

User manual

Qqualyfan selection software



HW Ventilation s.r.l.

User manual

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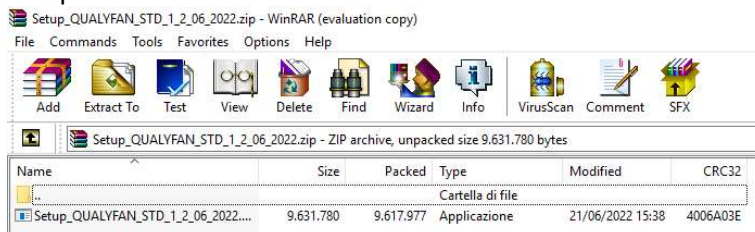
2 System requirements

- Hardware architectures supported by Qualyfan:
 - x86
 - x64
- Supported operating systems:
 - Windows 10
 - Windows 11
- Hardware requisites:
 - 1 or more GHz processor
 - 8 GB RAM
 - 1 GB free hard drive space
- Minimum monitor resolutions:
 - 1600 x 900
- An internet connection is required for the initial program run to obtain the license

3 Qualyfan installation instructions

To install the program, follow these steps:

1. Download the installation .zip file and save it to your computer.
2. Unzip the file



3. Click on the .exe file
4. Follow the on-screen instructions to complete the installation process

After successful installation, you should see the program icon on your desktop:



If you encounter any issues during installation, please contact us at qualyfan@hwventilation.com for assistance.

4 Starting Qualyfan

To begin using Qualyfan, follow these steps:

1. Run the program. The login screen will appear.
2. Enter your account credentials to access Qualyfan.

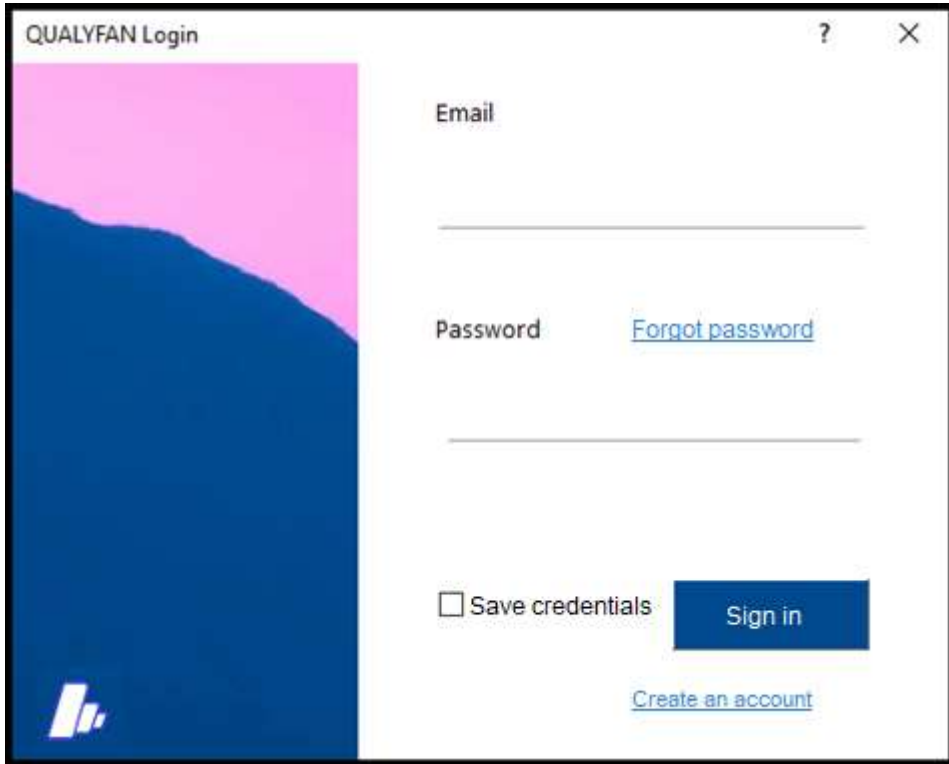


Figure 1 Login pop-up screen

4.1 Registration instructions

If you are running the program for the first time or do not already have an account, follow these steps to obtain a license and create a new account:

1. Click on "Create an account" when prompted.
2. Follow the instructions displayed on the user identification pop-up screen to complete the registration process.

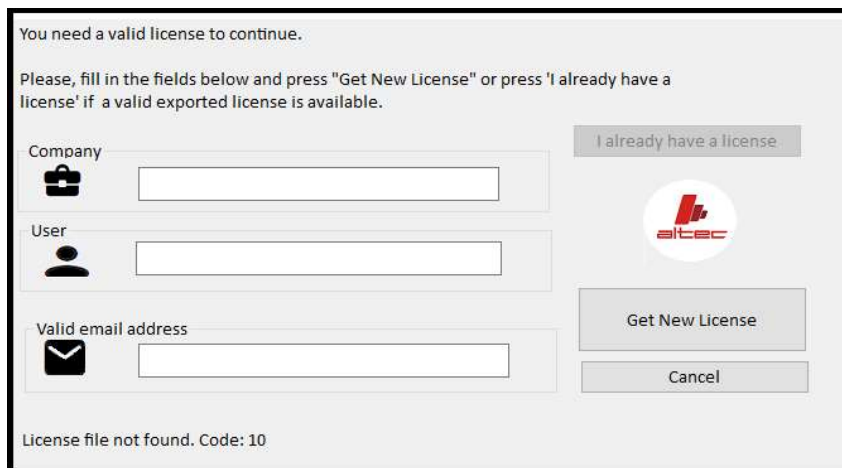


Figure 2 Registration pop-up screen

Once you have received the confirmation email for your license:

1. Run the program again.
2. Click on the blue text "Forgot password".
3. Fill in your email address and choose a password.
4. Repeat the chosen password.
5. Click on the blue button labeled "Sign in".

You will then receive an email with a confirmation link to activate your account. Click on the link to complete the activation process.

