**CIPRIANI**

Exchange
for good

# PHEmanager
software

# User's manual

# Summary

# 1. Introduction and access

**PHE manager WEB software** has been developed to answer to the needs of a large amount and different types of customers. To better answer to specific needs, some functions may not be available for the assigned profile.

This document is a general user guide of **PHE manager WEB software**.

**WARNING: For all versions, checking of CHEMICAL COMPATIBILITY between fluids and materials of construction is on user charge! Contact us for support.**

- Connect to https://phemanager.cipriani-phe.com/#/login and sign in with the email and password given.
- In the next page, read and accept the license agreement and the Privacy Statement and press the Save&Continue button.

## Please Sign In

Login (email)

| Login |

Password

| Password |

| Login |

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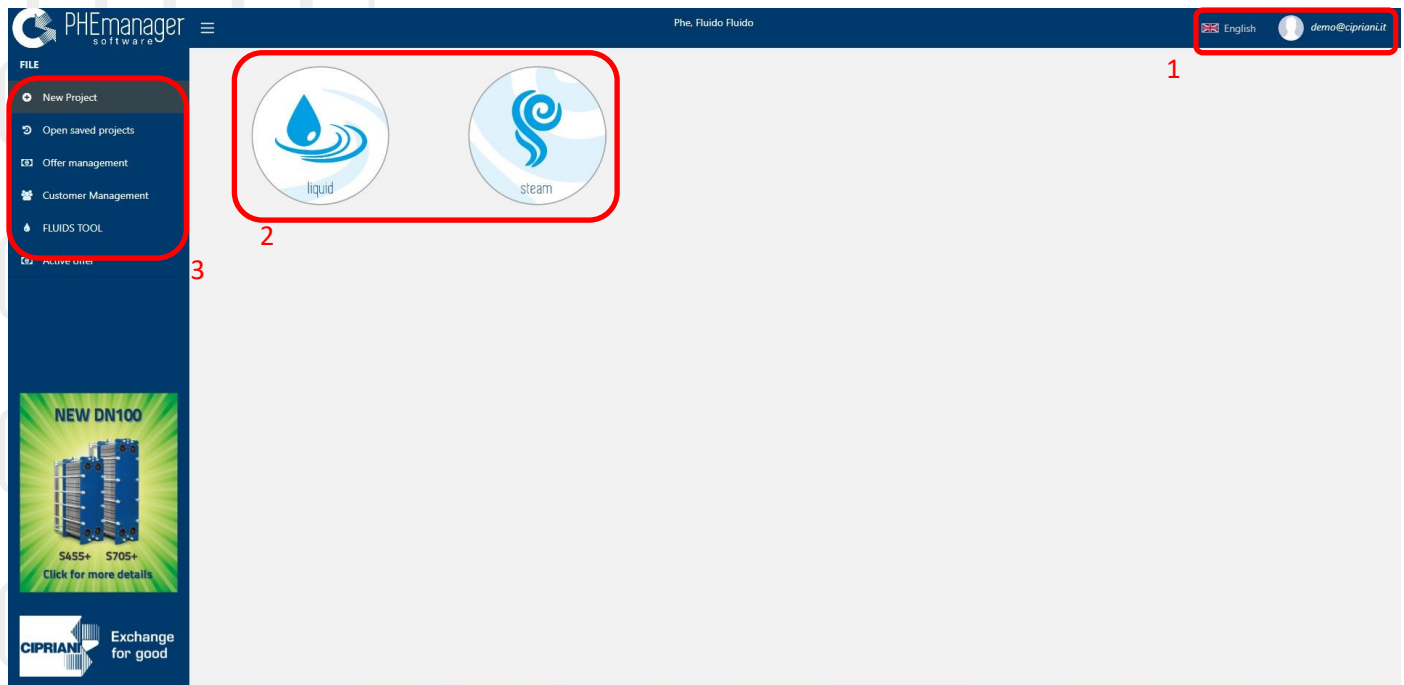
| LOGOUT | SAVE & CONTINUE |

## 2. Homepage

The starting window is a sort of menu that allows you to browse quickly within the software. In this page is possible to select the language, insert User's data and log out (1), quickly start a project for liquid-liquid or vapor-liquid applications (2) or browse through the other functions by means of the dedicated menu (3).



