Rittal – The System.

Faster – better – everywhere.

Rittal Therm User Manual Version 6.7

Contents

Program description

The basic purpose of the software Rittal Therm is to calculate the effective surface area and the heat dissipation via this surface for a selected housing specification. The external and internal temperatures, and the voltage and frequency of the available power system are required as input parameters. On this basis, the program determines appropriate selections of climate control solutions from the following categories: Fans, air/air heat exchangers, cooling units, air/water heat exchangers, heaters and climate control doors.
The program also takes into account the geometry of the available climate control units and specifies only those units which are suitable for the selected housings. An economic water cooling can be configured via the Chiller configurator.

The free-of-charge download for Therm is available at: www.rittal.com/therm

An online version and an offline version for permanent installation on your PC are available.

When Therm is started, a software package integrating the Windows operating system, an Apache-compatible server, a MySQL database and a PHP interpreter is installed on your computer. Such a package type is abbreviated to WAMP. The installation is performed with the Microweb tool from IndigoStar in the version 3.00 dated January 6, 2009. The browser then opens automatically and the Therm start page is displayed.

Therm uses HTML, JavaScript, PHP version 5.2.8, MySQL version 5.1.30 and ionCube PHP Encoder 6.5.13.

PHP is a server-side programming language which can be incorporated into the HTML pages of Web applications. When a page is called, the PHP code contained on that page (together with any files required by this code) is read, parsed and executed; the finished page is then output to the browser.

MySQL is an SQL relational database with data stored as tables. Since May 2003, MySQL handles the database activities of SAP. The SAP DB database system has been renamed MaxDB and is now based on the MySQL core.
ionCube PHP Encoder is a PHP accelerator and encoder solution. It accelerates PHP scripts by saving them in their compiled state, eliminating the need for compilation at runtime. A number of other optimised features also serve to speed up script execution.

Note:
If you have any questions concerning Therm, please contact therm@rittal.com.

Therm 6.7 Online version

Use without cost at www.rittal.com/therm

System requirements

- A UTF8-conform browser; the following have been tested
  - Microsoft Internet Explorer 11.0
  - Mozilla Firefox 51.0

### Registration, login, reset password

Before starting Therm Online for the first time, you must register yourself with your e-mail address and specify a password of your choice. You then receive a confirmation e-mail that you must confirm within 24 hours.

After confirmation of your registration, you can login with your e-mail address and your password.

Your registration and login are required so you can access your saved projects at any time.

If you want to change your password or you have forgotten it, you can reset it. You receive an e-mail at the registered address that you must confirm within 24 hours. You can then specify a new password.

For security, you must always specify a Captcha shown as graphic.
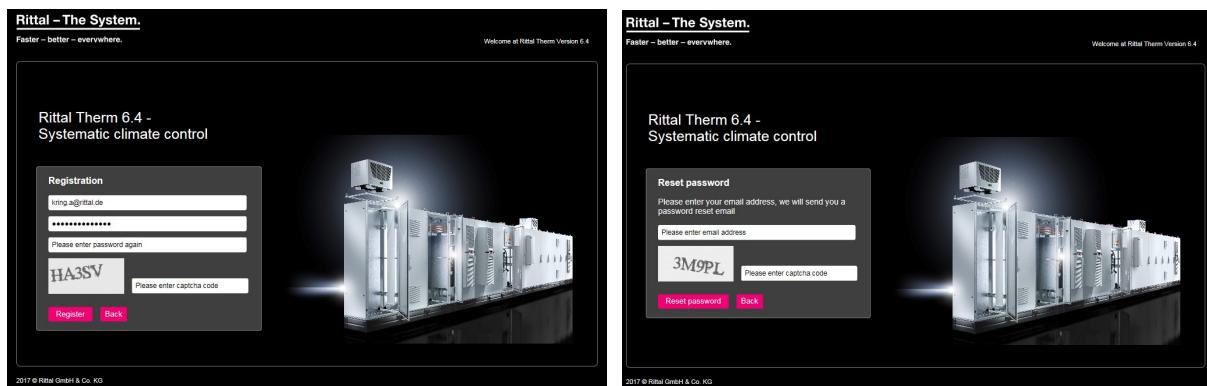
Note:
For the Therm Online version, you cannot import any projects from a local directory or export there. The other functions are the same as for the offline version.

Therm 6.7 Offline version

Download without cost at www.rittal.com/therm

System requirements

Smooth working requires at least:

- 500 MB free hard disk capacity
- A UTF8-conform browser; the following have been tested
  - Microsoft Internet Explorer 11.0
  - Mozilla Firefox 51.0
- CPU with 2.0 GHz clock frequency
- Windows 7 or 10
  - Dual-core or equivalent processor
  - 1 or 2 GB RAM main memory

Setup

The program is started by double-clicking the "microweb.exe" file. The data is stored in a MySQL database. To allow writing to the database, the data is copied to the Windows installation temporary directory when Therm is started for the first time. To locate this directory on your local PC, you can open the MS DOS command prompt and enter "echo %TEMP%" there.