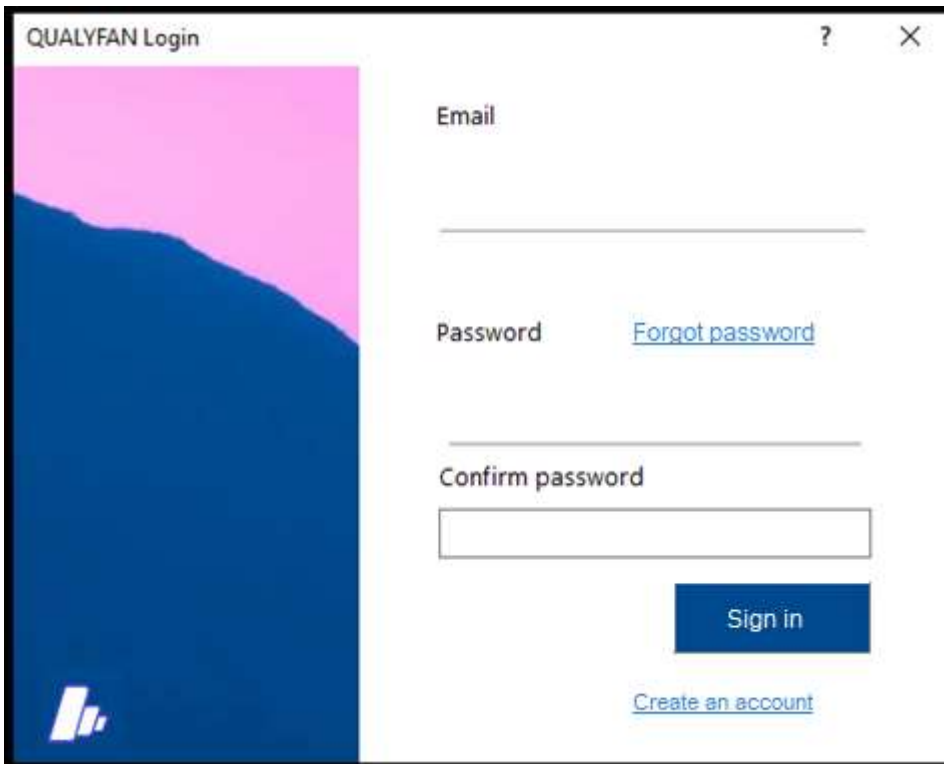


Figure 3 Login pop-up screen – create password

5 Qualyfan features

After logging in with your account credentials, the main screen of the software will be displayed as shown in Figure 4.

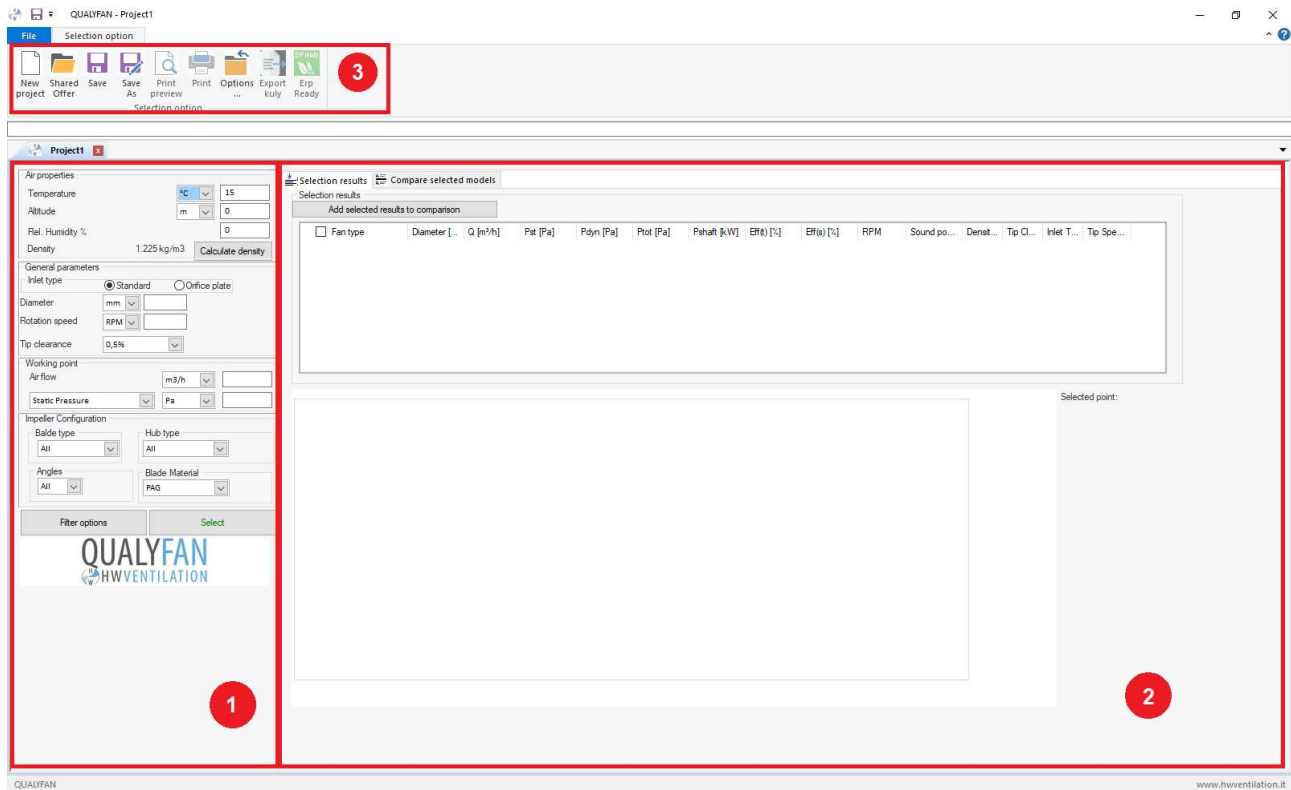


Figure 4 Qualyfan main screen

The main screen consists of three primary sections:

1. Fan Selection Dashboard
2. "Selection Results" and "Compare Selected Models" Sections
3. Other Tools

5.1 Fan selection dashboard

The screenshot shows the 'Fan selection dashboard' interface, which is organized into several sections:

- Air properties:** Includes input fields for Temperature (15 °C), Altitude (0 m), and Rel. Humidity (%). A 'Calculate density' button is present, and the resulting density is shown as 1.225 kg/m³.
- General parameters:** Features an 'Inlet type' selector (Standard selected, Orifice plate unselected), 'Diameter' (mm), 'Rotation speed' (RPM), and 'Tip clearance' (0,5%).
- Working point:** Includes 'Air flow' (m³/h) and 'Static Pressure' (Pa) input fields.
- Impeller Configuration:** Contains dropdown menus for 'Blade type' (All), 'Hub type' (All), 'Angles' (All), and 'Blade material' (PAG).
- Bottom section:** Includes 'Filter options' and a green 'Select' button.