**User's data (1):**

In the drop-down menu, it is possible to open a form to insert the email and the telephone number shown inside offer printout. If those are let blank, the email in the offer printout will be the one used to register the user, while the telephone number will not appear.
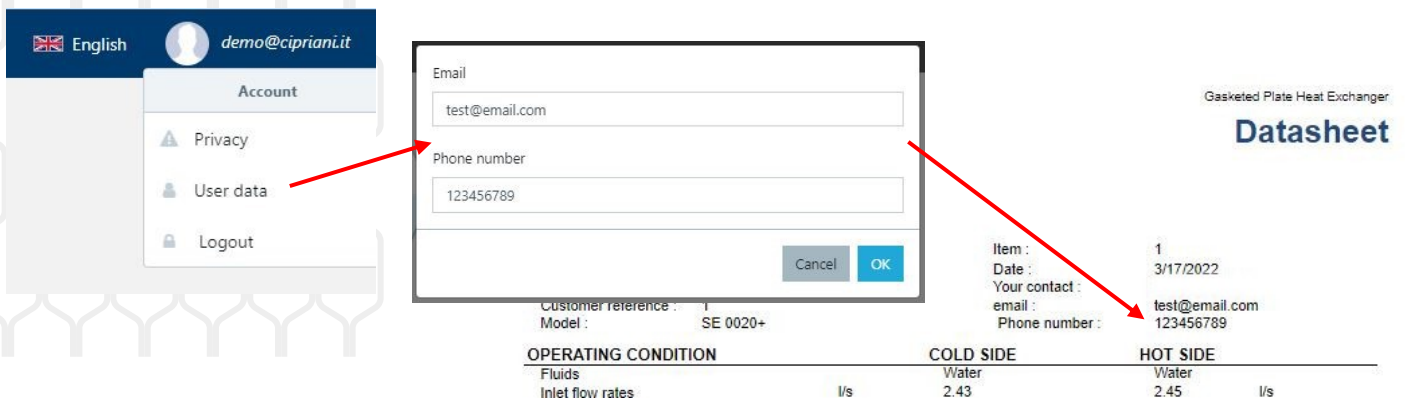
## 3. New project

To create a new project, click on the "liquid" or "steam" icon or press "New project" on the left side menu.
The side menu allows you to recall previous projects using the "recent projects" tab.



Once the desired application (liquid-liquid or vapor-liquid) is selected, the thermal configuration page will open.

## 3.1. Product configuration (1)

**A. Calculation type:**

    a.   <u>Selection</u>: allows **PHE manager software** select the list of PHE able to best satisfy the required input data (including thermal pattern and required pressure drops, but also PS, TS, plates materials and thickness, gaskets materials). The software according to input data sets product configuration automatically. In most cases, "Selection" mode is the correct calculation mode you should use to make a quotation.

    b.   <u>Checking</u>: to check how an existing PHE (code) satisfies the required input data. Product configuration has to be set manually.

    c.   <u>Simulation</u>: to evaluate actual outlet temperatures and capacity given by an existing PHE (code) by giving as an input the inlet temperatures and flow rates. Product configuration has to be set manually.

**B. Type of PHE:**

    a.   <u>GPHE:</u> Gasketed plate heat exchanger.

    b.   <u>BPHE:</u> Brazed plate heat exchanger.

**C. Design standard:**

    a.   <u>PED 2014/68/EU</u>: Mandatory for all PHE supplied in EU

    b.   <u>Manufactured (extra</u>-UE): Alternative standard for PHE supplied in outside of EU.

**D. Product line:**

    a.   <u>Standard:</u> No specific compliance or certification.

    b.   <u>Industrial:</u> Include more specific configurations (this product line is not always available).

    c.   <u>ACS:</u> Attestation de Conformité Sanitaire (valid in France).

    d.   <u>Double-wall:</u> double-wall plate product line.

**E. Design Pressure (PS), Design Temperature (TS):**

    a.   These are design data/customer's requirements usually indicated in the offer request, tender or technical specification. These are used by the software, among other things, to determine the PED 2014/68/EU classification.

**F. Plates, gaskets and frame materials:**

a.  It is possible to select different materials for gaskets, plates or frames. According to the TS selected, some gaskets materials might not be available. In "Selection" mode, PHE manager WEB software will automatically chose the thinnest plates available.

b.  The ☑ Plates material filter, if unticked, disable the plates material filter: all materials will be shown in the selection list.

