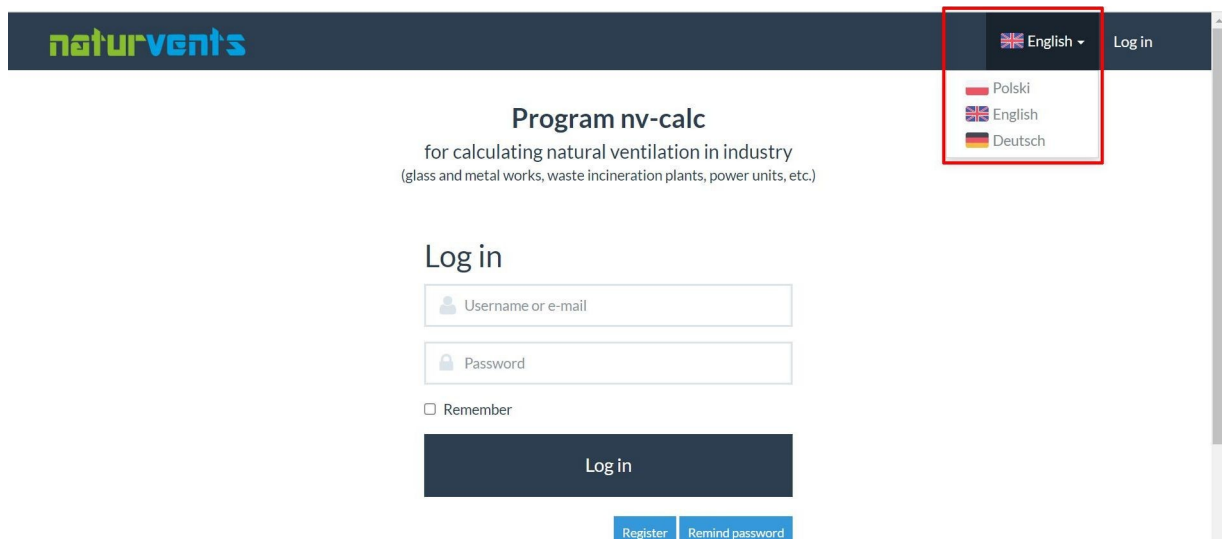


## Instructions for use naturvents-calc nv-calc

**nv-calc** is a program intended for designers to calculate natural ventilation in industrial facilities - power blocks, waste incineration plants, glass and metal works and similar hall-type facilities with high heat gains released to the volume. The thermal draught generated in the hall by the heat source is then a sufficient "engine" for ventilation, which is not significantly disturbed by gusts of wind.

### Language

The program is available in 3 languages (Polish, German and English). Changing the language is done using the button in the upper right corner of the window. The language can be changed at any stage of using the program, especially for printing the calculation report.



### Registration

When registering, you need to complete all the required fields. Then the User's account is activated by the administrator. Only after the account is activated, the User can log in with his/her data.

## Register


Username

E-mail

Password

Confirm password

Captcha

☐ I'm not a robot
 

First Name

Last Name

Company

Phone

☐ I declare that I have read and agree to the terms of the [license](#).
   
☐ I hereby give consent for my personal data to be processed in the collection of personal data "VENTOS". [Look at the Personal Data Policy](#)

Sign up

Log In


Remind password

## Log in and Remind password

When logging in, the User enters the login or e-mail and the password given during registration. If the User forgets the password, there is an option to change it. After selecting the "Password Reminder" option and entering the e-mail from the registration process, a confirmation code and a link allowing to change the password will be sent to the mailbox.

## Calculations


After logging in, the user is on the main page of the program, where the program's license is displayed. In order to proceed to the calculations from the top menu, select the Projects tab.




Projects

Help

License to:  
 2024-03-14  
 (left 49 days)

 Renew your account

 English

Hello Karol!

### Licence agreement

1. This licence agreement applies only to the SOFTWARE of the **nv-calc** (naturvents-calc) program.
2. The firm VENTOSYSTEM Bohdan Kontrymowicz (VentosystemBK) is the Owner of the program and the Company maintains the legal copyright to this program.
3. This program is dedicated to designers for calculation natural ventilation of workshops, specially industrial buildings with high thermal load. Any final reports produced with the assistance of this software may be included into the User's projects, but in its original form only. No changes, especially those that do not credit the origin of the software's ownership are allowed.
4. This licence empower the User for legal use of the program after registration and activate account by the Owner.
5. The login data to **nv-calc** (naturvents-calc) program in professional version can not be available to the third party (no registered) without Owners knowledge and agreement.
6. Legal liability restrictions apply. The contents of these restrictions are displayed on program's homepage and also on the report of the calculation printout.
7. VentosystemBK reserves the right to contact the User of the program in order to offer any additional or new information and obtain information on the use of the **nv-calc** program.