The 'QUALIFYFAN' logo and 'HWVENTILATION' text are displayed at the bottom of the dashboard.

Figure 5 Fan selection dashboard

The fan selection dashboard is divided into the following fields:

- Air properties
- General parameters
- Working point
- Impeller configuration
- Selection options and select buttons

5.1.1 Air properties

This close-up view of the 'Air properties' field shows the following elements:

- Temperature: 15 °C (with a dropdown menu for units)
- Altitude: 0 m (with a dropdown menu for units)
- Rel. Humidity %: 0
- Density: 1.225 kg/m³ (with a 'Calculate density' button)

Figure 6 Air properties field

- Temperature
 - [degr. C]
 - [degr. F]
 - [K]

- Altitude
 - [m]
 - [ft]
- Humidity [%]
- Density – once the above parameters have been filled in, the software automatically will calculate the fluid density.

5.1.2 General parameters

Figure 7 General parameters field

- Inlet type
 - Standard
 - Orifice plate
- Diameter
 - [in]
 - [mm]
- Rotation speed
 - [1/min]
 - [1/s]
 - [rad/s]
 - [RPM]
 - [RPS]
- Tip clearance – radial distance between the tip of the blade and the casing, represented in terms of % of the impeller’s diameter:
 - 0.5%
 - 1%
 - 1.5%

5.1.3 Working point

Figure 8 Working point field

- Air flow
 - [cfm]
 - [kg/h]
 - [kg/s]
 - [l/s]
 - [lb/s]

- [m3/h]
- [m3/min]
- [m3/s]
- Static pressure or total pressure
 - [inH2O]
 - [mbar]
 - [mmH2O]
 - [Pa]

5.1.4 Impeller configuration

The image shows a software interface titled "Impeller Configuration". It contains four dropdown menus arranged in a 2x2 grid. The top-left menu is labeled "Blade type" and has "All" selected. The top-right menu is labeled "Hub type" and has "All" selected. The bottom-left menu is labeled "Angles" and has "All" selected. The bottom-right menu is labeled "Blade material" and has "PAG" selected.

Figure 9 Impeller configuration field

Users can filter fan selection by the following parameters:

- Blade Type
- Hub Type
- Angles
- Blade Material

For the Blade Material parameter, users must select a specific material. However, for the other parameters, users can choose a specific element from the menu or select "all" to include all available options in the menu.

- Blade type – select from the following available blade types:
 - G – fixed pitch airfoil profile
 - D – fixed pitch airfoil profile
 - N – variable pitch airfoil profile
 - V – variable pitch airfoil profile
 - R – reversible profile
 - SR – variable pitch sickle-right profile
 - C – variable pitch sickle profile
 - Q – fixed pitch sickle profile
 - F – variable pitch sickle profile
 - De – fixed pitch airfoil profile
 - A – variable pitch airfoil profile
- Blade material – select from the following available blade materials::
 - PP – Polypropylene, yellow
 - PPG – Glass reinforced polypropylene, orange
 - PAG – Glass reinforced polyamide (PA), white
 - ALU – Aluminum

- RYT – Ryton, brown
- ATEX - PAA – Antistatic polyamide (ATEX), black; PAX – Antistatic, self-extinguishing polyamide (ATEX), black; PAM- Antistatic, self-extinguishing, magnetically shielded polyamide (ATEX), black

Material	Description	Color	Applications	Op. temperature
PP	Polypropylene (PP)	Yellow	G, D, Q	From -10°C to +85°C
PPG	Glass Reinforced Polypropylene (PP)	Orange	G, D, N, V, C, Q, F	From -20°C to +90°C
PAG	Glass Reinforced Polyamide (PA)	White	G, D, N, V, SR, C, Q, F, A	From -40°C to +120°C
ALU	Aluminum		R, C-ALU, De	From -50°C to +180°C
RYT	Ryton	Brown	G, V	From -20°C to +140°C
PAA	Antistatic Polyamide	Black	G, D, N, V	From -20°C to +110°C
PAX	Antistatic, Self extinguishing PA	Black	G, D, N, V	From -20°C to +110°C
PAM	Antistatic, Self extinguishing, Magnetically shielded PA	Black	G, D, N, V	From -20°C to +110°C

Table 1 Available materials and blades

5.1.5 Filter options and select buttons



Figure 10 Selection options and select buttons

Clicking on the first button the filter options screen shows up.

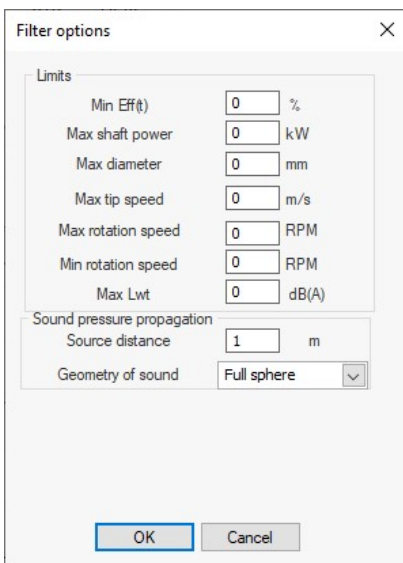


Figure 11 Selection options pop-up screen

- Limits – Users can set limit values for specific performance characteristics of fans to filter the list of result selections.
- Sound pressure propagation – Users can adjust the default parameters used to calculate the sound pressure.

