. The circuit window opens with the [Circuit Wizard First Step](#) as described in the next section.

5.4.2. Circuit Wizard First Step

To add a new circuit, after [How to Add a New Circuit](#), follow these steps:

1. In the circuit wizard window (window 2 in the following figure):
 - **Terminal Unit:** check this box to add a terminal unit circuit and uncheck to keep a open hydronic module.
 - **Return type:** select the **Direct return** or **Reverse return** configuration according to your circuit system. Please refer to the [Hydronic Circuit Description](#) section for the difference between both configurations.
 - Set the other parameters to filter the circuits displayed in the window lower area.
 - Click on the  button, in the bottom left corner, to open the hydraulic network tree window (window 1 in the following figure).



The wizard first step

2. Click on the circuit you want to add in the window lower area. The type and number of proposed circuit configurations will depend on your settings.
3. Click on the **Next>>** button to go to the [Circuit Wizard Second Step](#) as described in the next section.
4. Click on the **Cancel** button to exit the wizard without adding any circuit.

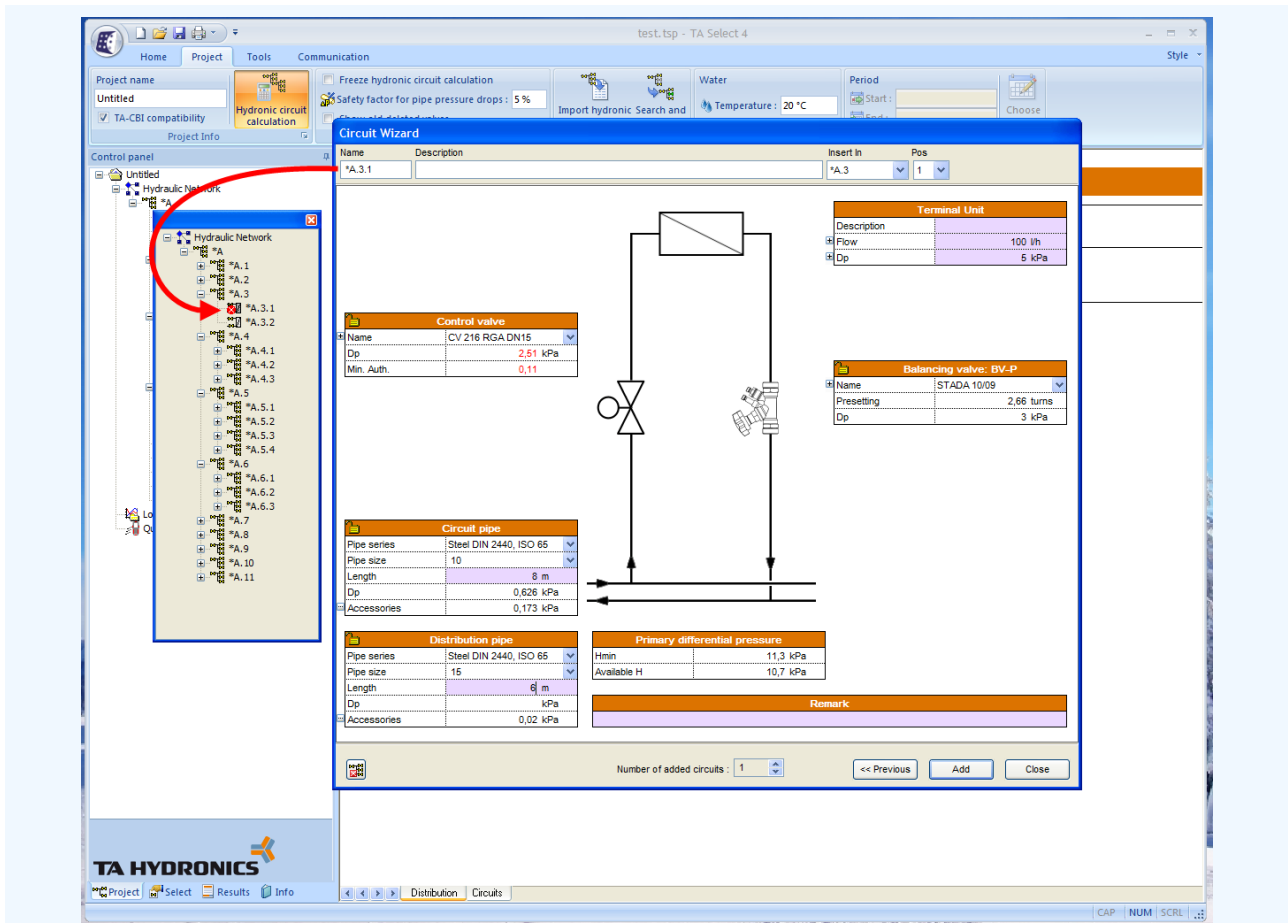
5.4.3. Circuit Wizard Second Step

To add a new circuit, after completing the [Circuit Wizard First Step](#), follow these steps:

1. In the wizard window top area:
 - Enter a description for the circuit (not mandatory but recommended).
 - Change the parent circuit in **Insert In** and the position in **Pos** if required.
 - The name is automatically set according to the circuit position.
 - In the left window, the circuit is automatically positioned according to this name.

- The circuit  icon indicates that this is the currently edited valve.

 The asterisk in front of the name indicates that this circuit can be automatically renamed if the configuration changes to match the TA Select 4 naming rules.



The wizard second step

- In the wizard window main area, enter or select, in the various tables, the required parameters:

 The available tables and parameters depend on the circuit type. Please refer to the notes hereunder for circuit specific information.

- The editable purple fields are fields that should be manually completed as they are related to plant and circuits setup that the software uses as inputs and cannot compute (such as the pipe length or the terminal unit power...).
- The editable white fields have default values defined globally but may be changed locally if desired.
- The non-editable white fields display values automatically calculated by TA Select 4.
- The  icon enables you to lock the values in this table to ensure that the calculation will not change them. Once locked, the icon is  and the locked values are bold.
- A  icon next to a field indicates additional or alternate fields that can or must be completed.
- The  icon next to the **Accessories** fields opens an additional window in which you can select various accessories compatible with the current component (such as a tee for a pipe...).

3. In the wizard window bottom area:

- Enter the number of identical circuits to be added at once (these circuits will be added in parallel and the names will be incremented).
- Click on the <<Previous button to go back to the wizard first step if you want to change the circuit type.
- Once all mandatory fields are completed, click on the Add button to add the circuit(s) in the whole circuit.

4. Once a circuit is added with the Add button:

- The circuit is added in the circuit and cannot be changed anymore from this wizard.
- The circuit name is incremented.
- You can specify again a similar circuit and add it to the circuit.

5. When all desired circuits are added, click on the Close button or on the  button to exit the wizard.

Pipe lengths

To determine the different pipe lengths required according to your circuit configuration, please refer to the information and notes described in the [Pipe Lengths](#) section.

Balancing valves

An additional feature is available for balancing valves only, once the required circuit parameters have been entered:

- Move the mouse over the table title to open a pop-up displaying the overflow that would occur when the control valve closes if the by-pass is not balanced as illustrated hereunder:



The overflow pop-up window

- An additional icon allows to force (☒) , forbid (☐) , or leave automatic (☒) the selection of the regulating valve in the 3-way by-pass.

Pending circuits

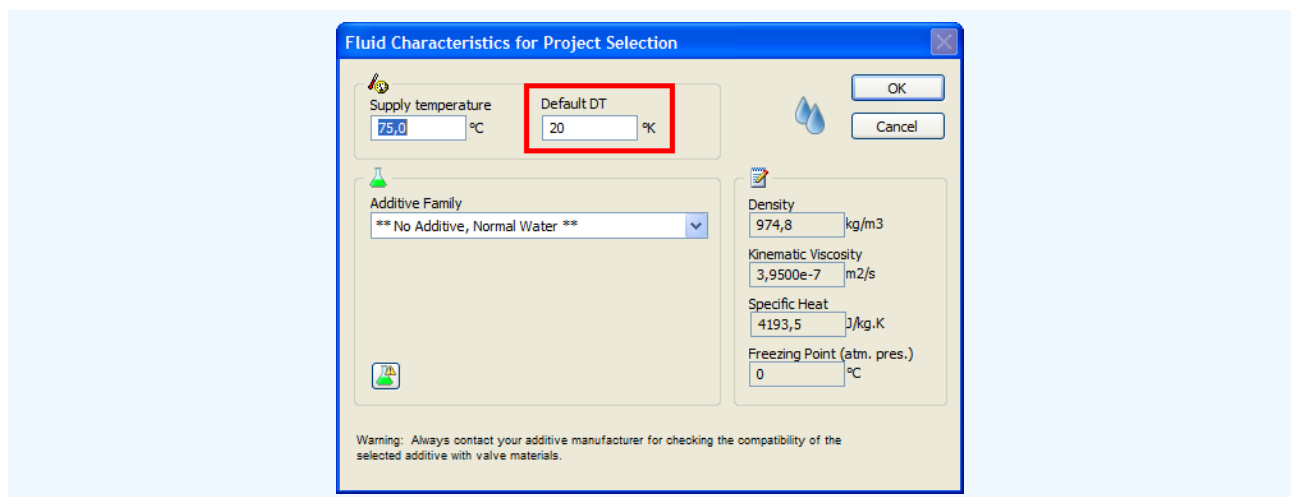
When you add a pending circuit (see [Hydronic Circuit Description](#)), you should provide the total flow that will circulate in that circuit to be added at a later stage in the plant building and, if you already know them, the circuit pipe length(s) and Dp of that circuit .

Injection circuits

When you add an injection circuit (see [Hydronic Circuit Description](#)), you should also provide some of the circuit pump characteristics as well as the supply and return temperatures.

The calculation of such circuits take into account the parameters defined in the [Fluid Characteristics](#) window:

- The fluid characteristics adjusted in this window are specific for the current project (and can differ from the general fluid configuration).
- There is an additional parameter, **Default DT** (default temperature variation). In case of adjustment, the new value will be used for any injection circuit added from now on.
- The **Default DT** sign depends on the project type setting (heating or cooling).
- The pump Dp is optional and will be taken into account only if it is higher than the minimum required Dp.



The fluid characteristics window for the project selection

5.4.4. Pipe Lengths

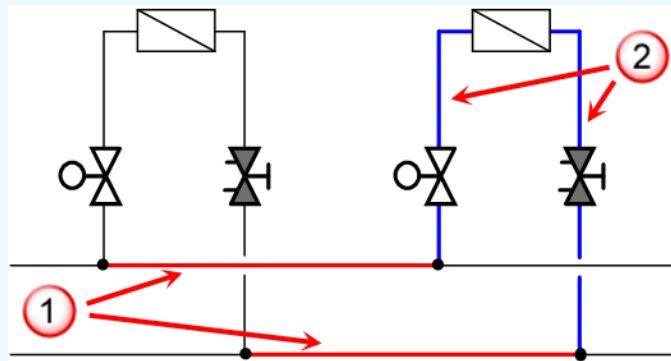
The way to determine and enter the pipe lengths in a *TA Select 4* project depends on the circuit configuration, direct or reverse return, as described hereunder.

Direct return circuit

In a direct return circuit, follow the next rules when measuring and entering the various pipe lengths to ensure proper calculation and configuration:

- › The entered values **MUST** include the supply **AND** the return lengths.
- › The **Distribution pipe** of the circuit is the length of the pipe leading to the circuit connection point and coming from the previous pipe connection as illustrated hereunder.
- › The **Circuit pipe** of the circuit is the length of the pipe inside the circuit as illustrated hereunder.
- › Circuits without a terminal unit only require a **Distribution pipe** length.

- › The root circuit do not require any pipe length.

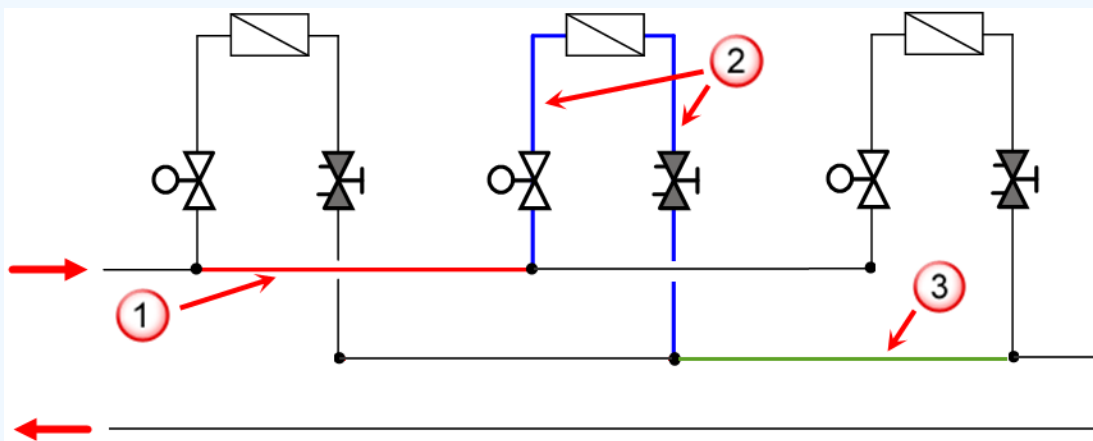


Pipe length measurement: (1) - red - **Distribution pipe** length, and (2) - blue - **Circuit pipe** length

Reverse return circuit

In a reverse return circuit, follow the next rules when measuring and entering the various pipe lengths to ensure proper calculation and configuration:

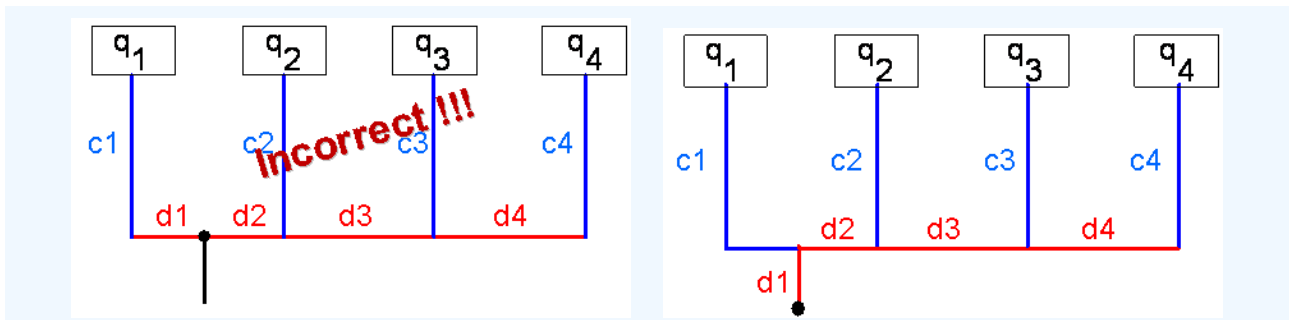
- › The entered values **MUST** include the supply AND the return lengths.
- › The **Distribution supply pipe** of the circuit is the length of the pipe coming from the previous pipe connection point as illustrated hereunder.
- › The **Distribution return pipe** of the circuit is the length of the pipe leading to the following circuit connection point as illustrated hereunder.
- › The **Circuit pipe** of the circuit is the length of the pipe inside the circuit as illustrated hereunder.
- › Circuits without a terminal unit only require a **Distribution pipe** length.
- › The root circuit do not require any pipe length.



Pipe length measurement:
 (1) - red - **Distribution supply pipe** length
 (2) - blue - **Circuit pipe** length
 (3) - green - **Distribution return pipe** length

Tip to differentiate distribution and circuit pipes

- › Distribution pipes are travelled through by the flow of several circuits.
- › Circuit pipes are travelled through by the circuit flow only.



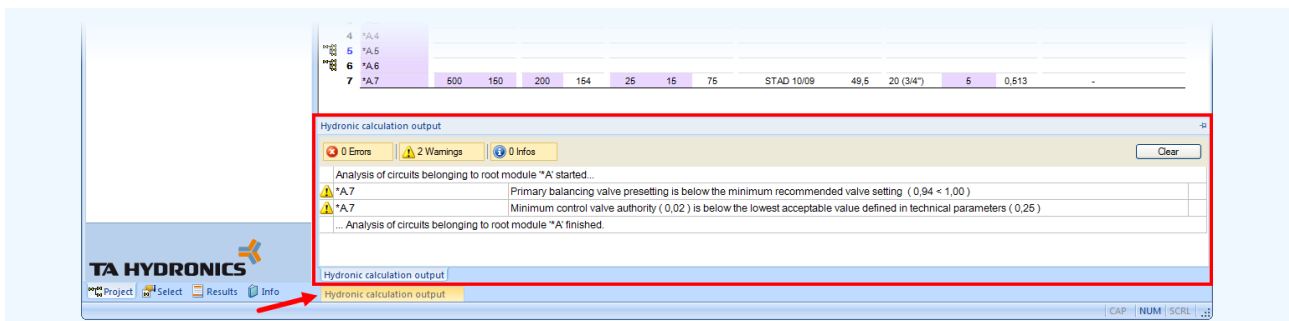
Distribution lengths "dx" in red, and circuit lengths "cx" in blue

5.5. Distribution and Circuits

Once the whole circuit architecture and all the components have been entered, you get the calculation results in the *TA Select 4* interface main area.

Hydronic calculation output

Click on the **Hydronic calculation output** tab at the bottom of the screen to open the log of the calculation process. This log lists the errors, warnings, and information returned by the calculation algorithm as illustrated hereunder.



The hydronic calculation log

Click on the **Clear** button at any time to empty this log.

Distribution tab

The first tab, **Distribution**, displays the flow distribution through all circuits and components as illustrated hereunder.

This window displays a table with all information about the distribution between the different circuits such as Havailable, flows, distribution pipes, circuit type... for the selected circuit in the left pane tree.

***A.2.1**

Module description: Antenne EG R-1 NORD
Remark: -

Total flow: 7862 l/h
Hmin: 97.9 kPa
Havailable: 108 kPa

Circuit					Distribution Pipe ** Generic Steel Pipes **			Accessories	
Name	Description	Circuit Type	Flow	H available	Size	Length	Dp	Description	Dp
			l/h	kPa		m	kPa		kPa
1	*A.2.1 Antenne EG	Distribution	7862	108	80 (3")	18	2,13	T6	0,361
1	*A.2.1.1 V-C LABO DE	2-way	421	57	65 (2 1/2")	2	0,165	T6	0,034
2	*A.2.1.2 V-C LABO DE	2-way	421	56,6	65 (2 1/2")	6	0,447	T6	0,032
3	*A.2.1.3 V-C bureau 11	2-way	592	53,4	50 (2")	13	3,13	T6	0,115
4	*A.2.1.4 V-C bureau 10	2-way	480	50,7	50 (2")	13	2,68	T6	0,086
5	*A.2.1.5 V-C bureau 9	2-way	270	60	50 (2")	4	0,711	T6	0,047
6	*A.2.1.6 V-C bureau 8-1	2-way	364	49,1	50 (2")	5	0,817	T6	0,059
7	*A.2.1.7 V-C bureau 8-2	2-way	364	49,1	50 (2")	0		T6	0,056
8	*A.2.1.8 V-C bureau 7	2-way	360	48,8	50 (2")	2	0,254	T6	0,05
9	*A.2.1.9 V-C bureau 6	2-way	286	48,1	50 (2")	6	0,665	T6	0,037
10	*A.2.1.10 V-C bureau 5	2-way	286	47,5	50 (2")	6	0,592	T6	0,035
11	*A.2.1.11 V-C Reunion 3	2-way	648	47,2	50 (2")	4	0,349	T6	0,06
12	*A.2.1.12 V-C bureau 4	2-way	286	46,8	40 (1 1/2")	2	0,404	T6	0,069
13	*A.2.1.13 V-Creunion 3-2	2-way	648	46	40 (1 1/2")	4	0,688	T6	0,12
14	*A.2.1.14 V-C bureau3	2-way	286	45,6	32 (1 1/4")	2	0,473	T6	0,086
15	*A.2.1.15 V-C bureau 2-1	2-way	176	44,4	32 (1 1/4")	6	1,13	T6	0,05
16	*A.2.1.16 V-C bureau 2-2	2-way	176	43,4	32 (1 1/4")	6	0,969	T6	0,045
17	*A.2.1.17 V-C Reunion ...	2-way	634	40,9	32 (1 1/4")	18	2,46	T6	0,127
18	*A.2.1.18 V-C Reunion ...	2-way	634	40,9	25 (1")	0		T6	0,168
19	*A.2.1.19 V-C bureau 1	2-way	530	40,1	20 (3/4")	4	0,728	-	

The **Distribution** tab

Pending circuits

- › Pending circuits are marked with a icon in the first column of the table.
- › The listed distribution pipes are sized taking into account the pending circuits.
- › The listed flows represent the current value, that is without taking into account the pending circuits.

Injection circuits

- › The injection circuits are visible in the **Circuit Type** column.

Reverse return circuits

- › The **Distribution pipe** and the corresponding **Accessories** sections of the table are duplicated, once for the supply pipes and once for the return pipes.

Circuits tab

The second tab, **Circuits**, displays the components selected by *TA Select 4* calculation algorithm to optimise your circuit as illustrated hereunder.

This window displays a table with all valves and components selected by the calculation as well as the respective operating conditions and settings.

***A.2.1**

Module description: Antenne EG R+1 NORD
Remark: -

Total flow: 7962 l/h
Hmin: 65,8 kPa
Havailable: 97,2 kPa

Description	Unit	Flow	Dp	Control Valve		Balancing Valve		Dp Controller			Size
				Name	Dp	Name	Dp	Name	Dpl range	Dp	
		l/h	kPa		kPa		kPa		kPa	kPa	
1 Antenne EG ...		7862	67,8			STAF 65-2	3	STAP 65	[40-160]	36,5	60,8
1 V-C LABO DE ...		421	17,4	TBV-C 15LF	39,2						20 (3/4")
2 V-C LABO DE ...		421	17,4	TBV-C 15LF	38,7						20 (3/4")
3 V-C bureau 11		592	32,2	TBV-C 20NF	19,8						20 (3/4")
4 ...		480	21,9	TBV-C 15NF	27,9						20 (3/4")
5 V-C bureau 10		270	7,38	TBV-C 15LF	40,9						15 (1/2")
6 V-C bureau 10		364	12,2	TBV-C 15LF	35,4						20 (3/4")
7 V-C bureau 10		364	12,2	TBV-C 15LF	36,4						20 (3/4")
8 V-C bureau 10		360	11,9	TBV-C 15LF	36,7						20 (3/4")
9 V-C bureau 10		286	7,87	TBV-C 15LF	40,2						20 (3/4")
10 V-C bureau 5		286	7,87	TBV-C 15LF	39,7						20 (3/4")
11 V-C Réunion 3		648	37,6	TBV-C 20NF	9,36						25 (1")
12 V-C bureau 4		286	7,87	TBV-C 15LF	38,7						20 (3/4")
13 V-C Réunion 3-2		648	37,6	TBV-C 20NF	8,13						25 (1")
14 V-C bureau 3		286	7,87	TBV-C 15LF	37,5						20 (3/4")
15 V-C bureau 2-1		176	3,1	TBV-C 15LF	41						15 (1/2")
16 V-C bureau 2-2		176	3,1	TBV-C 15LF	40,1						15 (1/2")
17 V-C Réunion ...		634	36	TBV-C 20NF	3,63						20 (3/4")
18 V-C Réunion ...		634	36	TBV-C 20NF	3,48						20 (3/4")

The **Circuits** tab

Pending circuits

- The balancing valves of the existing circuits are set down to absorb the higher Dp. They will be set to a better value when the pending circuits are commissioned at a later stage.

Injection circuits

- For injection circuits, the information displayed in this tab corresponds to the primary section of these circuits.

2w-inj. circ. tab

Injection circuits

If injection circuits are used in your plant, a third tab, **2w-inj. circ.**, displays the circuits components as well as the respective operating conditions and settings for the secondary part of these injection circuit as illustrated hereunder.

The screenshot shows the TA Select 4 software interface. The main workspace displays a table with the following data:

Circuit	Unit/Sec. side	Pump	Temperature	Balancing Valve	Circuit Pipes	Accessories								
Name	Flow	Dp	Head	H min.	Ts	Tr	Tp	Name	Dp	Size	Length	Dp	Description	Dp
	l/h	kPa	kPa	kPa	°C	°C	°C		kPa		m	kPa		kPa
1 *A														
2 *A.1														
3 *A.2														
4 *A.3														
5 *A.4														
6 *A.5														
7 *A.6	600	160	200	154	25	15	75	STAD 10/09	49.5	20 (3/4")	5	0.513	-	

The **2w-inj. circ. tab**

Legend

In the table, the following coding has a specific meaning:

- › **Blue text**: indicates the index circuit.
- › **Bold text**: indicates locked settings that will not be changed during a calculation.
- › : indicates in between which circuits a distribution pipe is located.