Formulas in this program are created to determine equilibrium between all thermal gains produced by industrial processes within a building as well as air flow exhausted by the ventilation system. Based on this principle, the program is not intended to calculate air exhaust used to prevent thermodynamic disasters such as fires or an explosion blast in the case of accidental discharge of flammable gases. This program requires the user to possess and apply engineering knowledge and to understand physical phenomena occurring in the natural ventilation of buildings. The results of the program's calculations will always correspond to the adopted criteria and the input data which have been entered, for which only

## Add project [1]

As a first step before starting calculations, add a new project by entering data such as:

- Object (e. g. power plant)
- Client (e.g. Investor, General Contractor, etc.)
- Project Number

1. Project Create or select from the list [1] + 2. Venting zone Create or select from the list [2] + 3. File name Select from the list, add or import the calculations + Options Calculations compare

Report Nr Date Remarks

Profile No profile

Before filling the Input Data, please fill the fields: 1. Project, 2. Venting Zone, 3. File name

4. Input data Results Calculate Report 5. Openings of natural ventilation - intakes and outlets

Name	Designation	Value	Unit
Room length	a		[m]

## Add venting zone [2]

Next, add a venting zone for which calculation will be done. Each project can have multiple venting zones added. Adding the area entering data such as:

- Venting zone (e. g. boiler-house, machine-room)
- Calculations author

User always can edit entered information about project and venting zone.

## New calculation

To perform a new calculations, select from the list, or push the green button “+” add or import the data from your disc. Remember to save your data using the "Options" button as pressing the "+" will clear all data thats been filled:

- 4. Input data
- 5. Openings of natural ventilation – intakes and outlets
- 6. Devices of mechanical and hybrid ventilation.

For each venting zone User can add many calculations entering information such as:

Report Number, Date, Remarks

## Data entry

The next step is to enter the object's input data, information about natural ventilation openings and mechanical or hybrid ventilation devices. Adding more openings is done using the plus symbol "+". There are balloons with prompts next to the data to be entered.

The names of devices recommended by VentosystemBK are available from the drop-down list. However, the program user can perform calculations for other devices outside this list by specifying the aerodynamic flow coefficient  $Cv0$  characteristic of the device in addition to the inlet opening dimensions.

It is required to introduce at least two devices at two different heights.

## Help

In the Help section, you will find the User's Manual and information about the equipment recommended by VentosystemBK. In addition, special calculation cases for selected types of objects are explained here.

The screenshot shows the 'naturvents' software interface. At the top, there is a navigation bar with 'Projects' and 'Help' (highlighted with a red box). The 'Help' dropdown menu is open, showing 'Instructions for use', 'Special cases', and 'Devices dimensions'. Below the navigation bar, there are input fields for '1. Project', '2. Venting zone', and '3. File name'. A warning message box is displayed in the center: 'Before filling the Input Data, please fill the fields: 1. Project, 2. Venting Zone, 3. File name'. Below the warning, there are tabs for 'Results', 'Calculate', and 'Report'. The 'Input data' section shows a table with columns 'Name', 'Designation', 'Value', and 'Unit'. The 'Room length' row is visible. To the right, there is a section for '5. Openings of natural ventilation - intakes and outlets'.

## Results

To get the calculation results, click the "Calculate" button, and then the "Results" tab will be displayed.