The Setup provides entries in the Start menu and on the desktop as well as the deinstallation information. To start the Setup, double-click the setup.exe file in the root directory. Follow the instructions given by the Setup. The computer does not need to be restarted.

The installer/deinstaller program is multilingual and starts in the language of your installed Windows.

The user requires write rights to the temporary directory because the databases, projects, import/export files, etc. are located in these directories. It must be possible to edit these files while the application is running.

The installer installs the program in the program directory specified by the user. The default directory is "C:\Programs\Rittal\ApplicationName", but it can be changed to any other directory by the user. If the chosen directory does not yet exist, it will be created.

ENCLOSURES   POWER DISTRIBUTION   CLIMATE CONTROL   IT INFRASTRUCTURE   SOFTWARE & SERVICES

Within the chosen installation directory, further subdirectories will also be created:

...\ApplicationName\firefox

...\ ApplicationName\htdocs

...\ ApplicationName\mysql

...\ ApplicationName\php

Modifiable files are managed in the temporary path, where the following folders are installed

...\microweb\localhost\mysql\data00xx

...\ ApplicationName\projekte   (projects)

...\ ApplicationName\sicherung   (backups)

...\ ApplicationName\verlustdaten   (heat loss data)

All files are installed locally.

Network-compatibility

Each Therm user installs Therm locally on their PC.

In the next step, the **content** of the folder "mysql-5.1.30\data" must be copied centrally to a server (for example to H:\data0049).

Each user then specifies the path to this server in their local installed version of Therm in the "microweb.ini" file:

[…]

; MySql start command

OnStart="%B%\bin\mysqld.exe" --defaults-file="%B%/my.ini" --basedir="%B%" --datadir="**H:\data0049**" --log-error="%C%/mysqllog.txt" --pid-file="%C%/mysql.pid" --bind-address=127.0.0.1 --innodb_log_group_home_dir="%C%" --skip-innodb --external-locking

Also the following line in the microweb.ini file must be changed:

;CopyMysqlFile=1

Please remove the semicolon and change the 1 to 0

CopyMysqlFile=0

You receive an appropriate notification when a project is being processed by another user.

Deinstallation

Deinstallation removes the installed files, directories and Windows registry entries, with the exception of the data in the temporary directory.

Note:
If files or directories that were not installed or generated by the application exist in an installed folder, they will not be deleted.

User interface

The user interface is based on the Microsoft Windows Standard, i.e. it provides
- a menu bar in text form
- a working area

Note:
The main menu is always displayed while the program is running.

Start screen

The desired language can be set by clicking the "Please choose your language" button shown on the screen below or changed at any time during program execution. The language selection will influence not only the user interface texts, but also the displayed addresses and the date format.

The start screen will be skipped when Therm is called the next time. If required, this setting can be changed later via the "Options" – "Settings" menu item at "Welcome".

Clicking "Start program" opens the "Quick start" page.
This page contains the options:
- Calculate enclosure climate control
- Chiller configurator
- IT Cooling Calculator
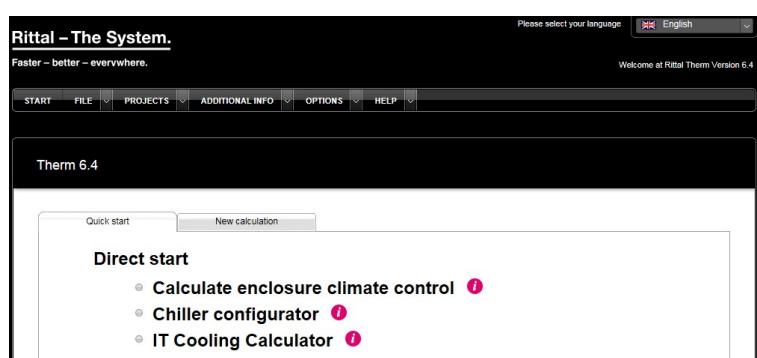
The "Calculate enclosure climate control" function opens a new project.
Clicking "Chiller configurator" opens the online designer for an economical configuration of your required machine and process cooling.
The "IT Cooling Calculator" allows the simple selection of Liquid Cooling Packages (LCP) for the rack and row cooling of your IT infrastructure.