Navigation and display

The following icons and buttons are available in this table to help you navigate it and display what information is important for you. They are not always visible as some depend on the context.

- › Navigation buttons (in the left margin):
 - : click to go up to the parent circuit (the left pane tree corresponding item is selected accordingly).
 - : click to go down and display the circuit details.

Columns display buttons (next to the column title grey boxes):

- : click to expand the corresponding group and display more columns and data in the table.
- : click to collapse the corresponding group and display fewer columns and data in the table.
- : click to expand all the groups.
- : click to collapse all the groups.

Editing

 The project must be set as follows prior to using this function:

- **Hydronic circuit calculation** *activated*.
- **Freeze hydronic circuit calculation** *unchecked*.

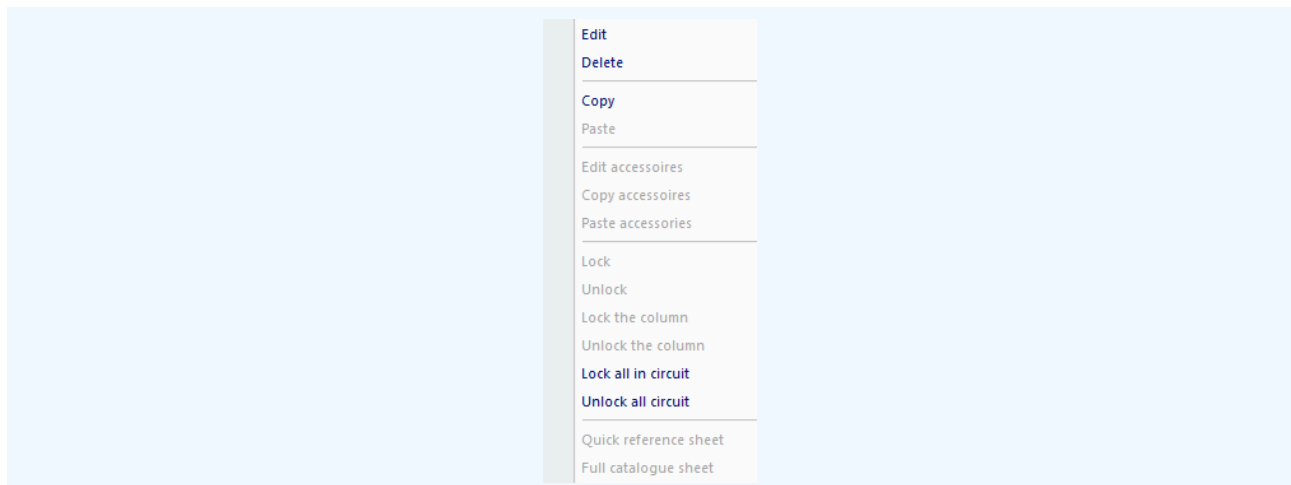
You can edit some data in your circuit. The whole circuit will be automatically calculated again in real time.

Right-click on a line to open the contextual menu illustrated hereunder, and access the following commands.

- **Edit**: to edit the circuit and open the corresponding [Circuit Wizard Second Step](#) window.
- **Lock and Unlock**: to lock and unlock a circuit or a set of circuits. A locked setting will not be changed during a calculation.
- **Copy and Paste**: to copy and paste the selected circuit.
- **Delete**: to remove the selected circuit.
- **Edit accessories**: to edit the accessories linked to the selected component (if relevant).

Only for valve components:

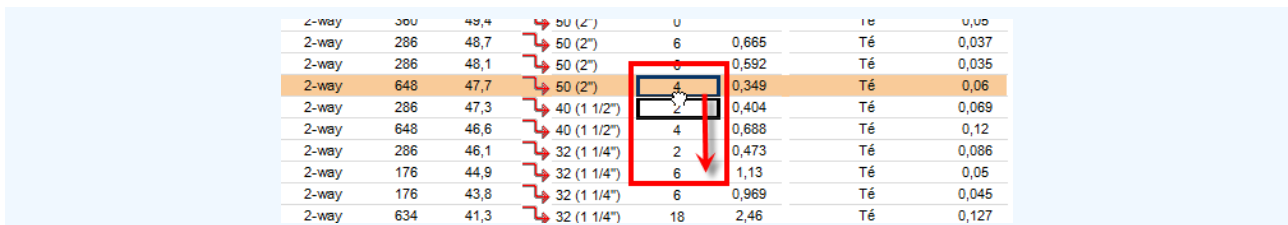
- **Quick reference sheet**: open the pdf quick reference sheet for this product.
- **Full catalogue sheet**: open the pdf catalogue sheet for this product.



The editing contextual menu

- Double-click on a circuit: to edit the circuit (same as the **Edit** command in the context menu).
- : (editable column) click on any setting in that column to select a new value via a drop-down list.
- : (editable column) click on any setting in that column to enter a new text in the text box.

- › Drag copy: to copy a setting in the following adjacent cells at once.
 - Click on the cell you want to copy (it should be editable).
 - The cursor changes into an open hand.
 - Click on the cell again and do not release the mouse button.
 - The cursor changes to a closed hand as illustrated.
 - Move the cursor down over the cells you want to replace with the selected value.
 - Release the mouse button.
 - All cells are replaced with the selected value. These cells are now locked by default.



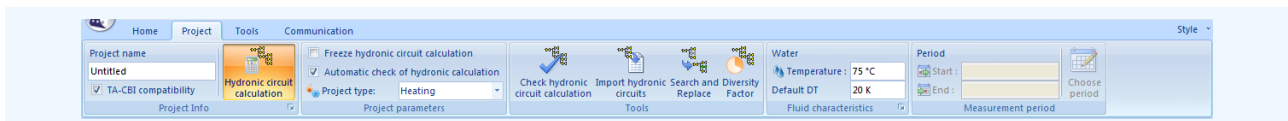
2-way	300	49,4	50 (2")	0		Té	0,00
2-way	286	48,7	50 (2")	6	0,665	Té	0,037
2-way	286	48,1	50 (2")	6	0,592	Té	0,035
2-way	648	47,7	50 (2")	2	0,349	Té	0,06
2-way	286	47,3	40 (1 1/2")	2	0,404	Té	0,069
2-way	648	46,6	40 (1 1/2")	4	0,688	Té	0,12
2-way	286	46,1	32 (1 1/4")	2	0,473	Té	0,086
2-way	176	44,9	32 (1 1/4")	6	1,13	Té	0,05
2-way	176	43,8	32 (1 1/4")	6	0,969	Té	0,045
2-way	634	41,3	32 (1 1/4")	18	2,46	Té	0,127

Drag copy operation and specific cursor

5.6. Advanced Project Configuration

5.6.1. Overview

When you create a new project, some setup is required via the different groups of the **Project** ribbon.



*The **Project** ribbon*

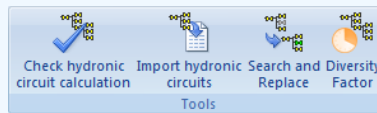
The basic configuration in the following groups is described in the [Project Configuration](#):

- › **Project Info**: enter the project, plant, and customer information.
- › **Project parameters**: select some project high level parameters.

The advanced project configuration in the following groups is described in this chapter:

- › **Tools**: launch some additional tools:
 - **Check hydronic circuit calculation**: to check the circuit compliance with your settings after an automatic recalculation following any change.
 - **Import hydronic circuits**: to import existing circuits or parts of them into the current circuit.
 - **Search and Replace**: to automatically search and replace pipe and/or hydraulic circuits within your project.
 - **Diversity Factor**: to apply a diversity factor to your whole project or to a part of it.
- › **Fluid characteristics**: enter the characteristics of the fluid used in your circuit.
- › **Measurement period**: enter the measurement period when using a TA Scope.

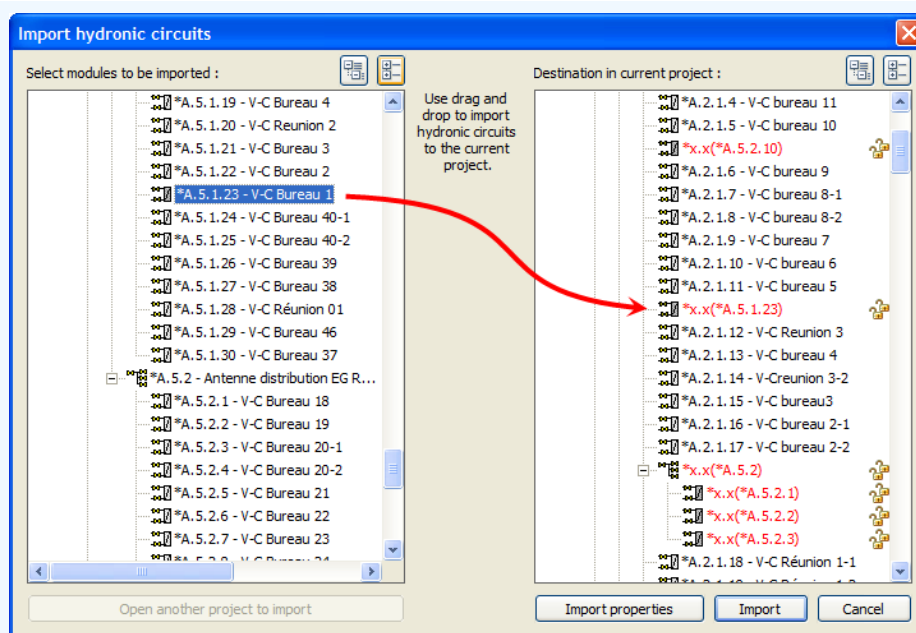
5.6.2. Import Hydronic Circuits



The **Project ribbon - Tools group**

To reuse and import an existing circuit or part of it into your current circuit, follow these instructions:

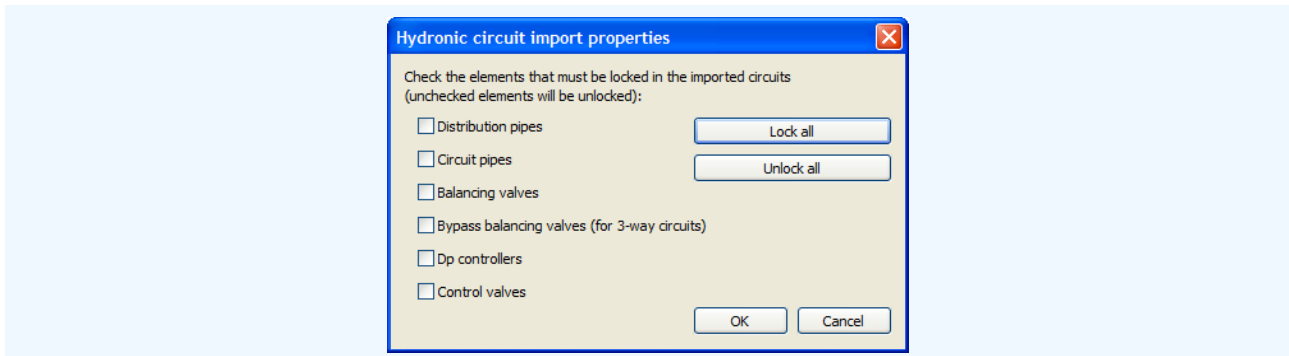
1. Click on the **Import hydronic circuits** button in the ribbon to open a browse window.
 2. Browse to and open the circuit to import (*.tsp file).
 3. The following import window opens with, in the left column, the open import file and, in the right column, your current project.
 4. Drag and drop the circuit or part of the circuit you want to import from the left column to the right column at the desired place as illustrated hereunder.
- The drop place of the imported element is indicated with a blue line in the current project.
 - The imported element appears in red as "***x.x (old reference)**" in the right column.
 - To move a dropped element (in red), drag and drop it again in the right column.
 - To remove a dropped element (in red), click on it then press the **DEL** key, or drag and drop it outside the destination area.



Importing a terminal unit into the current project

5. Click on the **Import properties** button to open the following window and configure the import behaviour.

- Select the circuit components that should be imported.
- Use the **Lock all** button to lock all components and leave them unchanged.
- Use the **Unlock all** button to unlock all components and let *TA Select 4* recalculate the whole circuit according to the current project settings.

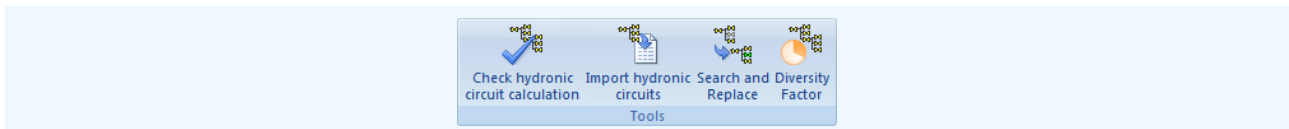


*The **Hydronic circuit import properties** window*

6. Click on the **Import** button to start the import and the circuit recalculation.

 Please note that all circuit elements will be renumbered according to the *TA Select 4* rules (incrementally with the first component being next to the flow entry).

5.6.3. Search and Replace



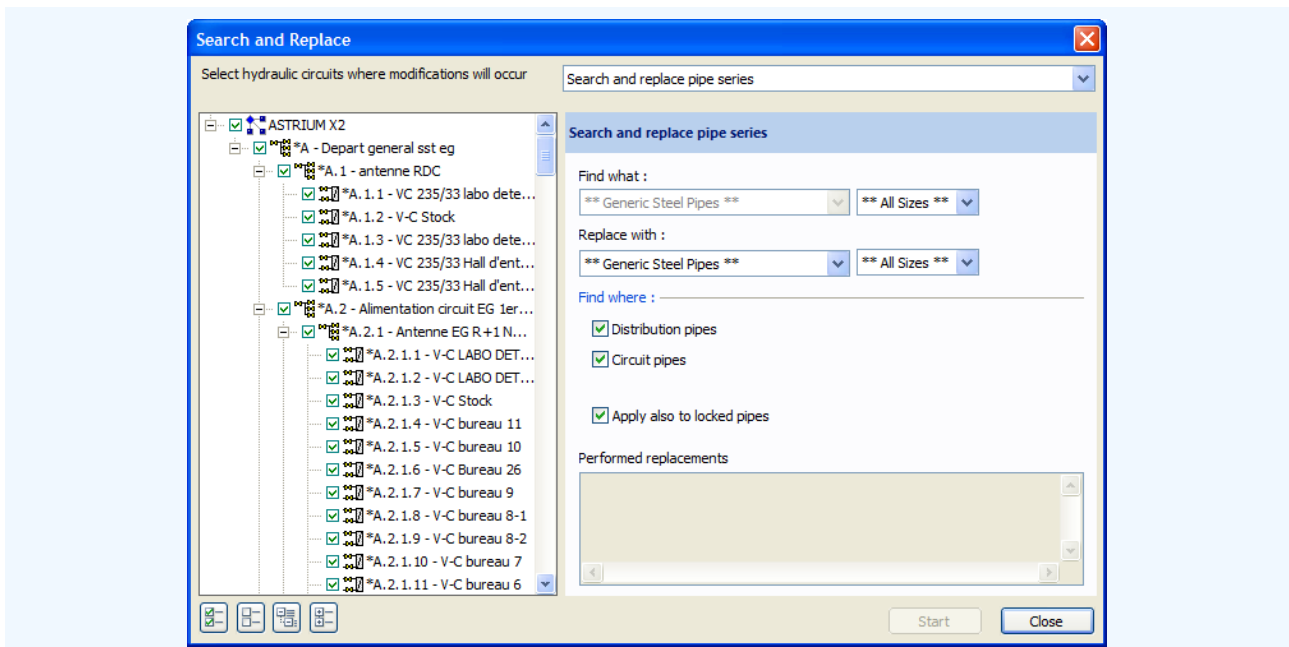
*The **Project** ribbon - **Tools** group*

 The project must be set as follows prior to using this function:

- **Hydronic circuit calculation** activated.
- **Freeze hydronic circuit calculation** unchecked.

Pipe search and replace

1. Click on the **Search and Replace** button in the ribbon.
2. By default, the following window opens with the **Search and replace pipe series** option selected in the upper right drop down box.



The Search and Replace window - Search and replace pipe series

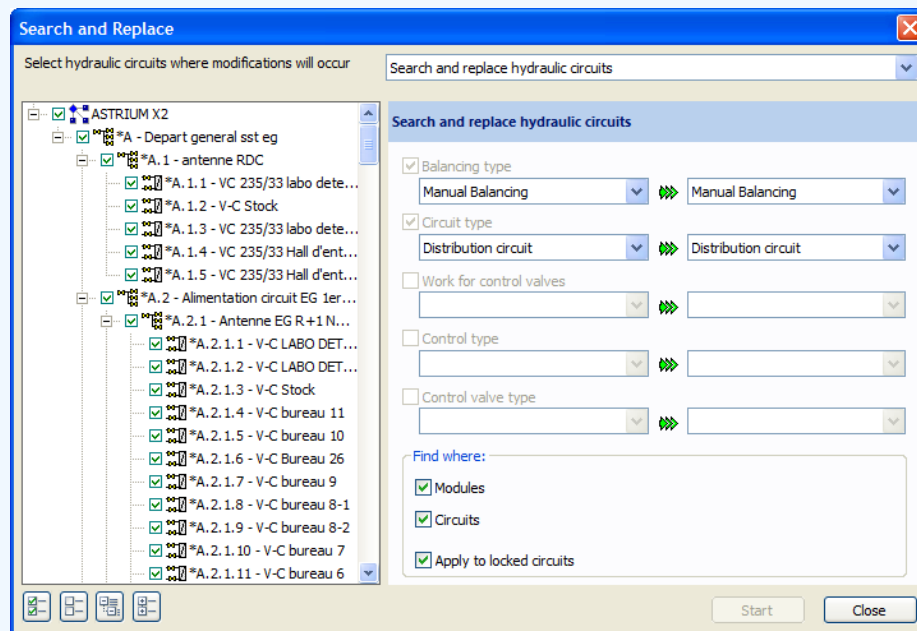
3. In the left column, select or unselect the circuit to which you want to apply or not the search and replace.
 - Check or uncheck individually all circuits or terminal elements.
 - Click on the  button to check all elements at once.
 - Click on the  button to uncheck all elements at once.
 - Click on the  button to expand the circuit tree.
 - Click on the  button to collapse the circuit tree.
4. In the right column, select the type of pipe to be replaced and the type of pipe to use as a replacement in all the selected circuits.

 If the type of pipe to replace cannot be selected, that means that this is the only type of pipe used over the whole circuit.

5. In the right column, select the additional options for the replacement process.
6. Click on the **Start** button.
7. The replacements performed are displayed in the bottom right text area.

Hydraulic circuits search and replace

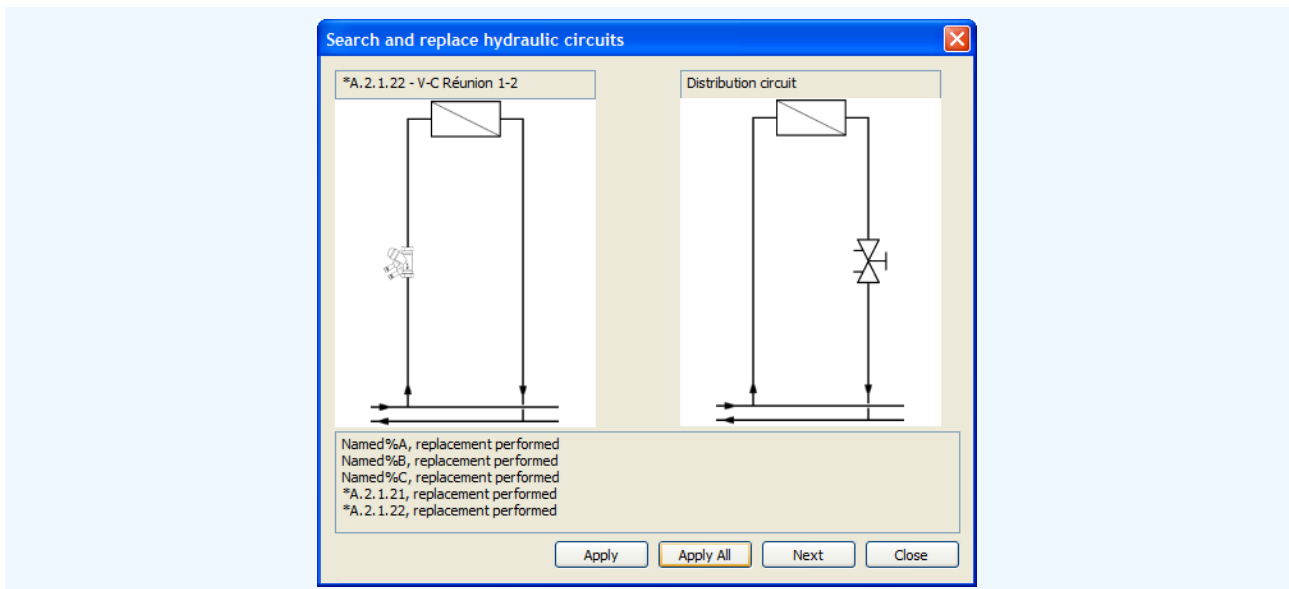
1. Click on the **Search and Replace** button in the ribbon.
2. In the upper right drop down box, select the **Search and replace hydraulic circuits** option.



The Search and Replace window - Search and replace hydraulic circuits

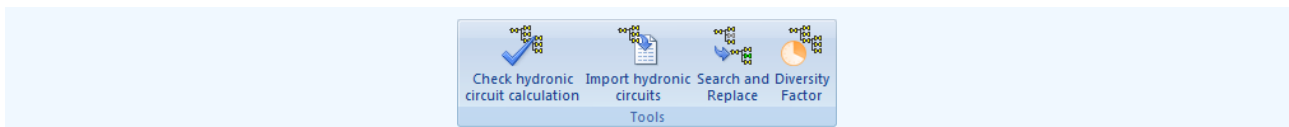
3. In the left column, select or unselect the circuit to which you want to apply or not the search and replace.
 - Check or uncheck individually all circuits or terminal elements.
 - Click on the  button to check all elements at once.
 - Click on the  button to uncheck all elements at once.
 - Click on the  button to expand the circuit tree.
 - Click on the  button to collapse the circuit tree.
4. In the right column, select the type of circuit to be replaced.
5. Depending on the previous selection, additional parameters may or not be adjusted to fine tune the replacement targets.
6. In the right column, select the additional options for the replacement process.
7. Click on the **Start** button.
8. A window similar to the one illustrated hereunder opens with the replacements to be performed.

9. Confirm each replacement individually with the **Apply** button, or all at one with the **Apply All** button.
10. The replacements performed are displayed in this window bottom text area.



Replace confirmation window

5.6.4. Diversity Factor



*The **Project** ribbon - **Tools** group*

 *The project must be set as follows prior to using this function:*

- **Hydronic circuit calculation** activated.
- **Freeze hydronic circuit calculation** unchecked.

The diversity factor

When you define your circuit and your plant, you usually size your components to take into account a circuit operating at its full capability (that is all terminal units delivering their full power together). However, in practice, this situation is never required and so your whole installation is oversized.

To answer this problem and help you reduce the cost of the installation, *TA Select 4* allows you to define and apply a **Diversity Factor** to a part or to your complete plant.

 *The diversity factor can be regarded as the probability that a piece of equipment will come on during the peak load in the plant.*

During the hydronic calculations, *TA Select 4* will review possible patterns and determine for each pipe the design flow required to:

- › Be as close as possible to the specified diversity factor.
- › Allow full flow and full power at each terminal unit.