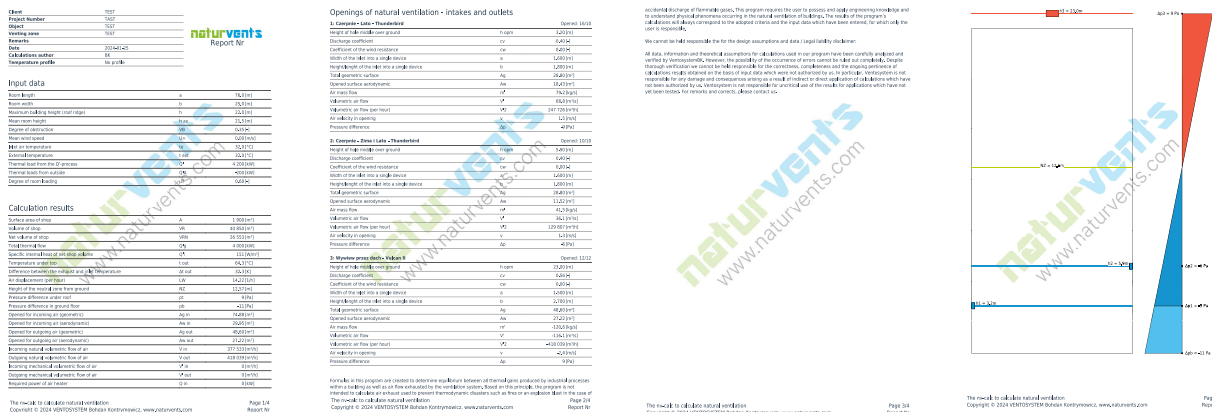
The screenshot shows the 'naturvents' software interface after the calculation. The 'Calculate' button (highlighted with a red box) has been clicked, and the 'Results' tab is active. The 'Calculation results' table is displayed, showing various parameters and their values. The table has columns 'Name', 'Designation', 'Value', and 'Unit'. The results are as follows:

Name	Designation	Value	Unit
Surface area of shop	A	1 900	[m <sup>2</sup> ]
Volume of shop	VR	40 850	[m <sup>3</sup> ]
Net volume of shop	VRN	26 553	[m <sup>3</sup> ]
Total thermal flow	Q <sub>g</sub>	4 000	[kW]
Specific internal heat of net shop volume	Q <sub>i</sub>	151	[W/m <sup>3</sup> ]
Temperature under top	t <sub>out</sub>	64.3	[°C]
Difference between the exhaust and inlet temperature	Δt <sub>out</sub>	32.3	[K]
Air displacement (per hour)	LW	14.22	[1/h]
Height of the neutral zone from ground	NZ	12.57	[m]
Pressure difference under roof	pt	9	[Pa]

Below the table, there is a section for '5. Openings of natural ventilation - intakes and outlets' and '6. Devices of mechanical and hybrid ventilation'.