## 3.2. Product parameters (2)

In this menu is possible to select the thermal power and to visualize some parameters (total oversizing, heat transfer area, heat transfer coefficient, LMTD and fouling factor) of the selected PHE.

## 3.3. Thermal program (3)

**A. Fluid selection:**

    a. When selecting a fluid, type the initial letter to enable the quick finder. **PHE manager WEB** will show you the first fluid with that specific initial letter. Press the initial letter to move through the list then press "Enter" to select the desired one.

**B. Insert thermal pattern:**

    a. Insert required thermal pattern: 5 inputs are required (+ required pressure drops on both sides). Most commonly used parameters combinations are:

- Capacity + Inlet & Outlet Temperatures on both sides of the PHE + required pressure drops on both sides.
- Capacity + Inlet Temperatures & Flow Rates on both sides of the PHE + required pressure drops on both sides.
- Inlet & Outlet Temperatures on both sides of the PHE + Flow Rate on one side + required pressure drops on both sides.

    b. Operating pressures: actual service pressure inside each circuit.
    c. Fouling factor: Default value of fouling factor between the plates is 0. If a specific fouling factor is required, you can add and it will be considered in the calculation.

All the parameters could be inserted by using the different units of measurement selecting them from the drop-down menu. Pressure, for example, is measured by default in kPa, but could be measured in bagG (gauge) or in mcH2O (meters of water) or in PSI (puond-force per Square Inch). Changing the units of measurement, selections can be adapted to different requirements of where the PHEs are installed.
On first access to the software, common units of measurement are used by default. If different units should be used, you can change them from the drop-down menu and calculate the solutions. When the first projects with the new units of measurement is saved, the software retain the units selections and them became the new defaults units on the next projects.

## 3.4. Others parameters (4)

**A. Insert other parameters:**

a. <u>Fixed number of Passes</u>: if flagged, **PHE manager WEB software** will offer solutions with the specified number of passes. Default value is 1 but, if needed, you can also fix a different No. of passes (up to 5). Remove the flag to view all possible solutions.

b. <u>Pressure drop filter</u>: if flagged, **PHE manager WEB software** will offer solutions with pressure drops exceeding the required pressure drops up to the indicated value (% vs. required value).

c. <u>Price filter</u>: if flagged, **PHE manager WEB software** will offer solutions with price exceeding the cheapest solution up to the indicated value (% vs. best solution price).

d. <u>Minimum oversizing</u>: if=0 (default value) **PHE manager WEB software** will offer the minimum possible oversizing value (ideal=0); if>0, **PHE manager WEB software** will offer solutions with oversizing exceeding the best solution. Minimum oversizing value proposed in this case is the indicated value (%).

## 3.5. Calculation

Click on "CALCULATE" to obtain solutions.

| List Price | GEOMETRY | Plates A [%] | Connections | No. of passes | No. of plates | Thickness [mm] | Heat transfert area [m²] | Total oversizing (calc.) [%] | PD (cold side) [kPa] | PD (hot side) [kPa] | PED | Plates material | W x H x L [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 829.80 | 0020+A | 100 | DN32 / J-J | 1 - 1 | 27 | 0.4 | 0.52 | 23.05 | 43.22 | 44.36 | - | AISI 316L (EN 1.4404) | 200 x 320 x 251 |
| 1188.00 | 0040+A | 100 | DN32 / J-J | 1 - 1 | 33 | 0.4 | 1.27 | 171.32 | 46.62 | 48.01 | - | AISI 316L (EN 1.4404) | 200 x 470 x 351 |
| 1701.60 | 0070+B | 0 | DN50 / J-J | 1 - 1 | 9 | 0.4 | 0.54 | 13.31 | 26.89 | 26.87 | - | AISI 316L (EN 1.4404) | 310 x 678 x 408 |
| 1764.40 | 0070+M | 50 | DN50 / J-J | 1 - 1 | 11 | 0.4 | 0.70 | 84.95 | 45.27 | 45.56 | - | AISI 316L (EN 1.4404) | 310 x 678 x 408 |
| 1952.80 | 0070+A | 100 | DN50 / J-J | 1 - 1 | 17 | 0.4 | 1.16 | 200.79 | 42.20 | 42.55 | - | AISI 316L (EN 1.4404) | 310 x 678 x 408 |
| 2040.60 | 0110+B | 0 | DN65 / J-J | 1 - 1 | 7 | 0.4 | 0.59 | 19.28 | 25.06 | 25.41 | - | AISI 316L (EN 1.4404) | 385 x 729 x 408 |
| 2046.30 | 0080+A | 100 | DN32 / J-J | 1 - 1 | 45 | 0.4 | 3.48 | 540.50 | 48.03 | 49.00 | - | AISI 316L (EN | 200 x 755 x 35 |