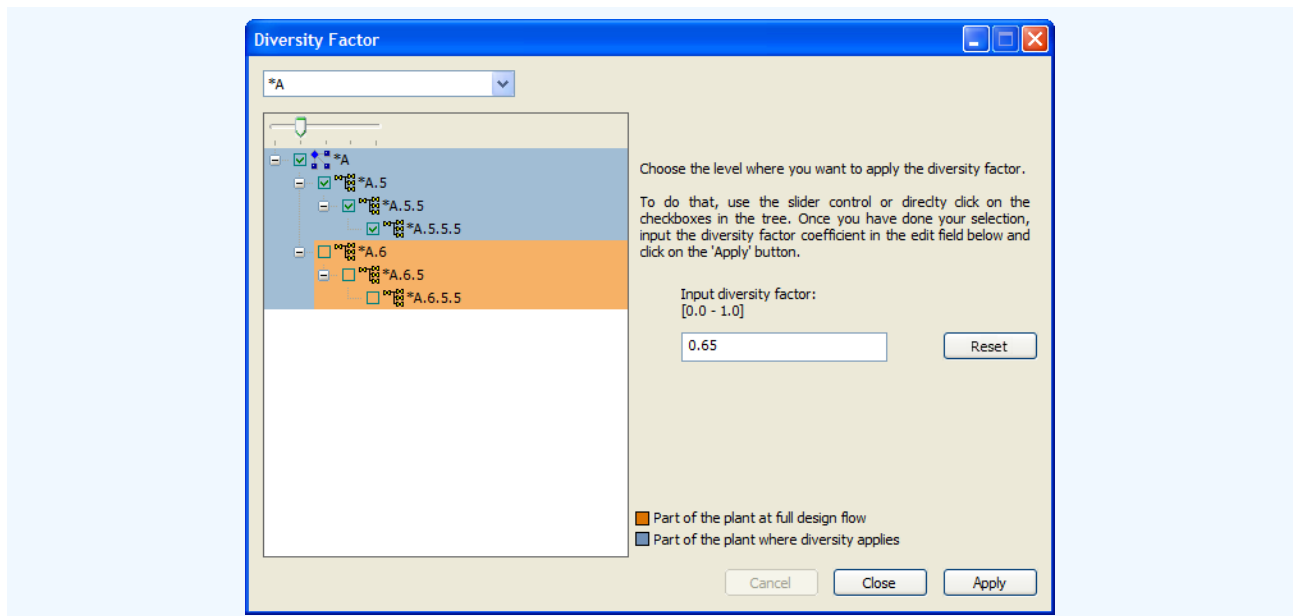
This means that regarding:

- › **Production units:** the diversity factor is applied in full to the sizing of production units such as boilers, chillers... They are downsized accordingly.
- › **Distribution circuits:** the diversity factor impacts partially the circuits by partially reducing the design flow in some pipe segments.
- › **Terminal units:** there is no impact on the sizing of the end circuits as each terminal unit is always able to provide its full power.

Applying the diversity factor

To select a part of your plant and define the diversity factor to apply to it:

1. Open the **Project** ribbon.
2. Go to the **Tools** group.
3. Click on the **Diversity Factor** button to open the following window:

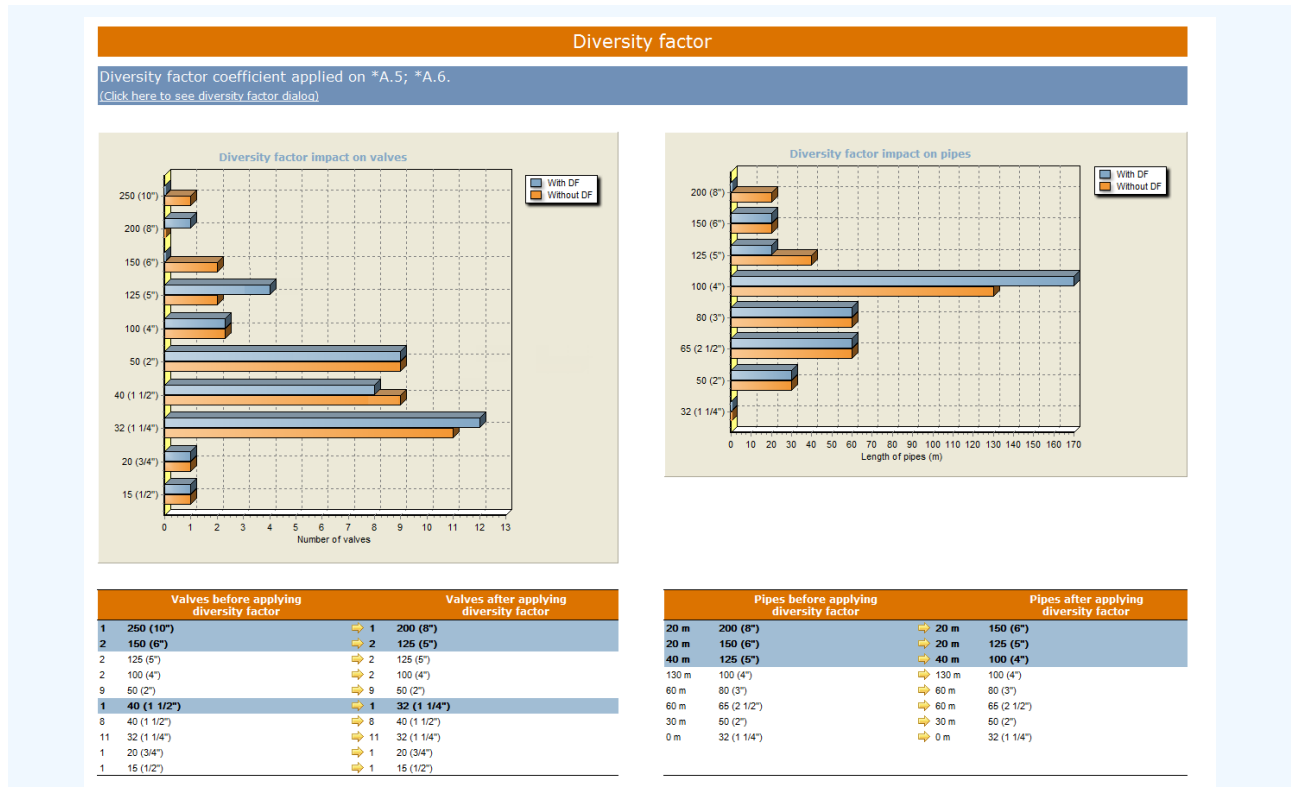


The Diversity Factor window

4. If you have several circuits, select the one on which you are going to apply the diversity factor.
5. Either select the level under which you want to apply this factor by moving the slider or manually click on the branches to select in the circuit tree.
6. Enter the diversity factor (between 0.0 and 1.0) in the corresponding field.
7. Click on the **Reset** button to cancel any diversity factor currently applied on your circuit.
8. Click on the **Apply** button to apply this factor to your plant and calculations.
9. Click on the **Close** button to close this window.
10. Click on the **Cancel** button to quit this window without applying the diversity factor.

Analysing the diversity factor effect

Once you have applied a diversity factor, the result page is displayed as illustrated hereunder:

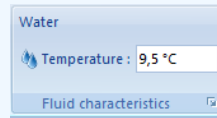


Diversity factor result page

- › The left part of the window displays the diversity factor effect on the valves selection in a graphical and a table form.
- › The right part of the window displays the diversity factor effect on the pipes selection in a graphical and a table form.

You can easily see the reduction allowed in the size of some of the valves and some of the pipe lengths.

5.6.5. Fluid Characteristics



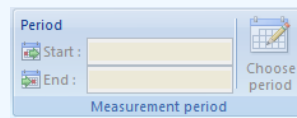
*The **Project** ribbon - **Fluid characteristics** group*

Define the fluid (water and additive) used in your system. The fluid characteristics will be automatically computed and used in the calculation made during the project calculation.

The **Water Characteristics** window is described in the [Fluid Characteristics](#) section.

i Please note that the **Fluid Characteristics** you enter when performing different operations such as individual selection, hydronic calculation, or using the additional tools are independent from one another. If you change the fluid or its temperature here, these values will NOT be changed in other TA Select 4 parts.

5.6.6. Measurement Period



*The **Project** ribbon - **Measurement Period** group*

i This group is active and can be used only when you have previously imported measurement data from a TA-SCOPE for the current project.

Only the measurements performed during the selected period will be displayed. Please refer to the [TA Scope Data Processing](#) chapter for more information about measurements management.

In this group, the following data are displayed:

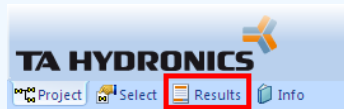
- › **Start**: the beginning date of the interval to be used for data filtering.
- › **End**: the end date of this interval.

Click on the **Choose period** button to change these dates.

6. Results Management

6.1. Overview

After products selection, either manually or after calculation, you can review the selected components and the complete bill of material in the control panel **Results** tab as illustrated hereunder.



The Results tab in the control panel

The displayed table depends on the selected tab in the main window area: **Balancing Valves**, **Control Products**, **Article List**, as illustrated in the following figures.

Selected differential pressure control sets

#1	#2	Water	Product	Technical Info	Article N°	Pipe	Qty	\$
Dp Controllers (from individual selection)								
cta reunion	batterie eg	Water Temperature: 9,5 °C	STAP 50	4816 l/h	52265-050	-	1	
			Thread Standard [20-80] kPa PN 16	Dpmin = 3,89 kPa 13 turns Hmin = 30,1 kPa Sch. A (Kv=10) Authority>0,63				
cta reunion	batterie eg	Water Temperature: 9,5 °C	STAD 50	4816 l/h	52151-650	-	1	
			Thread With drain 3/4" PN 20	3 kPa 3,61 turns				
cta reunion	batterie eg	Water Temperature: 9,5 °C	STAP 50	4816 l/h	52265-050	-	1	
			Thread Standard [20-80] kPa PN 16	Dpmin = 3,89 kPa 13 turns Hmin = 30,1 kPa Sch. A (Kv=10) Authority>0,63				
cta reunion	batterie eg	Water Temperature: 9,5 °C	STAD 50	4816 l/h	52151-650	-	1	
			Thread With drain 3/4" PN 20	3 kPa 3,61 turns				
Scheme A (STAP)								
Dp Controllers (from hydraulic circuit calculation)								
*A.1	antenne RDC	Water Temperature: 9,5 °C	STAP 20	2178 l/h	52265-020	-	1	
			Thread	Dp = 49,6 kPa				

Navigation: Balancing valves | **Dp controllers** | Pipe list | Article list

Example of Results for Dp controllers

The **Results** interface is divided in the following parts:

1. The page title displays the name of the corresponding chosen tab.
2. The columns titles and, if relevant, the corresponding unit.
3. The list of selected products list with, depending on the tab, one line or one section per product.

 In this list, the products issued from a selection or from a calculation are clearly separated.

4. The bottom tab bar gives access to the different tabs and corresponding tables and bill of material.

 In all these tables, the products are listed in chronological order of their selection.

6.2. Selection Results Edition

In the **Results** tables, you can perform following operations on products issued from a individual or direct selection:

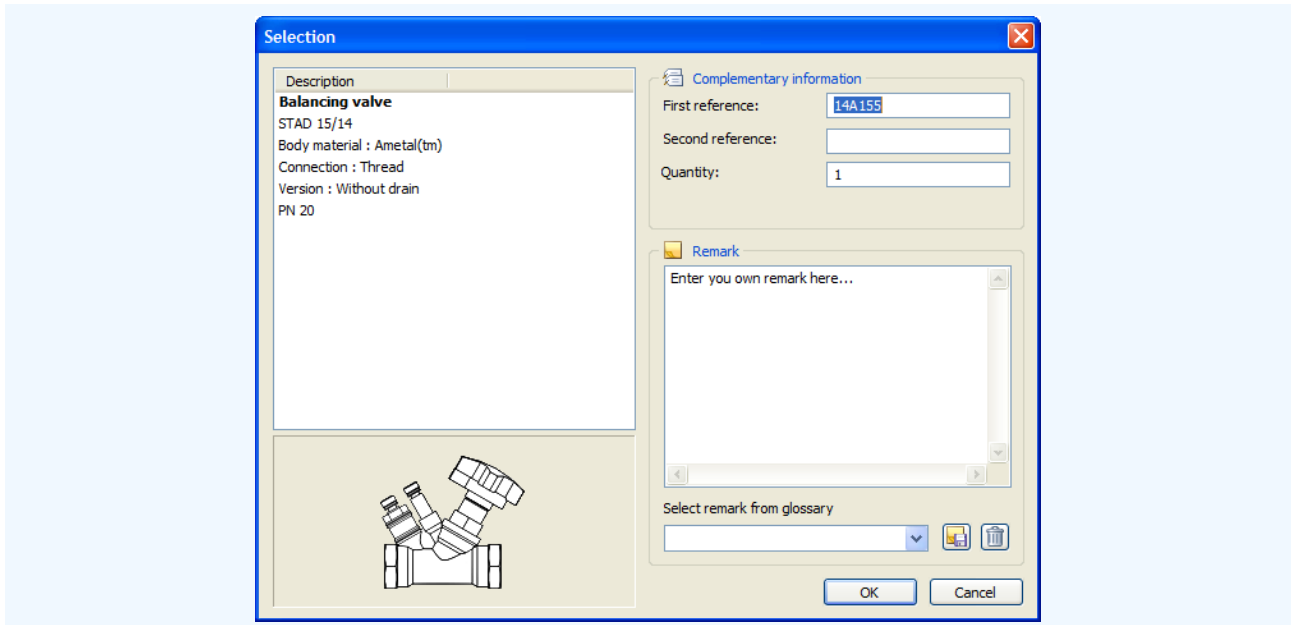
- Click on a line to highlight (its background is orange) and select it.
 - Use **SHIFT+left click** to select a range of products at a time.
 - Use **CTRL+left click** to select several separated products.
- Right click on one of the selected products to open the contextual menu as illustrated.

Selected balancing valves								
#1	#2	Water	Product	Technical Info	Article N°	Pipe	Qty	\$
Balancing Valves (from individual selection)								
		Water	STAD 10/09	3 l/h	52151-609	Steel DIN 2440, ISO 65	1	
		Temperature: 20 °C	Thread	3,02 kPa		10		
			With drain 3/4"	0,25 turns		0,0068 m/s		
			PN 20			1,39 Pa/m		
Balancing Valves (from direct selection)								
			STAF-SG 20		52182-020		1	
			Flange					
			Standard					
			PN 16-25					
			STA-DR 15		52173-015		1	
			Thread					
			With drain 1/2"					
			PN 20					

The contextual menu in the **Results** tables

The following commands are available from this menu:

- › **Edit:** edit and, if wanted, change the selected product as described in the [Parameterised Selection](#) section.
- › **Quick edit:** open the selection window illustrated below to quickly change the product references (but without changing the product itself). Please refer to the [Selection](#) section for a complete description.



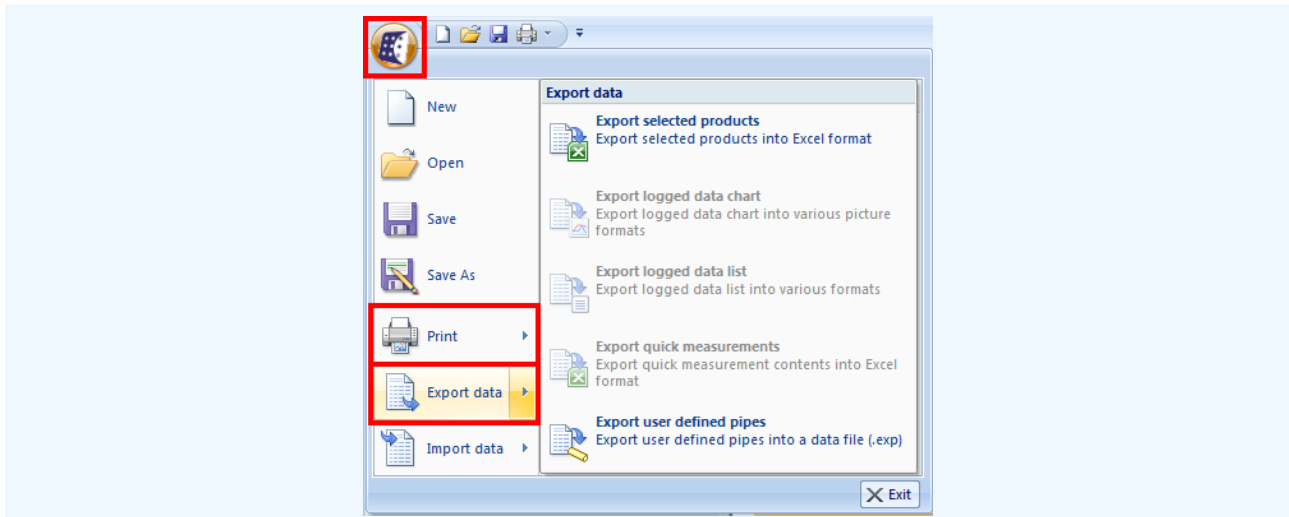
The Quick Edit window

- › **Delete:** remove the selected products from the list.
- › **Cut:** remove the selected products but keep them in the clipboard for later paste reuse.
- › **Copy:** copy the selected products in the clipboard.
- › **Paste:** paste the selected products from the clipboard into the list.
- › **Quick reference sheet:** open a pdf reader to display the quick reference sheet of the product.
- › **Full catalogue sheet:** open a pdf reader to display the full catalogue sheet of the product.

6.3. Results Output

You can easily export as Excel sheets and print the different **Results** tables issued from your selection or from automatic calculation.

Click on the *TA Select 4* button in the upper left corner of the software window to access the general functions including **Print** and **Export data** as illustrated hereunder.



The TA Select 4 button and associated menu

Exporting results

Click on the **Export data** command then select one of the export options (depending on the data available) to export the **Results** tables as Excel data files.

All available tabs are exported as Excel sheets with the same name as illustrated hereunder.

Microsoft Excel - ASTRUM X2.xls

FichierEditionAffichageInsertionFormatOutilsDonnéesFenêtreAdobe PDF

Tapez une question

SnagitWindow

Arial Unicode MS8G I S

B7	cta reunion										
A	B	C	D	E	F	H	I	J	M	O	P
1	Selected differential pressure control sets										
2											
3											
4	#1	#2	Water	Product	Technical Info	Article N°	Pipe	Qty	\$		
5											
6	Dp Controllers (from individual selection)										
7	cta reunion	batterie eg	Water Temperature: 9,5 °C	STAP 50	4816 l/h	52265-050	-	1			
8				Thread	Dpmin = 3,89 kPa						
9				Standard	13 turns						
10				[20-80] kPa	Hmin = 30,1 kPa						
11				PN 16	Sch. A (Kv=10)						
12				Authority>0,63							
13				STAD 50	4816 l/h	52151-650		1			
14				Thread	3 kPa						
15				With drain 3/4"	3,61 turns						
16				PN 20							
17	cta reunion	batterie eg	Water Temperature: 9,5 °C	STAP 50	4816 l/h	52265-050	-	1			
18				Thread	Dpmin = 3,89 kPa						
19				Standard	13 turns						
20				[20-80] kPa	Hmin = 30,1 kPa						
21				PN 16	Sch. A (Kv=10)						
22				Authority>0,63							
23				STAD 50	4816 l/h	52151-650		1			
24				Thread	3 kPa						
25				With drain 3/4"	3,61 turns						
26				PN 20							
27											
28											
29	Scheme A (STAP)										

Prêt

Balancing valves / Dp controllers / Pipe list / Article list /

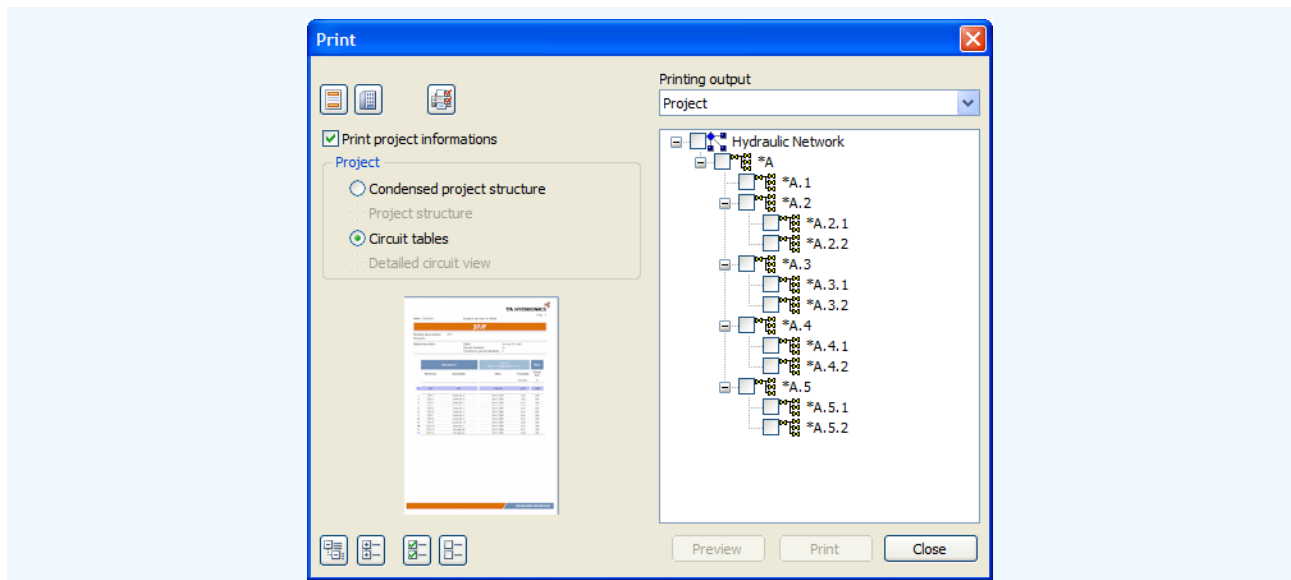
NUM

Example of results exported as Excel sheets and tables

Printing results

Click on the **Print** command then select:

- › **Print Setup** to select your printer and printer configuration.
- › **Print** to print your data. The following window opens with the selection option for printing:

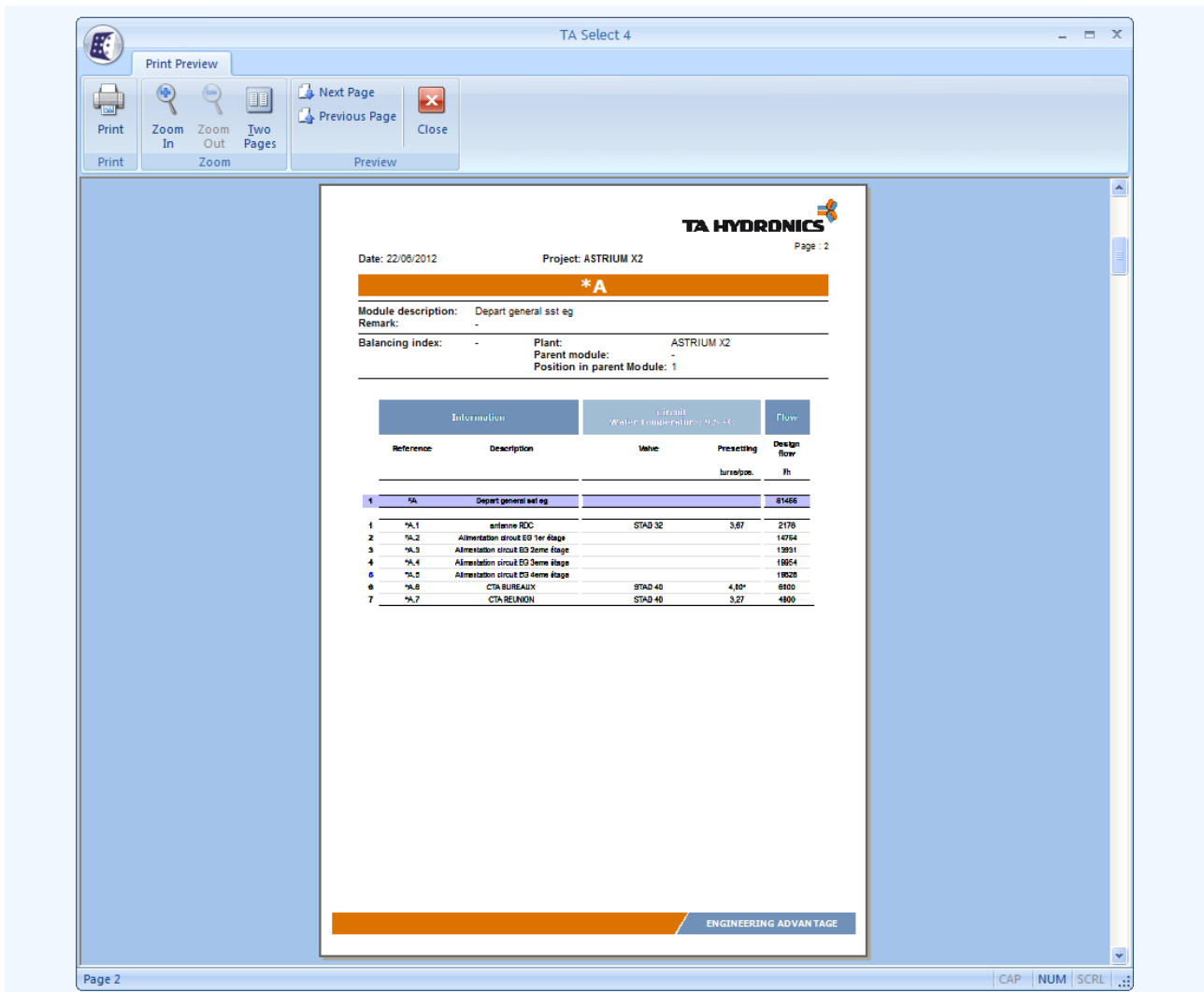


The **Print** menu

This window is divided in several areas:

- › In the left side of this window, several options are available to configure the printed output including the following buttons:
 - : configure the printed pages header and footer.
 - : select the project information to be displayed on the printed pages.
 - : configure your printer.
- › In the right side of the window, select the printed output as the project or the selected products. Then, check in the corresponding displayed tree or list, the items to be included in the printed output. Use the following buttons for easier selection:
 - : expand the circuit tree.
 - : collapse the circuit tree.
 - : check all elements at once.
 - : uncheck all elements at once.
- › In the bottom left area of the window, a small preview of the output is displayed to help you with the layout configuration.