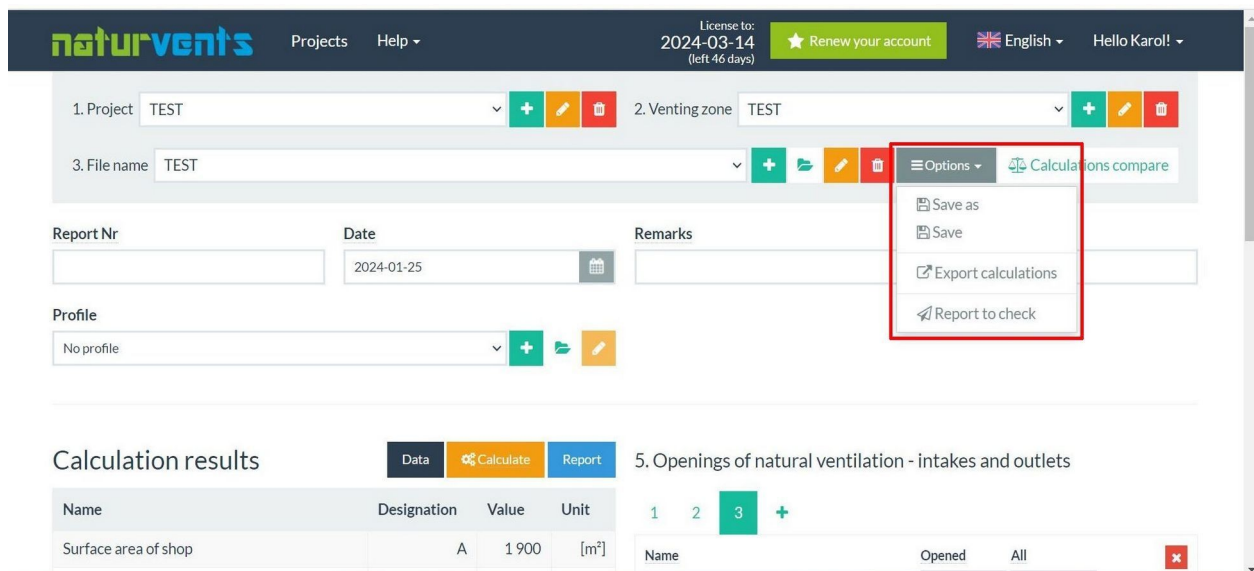
## Report

The end result of the calculation is a report containing all input data and results. It gives the results for each hole and device. At the end of the report is a schematic drawing of the building, along with an illustrative diagram of the pressure difference. The report can be displayed in Polish, English or German regardless of the language in which you work in the program. It is possible to download the report in pdf format.



## Save and Save as

Each new calculation can be saved using the "Save" or "Save As" option. The "Save As" function creates new calculations. While "Save" overwrites the current calculation. Pressing the "Calculate" button also overwrites the last calculation.



## Delete calculations

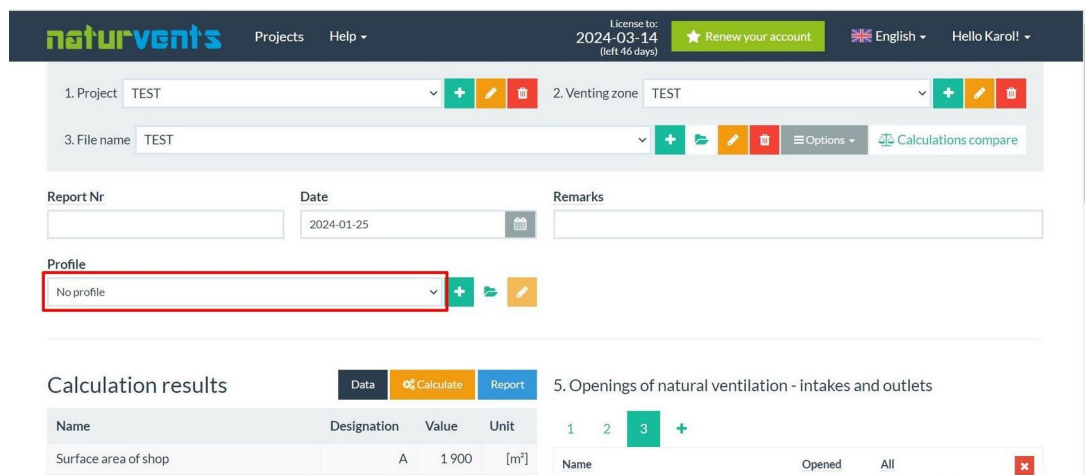
Calculations that are no longer needed can be deleted using the "Delete calculation" button.



## Temperature profile

For calculations, you can use the available temperature profiles. Currently, profiles are available for the boiler plant of a power block and a glass factory.

NOTES: These are temperature profiles measured at specific facilities. The object for which you are doing your calculations is probably different. That's why we suggest not using any profile at the beginning of your calculations.