ENCLOSURES   POWER DISTRIBUTION   CLIMATE CONTROL   IT INFRASTRUCTURE   SOFTWARE & SERVICES
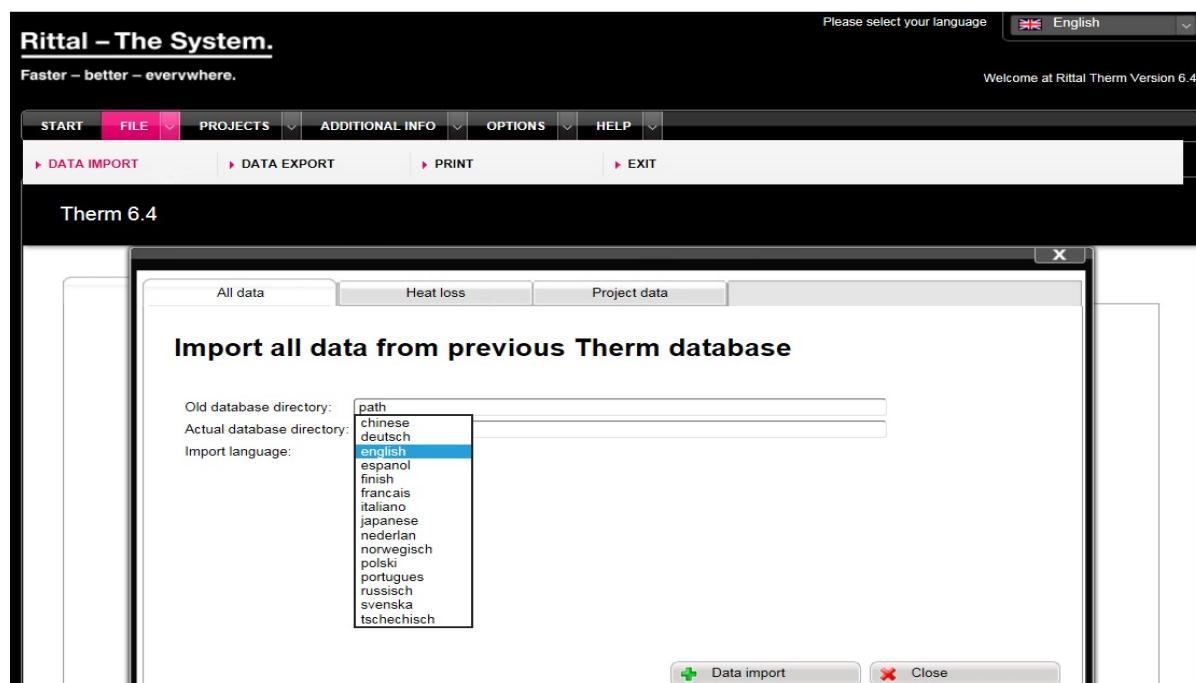
"File" main menu

"Data import" menu item

The "Data import" selection is provided at the "File" menu item in the main menu. This function allows you to transfer all files from a previous version or to import specific heat loss or projects from previously stored files into Therm. You should have exported the data beforehand. "Data import" opens a window with the tabs: "All data", "Heat loss" and "Project data".

When all data is transferred, the project import language must be specified because the names of the loss devices must be transferred to the project data in accordance with this language. The import path can be changed at "Save file as" in the "Options" – "Settings" menu item.

When Therm is started for the first time, the program searches for a previous version of Therm and activates the "All data" tab automatically.

The import of the heat loss and project data is possible only for data that has already been exported.

"Data export" menu item

"File" in the main menu also contains the "Data export" menu item. This menu item opens a window with the tabs: "Heat loss" and "Project data". This permits you to export specific heat loss or project data from the existing Therm database. The export path can be changed at "Save file as" in the "Options" – "Settings" menu item.
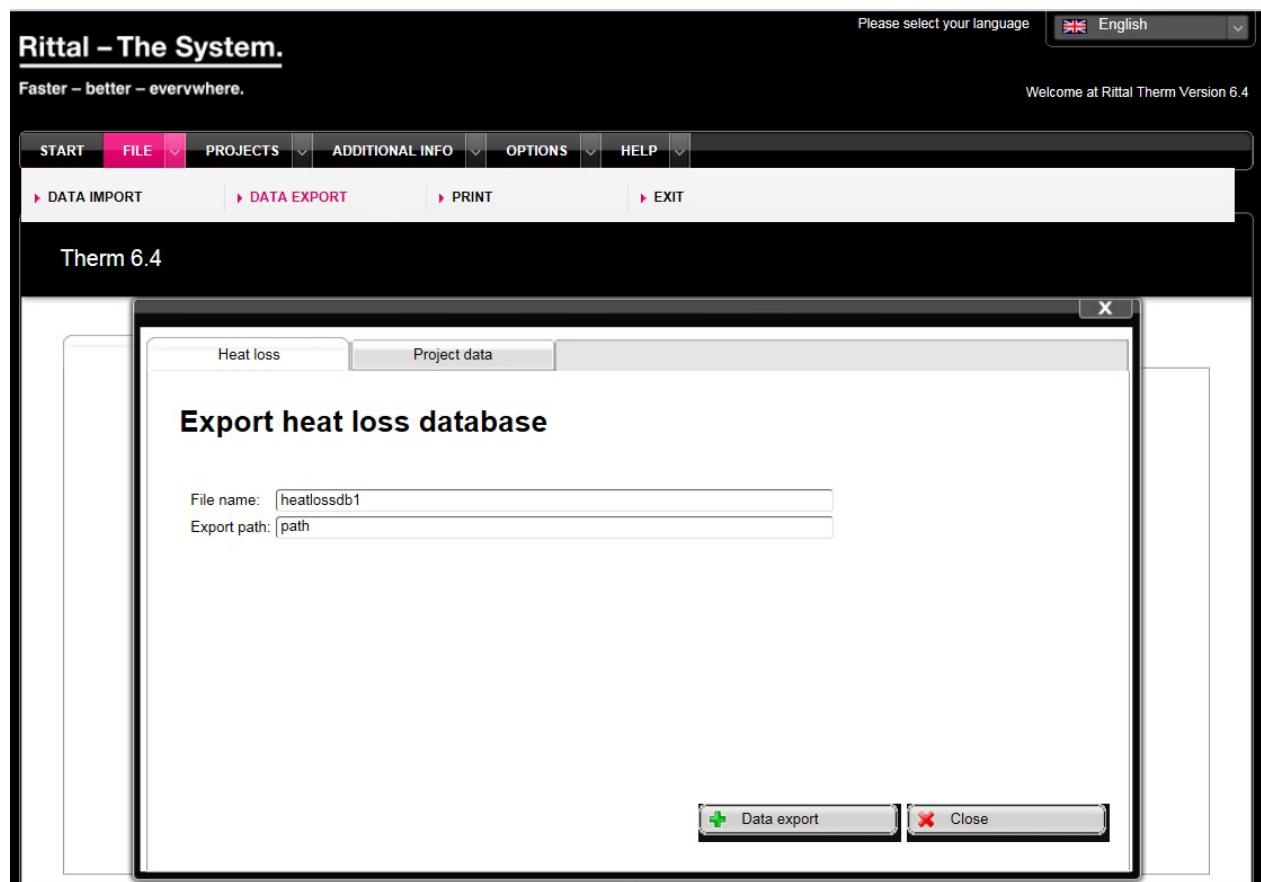
"Print" menu item