- Once you have the desired layout, click on:
- The **Preview** button to open a preview window as illustrated hereunder.
 - The **Print** button to print your output according to the set configuration.

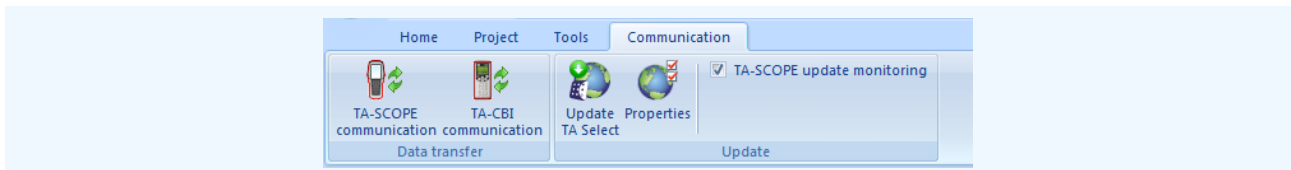


Example of print preview

7. TA-SCOPE and TA-CBI Communication

7.1. Overview

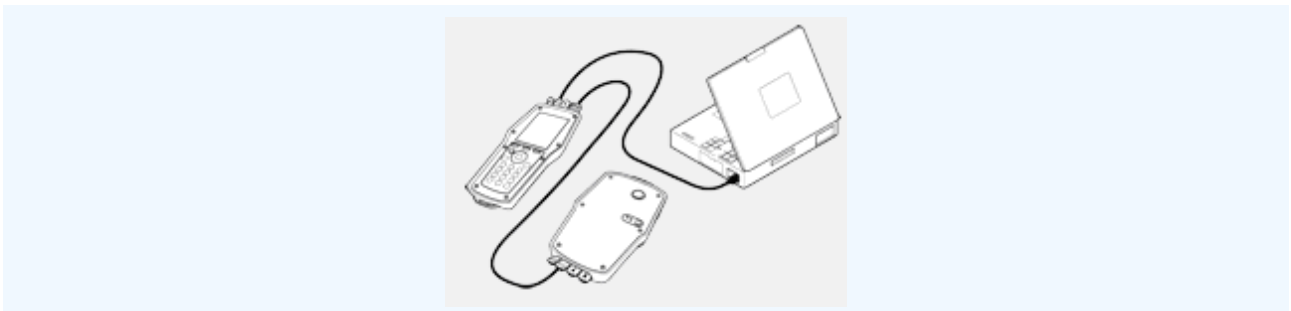
The **Communication** ribbon, illustrated hereunder, is used to connect *TA Select 4* to a TA-SCOPE or a TA-CBI measurement device. These devices are developed by TA Hydronics to measure the actual operation conditions of a system and to transfer the collected data back to *TA Select 4* for analysis.



*The **Communication** ribbon*

 The **Update** group is described in the [Software Update](#) section of the [Software Interface](#) chapter.

1. Before establishing any communication and load a plant configuration or download measurement data, you should connect your TA-SCOPE or your TA-CBI to your computer using the delivered cable as illustrated hereunder for the TA-SCOPE.



TA-SCOPE connection to the computer running TA Select 4

2. Once your device is connected, click on the corresponding button in the ribbon, either [TA-SCOPE communication](#) or [TA-CBI communication](#).

7.2. TA-SCOPE Communication

The **TA-SCOPE communication** button in the **Communication** tab opens the following window to enable connection between *TA Select 4* and your TA-SCOPE.



The TA-SCOPE communication window

This window display the following buttons described hereunder:

- › Software update if available
- › **Download**
- › **Upload**
- › **Maintenance**

TA-SCOPE communication screen

The TA-SCOPE should display the following window indicating that it is connected to your computer and *TA Select 4*.



The TA-SCOPE display

Software update

 The TA-SCOPE cannot communicate with TA Select 4 if its software version is older than your TA Select 4 software version.

If TA Select 4 detects that it has a newer version available for the connected TA-SCOPE, the following message is displayed. Click on it to update the TA-SCOPE software version.

Detected TA-SCOPE software version: 1.0.2.6
 [TA-SCOPE update available, click to install it.](#)

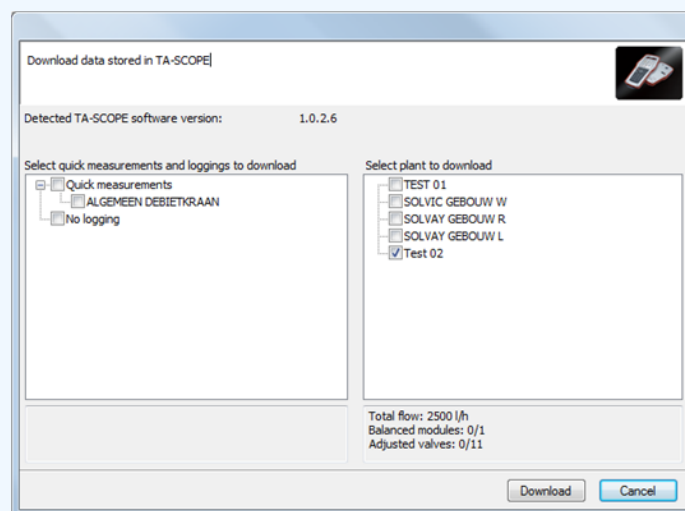
The TA-SCOPE available software update message

Download

Click on the **Download** button to open the following window. In this window, select:

- › On the left side, the quick measurements and the loggings stored in the TA-SCOPE.
- › On the right side, the plants stored in the TA-SCOPE.

Once you have selected all items you want to download, click on the **Download** button to transfer the data from the TA-SCOPE.



The TA-SCOPE download window

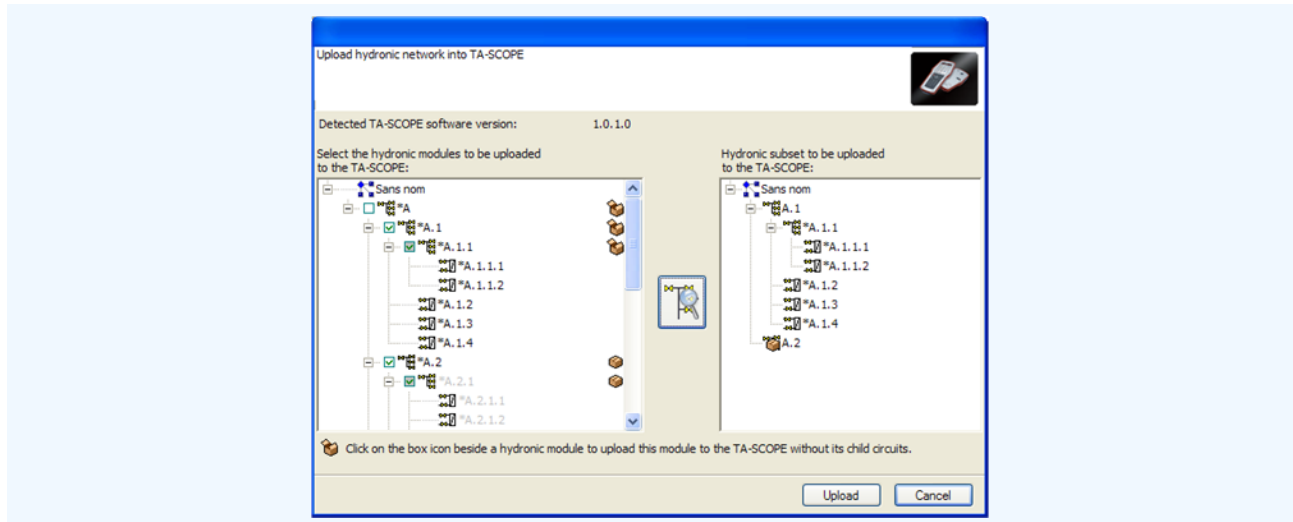
Upload

Click on the **Upload** button to open the following window.

In this window, select on the left side, the circuits and subcircuits you want to transfer:

- › Check the box next to the (sub)circuit name to select it for upload.
- › Click on the box icon on the right of the (sub)circuit name line:
 - The open box icon means that the child circuits will be uploaded with the circuit.
 - The closed box icon means that the child circuits will NOT be uploaded with the circuit.

Once you have selected all circuits you want to upload, click on the **Upload** button to transfer the data to the TA-SCOPE.

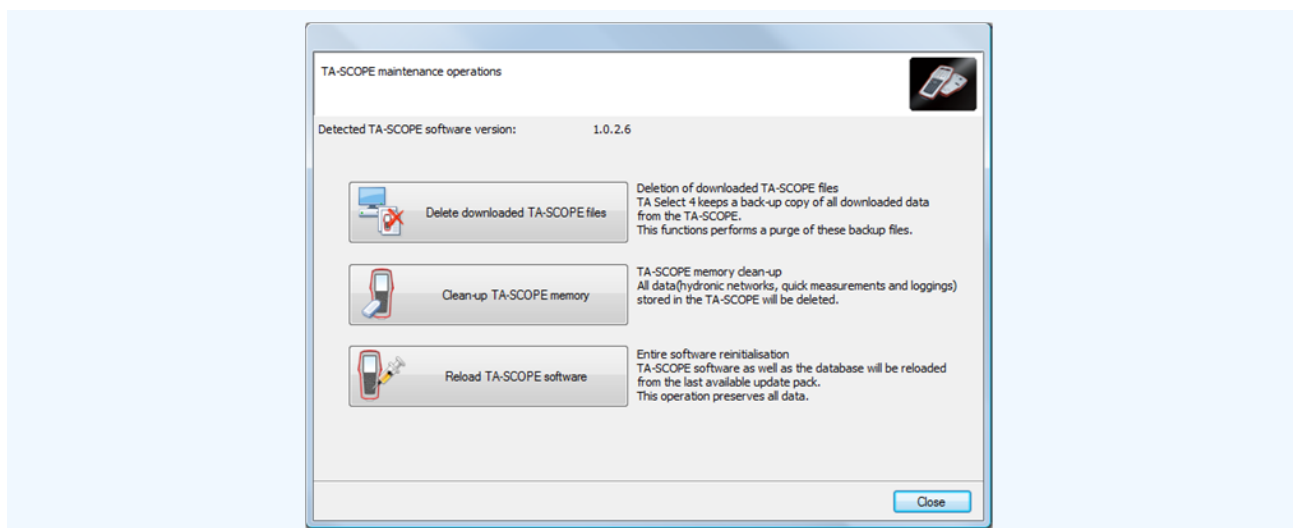


The TA-SCOPE upload window

Maintenance

Click on the **Maintenance** button to open the following window. In this window, the following buttons are available to perform maintenance operations on your TA-SCOPE:

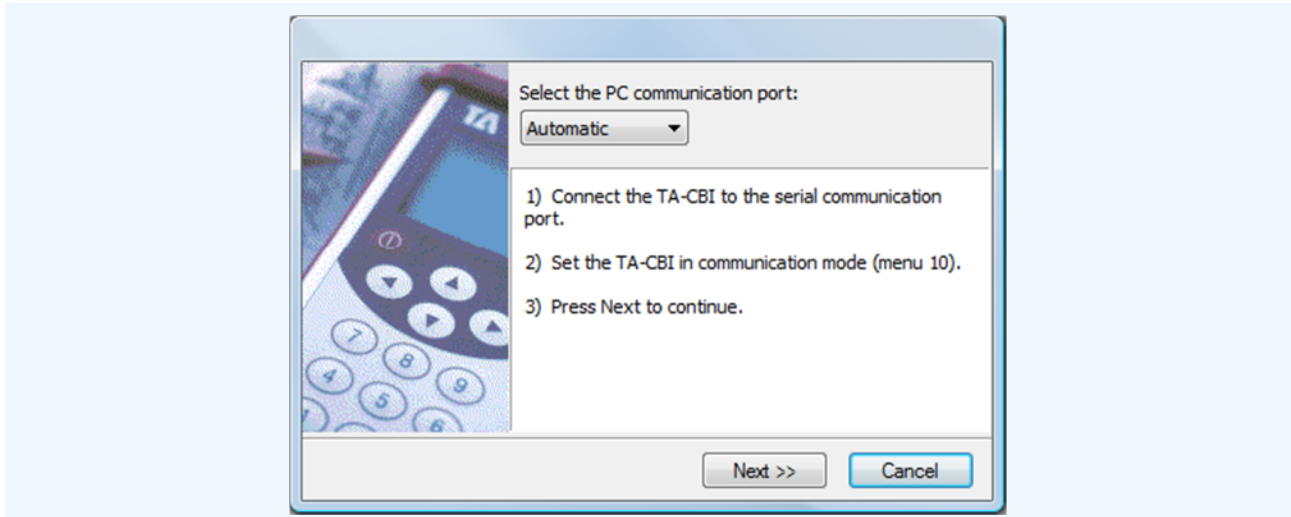
- › **Delete downloaded TA-SCOPE files:** TA Select 4 keeps a backup copy of all downloaded data from TA-SCOPE. This function performs a purge of these backup file.
- › **Clean-up TA-SCOPE memory:** All data (hydronic circuits, quick measurements, and loggings) stored in the TA-SCOPE will be deleted.
- › **Reload TA-SCOPE software:** TA-SCOPE software as well as the products database will be reloaded using the last available update pack. This operation preserves all user data.



The TA-SCOPE maintenance window

7.3. TA-CBI Communication

The **TA-CBI communication** button in the **Communication** tab opens the following window to enable connection between *TA Select 4* and your TA-CBI.



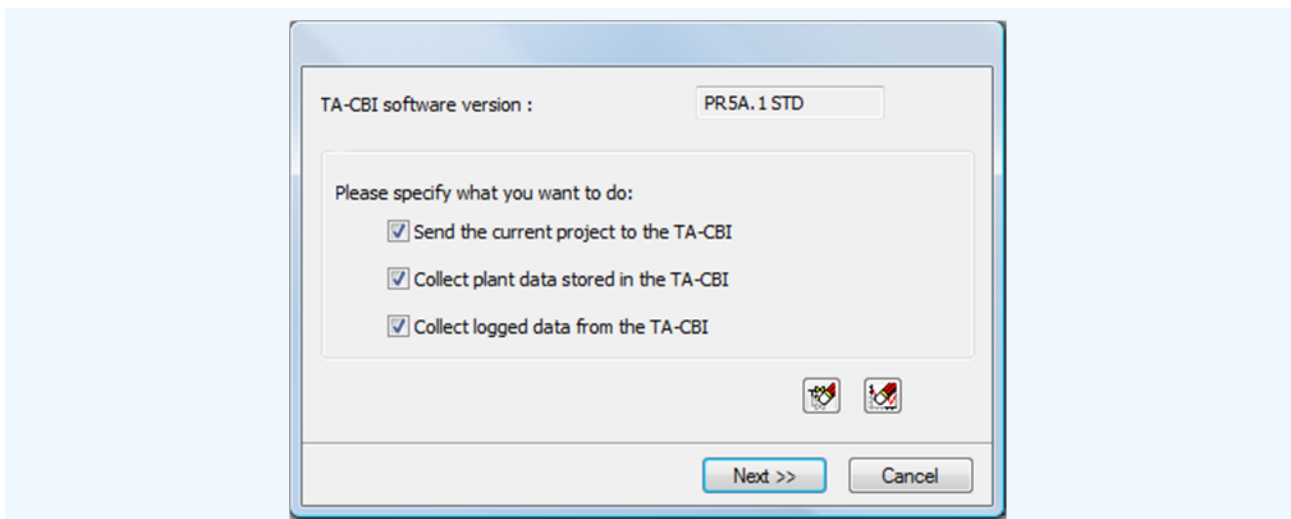
The TA-CBI communication window

Follow the displayed instructions to establish the communication between the TA-CBI and *TA Select 4* then click on the **Next >>** button.

Once the communication is established, the following window opens.

In this window:

- › Select the data to send and/or collect from the TA-CBI device.
- › Click on the  button to delete all saved plant data from the TA-CBI memory.
- › Click on the  button to delete all logged data from the TA-CBI memory.
- › Click on the **Next >>** button to start the data transfer then follow the displayed instructions.

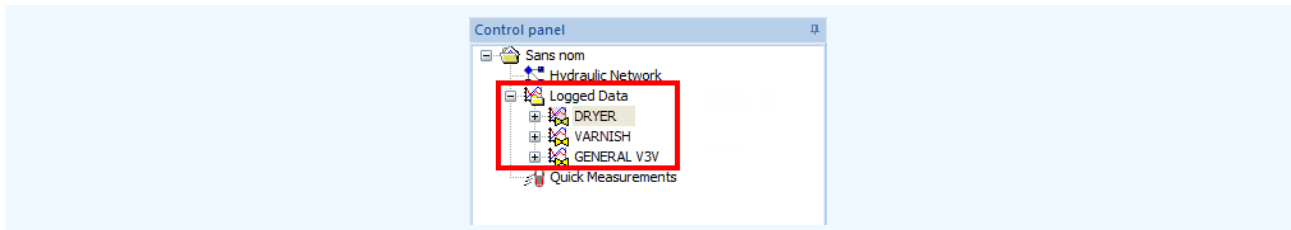


The TA-CBI transfer selection display

8. Logged Data Processing

One of the main functions of *TA Select 4* is to analyse data measured by and downloaded from a TA-SCOPE or a TA-CBI device.

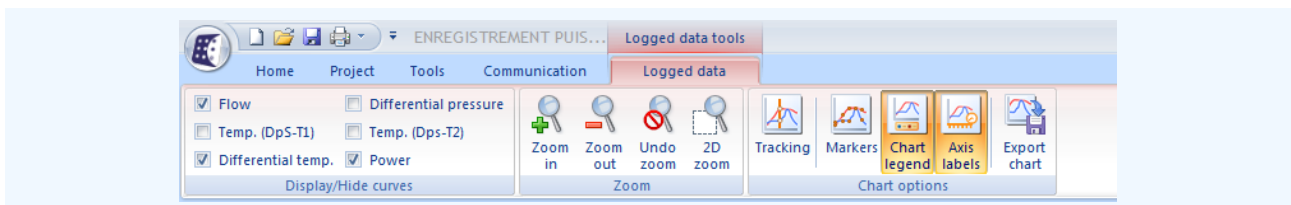
To analyse downloaded data, select a set of data in the **Control panel** under **Logged Data** as illustrated hereunder.



*The **Logged Data** in the **Control panel***

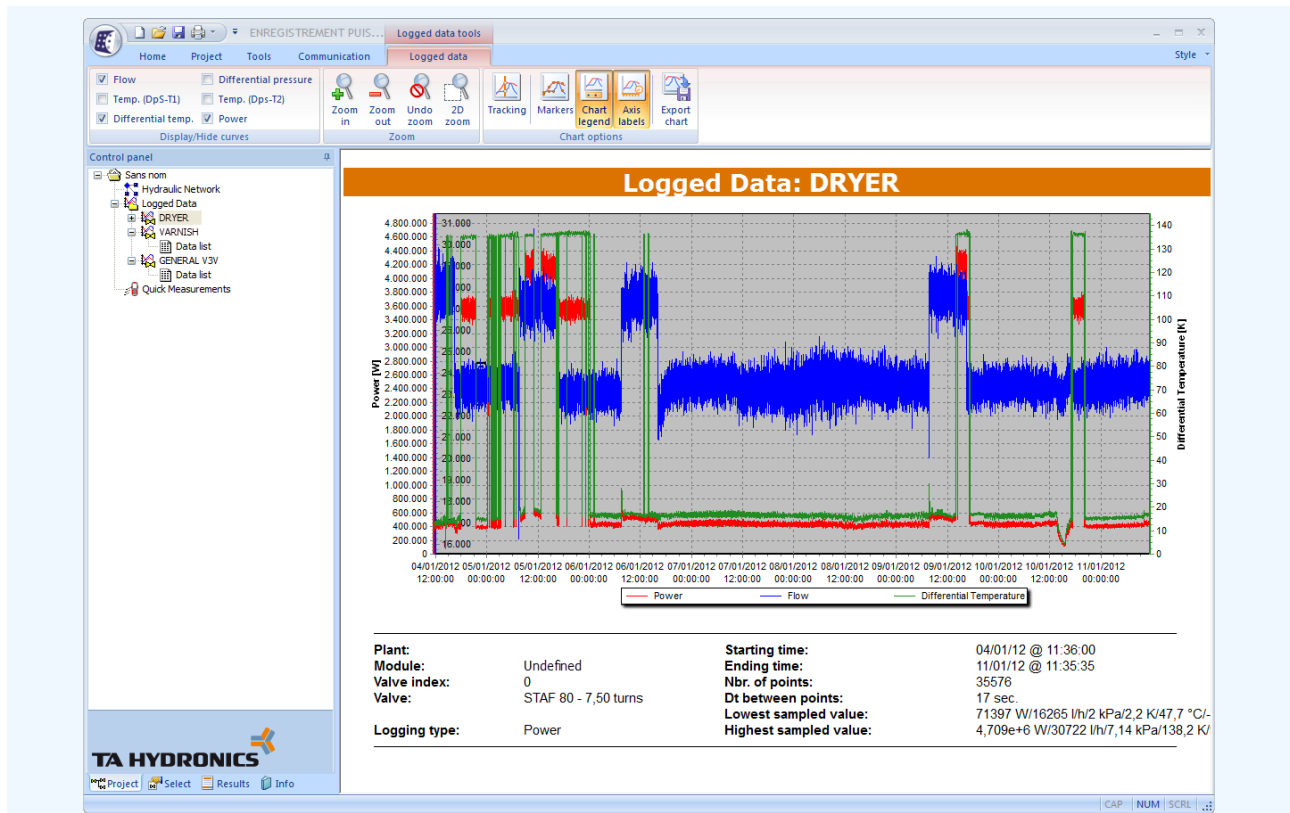
Once this data set selected, the following **Logged data** tab and ribbon is available and displayed:

 *This tab is only available when logged data are selected.*



*The **Logged data** tab and ribbon*

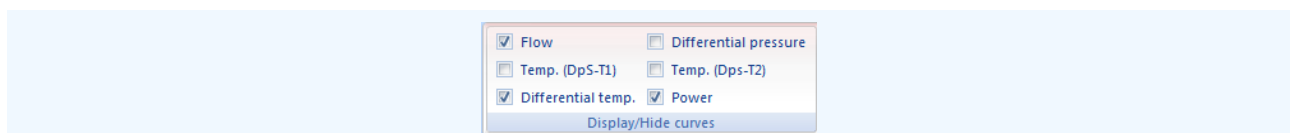
The logged data are displayed in a graphical way as illustrated hereunder.



The **Logged data** window

This chart may be adjusted using the ribbon button and settings.

The Display/Hide curves group

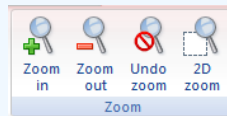


The **Display/Hide curves** group

In this group, select the data that you want to see on the chart:

- › **Flow**: the flow values measured in the circuit.
- › **Differential pressure**: the differential pressure computed as the difference between the valve input static pressure and output static pressure measures by the sensor.
- › **Temp. (DpS-T1)**: the temperature measured on sensor T1.
- › **Temp. (DpS-T2)**: the temperature measured on sensor T2.
- › **Differential temp.**: the difference between the temperatures measured by sensor T1 and T2.
- › **Power**: the power is calculated using sensor T1 and T2 placed in the same flow stream.

The Zoom group

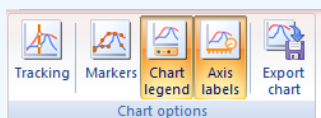


*The **Zoom** group*

In this group, select the zoom you want to apply to the chart:

- › **Zoom in**: increase the horizontal axis resolution (and decrease the set of data displayed at one time).
- › **Zoom out**: decrease the horizontal axis resolution (and increase the set of data displayed at one time).
- › **Undo zoom**: reset zoom to its default setting (the complete set of data is displayed).
- › **2D zoom**: select the part of the chart that will be displayed and zoomed (both axis are adjusted accordingly).

The Chart options group



*The **Chart options** group*

In this group, select the additional option that you want to set for the chart:

- › **Tracking**: display a cursor that you can move along the chart. The measurements values at this cursor position are displayed under the chart.
- › **Markers**: display marker at each measurement position.
- › **Chart legend**: display the chart legend or hide it to have more space to display the chart.
- › **Axis labels**: display detailed or simplified axis labels.
- › **Export chart**: export the chart as an image file (metafile, bitmap, JPEG, or PNG).