Alternatively, by clicking on the second button, the software will initiate the research and return a list of impellers compatible with the selected parameters.

5.2 Selection results

Users can run two main types of selection:

- Automatic selection – this option allows users to run a selection with a requested working point.
- Manual selection – Users can also perform a manual selection without specifying a working point.

5.2.1 Automatic selection – with a requested working point

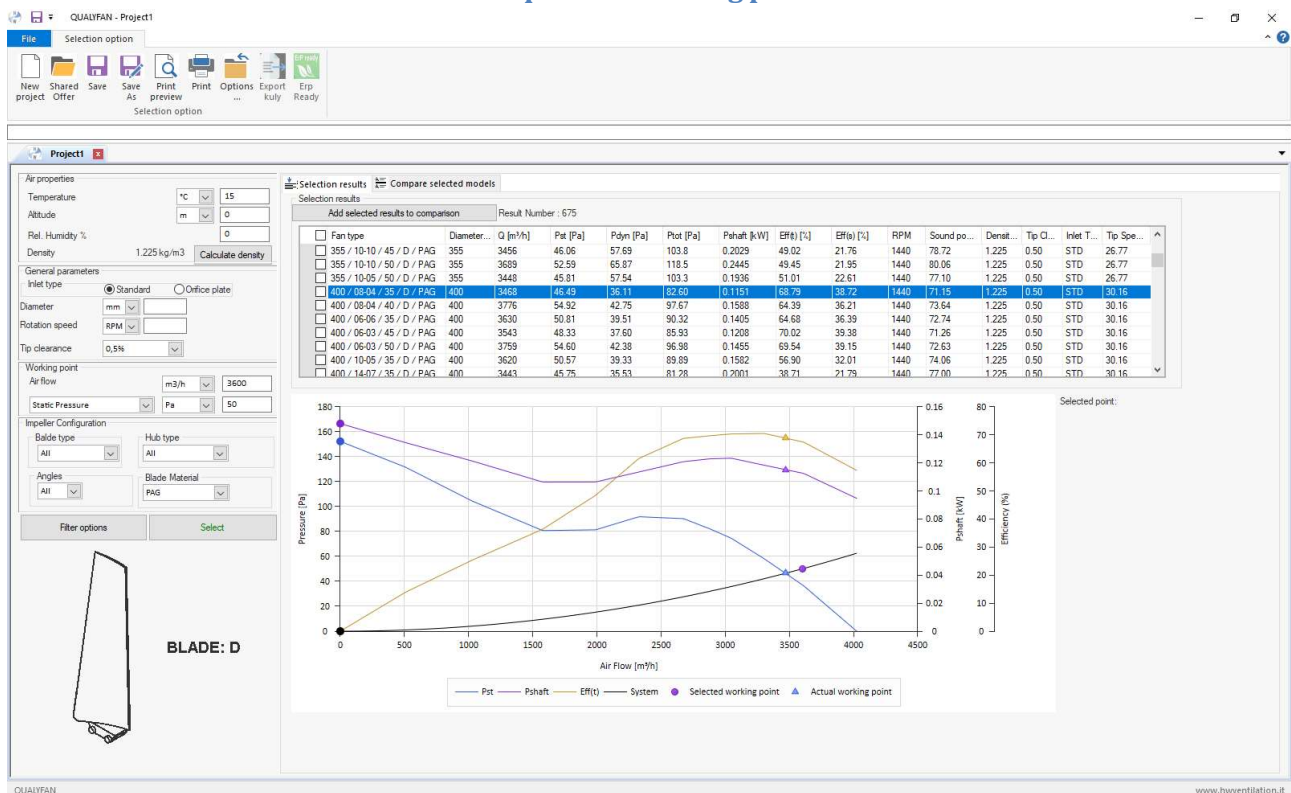


Figure 12 Example of an automatic selection

For this selection type, users have the flexibility to leave the diameter and/or rotation speed parameters blank. However, the requested working point must be filled in. Once all necessary parameters are entered, the software automatically generates a list of impellers whose performance levels meet the specified requirements, displayed at the top of the selection results area.

Each row of the results list includes:

- Impeller configuration code
- Performance data at the actual working point
- Additional parameters such as diameter, rotation speed, air density, tip clearance, inlet type, and tip speed.

Moreover, users can click on a row in the list to:

- View the characteristic curves of the selected impeller plotted below the list.
- Display the image of the blade used in that fan configuration in the bottom left corner of the screen.