← BACK  |  CALCULATE  EXPORT CSV

## 3.6. Choosing the solution

**A. Choose your favorite solution in the list of offered solutions:**

▪ **PHE manager software** will offer a list of PHE capable to satisfy required input parameters.
▪ The list of solutions is provided in ascending price order.
▪ The selected solution is highlighted in light blue;
▪ Solutions with warnings are highlighted in yellow and the warning can be visualized with the triangle icon that appears in the last column. The warning does not prevent the selection of the PHE, but gives additional informations to further improve the PHE efficiency and reliability, when needed.

When there are conditions that prevent the PHE selection, the list will be blank and a message inform the user about the problem.

- By moving through the list with the mouse, details for each solution are shown.
- Click on the folder icon in the last column to go on with the configuration.

After the selection of a PHE, the grey cells are automatically filled with the values calculated by the software:

- Total oversizing: $\frac{K_{calc.} - K_{req.}}{K_{req.}} \cdot 100$, where $K_{calc.}$ Is the global heat transfer coefficient of the selected PHE, and $K_{req.}$ The global heat transfer coefficient required by the thermal program.
- Heat transfer coefficient (calculated/required)
- LMTD: Logarithmic mean temperature difference
- Fouling factor calculated
- Pressure drop into connections
- Fluid velocity into connections
- Fluid velocity into channel
- Reynolds number into channel
- Shear Index: is an adimensional index used by Cipriani to take into account the wall shear stress.

## 3.7. Checking mode

Once a solution is selected, **PHE manager software** automaticaly sets in "Checking" mode .
In this calculation mode, if necessary, you can modify product configuration (e.g. change No. of plates or plates material or plates thickness) to otimize the solution.



Once completed the optimization job, click on "Next" to go on with the quotation.

## 3.8. PHE quotation

Once that the PHE is selected and confirmed, the quotation page is opened. In this page it is possible to add options, accessories and select the connections.

- All options and accessories available for selected model are listed and quoted.
- Click on connections code to obtain the complete list of connections available for selected model.
- Accessories are automatically filtered in order to match the PHE selected and the operating conditions. However full compatibility of accessories may not always be guaranteed. Some exceptions: stud bolts are not always suitable with all the connections (e.g threaded connections) and plate pack protection are not useful if thermal insulation is fitted.
- Flag desired accessories to add them to the quotation.
- Add a discount, if necessary.



**Extended frame option:**

This option permit to verify future expansions of plates' pack and to extend, if necessary, the frame length.

The drop-down menu select the desired % of increase of the installed number of plates for future pack expansions. The software, if necessary, automatically select a longer frame to satisfy the selected value and update prices and accessories accordingly. Every frame length change is reported by a warning message.

Note: this options does not change the number of installed plates, but only the capacity of add more plates in the future. The maximum number of plates that the frame can hold is change accordingly. It is only permit to change to the immediately following frame length.

After adding options and accessories, save, add to an offer or print the project.

1. **Saving the project**

If necessary, save the project by clicking on "save". Specify item, customer reference and select the customer from the drop-down menu.