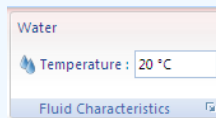
9. System Configuration

9.1. Introduction

This chapter describes technical settings that are used in several operation performed by *TA Select 4* such as the fluid characteristics settings or the advanced technical parameters that can be configured from different places within the interface and during the software operation.

9.2. Fluid Characteristics

In the **Fluid Characteristics** group in the **Individual selection** tab of the ribbon, enter the information concerning the fluid used in your system.



The **Fluid Characteristics** group

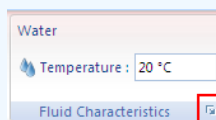
 Please note that the **Fluid Characteristics** you enter when performing different operations such as individual selection, hydronic calculation, or using the additional tools are independent from one another. If you change the fluid or its temperature here, these values will NOT be changed in other TA Select 4 parts.

Water

-  **Temperature:** select the temperature at which the fluid calculations will be made such as the pressure drop... This is the mean temperature between the temperature of the incoming flow and the temperature of the outgoing flow in the plant (for example, if the incoming flow is 70°C and the outgoing one is 50°C, then you should use 60°C as the mean temperature and enter that value in the **Temperature** field).

Dialogue box launcher

This parameter as well as more detailed ones can be also configured in the **Water Characteristics** window by clicking on the dialogue box launcher as illustrated hereunder.



The **Water Characteristics** dialogue box launcher

Water Characteristics window

In this window, you should define the fluid (water and additive) used in your system. The fluid characteristics will be automatically computed and used in the calculation made during a product selection.

Click **OK** to save your settings and close this window or **Cancel** to quit without saving your changes.

The water characteristics window

Temperature

- › **Temperature:** this is the same parameter as available in the ribbon and described above.

Additive

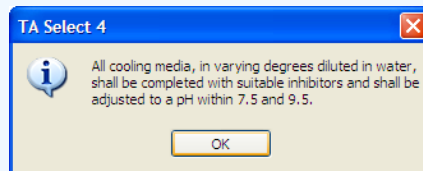
- › **Additive Family:** select the type of additive present in your circuit if any such as **Alcohols**, **Brines**, or **Glycols**. You can also specify another additive by selecting the **Any Other Fluid** value.
- › **Additive Name:** select the additive present in your circuit according to the family selected. The following additive are available:
 - **Alcohols:** Methyl Alcohol, Glycerol, and Ethyl Alcohol.
 - **Brines:** Sodium Chloride, Magnesium Chloride, Potassium Carbonate, and Calcium Chloride.
 - **Glycols:** Propylene Glycol and Ethylene Glycol.
- › **% Weight:** set the percentage in weight of additive in the water used in your circuit.

Characteristics

The following fluid characteristics are computer automatically by *TA Select 4* at the set temperature and displayed in this area:

- › **Density**
- › **Kinematic Viscosity**
- › **Specific Heat**
- › **Freezing Point** at atmospheric pressure.

If you click on the  icon, the following warning message is displayed reminding you of standard consigns to follow regarding your fluid mix.



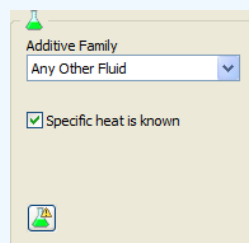
Warning message about the fluid mix

User defined additive characteristics

If you selected **Any Other Fluid** in **Additive Family**, you should manually define the following fluid characteristics:

 *If you change the temperature, these values should be adjusted manually accordingly.*

- › **Density**
- › **Kinematic Viscosity**
- › **Specific Heat** if the **Specific heat is known** box is checked as illustrated hereunder.

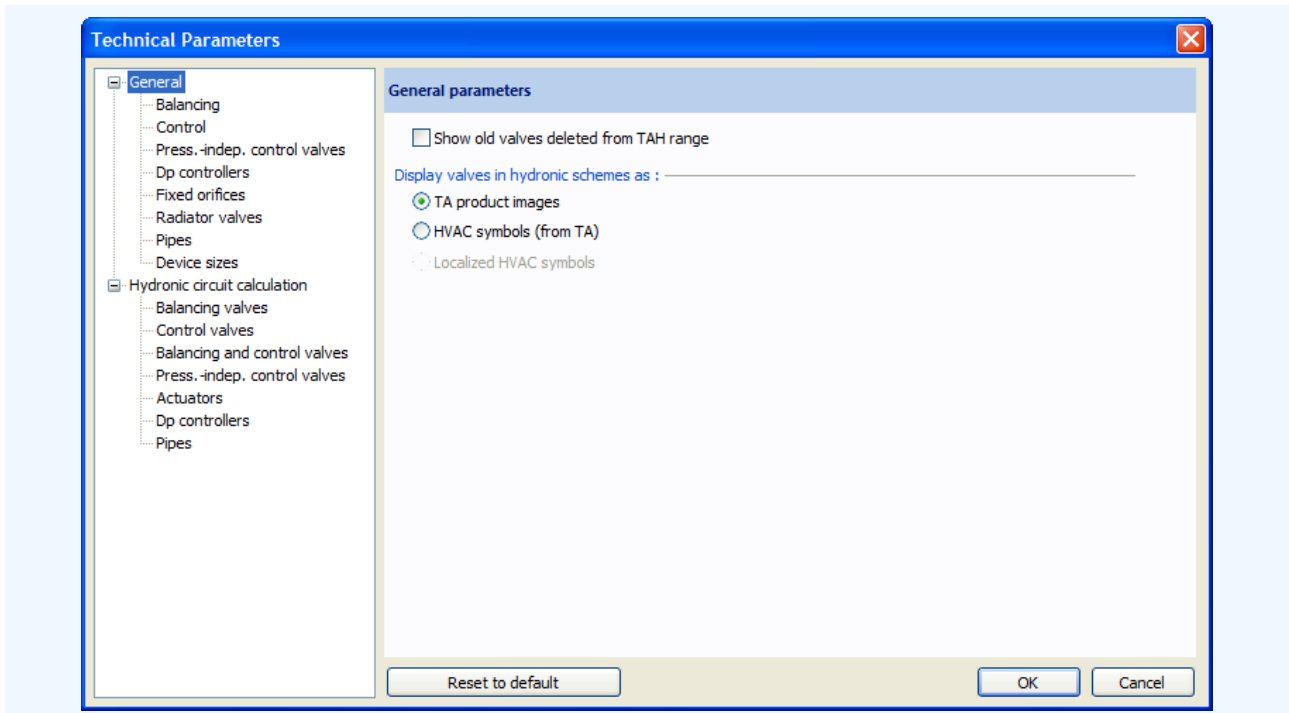


*The **Specific heat is known** check box*

9.3. Advanced Technical Parameters

9.3.1. Parameters Organization

After clicking on the small arrow at the right bottom of the ribbon **Technical parameters** group, the **Technical Parameters** window is displayed as illustrated below.



Technical Parameters window

This window is divided in two parts with a menu tree in its left part and the parameters related to the entry selected in the menu tree in its right part.

The menu tree is divided in main branches:

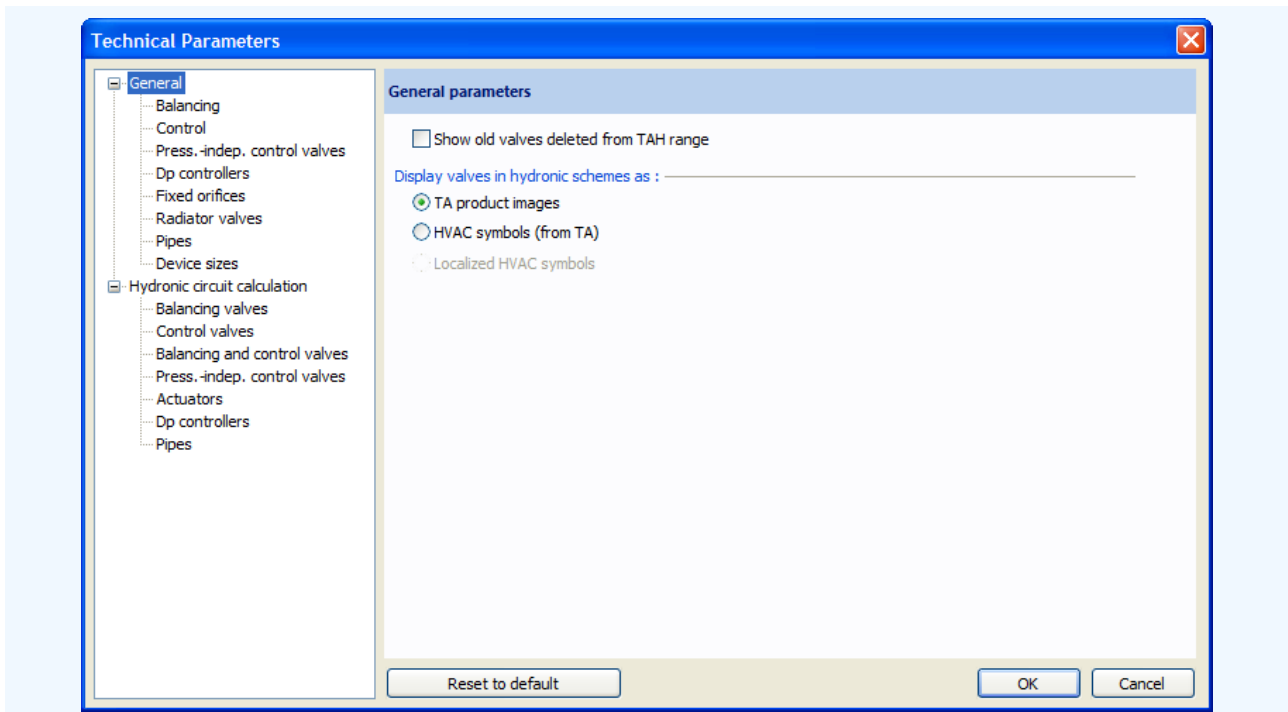
1. The **General** branch with all the general purpose parameters.
2. The **Hydronic circuit calculation** branch with all parameters relating to the hydronic calculation of a circuit.

You can always reset all the technical parameters to their default values by clicking on the **Reset to default** button at the bottom of the window.

All restrictions in valve selection in the various entries are indicated with the warning sign .

9.3.2. General

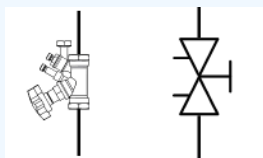
The General section



Technical Parameters window - General section

In this section you can include valves no longer offered by TA by checking the box **Show old valves deleted from TA range**. This is relevant in older installed applications that require balancing.

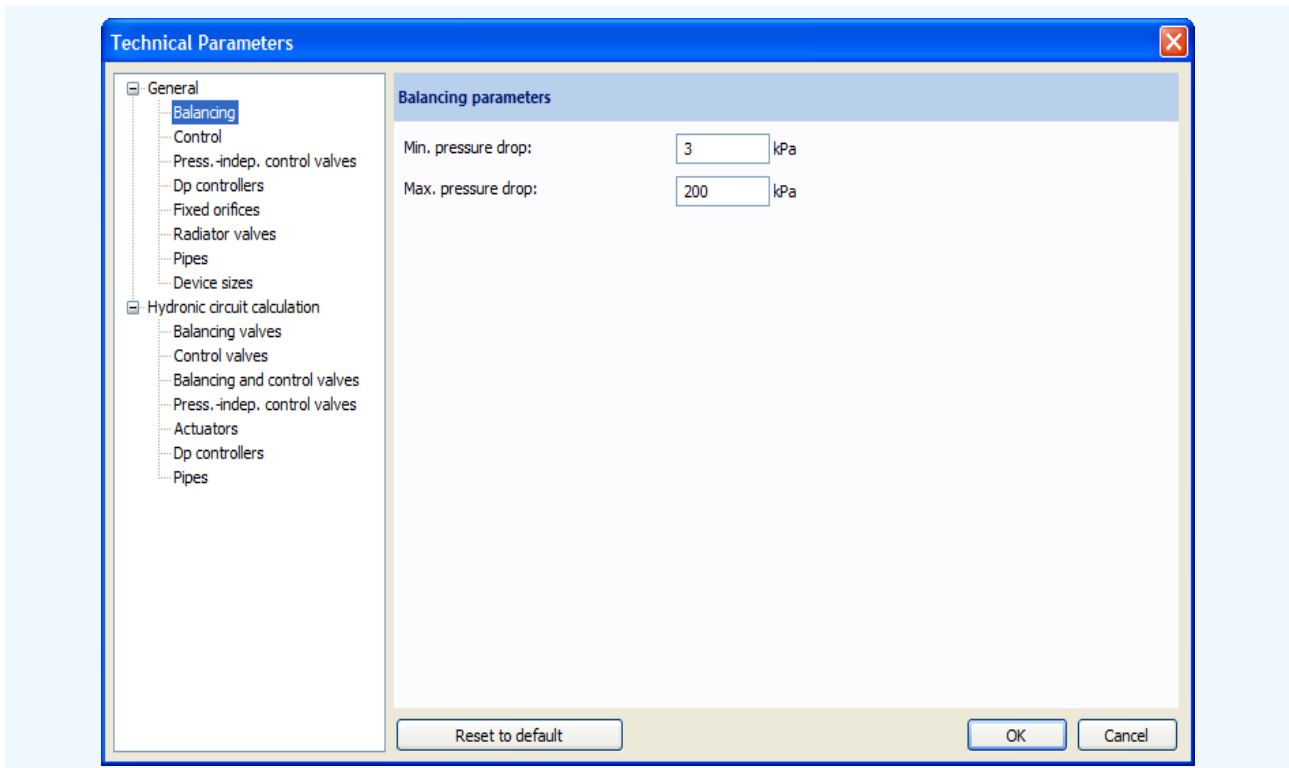
You can also choose the way the valves will be displayed in hydronic schemes between **TA product images**, **HVAC symbols (from TA)** and **Localized HVAC symbols**.



Valve displayed as a TA Product image (left) or as the HVAC Symbol (from TA) (right)

i If the TA Product image is not available for a particular valve, the HVAC Symbol (from TA) will be used.

The Balancing section

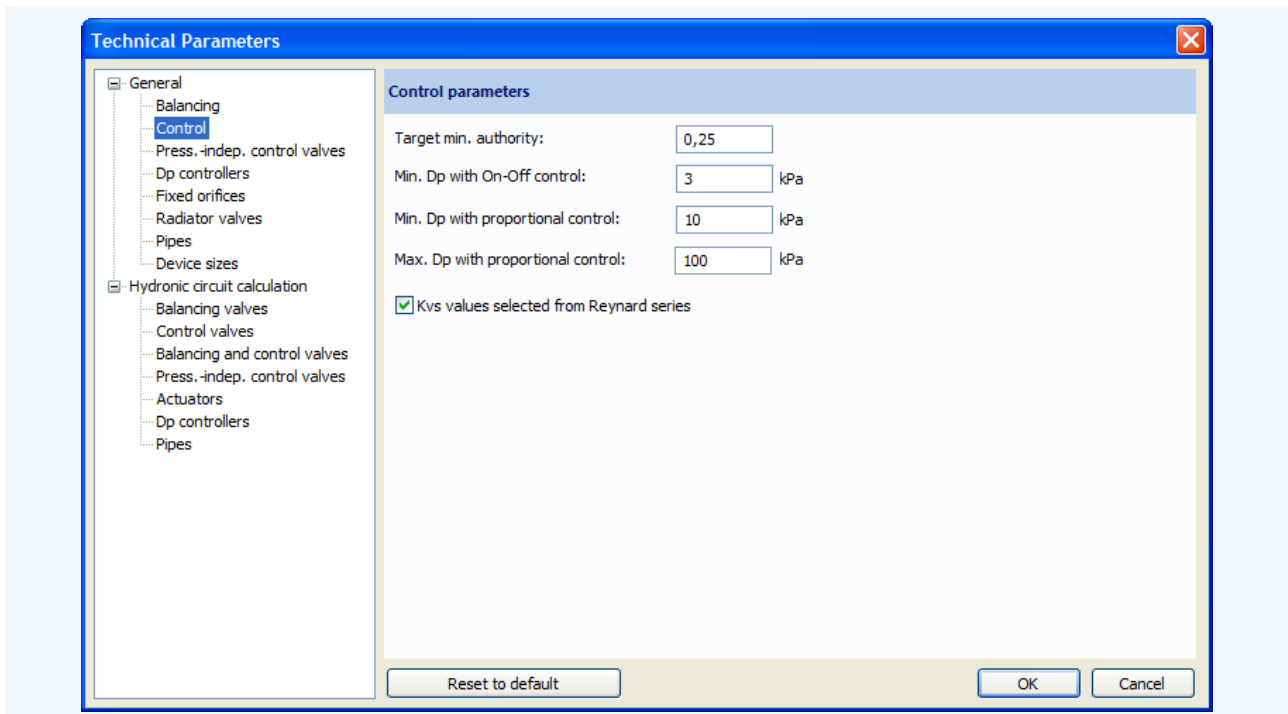


Technical Parameters window - Balancing section

In this section you can define the following balancing valve parameters:

- › **Min. pressure drop** is the minimum pressure drop across balancing valves. The suggested and default minimum pressure drop is 3 kPa.
- › **Max. Pressure drop** is the maximum pressure drop across balancing valves. The suggested and default maximum pressure drop is 200 kPa.

The Control section



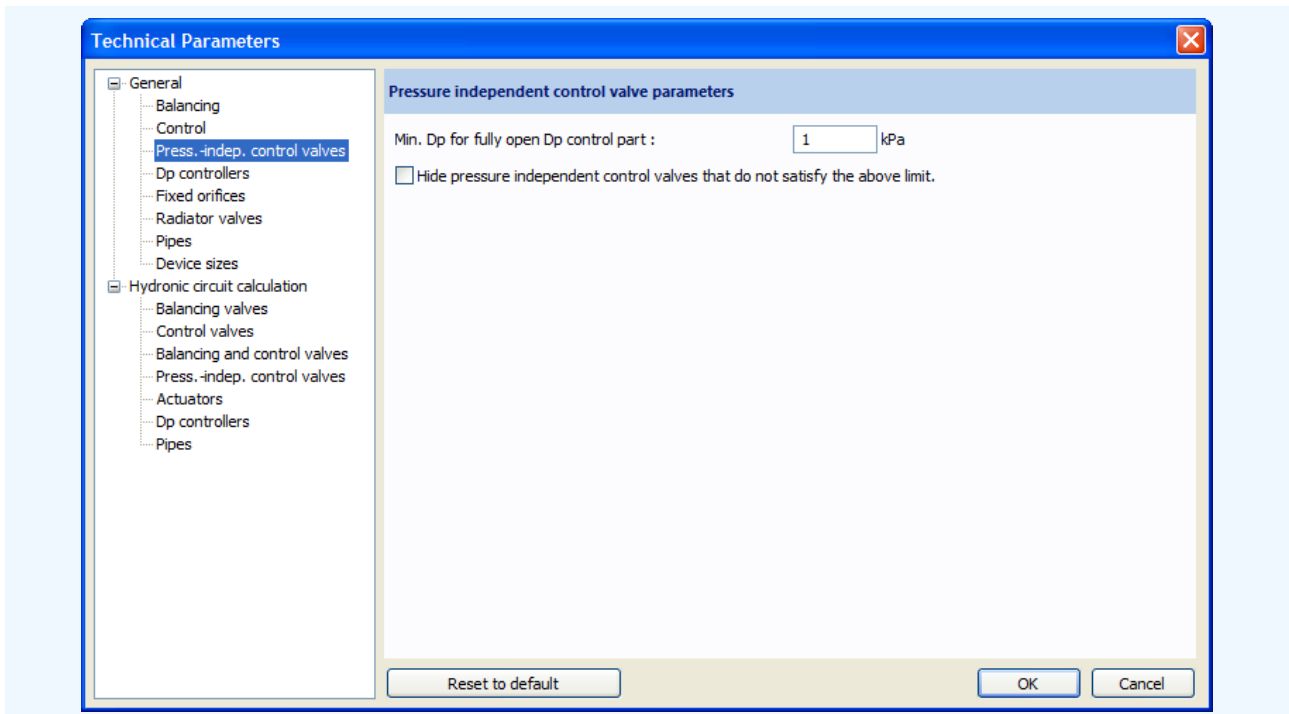
Technical Parameters window - Control section

In this section you can define the following control valve parameters:

- › **Target min. authority:** you can define the target minimum authority for the control valves. The suggested and default minimum authority is 0.25.
- › **Min. Dp with On-Off control:** you can define the minimum pressure drop across an On-Off control valve. The suggested and default minimum authority is 3 kPa.
- › **Min. Dp with proportional control:** you can define the minimum pressure drop across a modulating control valve. The suggested and default minimum authority is 10 kPa.
- › **Max. Dp with proportional control:** you can define the maximum pressure drop across a modulating control valve. The suggested and default maximum pressure is 65 kPa.
- › **Kvs values selected from Reynard series:** check this box if you want *TA Select 4* to suggest control valve Kvs which meets minimum authority from a set series reflecting industry nominal sizing (according to the Reynard Series). If the box is unchecked, the maximum required Kv is given.

 *By ensuring a maximum Kv is not exceeded, an acceptable authority of the control valve is ensured which is critical to being able to modulate the flow through a terminal unit.*

The Press.-indep. ctrl valves section

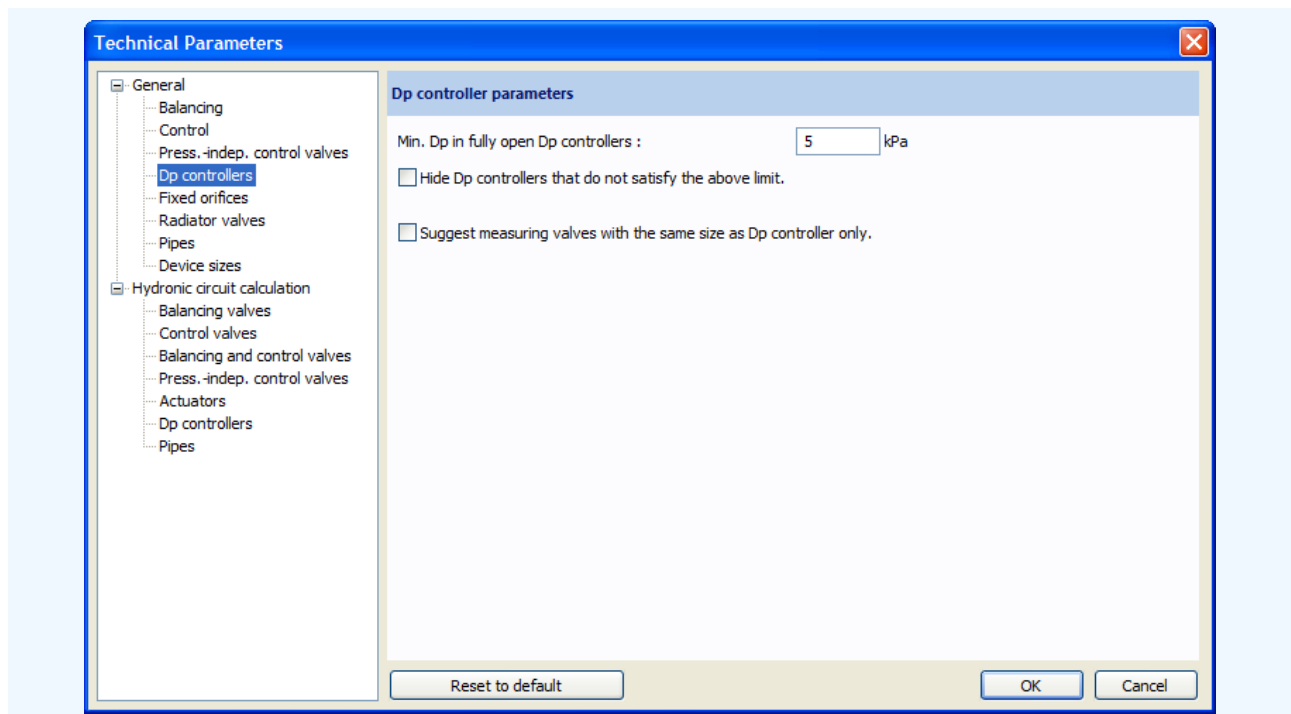


Technical Parameters window - Press.-indep. ctrl valves section

In this section you can define the following control valve parameters:

- › **Min. Dp for fully open control part:** you can define the target minimum pressure drop for the control valve. The suggested and default minimum pressure drop is 1 kPa.
- › Check the **Hide pressure independent control valves that do not satisfy the above limit** box to hide the valves that do not satisfy the limit defined with the previous parameter.