Prints the current screen contents.

"Exit" menu item

Closes the program. In Firefox, it is not permissible to close the program using this command; instead, a note is displayed explaining how the program can be closed in another way.

"Projects" main menu

"New" menu item

This menu item opens the "New calculation" tab where it is possible to initiate a new climate control calculation. This page contains the options
- Create new project
  - Specify minimum temperature for heating
  - *(Create a new project via EPLAN ProPanel Professional → visible only when you open Therm via the interface from EPLAN ProPanel Professional)*
- Edit an existing project
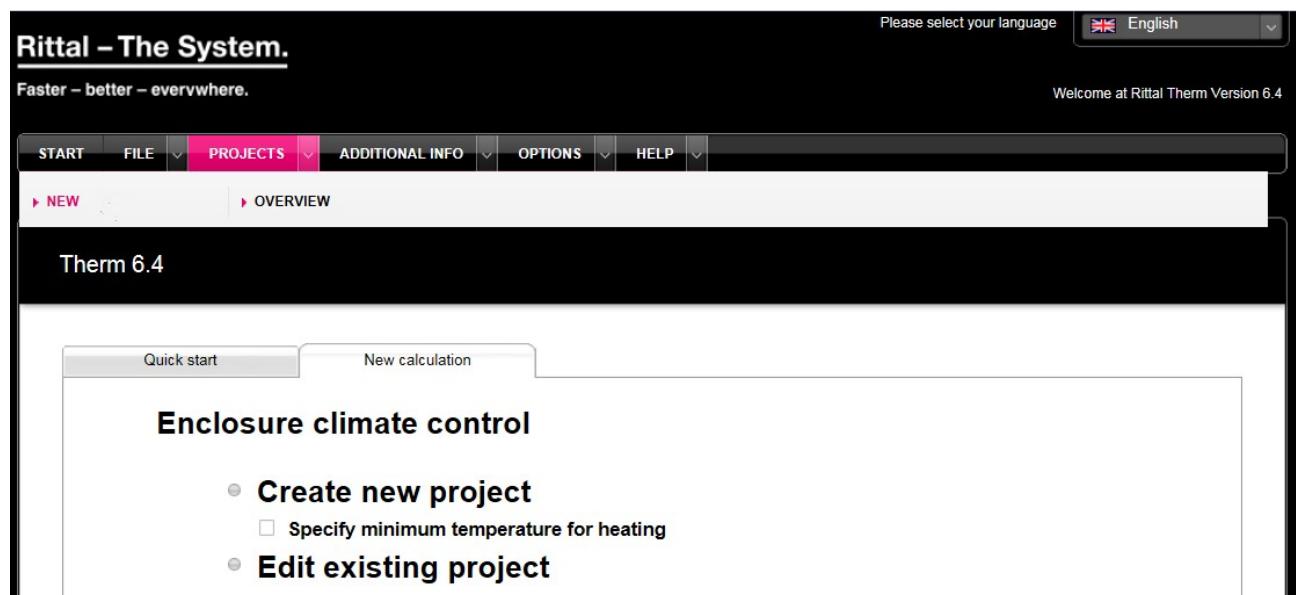
You can configure an enclosure heating in the "Specify minimum temperature for heating" menu item.