2. **Add to an offer**

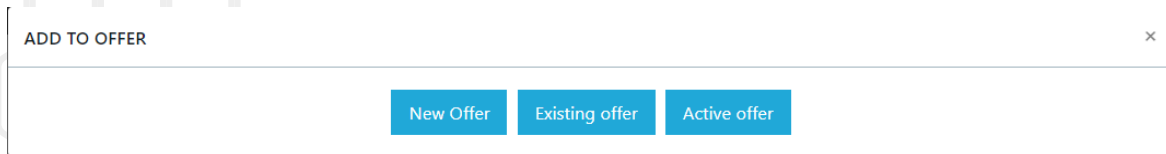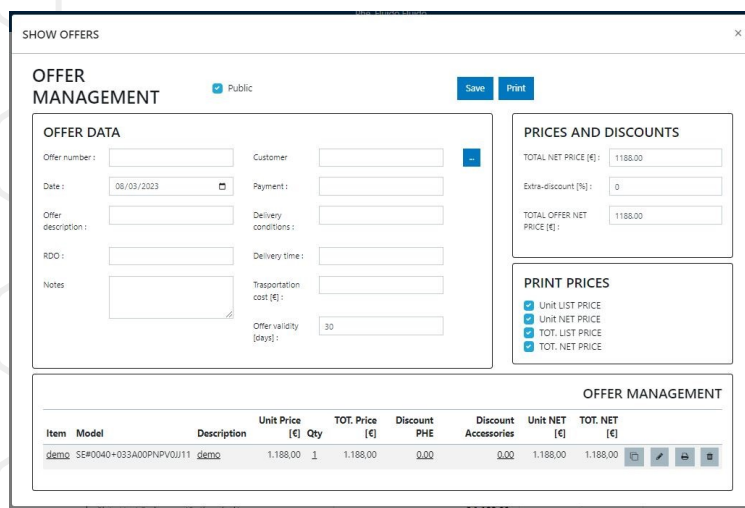The "add to offer" button add the current project to a new offer, an existing offer or the active offer.



a. <u>New offer:</u> open the offer management with a new offer. Save to add the project to a new offer after inserting all the necessary data.



b. <u>Existing offer:</u> select the offer from the existing offers list and click on "ok" in order to add the project to the selected offer.

c. <u>Active offer:</u> add the project to a previous offer selected as active.

## 3. Replace in offer

The "replace in offer" button, it is possible to replace an item inside the active offer with the selected one, by pressing the ⇄ button inside the offer item to be replaced.



## 4. Print the project

By clicking on "Next", it is possible to print the project after inserting the print data required and the customer selected from the menu.



Once saved, the project print will open in a new tab on the browser (popup).

In the left menu, it is possible to select what will be shown: datasheet, complete datasheet or the specification.

It is also possible to export in PDF or Word format the printout.

At the end of the project print page, there is a internal technical string useful to manage the orders:

- Software version;
- List Price validity;
- User profile;
- User code string.