The DP controllers section

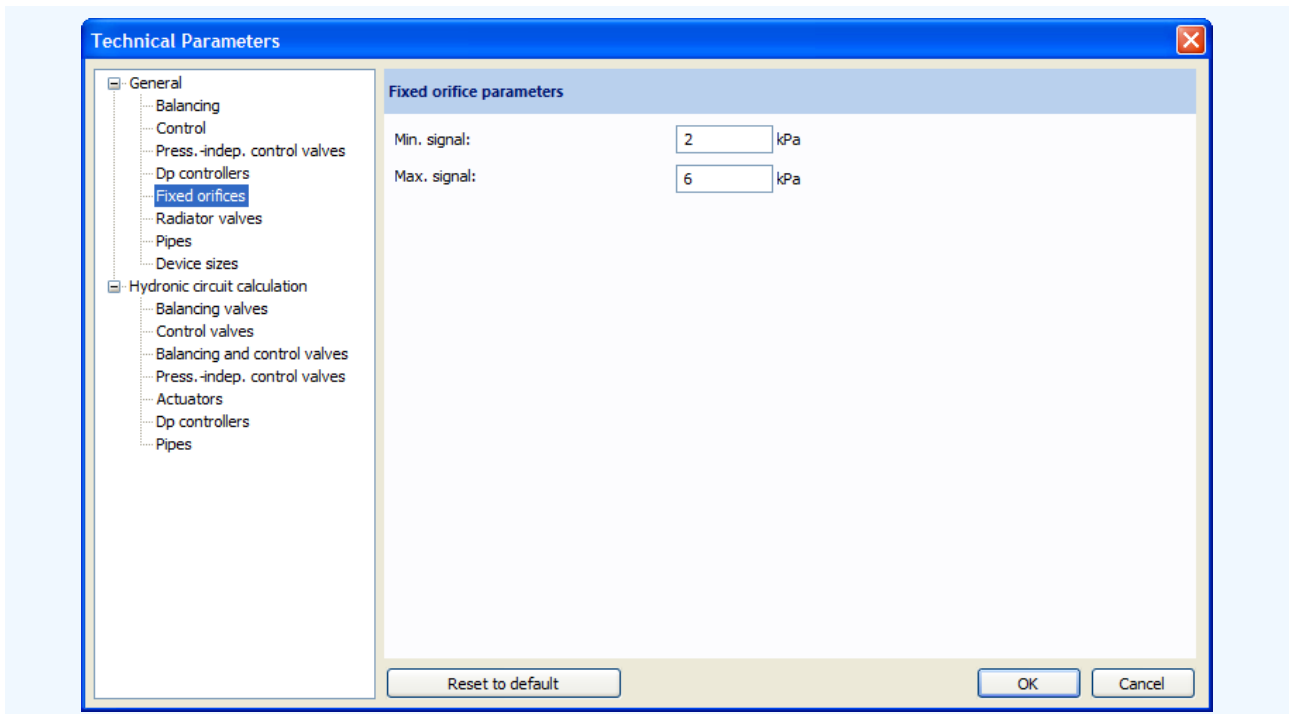


Technical Parameters window - **Dp controllers** section

In this section you can define the following Dp controller parameters:

- › **Min. Dp for fully open Dp controllers:** you can define the target minimum pressure drop for the Dp controller. The suggested and default minimum pressure drop is 5 kPa.
- › Check the **Hide Dp controllers that do not satisfy the above limit** box to hide the controllers that do not satisfy the limit defined with the previous parameter.
- › Check the **Suggest measuring valves with same size as Dp controller only** box to use such suggestions.

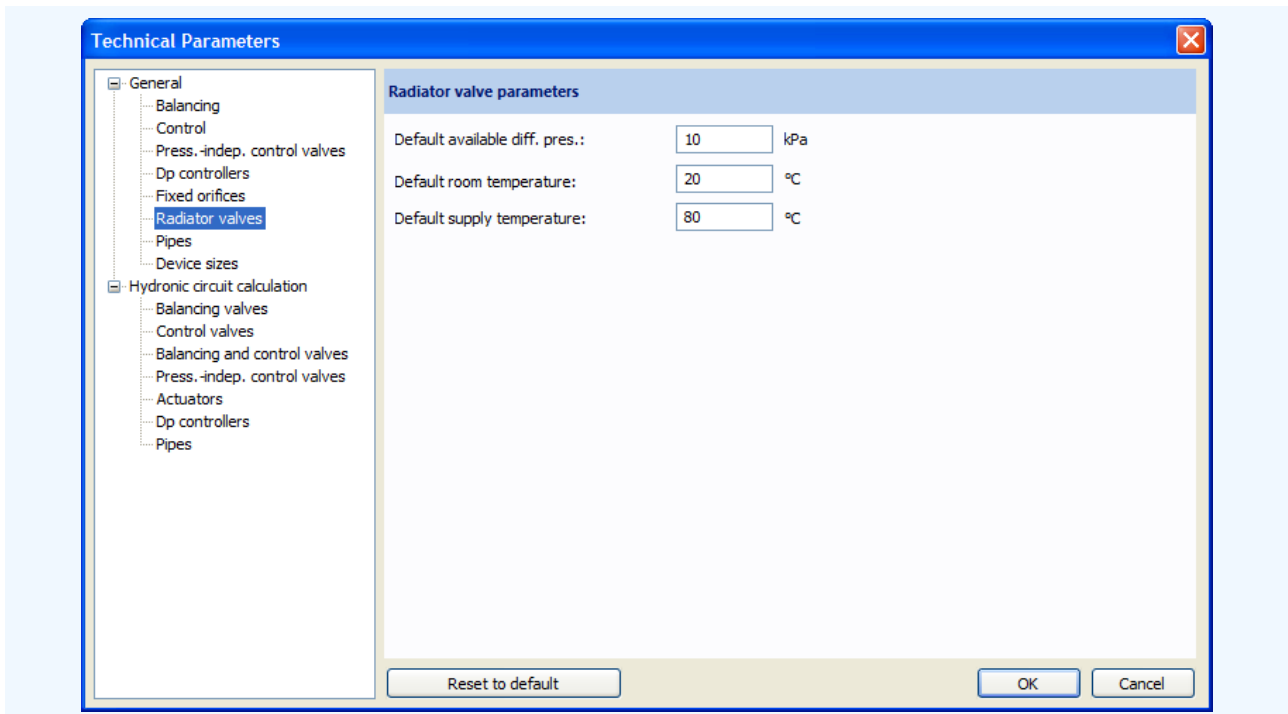
The Fixed orifices section



Technical Parameters window - **Fixed orifices** section

In this section you can define the minimum and maximum signal allowable through a fixed orifice, which will drive the design of the fixed orifice based on flow conditions. The default **Min. signal** is 2 kPa and the default **Max. signal** is 6 kPa.

The Radiator valves section

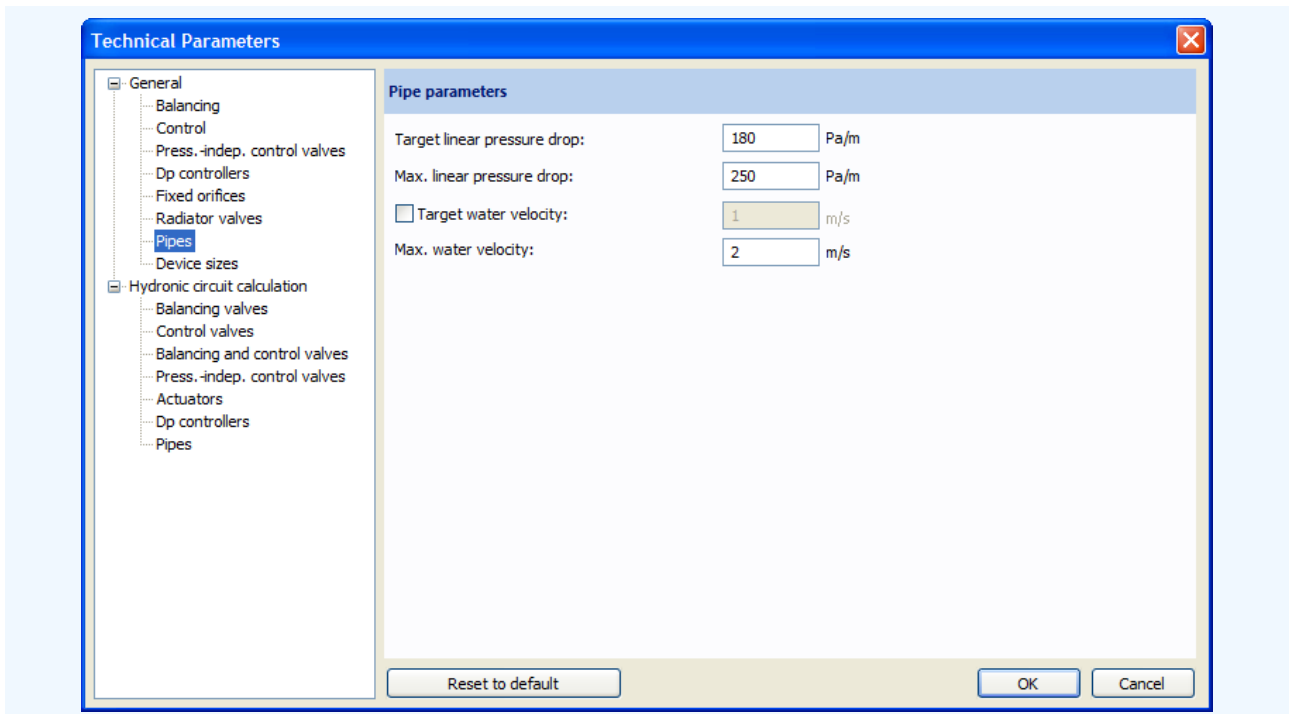


Technical Parameters window - **Radiator valves** section

In this section you can define the following radiator valve parameters:

- › **Default available diff. pres.:** you can define the default available differential pressure for the radiator valve. The suggested and default differential pressure is 10 kPa.
- › **Default room temperature:** you can define the default room temperature. The suggested and default value is 20°C.
- › **Default supply temperature:** you can define the default supply temperature. The suggested and default value is 80°C.

The Pipes section



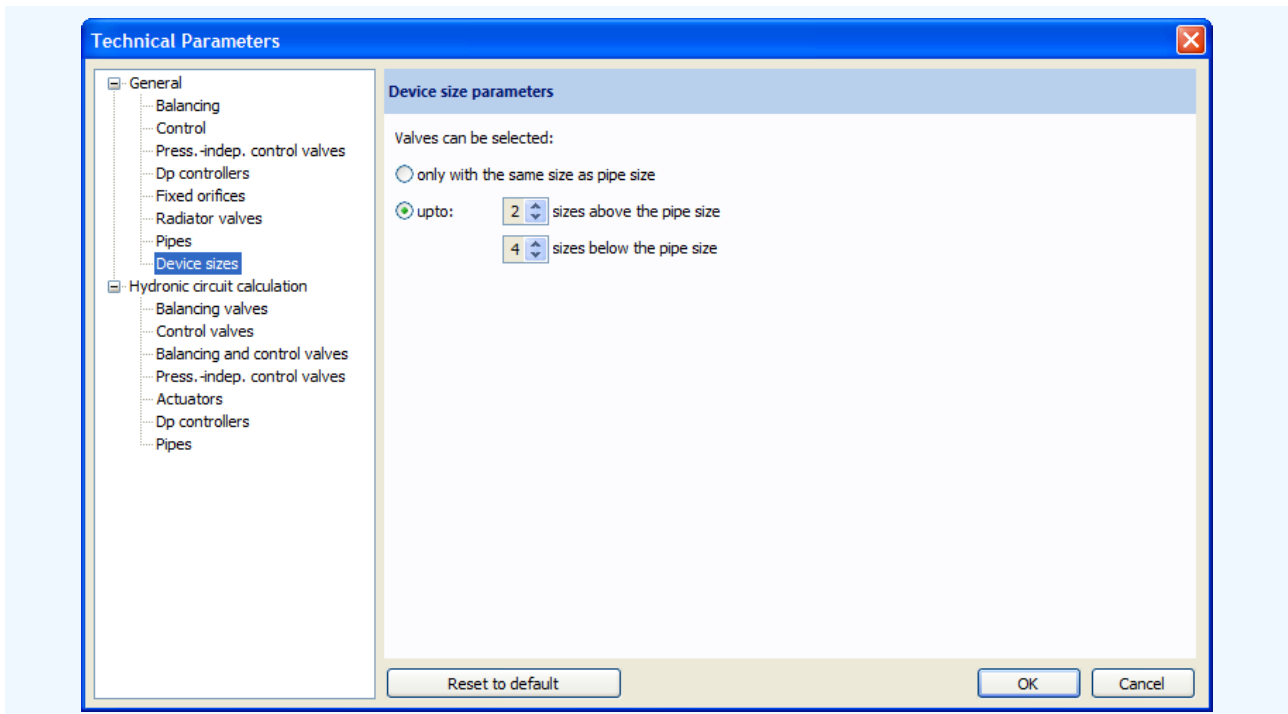
Technical Parameters window - Pipes section

In this section you can define the following pipe parameters:

- › Target linear pressure drop
- › Max. linear pressure drop
- › Target water velocity
- › Max. water velocity

These parameters are redundant with the **Pipe pressure drop** and **Pipe water velocity** controls on the ribbon **Technical parameters** group. Thus filling these fields in one place will automatically modify them in the other place. See [The Technical Parameters Group](#) section for more detailed explanations concerning these parameters. .

The Device sizes section



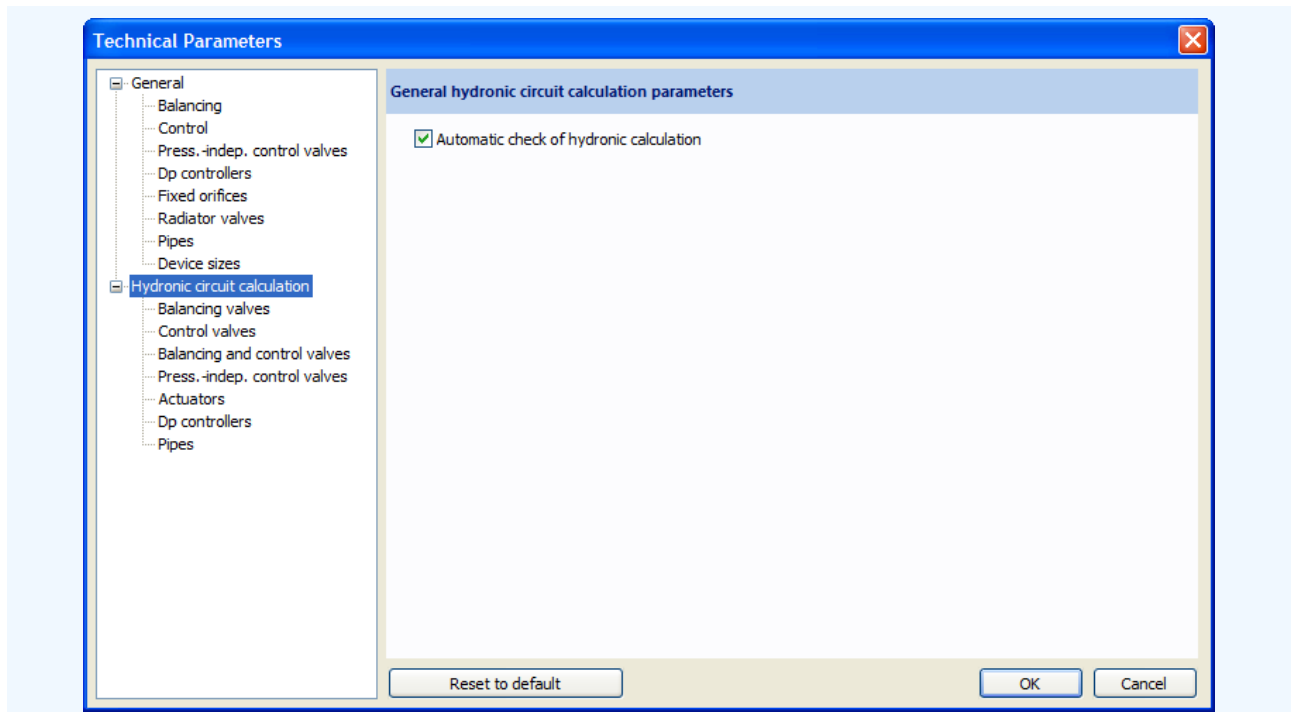
Technical Parameters window - Device sizes section

In this section you can select the following options concerning the device sizes:

- › Select **upto** to select the number of sizes above and below the selected pipe size to be considered for valve selection. These fields are redundant with the **Devise size** controls on the ribbon **Technical paramaters** group. Thus filling these fields in one place will automatically modify them in the other place. See [The Technical Parameters Group](#) section for more detailed explanations concerning these parameters.
- › Select **only with the same size as pipe size** to essentially allow zero sizes above the pipe size and zero sizes below the pipe size.

9.3.3. Hydronic Circuit Calculation

The Hydronic circuit calculation [section](#)



Technical Parameters window - Hydronic circuit calculation section

In this section you can select or deselect the **Automatic check of hydronic calculation parameter**. This is the same parameter as the one available in the Project parameters ribbon described in the [Project Configuration](#) topic.

The Balancing valves section

Technical Parameters

Hydronic circuit calculation preferences for balancing valves

DN 50 and below	DN 65 and above
Type: Balancing Valve	Type: ² Balancing Valve
Family: STAD	Family: STAF
Body material: Ametal(tm)	Body material: Cast iron
Connection: Thread	Connection: Flange
Version: Without drain	Version: Standard
PN: 20	PN: 16

² Valves as defined above exist only from DN 65 (2 1/2") to DN 150 (6").

Selection of other sizes and types of balancing valves will be performed, if possible, according to the product priorities defined for your localized version.

Reset to default OK Cancel

Technical Parameters window - Balancing valves section

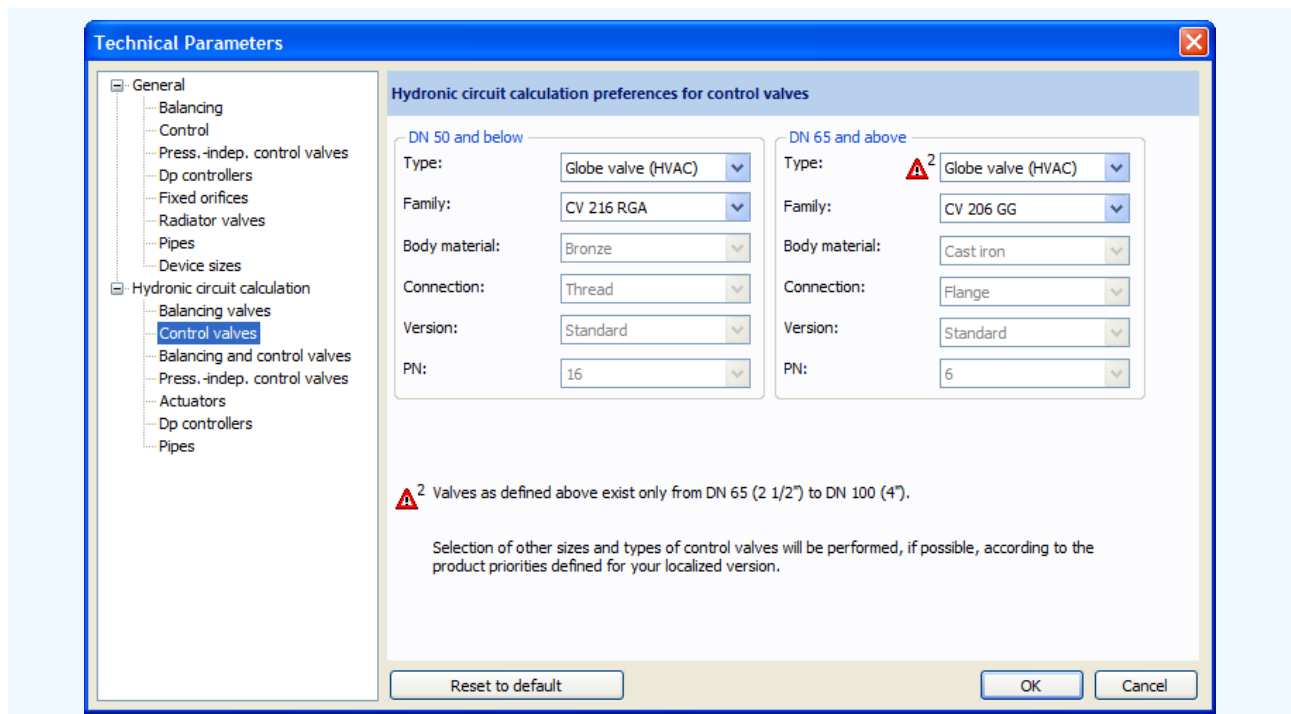
In this section you can define the balancing valve type to be used in circuit calculations.

A distinction is made for valves **DN 50 and below** and valves **DN 65 and above** due to the difference in body design. All possible variations available are given in a drop-down menu which shows applicable options within the **Type**, **Family**, **Body Material**, **Connection**, **Version**, or **PN**.

Begin by selecting the **Type** and the rest of the options will become apparent. If there are still multiple options, a further selection narrows the type of valves to be used.

All parameters that cannot be changed are given for your information.

The Control valves section



Technical Parameters window - **Control valves** section

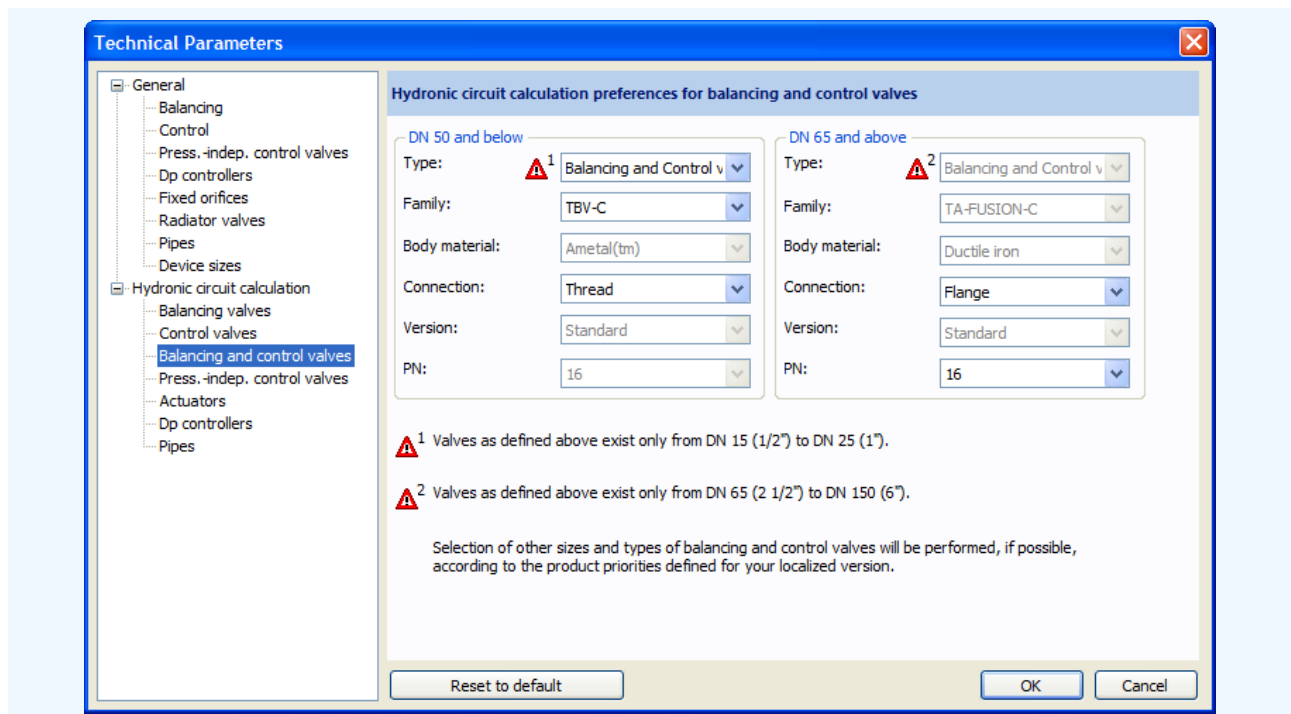
In this section you can define the balancing valve type to be used in circuit calculations.

A distinction is made for valves **DN 50 and below** and valves **DN 65 and above** due to the difference in body design. All possible variations available are given in a drop-down menu which shows applicable options within the **Type**, **Family**, **Body Material**, **Connection**, **Version**, or **PN**.

Begin by selecting the **Type** and the rest of the options will become apparent. If there are still multiple options, a further selection narrows the type of valves to be used.

All parameters that cannot be changed are given for your information.