5.2.2 Manual selection- without a requested working point

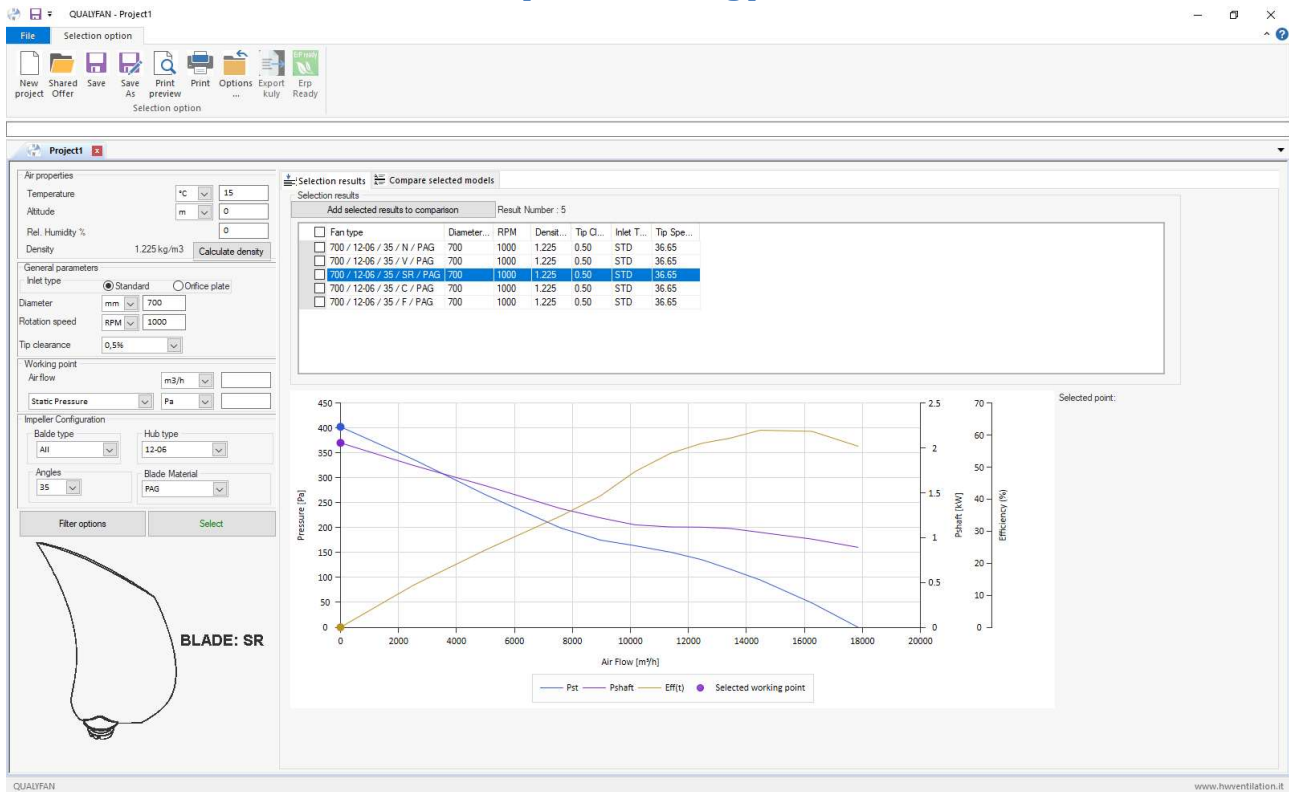


Figure 13 Example of a manual selection

This selection type is utilized when users wish to explore specific impeller configurations. To perform a manual selection:

- Users must enter all elements into the general parameters field on the dashboard.
- The working point field must be left blank.

After inputting the necessary parameters, suitable impellers meeting the specified criteria will be displayed in the results list.

5.2.3 Results list - functions

The screenshot shows the 'Selection results' table in the QUALIFAN software. The table has 15 columns: Fan type, Diam..., Q [m³/h], Pst [Pa], Pdyn [Pa], Ptot [Pa], Pshaft [kW], Eff(t) [%], Eff(s) [%], RPM, Sound po..., Densit..., Tip Cl..., Inlet T..., and Tip Spe... The table contains 5 rows of results for a fan type of '315 / 06-03 / 35 / G / PAG'.

Fan type	Diam...	Q [m³/h]	Pst [Pa]	Pdyn [Pa]	Ptot [Pa]	Pshaft [kW]	Eff(t) [%]	Eff(s) [%]	RPM	Sound po...	Densit...	Tip Cl...	Inlet T...	Tip Spe...
<input type="checkbox"/> 315 / 06-06 / 30 / G / PAG	315	3648	51.30	103.7	155.0	0.3027	51.77	17.14	2800	82.68	1.225	0.50	STD	46.18
<input type="checkbox"/> 315 / 06-03 / 35 / G / PAG	315	3630	50.89	102.7	153.5	0.2980	51.88	17.20	2800	81.41	1.225	0.50	STD	46.18
<input type="checkbox"/> 315 / 10-10 / 35 / G / PAG	315	3561	48.97	99.00	148.0	0.5161	27.09	8.96	2800	89.67	1.225	0.50	STD	46.18
<input type="checkbox"/> 315 / 10-05 / 35 / G / PAG	315	3560	48.79	98.94	147.7	0.3828	37.10	12.25	2800	85.54	1.225	0.50	STD	46.18
<input type="checkbox"/> 315 / 08-04 / 35 / G / PAG	315	3771	54.91	111.1	166.0	0.3431	49.91	16.51	2800	82.68	1.225	0.50	STD	46.18

Figure 14 Example of results list for an automatic selection

The results list displays all impeller configurations that meet the specified parameters. If a requested working point is entered by the user, the list will include performance data at the actual working point for each fan configuration.

Users can perform the following functions with the results list:

- **Sorting:** Clicking on the top of each column allows users to sort the list. A single click sorts the list in ascending order, while a double-click sorts it in descending order. Clicking three times deactivates the sorting function.
- **Viewing Performance Curves:** Clicking on a row of the list plots the performance curves of the selected impeller in the diagram below the results list. Only one set of performance curves can be displayed at a time.

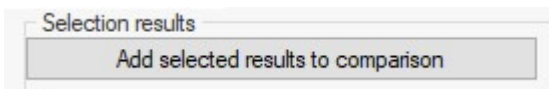


Figure 15 Add selected results to comparison button

Users can add selected impellers to the "Compare Selected Models" screen by checking the checkbox on the left side of each impeller configuration and clicking the "Add Selected Results to Comparison" button located at the top of the list. Adding selected configurations to the comparison screen allows users to keep track of them, even when starting a new search. It also enables users to gather more information and compare the performance curves of multiple configurations simultaneously.