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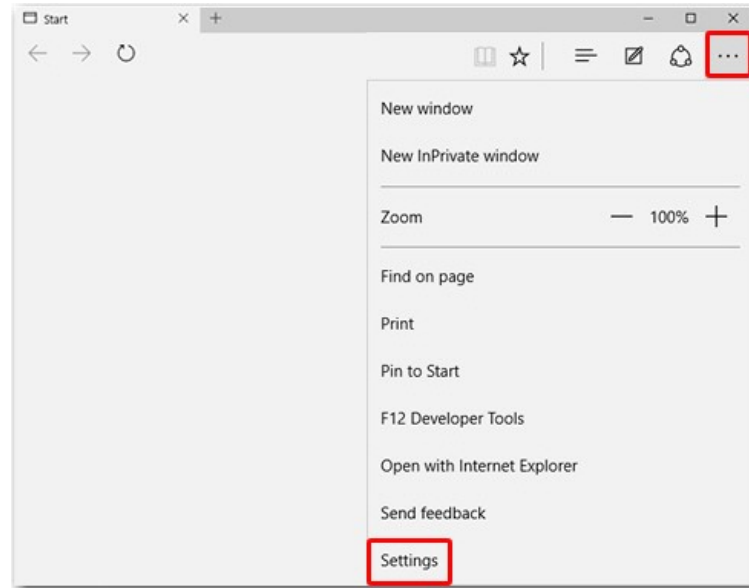**Important**: if popups are blocked, the selection data sheet preview will fail. Is necessary to allow the popups in your browser.
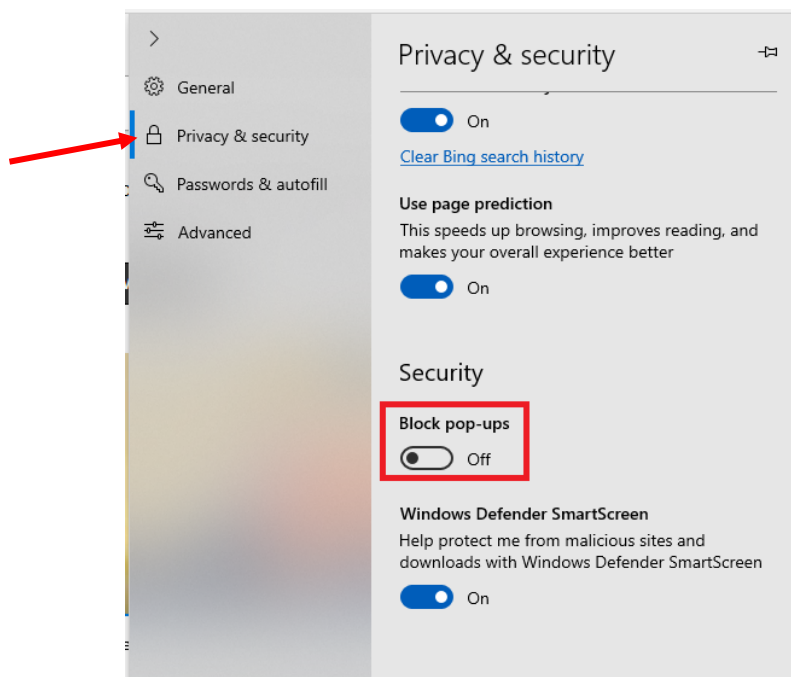
- Using **Chrome,** if the popup is blocked click on the icon on the upper right of the window and select "Always allow popups from …".
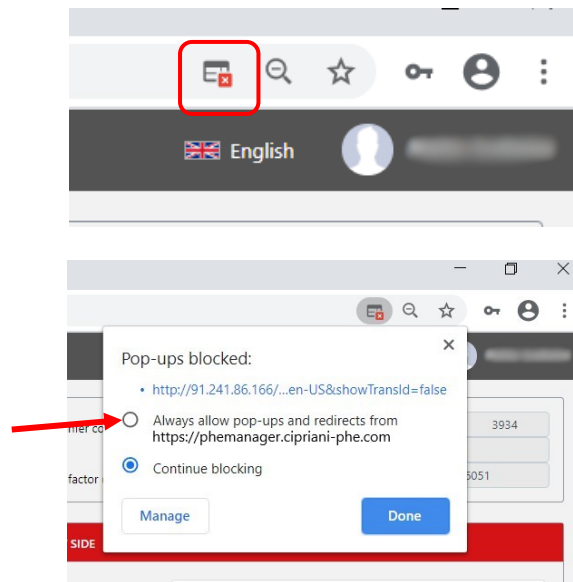
- In **Microsoft Edge,** press on the icon with three dots "…" in the upper right menu and select "settings".



Select "Privacy and security" and turn "Block Popups" to OFF.

In the print page, you can select the following three different print layouts from the left side menu:

- Compact datasheet + drawing
- Complete datasheet + drawing (if available to the current profile).

It is also possible to export the print layout by clicking on "Export Word" and "Export PDF".
Print language can be changed from the right side menu.

## 3.9. Open saved project

From the left side menu, it is possible to open the projects previously saved by clicking the dedicated button.
In this page are shown all the project saved by the user or user of the same company. The projects can be opened, deleted or modified.

The projects can be filtered in the drop-down menu and the filter.

# 4. Offer management

From the left side menu, it is possible to open the "Offer management" page by clicking the dedicated button.
All the offers created by the user or user of the same company are shown in this page.
Here it is possible to visualize, export or create new offers.
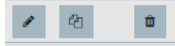


The menu (1) can be used to:

a. Create new offers: to create a new offer after inserting all the data required and the customer from the customer list. Different prices can be shown in printing page. Here it is possible to save, print or selected the current offer as active.
   If the public flag is selected, the offer is visible and editable by all the users inside the same company.

b. <u>Set as active offer</u>: to set the current offer as active, letting the user to quickly insert the project in this offer (see sec. *3.8.B.c*).
c. <u>Export offers</u>: to create a .csv file with the list of the offers generated.
d. <u>Search offers:</u> to search the offer setting the filters.
e. Set the number of offers shown in the page, and filter quickly by name.

Each offer can be:

- Modified, duplicated or deleted if the user is the creator of the offer (  ).