The Balancing and control valves section



Technical Parameters window - Balancing and control valves section

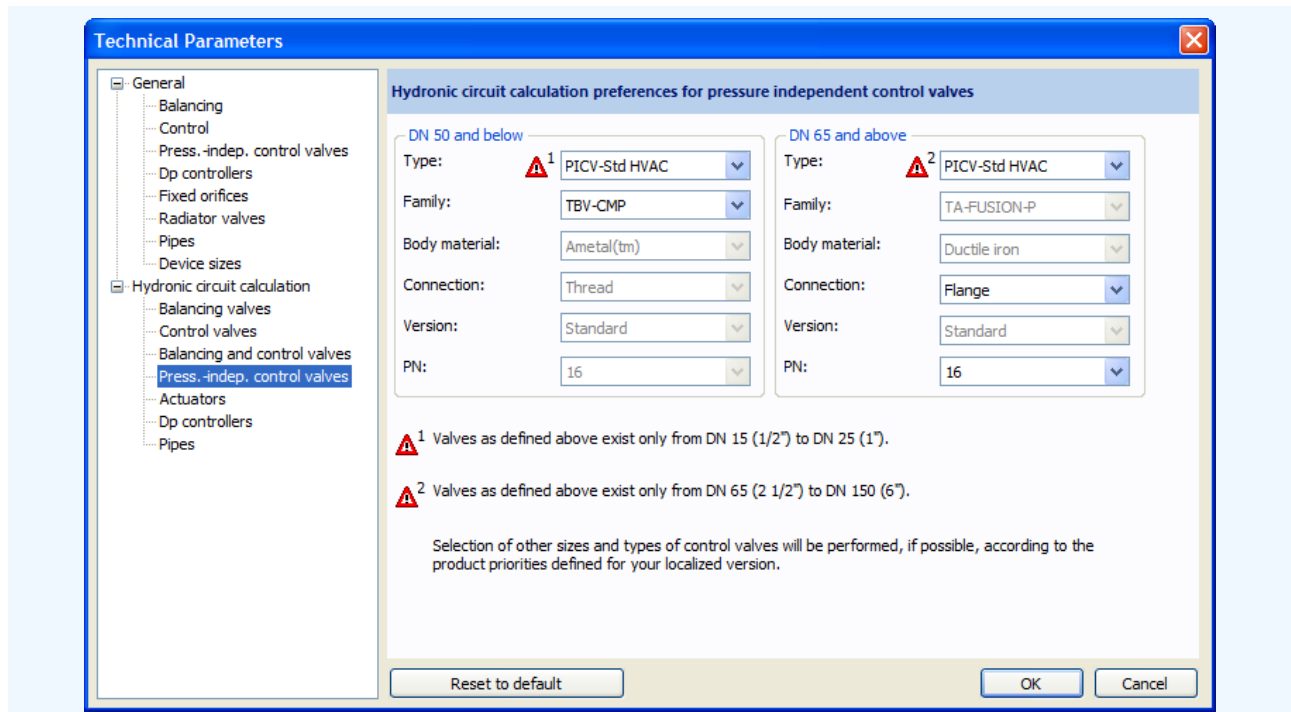
In this section you can define the balancing valve type to be used in circuit calculations.

A distinction is made for valves **DN 50 and below** and valves **DN 65 and above** due to the difference in body design. All possible variations available are given in a drop-down menu which shows applicable options within the **Type**, **Family**, **Body Material**, **Connection**, **Version**, or **PN**.

Begin by selecting the **Type** and the rest of the options will become apparent. If there are still multiple options, a further selection narrows the type of valves to be used.

 All parameters that cannot be changed are given for your information.

The Press.-indep. ctrl valves section



Technical Parameters window - Press.-indep. ctrl valves section

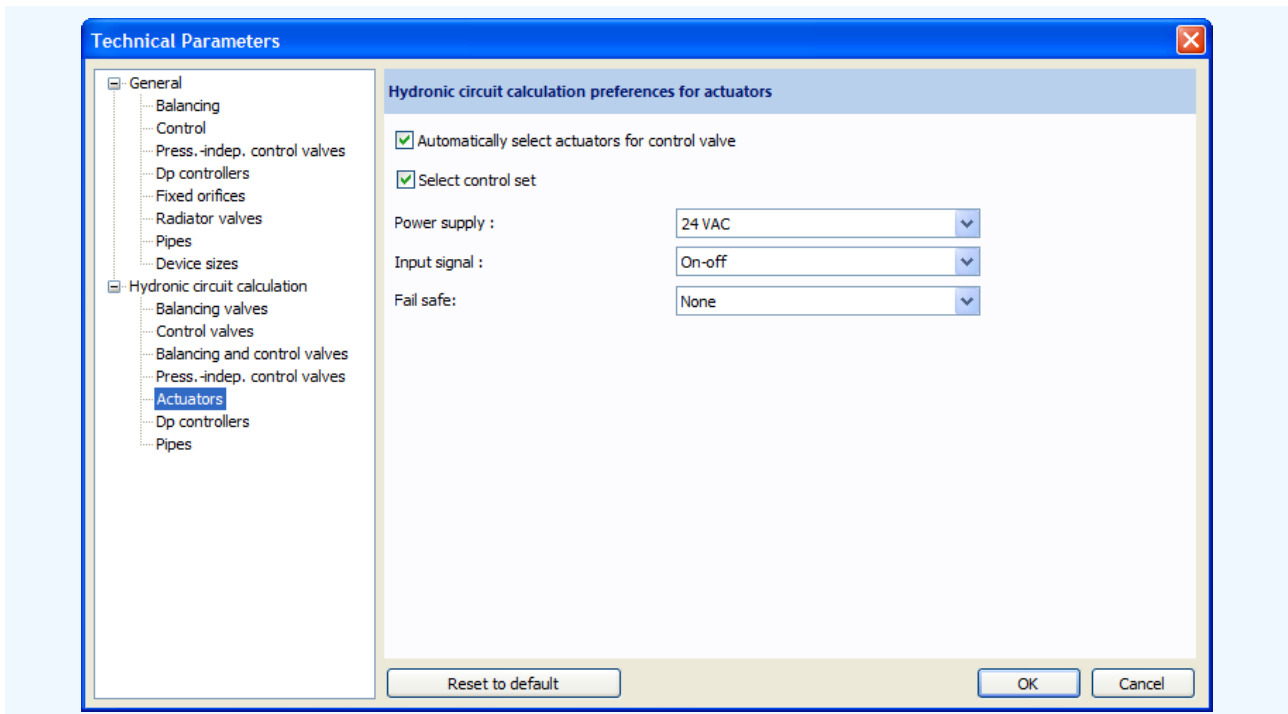
In this section you can define the balancing valve type to be used in circuit calculations.

A distinction is made for valves **DN 50 and below** and valves **DN 65 and above** due to the difference in body design. All possible variations available are given in a drop-down menu which shows applicable options within the **Type**, **Family**, **Body Material**, **Connection**, **Version**, or **PN**.

Begin by selecting the **Type** and the rest of the options will become apparent. If there are still multiple options, a further selection narrows the type of valves to be used.

 All parameters that cannot be changed are given for your information.

The Actuators section

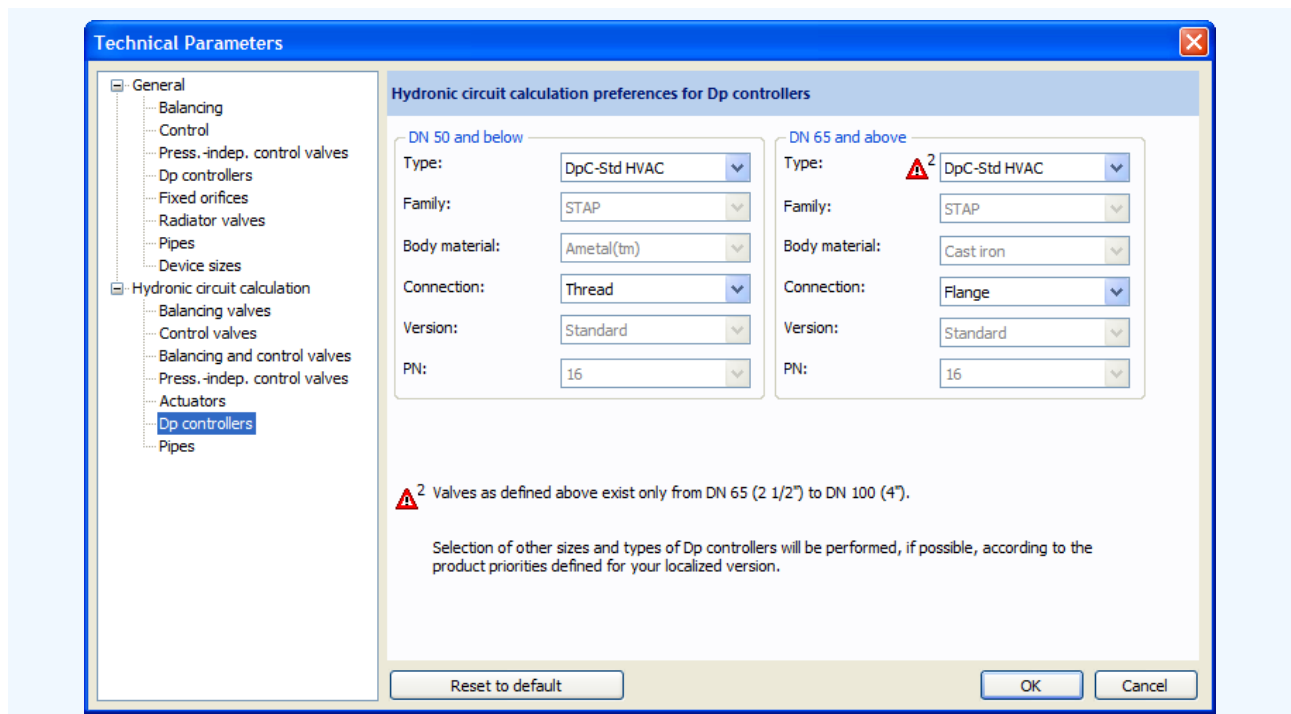


Technical Parameters window - **Actuators** section

In this section you can define the following parameters:

- › **Automatically select actuators for control valve** is selected if you want *TA Select 4* to automatically propose the actuators best fitted to the selected control valves.
- › **Select control set** to select the actuator among the existing complete sets of valve, actuator, and accessories.
- › **Power supply** is the default power supply used by the actuator automatically selected by the system (**24 VAC**, **24 VDC**, or **230 VAC**).
- › **Input signal** is the default input signal type used by the actuator automatically selected by the system (**On-off**, **3-point**, **0-10 V**, **2-10 V**, **0-20 mA**, or **4-20 mA**).
- › **Fail safe** is the actuator behavior in case of control fault used by the actuator automatically selected by the system (**None**, **Extending**, **Retracting**).

The DP controllers section



Technical Parameters window - **Dp controllers** section

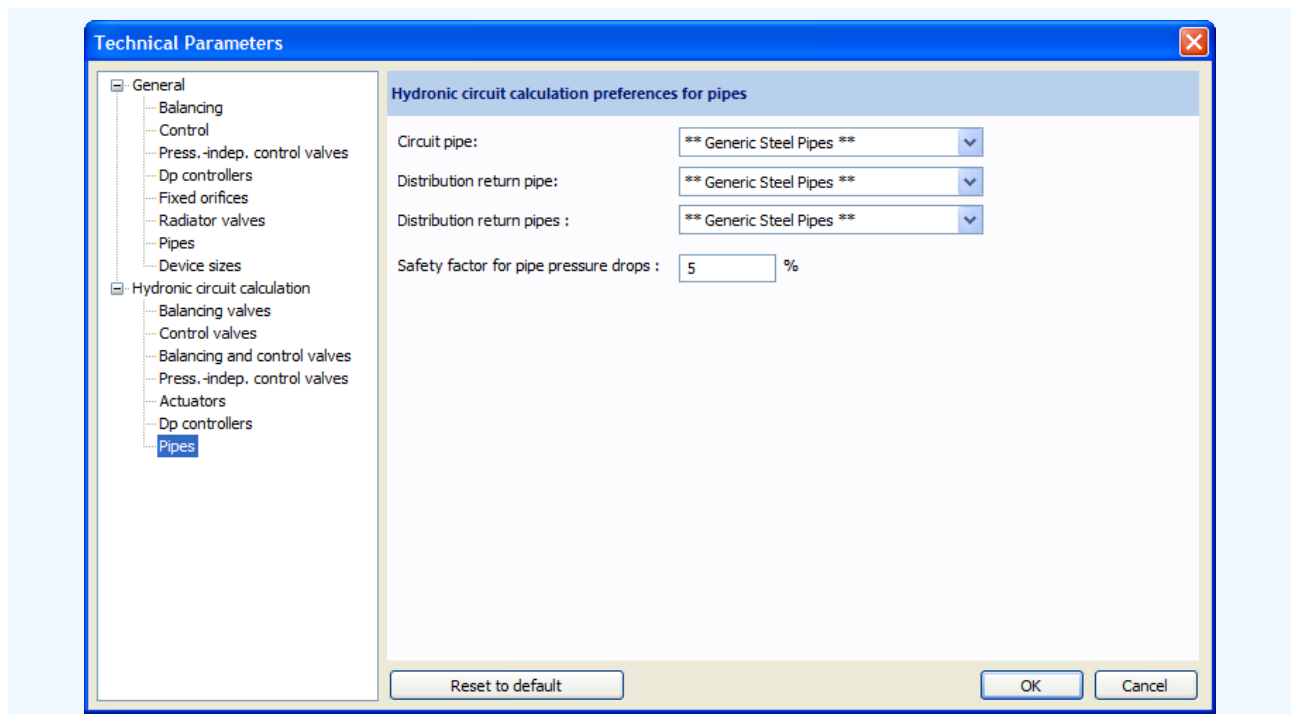
In this section you can define the balancing valve type to be used in circuit calculations.

A distinction is made for valves **DN 50 and below** and valves **DN 65 and above** due to the difference in body design. All possible variations available are given in a drop-down menu which shows applicable options within the **Type**, **Family**, **Body Material**, **Connection**, **Version**, or **PN**.

Begin by selecting the **Type** and the rest of the options will become apparent. If there are still multiple options, a further selection narrows the type of valves to be used.

 All parameters that cannot be changed are given for your information.

The Pipes section



Technical Parameters window - Pipes section

In this section you can define circuit pipes and distribution pipes used in circuit calculation.

The default circuit pipe and distribution pipe series are set in the ribbon **Pipe series** group (see [The Pipe Series Group](#) section for more detailed information about the pipe series selection and definition).

By default the default circuit pipe and distribution pipe series are the same but you can specify to use different default piping for distribution and for circuits by opening the drop down menu and making a selection.

- › **Safety factor for pipe pressure drops:** enter the safety margin that will be added to all pressure drops in the whole circuit pipe calculations.

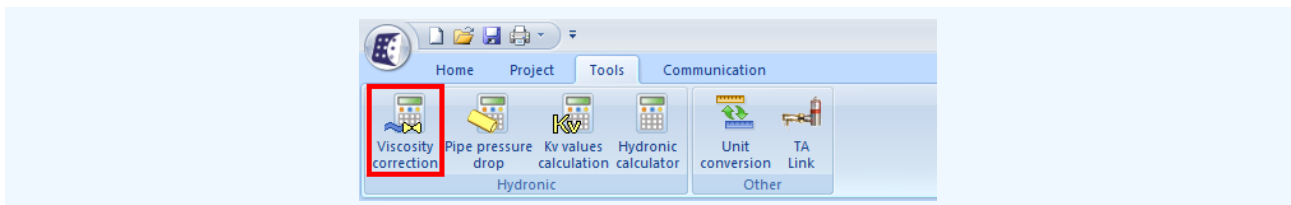
 For example if the calculation return a 2.0 kPa drop in a pipe, a 30% margin will make TA Select 4 use a 2.6 kPa drop in further calculation and component selection.

10. Additional Tools

10.1. Viscosity Correction

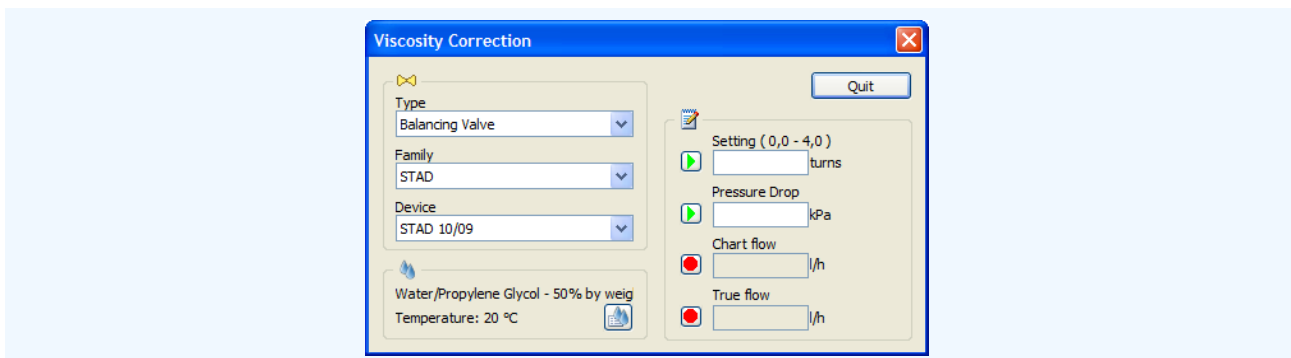
The **Viscosity correction** tool is used to compute the true flow of liquid in a valve according to the actual liquid characteristics and viscosity.

Usually, all computations are based on a strictly turbulent flow regime. Nevertheless, *TA Select 4*, thanks to its highly specialized mathematical models and algorithms, is able to determine the actual flow regime in a valve (turbulent, intermediary, or laminar) according to its operation conditions and thus take this flow regime into account to compute the true flow going through the selected valve in the specified conditions.



*The **Viscosity correction** button in the **Tools** ribbon*

When you select this tool in the ribbon, the following window is displayed:



*The **Viscosity correction** window*

Valve selection

In this window you should first specify your valve, in the left part of the window, by selecting the following parameters:

- › **Type**: the regulating valve type.
- › **Family**: the valve family within the selected type.
- › **Device**: the valve device within the selected family.

Water characteristics

Click on the  button to open the Water Characteristics window as illustrated hereunder:

This **Water Characteristics** window is described in the [Fluid Characteristics](#) section.

 Please note that the **Fluid Characteristics** you enter when performing different operations such as individual selection, hydronic calculation, or using the additional tools are independent from one another. If you change the fluid or its temperature here, these values will NOT be changed in other *TA Select 4* parts.

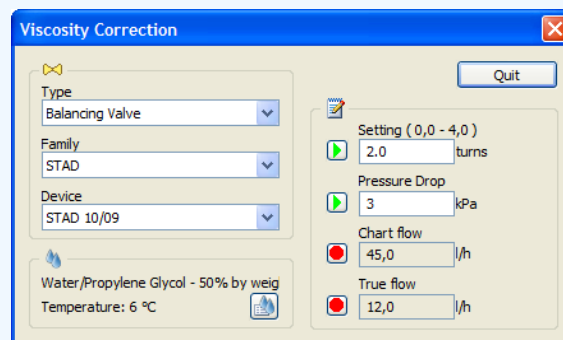
Valve characteristics

There are 4 parameters in the right area of this window. Enter a value for 2 of these parameters in order for the application to automatically compute the remaining 2 values as illustrated hereunder.

 The values you should enter are marked by a small  green icon. The values that will be computed are marked by a small  red icon. To change the values that you know and want to enter, simply click on the red icon.

- › **Setting (0,0 - xxx):** the valve current setting (in number of turns) up to the xxx value (maximum possible depending on the valve type).
- › **Pressure Drop:** the drop of pressure through the selected valve.
- › **Chart flow:** the theoretical flow value assuming a strictly turbulent flow regime.
- › **True flow:** the true flow value based on the actual flow regime (turbulent, intermediary, or laminar).

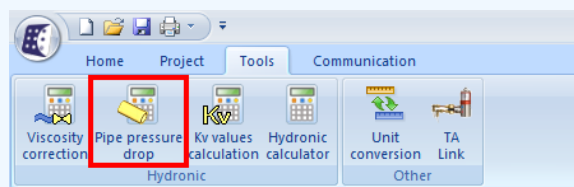
 If the true flow is similar to the chart flow, then the flow regime is turbulent. On the opposite, if these values highly differ, as in the illustrated example hereunder, then the actual flow regime is laminar (or intermediary).



Example of viscosity correction computation

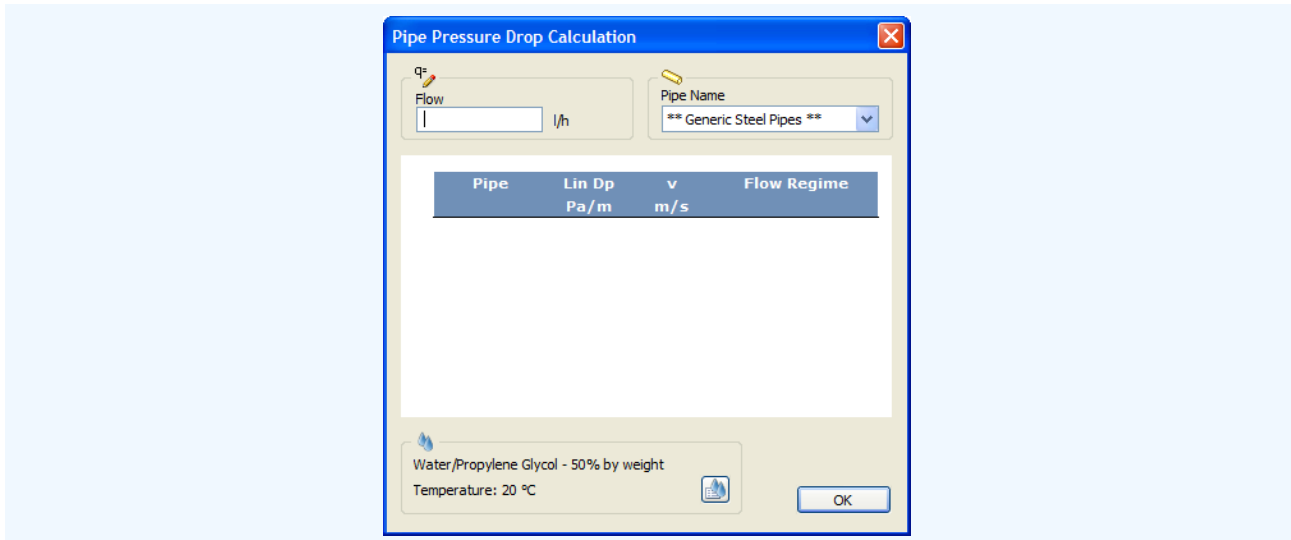
10.2. Pipe Pressure Drop Calculation

The **Pipe Pressure Drop Calculation** tool is used to compute the actual pressure drop in a selected pipe type and to recommend, within this type, a pipe size according to the liquid characteristics and viscosity.



The **Pipe pressure drop** button in the **Tools** ribbon

When you select this tool in the ribbon, the following window is displayed:



The **Viscosity correction** window

Flow and pipe

In this window you should first specify, in the upper area, the following parameters:

- › **Flow**: the desired flow in your pipe.
- › **Pipe Name**: the type of pipe you are using.

Water characteristics

Click on the  button to open the Water Characteristics window as illustrated hereunder:

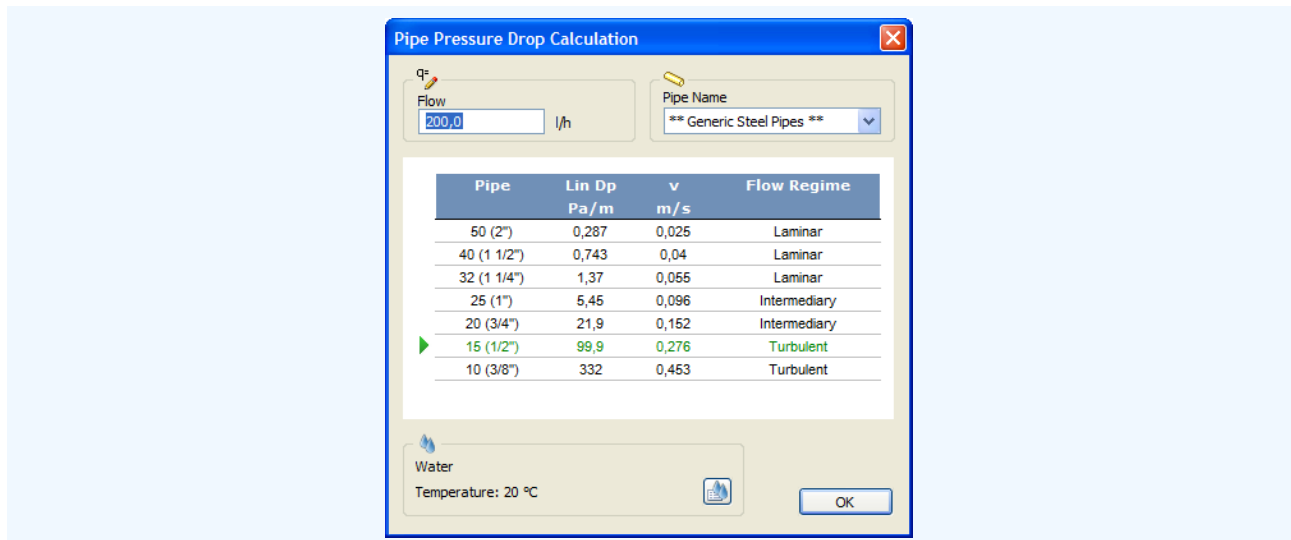
This **Water Characteristics** window is described in the [Fluid Characteristics](#) section.