5.2.4 Diagram on the selection results screen

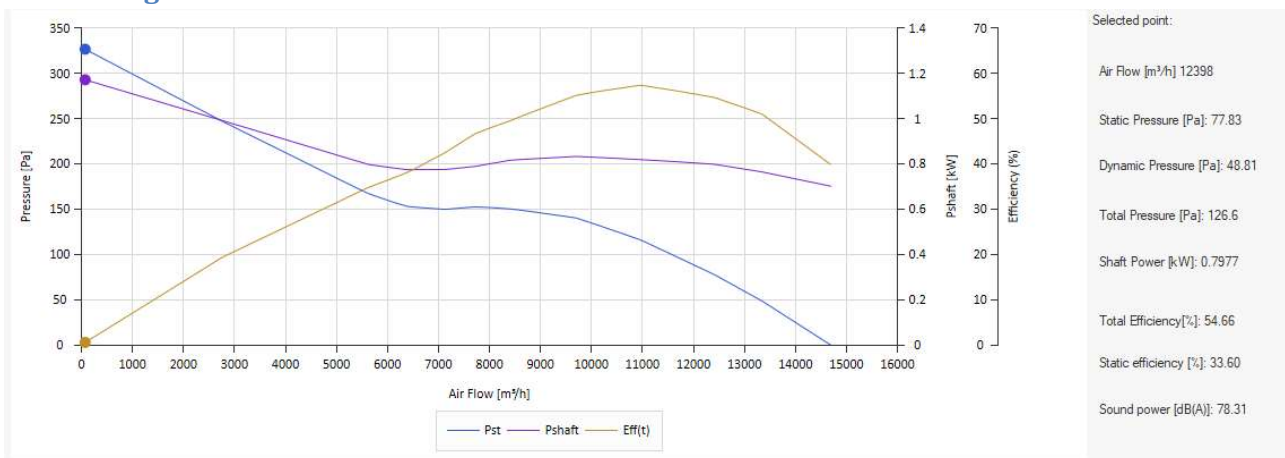


Figure 16 Example of performance curve for a manual selection

By clicking on any performance curve, the performance data of the selected point will be displayed on the right side of the diagram.

5.3 Compare selected models

Users can add impeller configurations to the compare section for the following reasons:

- To gather more information about the selected impeller.
- To work on the selected impeller.
- To compare two or more impeller configurations.

Below the compare list on the left side, there are three buttons:

- **Delete Configuration:** Allows users to remove the selected configuration from the compare list one at a time. Clicking on the related line in the compare list selects the desired impeller for deletion.
- **Delete All:** Removes all fan configurations from the compare list.
- **Reset Data:** Resets the actual working point data of checked configurations on the compare list to zero.

On the right side, there are three buttons that allow users to change what is displayed below them:

- **Performance:** Displays performance curves of the checked impeller configurations.
- **Noise Level:** Shows bar charts of octave band of sound power and sound pressure.
- **Datasheet:** Reports all the characteristics data of the selected impeller.

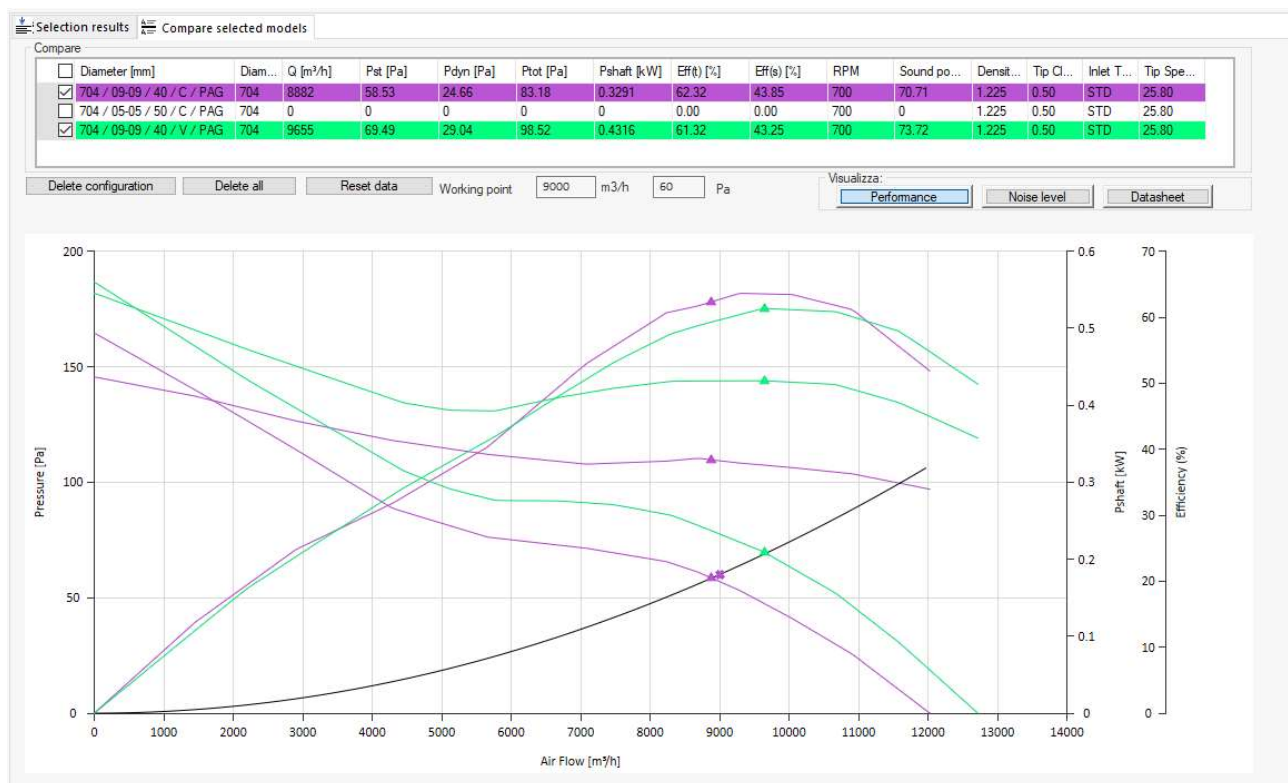


Figure 17 Example of compare selected models main screen

5.3.1 Performance screen

To plot the performance curves, users must check the checkbox on the left side of the impeller configurations. If the checkbox is not checked, the curves will not be displayed. Checked impellers are highlighted with a color that matches the color of the performance curves. By clicking on a curve, the actual working point data on the compare list of the related configuration will be automatically recalculated.

The system curve, represented by the black curve, will be plotted only if a checked impeller was a configuration result from an automatic selection. The required working point entered by the user for that automatic selection is reported on the right side of the "reset data" button.

5.3.2 Noise level screen

Sound values are associated with a working point on performance curves. Therefore, if the impeller configuration does not have an actual working point activated, the user must select one by clicking on a

curve at the desired point. Once the user has selected the impeller configuration by clicking on the list and has pressed the noise level button, bar charts of octave band of sound power and sound pressure will be displayed on the screen. Bar charts are displayed only for one configuration at a time.