Select first an enclosure, select a heating, and only then specify the minimum external and internal temperatures.
Confirming the temperatures changes the selection list of the heaters.

"Creating a new project via EPLAN ProPanel Professional" supplementary information

Requirements
To perform a climate calculation in EPLAN ProPanel, access to the EPLAN Data Portal must exist.

Settings in the ProPanel project properties
The correct calculation of the total heat loss requires that the involved components are prepared by setting specific properties.

Details in the project properties
The voltage, frequency and concurrency factor of the climate control must be specified in the project properties.

Concurrency factor
The concurrency factor is an estimate that considers the fact that devices are never all switched on with maximum power concurrently in a system.
The concurrency factor can be set individually for each component or be set generally in the project properties. If a general concurrency factor is defined in the project properties, this property is preset for the devices themselves and can no longer be edited there.

Adding project properties
If the project properties are not listed, they can be added to the project properties with the New ⚹ button.
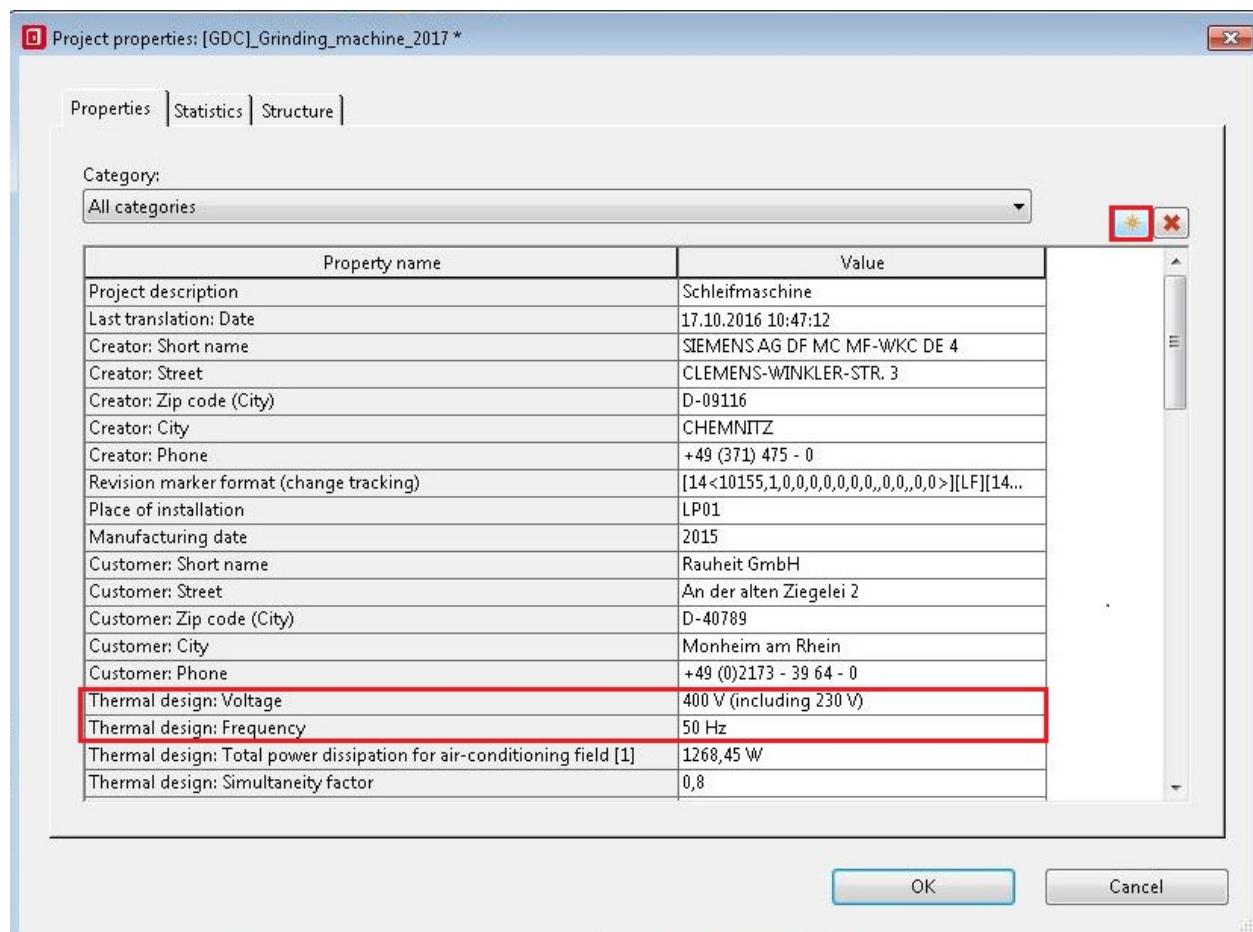
Settings of the housing or enclosure properties