 Please note that the **Fluid Characteristics** you enter when performing different operations such as individual selection, hydronic calculation, or using the additional tools are independent from one another. If you change the fluid or its temperature here, these values will NOT be changed in other TA Select 4 parts.

Pressure drop

Once you have entered a **Flow** value, the application automatically computes the recommended pipe size and the corresponding pressure drop. These results are adjusted in real time whenever you change any parameter (**Flow**, **Pipe Name** or water characteristics).

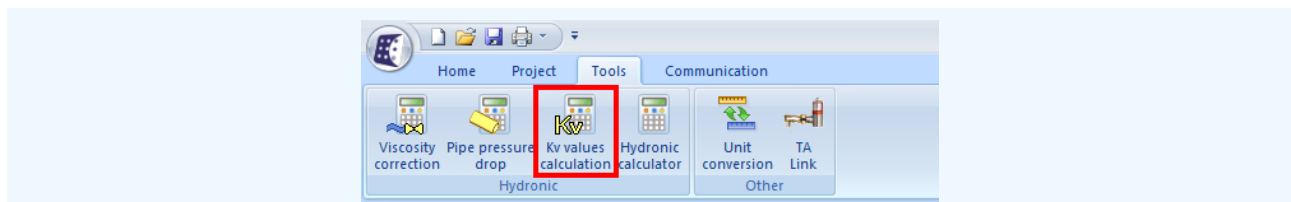
The result is a table as illustrated hereunder. Each line corresponds to a pipe size and presents the pressure drop, the fluid velocity and the flow regime (turbulent, intermediary, or laminar). The green text line highlights the recommended pipe size according to your current parameters.



Example of pressure drop computation results

10.3. Kv Values Calculation

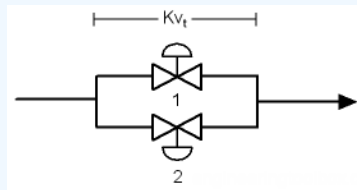
The **Kv values calculation** tool is used to compute the equivalent flow factor (Kv) of a pipe along which several items are placed in series.



The Kv values calculation button in the Tools ribbon

The flow factor or Kv is used to express the capacity and flow characteristics of control valves. When several valves are installed in a circuit, it is sometimes necessary to calculate the resulting equivalent Kv of the whole assembly.

Parallel assembly

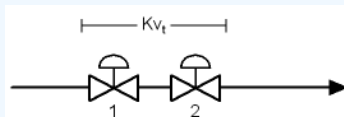


Valves mounted in parallel

When valves are installed in parallel, the resulting Kv is simply the addition of the individual Kv values.

$$K_{vt} = K_{v1} + K_{v2}$$

Series assembly



Valves mounted in parallel

When valves are installed in parallel, the resulting Kv is simply the addition of the individual Kv values.

$$\frac{1}{K_{vt}^2} = \frac{1}{K_{v1}^2} + \frac{1}{K_{v2}^2}$$

The Kv calculation window

This tool window is illustrated hereunder with a complete example. It directly computes the equivalent Kv for the different individual Kv entered assuming a series assembly (the way the individual values are entered is described below).

Ref.	Value	Kv
1	q=10 l/h; Dp=3 kPa	0,0577
2	Kv=1,2	1,2
3	Cv=1	0,865
4	Zeta=0,5; Di=19,9 mm	22,39

Example of a Kv calculation

- › When you have entered a Kv or the data required to calculate it in one of the left tabs:
 - The corresponding Kv value is displayed in the top right **Current Kv** field.
 - Click on the **Add =>** button to add this value in the right area.
- › The **Kv Total** resulting value is displayed in real time in the bottom right corner of the window as illustrated hereunder.
- › At any time, if you want to remove a value, simply click on it then click on the **Remove** button.

The Nominal Condition tab

Ref.	Value	Kv
1	q=10 l/h; Dp=3 kPa	0,0577

The **Nominal Condition** tab

In this tab, enter the **Flow** and the **Pressure Drop** in the valve as well as the [Fluid characteristics](#) if required.

The Kv flow factor is calculated using the following equation:

$$q = Kv \sqrt{\frac{\Delta p}{\rho} 1000}$$

where:

- q is the fluid flow (m³/h)
- ρ is the fluid density (kg/m³) retrieved from the fluid characteristics.
- Δp (or Dp) is the pressure drop (bar)

The Kv tab

In this tab, simply enter the **Kv** value you want to add.

The Cv tab

In this tab, enter the **Cv** or flow coefficient value (usually used with imperial units). The Kv is calculated using the following factor:

$$K_v = 0,865 \times C_v$$

The Zeta tab

Calculate Kv Values in Series

From : Current Kv : 22,39

Nominal Condition ☒ Kv ☐ Cv **Zeta**

Zeta coefficient ☐ Internal Diameter mm

Pipe Name

Pipe Size

Ref.	Value	Kv
1	Zeta=0,5; Di=19,9 mm	22,39

Quit **Kv Total : 22,39**

The **Zeta** tab

In this tab, enter the **Zeta** pressure drop coefficient and select a pipe type and size. If you do not know the pipe type used, you can simply enter its internal diameter.

The Kv flow factor is calculated using the following equation:

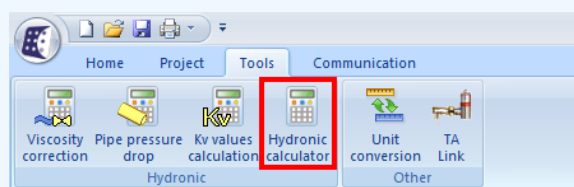
$$\zeta = \frac{\pi^2 \times D^4}{K_v^2 \times 8000}$$

where:

- ζ is zeta pressure drop coefficient
- D is the pipe internal diameter (m)
- Kv is the flow factor

10.4. Hydronic Calculator

The **Hydronic calculator** is used to easily and quickly compute different parameters using the standard hydronic equations.



The **Hydronic calculator** button in the **Tools** ribbon

When you select this tool in the ribbon, a window is displayed with 3 tabs allowing 3 similar kinds of calculation detailed below:

- › q-Kv-Dp
- › q-P-DT
- › q-Valve-Dp

For each of these calculations you should select 2 variables that you know and the system will compute the third one.

All these calculations are dependent on the water characteristics. In all 3 tabs, click on the  button to open the Water Characteristics window as illustrated hereunder:

This **Water Characteristics** window is described in the [Fluid Characteristics](#) section.

 Please note that the **Fluid Characteristics** you enter when performing different operations such as individual selection, hydronic calculation, or using the additional tools are independent from one another. If you change the fluid or its temperature here, these values will NOT be changed in other TA Select 4 parts.

q-Kv-Dp calculation

In this tab you have access to the following parameters:

- › **Flow**: the current flow in your system.
- › **Kv (Valve coefficient)**: the flow factor of your valve.
- › **Dp**: the current pressure drop in your system.

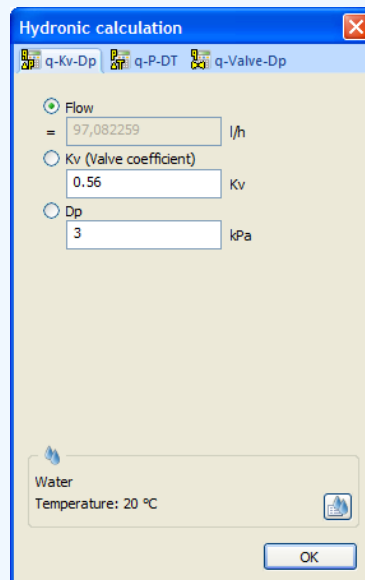
Click on the radio button of the parameter you want to calculate and enter a value for both other parameters as illustrated hereunder.

The unknown parameter is computed in real time and displayed according to the following formula:

$$q = Kv \sqrt{\frac{\Delta p}{\rho} 1000}$$

where:

- q is the fluid flow (m³/h)
- ρ is the fluid density (kg/m³) retrieved from the fluid characteristics.
- Δp (or Dp) is the pressure drop (bar)



Example of **q-Kv-Dp** calculation

q-P-DT calculation

In this tab you have access to the following parameters:

- › **Flow**: the current flow in your system.
- › **Power**: the terminal unit emitted power.
- › **DT**: the temperature drop or rise in the terminal unit.

Click on the radio button of the parameter you want to calculate and enter a value for both other parameters as illustrated hereunder.

The unknown parameter is computed in real time and displayed according to the following formula:

$$P = \frac{q \cdot \Delta T \cdot \rho \cdot c_p}{36 \cdot 10^5}$$

where:

- P is the terminal unit emitted power (W)
- q is the fluid flow (l/h)
- ΔT (or DT) is the temperature difference (K)
- ρ is the fluid density (kg/m³) retrieved from the fluid characteristics.
- Cp is the fluid specific heat (J/kg.K) retrieved from the fluid characteristics.

The screenshot shows a software window titled "Hydronic calculation" with three tabs: "q-Kv-Dp", "q-P-DT" (selected), and "q-Valve-Dp". In the "q-P-DT" tab, there are three radio buttons: "Flow", "Power", and "DT". The "DT" radio button is selected. Below the radio buttons, there are input fields for "Flow" (100 l/h), "Power" (200 W), and "DT" (1,724769 K). At the bottom, there is a section for fluid properties: "Water" and "Temperature: 20 °C". An "OK" button is at the bottom right.

Example of q-P-DT calculation

q-Valve-Dp calculation

In this tab you have access to the following parameters:

- › **Flow**: the current flow in your system.
- › **Setting**: setting of your valve.
- › **DpT**: pressure drop in your system.
- › **Valve (Type, Family, and Valve)**: type of valve used

Select your valve (**Type**, **Family**, and **Valve**) then click on the radio button of the parameter you want to calculate and enter a value for both other parameters as illustrated hereunder.

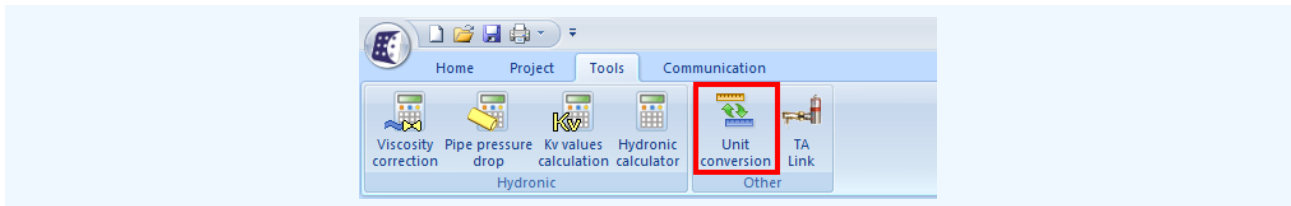
The unknown parameter is computed in real time and displayed according to the selected valve characteristics.

The screenshot shows a software window titled "Hydronic calculation" with three tabs: "q-Kv-Dp", "q-P-DT", and "q-Valve-Dp". The "q-Valve-Dp" tab is active. It contains three radio buttons for "Flow", "Setting (Max 4)", and "Dp". The "Flow" radio button is selected, and its value is "1000" with units "l/h". The "Setting (Max 4)" radio button is also selected, and its value is "2,64". The "Dp" radio button is not selected, and its value is "3" with units "kPa". Below these, there is a "Valve" section with three dropdown menus: "Type" (Balancing Valve), "Family" (STAD), and "Valve" (STAD 25). At the bottom, there is a "Water" section with "Temperature: 20 °C". An "OK" button is at the bottom right.

Example of **q-Valve-Dp** calculation

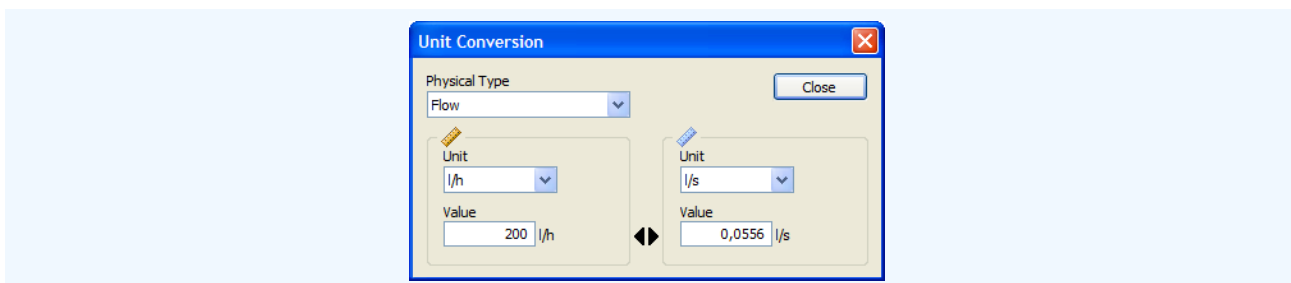
10.5. Unit Conversion

The **Unit conversion** tool is used to simply and quickly convert a value given in one unit type into another unit.



*The **Unit conversion** button in the **Tools** ribbon*

When you select this tool in the ribbon, the following window is displayed:



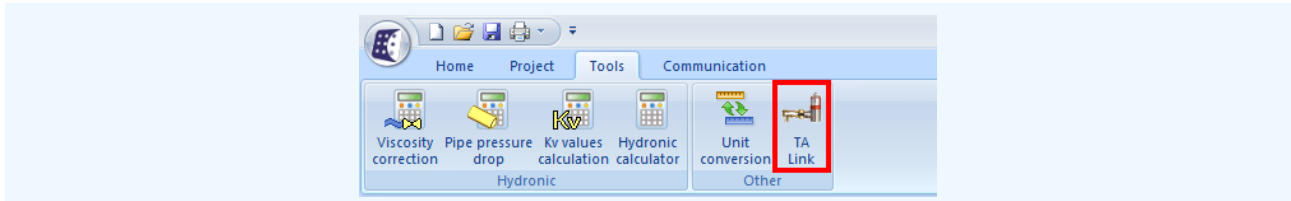
*The **Unit conversion** window*

In this window:

- › **Physical Type:** select the type of physical units you want to convert between (pressure, flow, thickness, area...).
- › **Unit:** select one unit on the left and another one on the right.
- › **Value:** enter a value either in the left with the first unit or in the right with the second unit. The other value is automatically calculated using the other unit as illustrated.

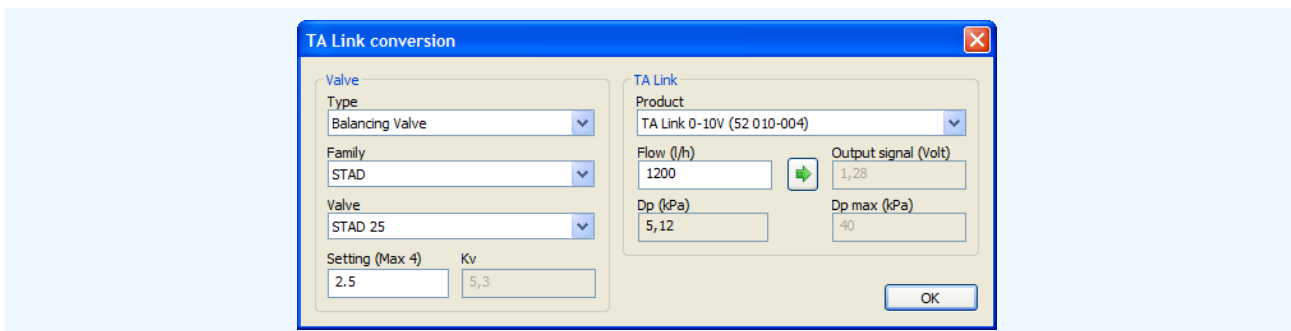
10.6. TA Link

The TA Link tool is used to check the connection with a TA Link and to compute, according to the TA Link type, the analogue signal output it will issue when mounted on the selected valve in the specified configuration.



The TA Link button in the Tools ribbon

When you select this tool in the ribbon, the following window is displayed:

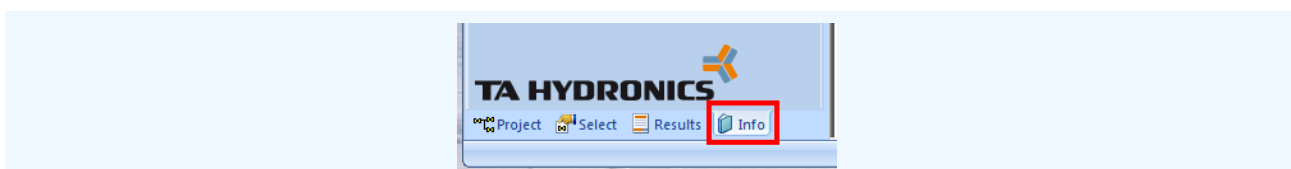


Example of the TA Link window

10.7. Catalogue Consulting

TA Select 4 includes the complete TA Hydronics valves and products catalogue in pdf format for easy reference (as well as consulting, printing, exporting...).

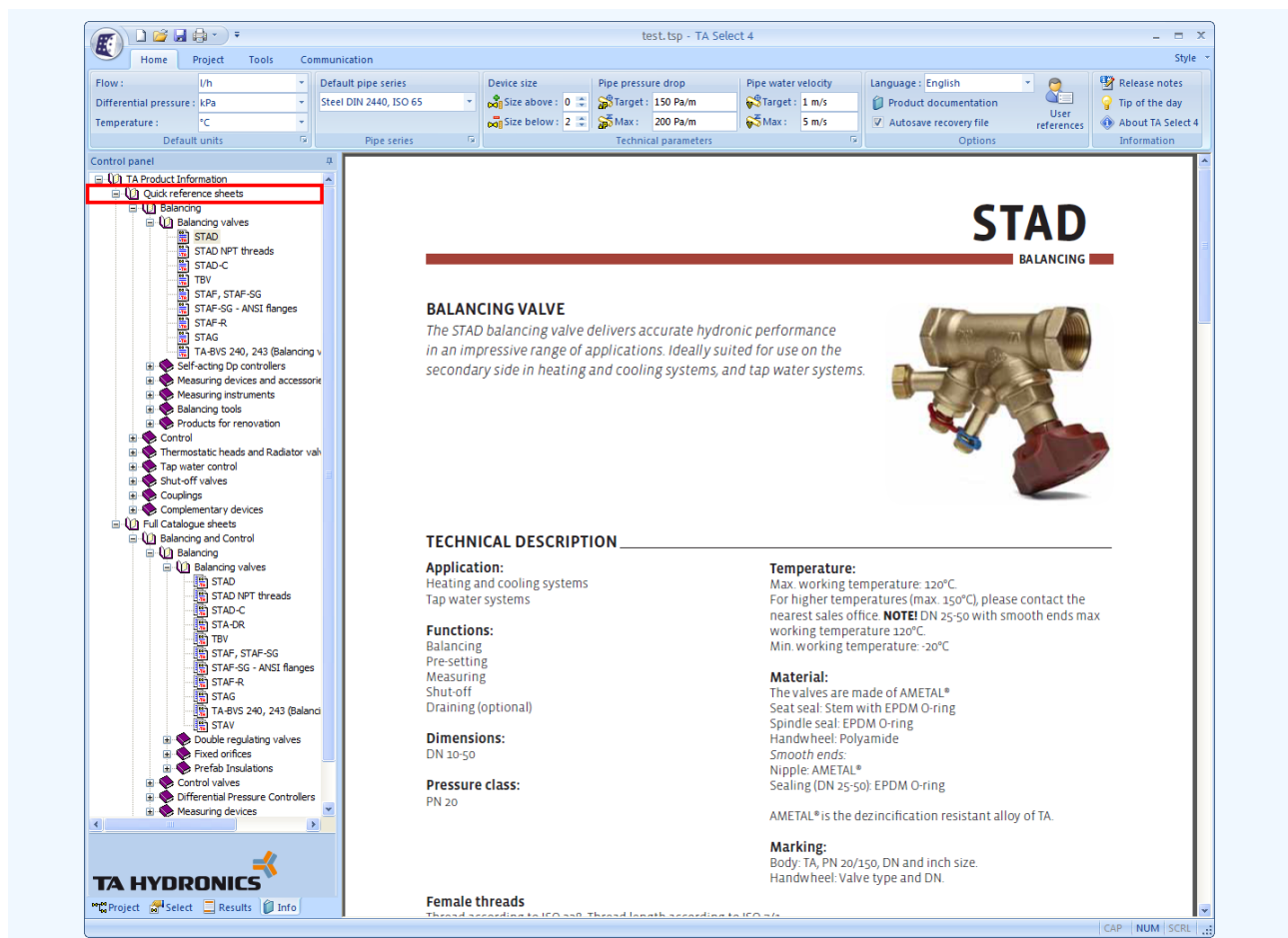
At the bottom of the control panel, click on the **Info** tab as illustrated.



The Info tab in the control panel

The catalogue is displayed in a tree form in the control panel with two high level divisions:

- ▶ The first part is the **Quick reference sheets** as illustrated hereunder.



Example of a quick reference sheet

The second part is the **Full catalogue sheets** as illustrated hereunder.

HomeProjectToolsCommunication

Flow: l/h
Differential pressure: kPa
Temperature: °C
Default units

Default pipe series
Steel DIN 2440, ISO 65
Pipe series

Device size
Size above: 0
Size below: 2

Pipe pressure drop
Target: 150 Pa/m
Max: 200 Pa/m

Pipe water velocity
Target: 1 m/s
Max: 5 m/s

Language: English
Product documentation
Autosave recovery file
Options

Release notes
Tip of the day
About TA Select 4
Information

TA Product Information
Quick reference sheets
Balancing
Balancing valves
STAD
STAD NPT threads
STAD-C
TBV
STAF, STAF-SG
STAF-SG - ANSI flanges
STAF-R
STAG
TA-BVS 240, 243 (Balancing valves)
Self-acting Dp controllers
Measuring devices and accessories
Balancing tools
Products for renovation
Control
Thermostatic heads and Radiator valves
Tap water control
Shut-off valves
Couplings
Complementary devices
Full Catalogue sheets
Balancing and Control
Balancing valves
STAD
STAD NPT threads
STAD-C
STAF-DR
TBV
STAF, STAF-SG
STAF-SG - ANSI flanges
STAF-R
STAG
TA-BVS 240, 243 (Balancing valves)
STAV
Double regulating valves
Fixed orifices
Prefab Insulations
Control valves
Differential Pressure Controllers
Measuring devices

Kv = 36 $\frac{q}{\sqrt{\Delta p}}$ q l/s, Δp kPa

Kv values

Turns	DN 10/09	DN 15/14	DN 20	DN 25	DN 32	DN 40	DN 50
0.5	-	0.127	0.511	0.60	1.14	1.75	2.56
1	0.090	0.212	0.757	1.03	1.90	3.30	4.20
1.5	0.137	0.314	1.19	2.10	3.10	4.60	7.20
2	0.260	0.571	1.90	3.62	4.66	6.10	11.7
2.5	0.480	0.877	2.80	5.30	7.10	8.80	16.2
3	0.826	1.38	3.87	6.90	9.50	12.6	21.5
3.5	1.26	1.98	4.75	8.00	11.8	16.0	26.5
4	1.47	2.52	5.70	8.70	14.2	19.2	33.0

Measuring accuracy

The zero position is calibrated and must not be changed.

Deviation of flow at different settings
The curve (Fig. 4) is valid for valves with normal pipe fittings (Fig. 5). Try also to avoid mounting taps and pumps, immediately before the valve.
The valve can be installed with the opposite flow direction. The specified flow details are also valid for this direction although tolerances can be greater (maximum 5% more).

Fig. 4

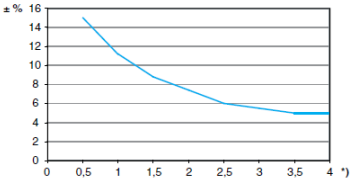
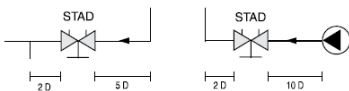


Fig. 5



*) Setting, No. of turns.

Example of a full catalogue sheet

120