On the top right of the diagram, the selected impeller configuration code is reported. On the left side, there are some useful parameters, such as the source distance and the geometry of propagation, that allow the user to recalculate the sound pressure by changing them and pressing the "recalc noise level" button.



Figure 18 Example of compare selected models – Noise level screen

5.3.3 Datasheet screen

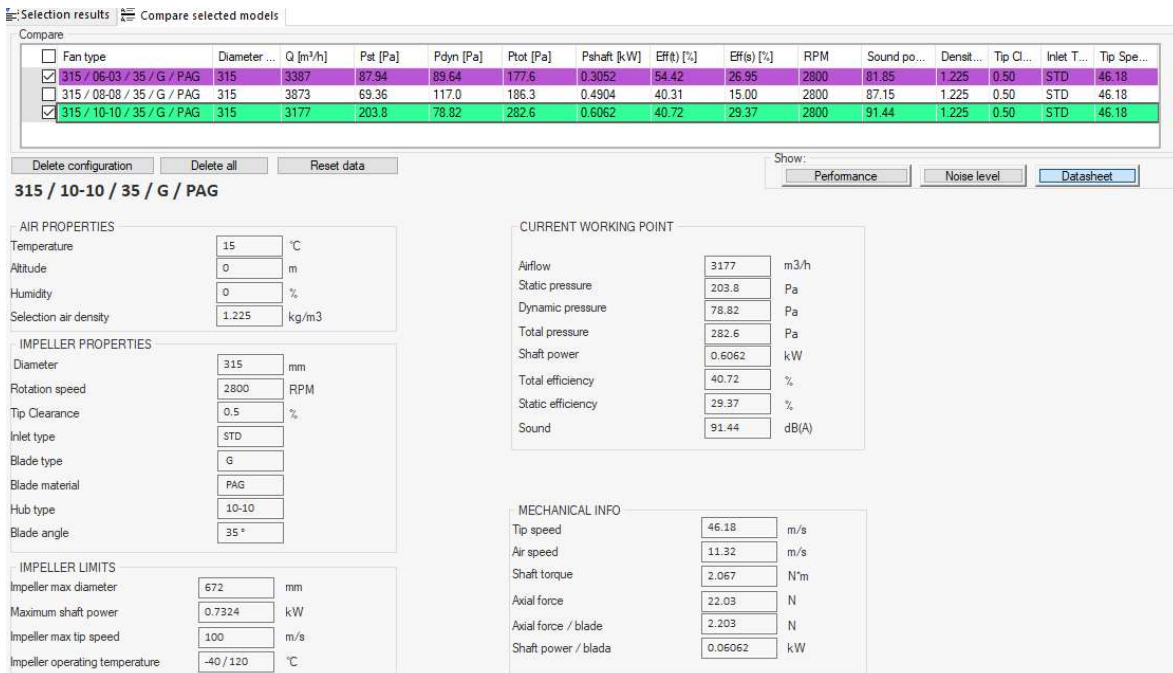


Figure 19 Example of compare selected models – Datasheet screen

The Datasheet button is only functional if an actual working point is activated on the selected configuration. Once the user has selected the impeller configuration by clicking on the list and has pressed the button, all the characteristics data of the selected impeller will be reported on the screen.

5.4 Other tools



Figure 20 Main screen – other tools

5.4.1 New project button

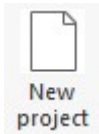


Figure 21 New project button

Clicking on the "New Project" button will open a new blank project.

5.4.2 Shared offer button



Figure 22 Shared offer button

Clicking on the "Shared Offer" button will display a list of all projects saved on the cloud. Users can open a project by double-clicking on a row in the list.

5.4.3 Save and Save as buttons



Figure 23 Save and Save as buttons

Clicking on the "Save" or "Save As" button allows the user to save a project on the cloud. For new projects, a unique project number will be automatically assigned.

When saving a project, only the compare selected model section and all parameters entered in the last selection on the dashboard are saved.

5.4.4 Print preview and print buttons

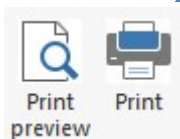


Figure 24 Print preview and print buttons

These buttons are activated when one or more impeller configurations are checked on the compare selected models section. Once the user has chosen desired configurations to print by checking them and pressing “print preview” or “print” button, the following screen will pop-up:

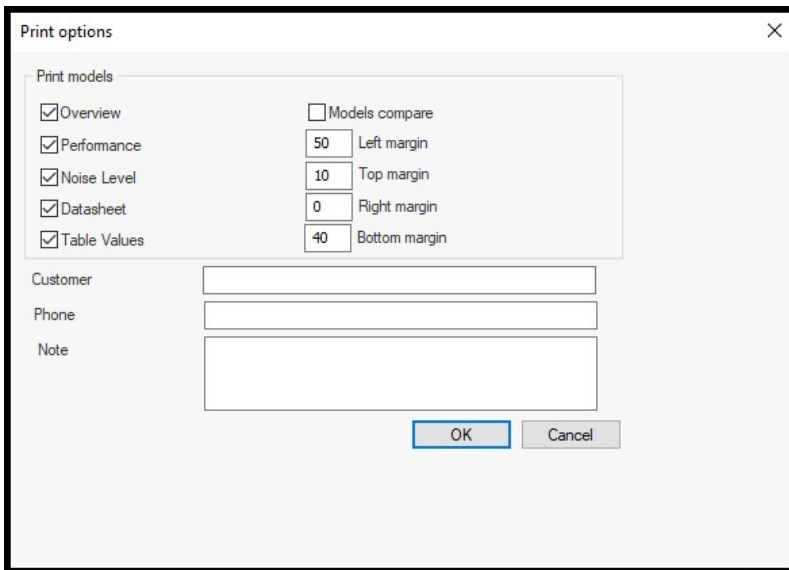


Figure 25 Print options pop-up screen

The user must decide which page models wants to print, by checking one or more checkboxes on screen:

- Overview
- Performance
- Noise level
- Datasheet
- Table values
- Models compare

To adapt page models on printed pages, margin values of the printed page can be changed. The user can also enter some information as costumer, phone number and/or notes which will be printed on the page models.