Details required in the ProPanel installation space
After creating the circuit diagram, you can place the components in the installation space. Properties must be prepared for housings/enclosures located in the installation space. To allow a climate calculation to be performed, details must be made for the installation situation, climate area and temperatures. The temperature details must be specified with unit **°C**.
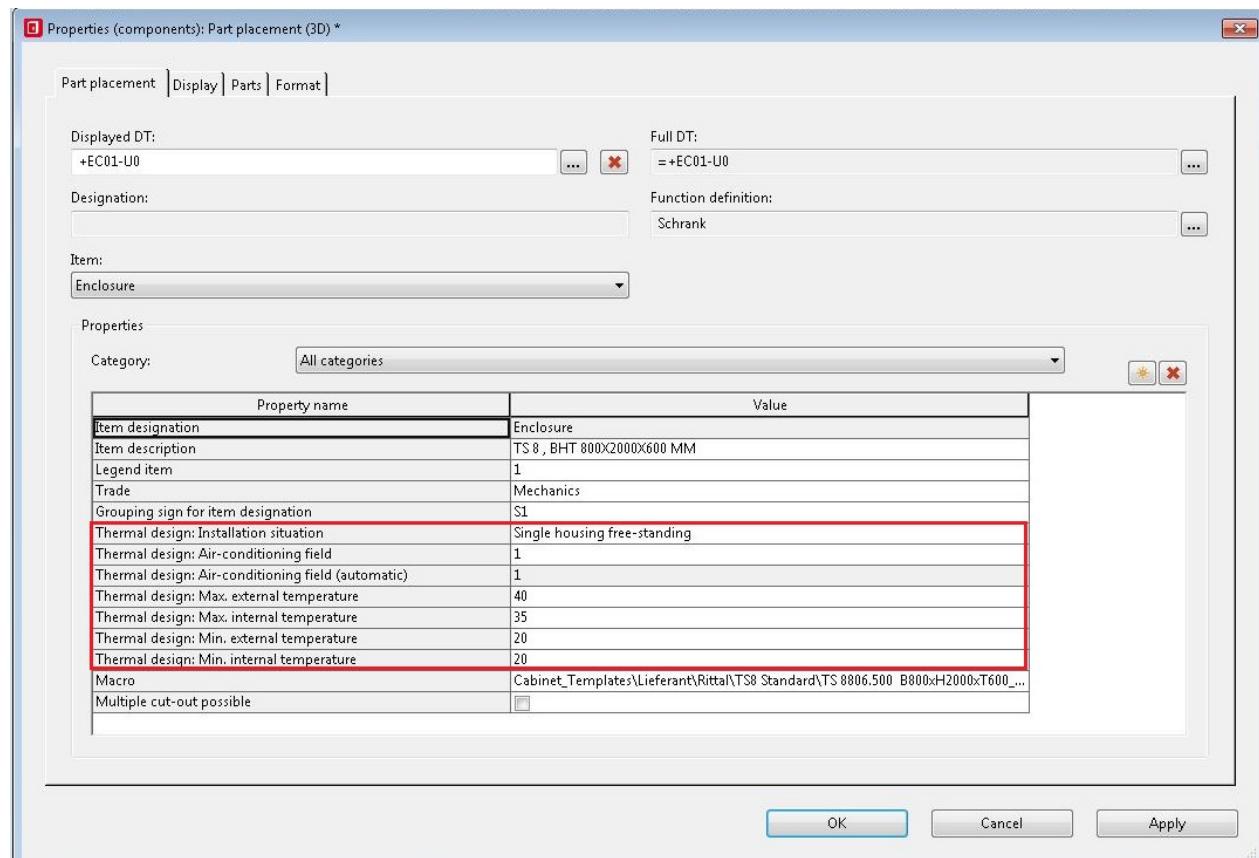
Setting the climate area
The climate area can be defined for each housing, e.g. for baying or multiple enclosures in the project. The climate area must be unique, otherwise it is not displayed in Therm. Each climate area can be evaluated individually in Therm.

Adding properties
If the properties
> Heat loss: Installation situation
> Heat loss: Climate area
> Heat loss: Max. external temperature:
> Heat loss: Max. internal temperature
> Heat loss: Min. external temperature
> Heat loss: Min. internal temperature

are not listed in the properties of the housing/enclosure, they can be added with the New button in the properties window.