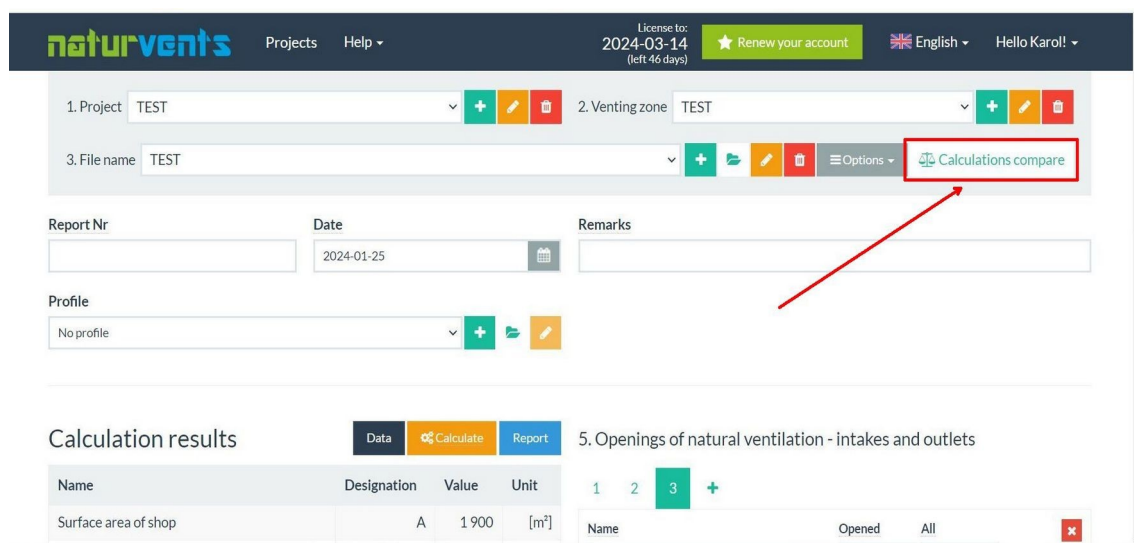


The screenshot shows the naturvents software interface. At the top, there's a header with the logo, navigation links, a license status (2024-03-14, left 46 days), a 'Renew your account' button, language settings (English), and a user greeting (Hello Karol!). Below the header, there are input fields for '1. Project' (TEST), '2. Venting zone' (TEST), and '3. File name' (TEST). A 'Calculations compare' button is visible next to the file name field. Further down, there are fields for 'Report Nr', 'Date' (2024-01-25), and 'Remarks'. A 'Profile' dropdown menu is highlighted with a red box, showing 'No profile' as the selected option. Below this, there's a 'Calculation results' section with tabs for 'Data', 'Calculate', and 'Report'. A table shows the 'Surface area of shop' with a value of 1 900 [m²]. To the right, there's a section for '5. Openings of natural ventilation - intakes and outlets' with a table for 'Name', 'Opened', and 'All'.

It is, of course, possible to use any of the ready-made profiles or to create a profile yourself, especially if there is an object available that is identical or similar in its shape and distribution of heat sources to the designed object. In such a situation, we recommend consulting with the owner of the **nv-calc** program

## Calculations compare

For convenient and easy comparisons between different calculations in the same venting zones, click the "Calculations compare" button. This function allows you easily compare 6 calculations. To compare you can also add openings of natural ventilation or devices of mechanical and hybrid ventilation.



This screenshot is similar to the previous one, showing the naturvents software interface. The 'Calculations compare' button is highlighted with a red box, and a red arrow points to it from the right. The rest of the interface, including the header, input fields, and calculation results table, is identical to the previous screenshot.

## Import calculations and Export calculations [3]

This function allows you to save a file of currently open calculations on the computer (export calculations) and to reload calculations from the computer (import calculations). Imported calculations are saved in the currently open ventilation area. It is possible to import calculations from the current and previous versions of the program. Exported files are compatible only with the current version of the program.

If your own profile was used for the calculation of the exported file (saved on your own computer), it is encoded in this file, but it will not load automatically. In this case, click on the "Load Profile" button and select the same saved calculation file.

It is good practice to export the finished final design results and archive them on your own computer, as they may be deleted from the system after a year (with prior email notice). In that case, the eventual need to return to that project years later will come down to loading all the data without having to re-enter it into the system.

The screenshot shows the naturvents software interface. At the top, there's a header with the logo, navigation links, a license status (2024-03-14, left 46 days), a 'Renew your account' button, language settings (English), and a user greeting (Hello Karol!). Below the header, there are input fields for '1. Project' (TEST), '2. Venting zone' (TEST), and '3. File name' (TEST). A 'Calculations compare' button is also visible. In the center, there are fields for 'Report Nr', 'Date' (2024-01-25), and 'Remarks'. Below these is a 'Profile' dropdown set to 'No profile'. A red box labeled [3] points to the 'Options' menu, which is open and shows 'Save as', 'Save', 'Export calculations', and 'Report to check'. A red box labeled [4] highlights the 'Export calculations' button. At the bottom, there's a 'Calculation results' section with tabs for 'Data', 'Calculate', and 'Report'. The 'Calculate' tab is active, showing a table with columns 'Name', 'Designation', 'Value', and 'Unit'. The table has one row: 'Surface area of shop' with Designation 'A' and Value '1 900' [m²]. To the right of the table, there's a section titled '5. Openings of natural ventilation - intakes and outlets' with a tab labeled '3' and a '+'. Below this, there's a table with columns 'Name', 'Opened', and 'All'.

## Submit for verification [4].

Using this function automatically sends the current calculations to the administrator. The correctness of the calculation will be checked by the administrator and he will contact the User submitting the calculation.