- Visualized or duplicated if the user is not the creator and the offer is public (  ).

- When an offer was made before a price list update, the software warns the price are not updated and offer to preview or do not update the prices.



By pressing "Do not update", the offer remains with old prices (every time the offer will be re-open, the software ask to update); by pressing "Preview", the software shows the new prices of PHE and accessories, offering to update or not them.
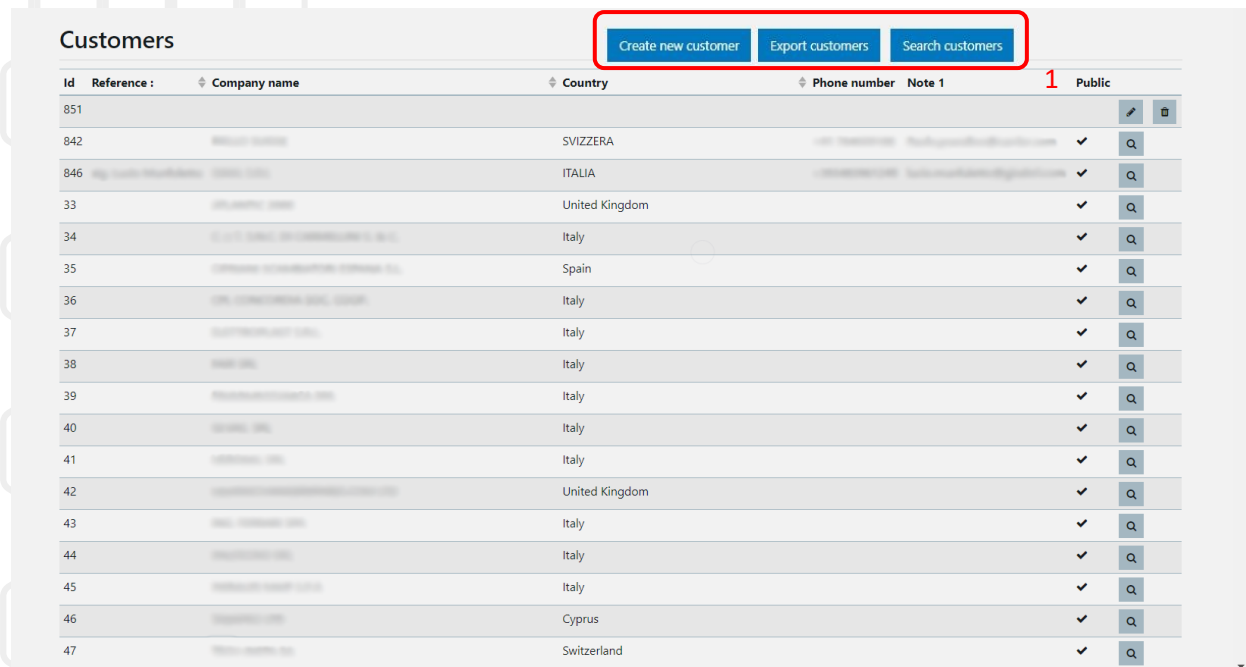


- If there is a project inside the offer, it is possible to duplicate, print or delete it (only print if the creator of the offer is different from the user that open it). Information like description, quantity or discount are shown and can be modified.



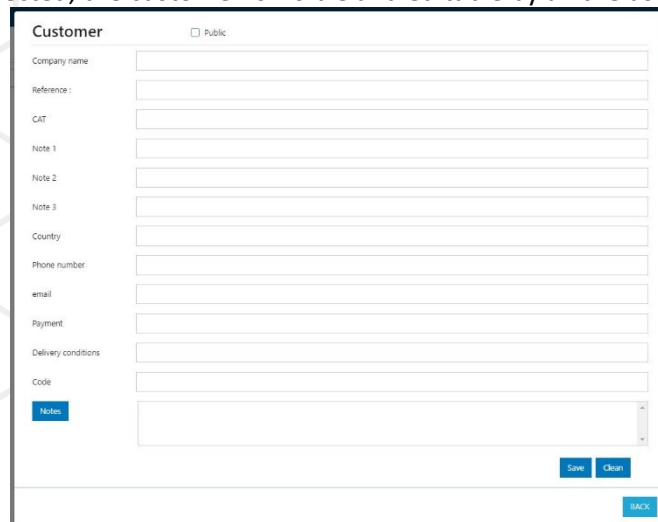| | | | | | | | | | OFFER MANAGEMENT | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Item | Model | Description | Unit Price [€] | Q.ty | TOT. Price [€] | Discount PHE | Discount Accessories | Unit NET [€] | TOT. NET [€] | | | |
| 1 | SE#0125+039B00HNPV0JJ11 | ****** | 2.522,10 | 1 | 2.522,10 | 0.00 | 0.00 | 2.522,10 | 2.522,10 | | | |