Calculating the total heat loss in ProPanel

Calculation via utility programs
Once the circuit diagram has been created and the components placed in the installation
space in a climate area, select ➜*Calculate heat loss* via **Utility programs**. The installation
space must be active in order to start the calculation.
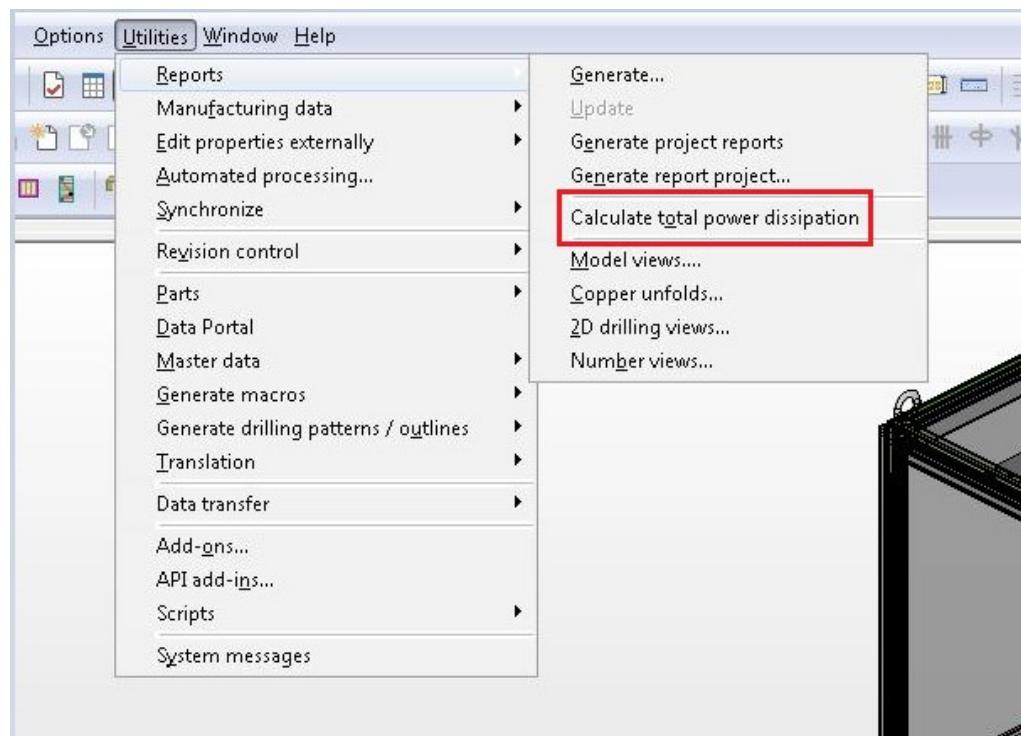
Basis for the calculation
The calculation is based on the heat loss and concurrency factor details of all components
installed in the installation space / climate area. The heat loss details are maintained in the
Single part data tab of the article management. Appropriate values can be obtained from
the data sheets provided by the manufacturer. EPLAN Software & Service and Rittal cannot
accept any responsibility for the correctness of these details.
The heat loss of a device is calculated using the formula:
actual heat loss of the device = heat loss x concurrency factor

Display of the total heat loss

After being calculated, the total heat loss can be shown in the project properties. Each climate area is listed individually.
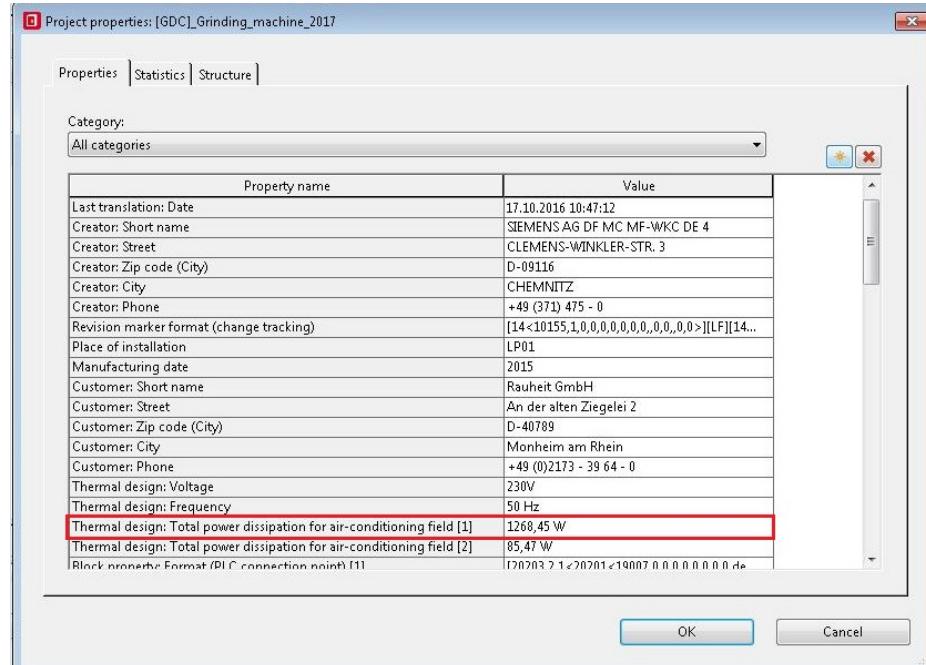
Rittal Therm in the EPLAN Data Portal

To select a suitable component for the climate control, the manufacturer **Rittal** must be selected in the EPLAN Data Portal. The Data Portal is located in the Utility Programs menu.