5.4.5 Options... button

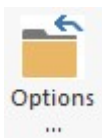


Figure 26 “Options...” button

Clicking the "Options" button allows the user to change software settings.

- Users can select the unit of measurements for parameters that cannot be changed on the fan selection dashboard, such as:
 - o Power
 - o Density
 - o Force
 - o Torque

- Velocity
- Distance
- Users can choose which type of noise curve to plot between sound power and sound pressure. Additionally, users can select the noise scale to use between decibels (dB) and decibels with A-weighted noise level [dB(A)]

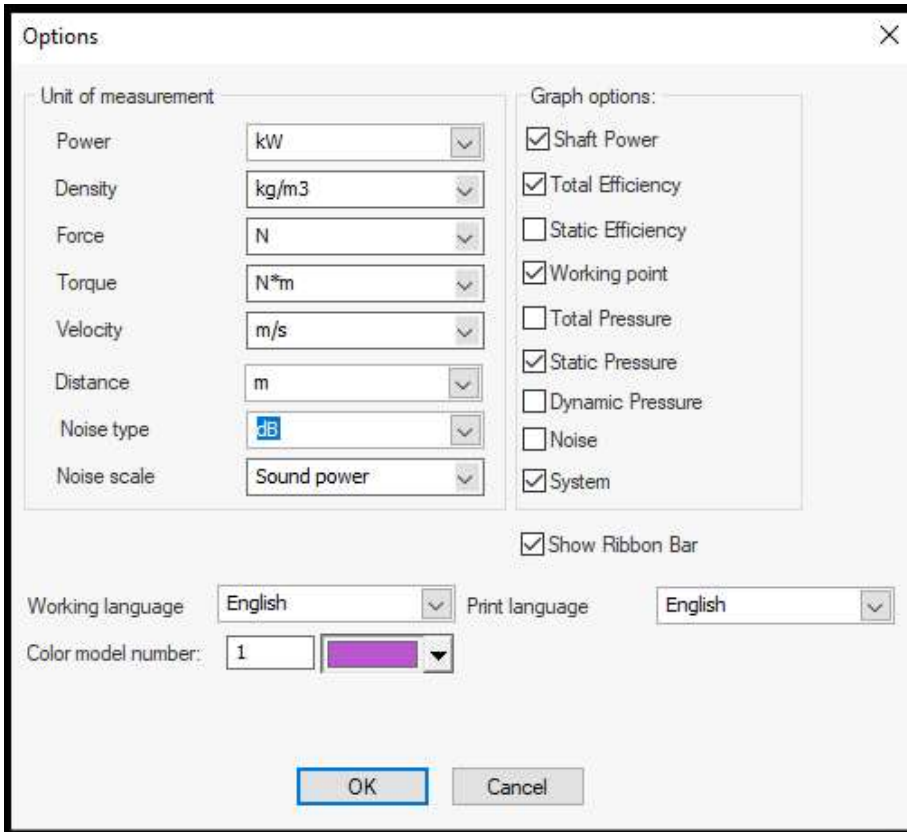


Figure 27 Software setting options pop-up screen

- By checking the check box on the right side of the screen, the user can decide which performance curve to display or to hide.
- Users can choose the language to use by selecting the desired one. After pressing the OK button, users must restart the program to apply the language change.
- Colors that highlight checked configurations on the compare list can be modified by entering the model number and selecting desired color.

5.4.6 Export kuly button

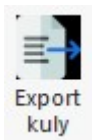


Figure 28 Export kuly button

This tool allows users to save performance data and make it available for KULY software. The button is functional only in the "Compare Selected Models" section and for one configuration at a time. Users can activate it by clicking on a row of the compare list.

5.4.7 Erp ready button



Figure 29 Erp ready button

This tool allows users to verify whether the application is compliant with the requirements of ErP Directive 2015. The button is functional only in the "Compare Selected Models" section and for one impeller configuration at a time. Users can activate it by clicking on a row of the compare list.

By clicking on the "ERP Ready" button, a screen like the following will pop up:

A screenshot of a software window titled 'ERP - Directive 2009/125/EU - Second phase from 1 January 2015 - 315 / 06-03 / 35 / G / PAG'. The window is divided into several sections. At the top, there is a dropdown menu for 'Application' set to 'Other'. Below this, the 'Motor data' section includes a dropdown for 'Motor Efficiency' (set to 'Manual') and a text input for 'Motor Efficiency [%]' (set to '0'). The 'Speed drive and assembly' section has dropdowns for 'Motor with speed drive' (set to 'No'), 'Assembly (matching)' (set to 'Partial'), and 'Drive' (set to 'Direct'). A blue 'Calculate' button is positioned below these sections. At the bottom left, there are text inputs for 'Year of manufacture' (set to '2024'), 'Manufacturer's name or trade mark', and 'Product's model number'. On the right side, a 'Results' section lists various parameters with corresponding input fields: 'Air performance maximum efficiency [%]', 'Cm Matching coefficient', 'Motor efficiency [%]', 'Transmission efficiency [%]', 'Overall efficiency [%]', 'Measurement Category', 'Efficiency Category', 'Efficiency grade at optimum energy efficiency point (N)', 'Flow rate at optimum energy efficiency point [m³/s]', 'Static Pressure at optimum energy efficiency point [Pa]', 'Rated motor power input at optimum energy efficiency point [kW]', and 'Rotation speed at optimum energy efficiency point [RPM]'. At the bottom of the window, there are 'Print' and 'Close' buttons.

Figure 30 Erp pop-up screen

At first the user must choose an application on the menu on top of the screen, then all parameters on the left side must be entered according to specification data of the application.

By clicking the "calculate" button, the program returns on right side of the screen all the results value of calculation process and below the button itself will be displayed if the application is or is not compliant with the requirements of ErP Directive 2015.

To save the verification result, the user must press the "print" button on screen and print the page (on paper, as a pdf, ...).