# 5. Customer management

From the left side menu, it is possible to open the "Customer management" page by clicking the dedicated button.
In this page are shown all customers created by the user or user of the same company.
Here it is possible to visualize, export or create new customers.



The menu (1) can be used to:

a. <u>Create new customers</u>: to create a new customer inserting the data required. It is possible to save or clean the page with the dedicated buttons.
   If the public flag is selected, the customer is visible and editable by all the users inside the same company.
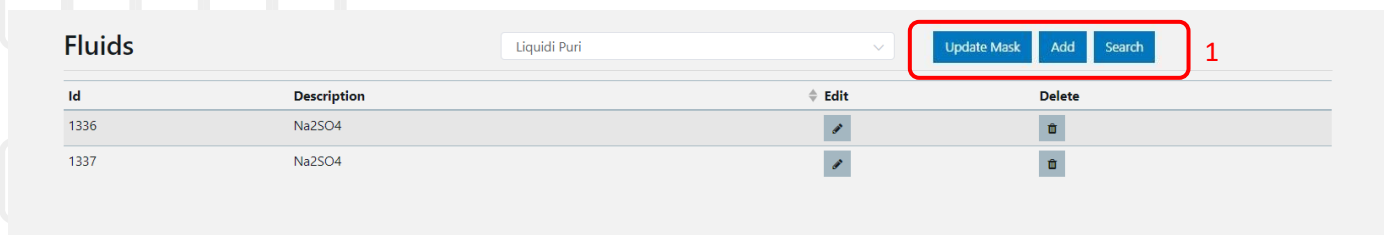
b. Export customers: to create a .csv file with the list of the customers generated.
c. Search customers: to search the customers setting the filters.

Each customer can be:

- Modified, duplicated or deleted if the user is the creator of the customer ( ).
- Only visualized if the user is not the creator of the customer ( ).

## 6. Fluid tools

From the left side menu, it is possible to open the "Fluid tool" page by clicking the dedicated button.
In this page are shown all the fluids created by the users and it is possible to modify, delete or create them.



The menu (1) can be used to:

a. Update mask: to refresh the visualization after modifications.

b. Add: open the tools to create a new fluid. It is possible to add a fluid describing the behavior of the thermo-physical parameters by points.
The required parameters are:

- Description: name of the fluid.
- Temp. Min/max: minimum and maximum allowed temperatures.
- Freezing temp.: freezing temperature of the fluid.
- Data type: type of data to insert (default: points).
- Present or not in favorites list.
- Dangerous (mandatory): G1 if dangerous, G2 if not.
- Vapor pressure > 0.5 bar temperature.
- Flash point temperature of the fluid.

On the right side, it is possible to describe the behavior of the fluid point by point, by setting thermo-physical properties at different temperatures.
The fluid can then be saved by clicking the dedicated button.

## Fluid

### Details

| | |
|---|---|
| Description ID | -1 |
| Description | |
| File name | |
| Min temp (°C) | 0 |
| Max temp (°C) | 100 |
| Freezing temp (°C) | 0 |
| Data type | Points |
| In the list of favorites | Non |
| Dangerous (G1=yes ; G2=no) | |
| Vapour pressure > 0,5 bar temperature (°C) | |
| Flash point temperature (°C) | |

### Points

| Item | Temperature [°C] | Density [kg/m³] | Specific Heat [J/(kg K)] | Thermal Conductivity [W/(m K)] | Viscosity [Pa s] |
|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 | 0 | 0 |

| Temperature | Density | Specific Heat | Thermal Conductivity | Viscosity |
|---|---|---|---|---|
| °C | kg/m² | J/(kg K) | W/(m K) | Pa s |

Save   << Back

c. <u>Search:</u> to search the fluid applying some filters.