The icon for Therm is located in the upper right corner. Clicking this icon opens the Therm program in the Data Portal.
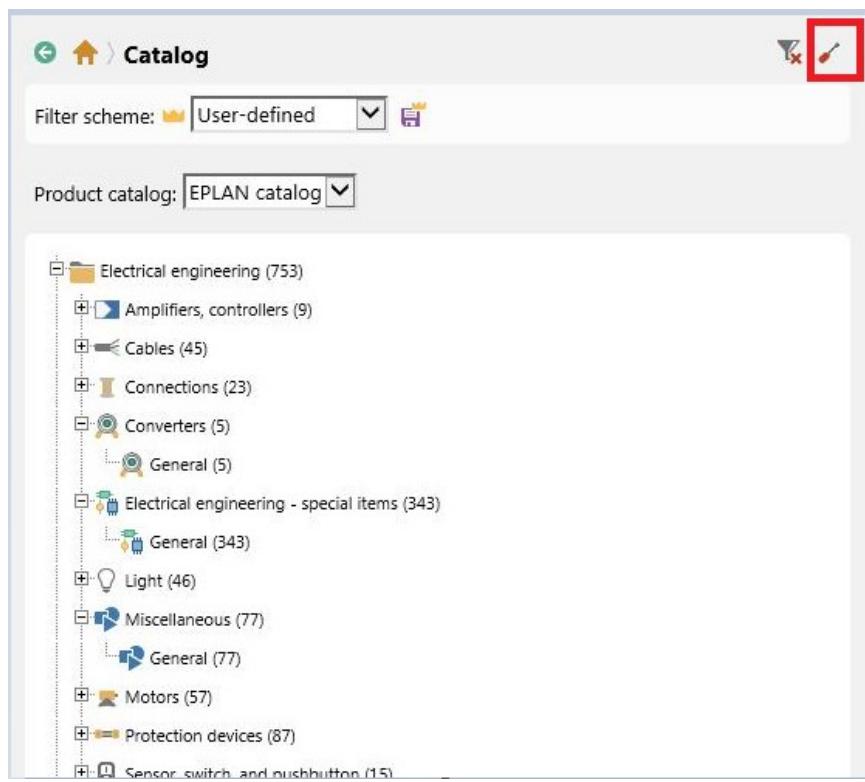
Importing EPLAN project data into Rittal Therm

Note:

EPLAN ProPanel Professional accesses Therm Online. The login is performed as described in the "Therm 6.7 Online version" item on page 4.

Calculating the enclosure climate control

After the selection, the Therm start screen opens. Select the *Calculate enclosure climate control* menu item.
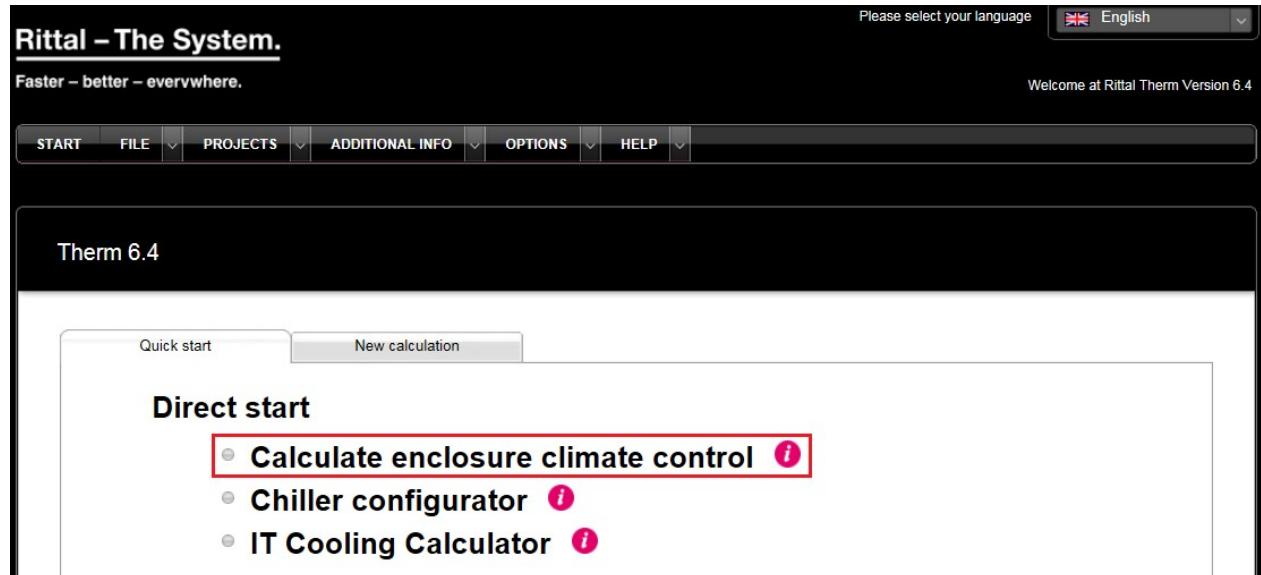
Import ProPanel project
To now import the settings made in ProPanel, select *Create new project via EPLAN ProPanel Professional* in the menu.
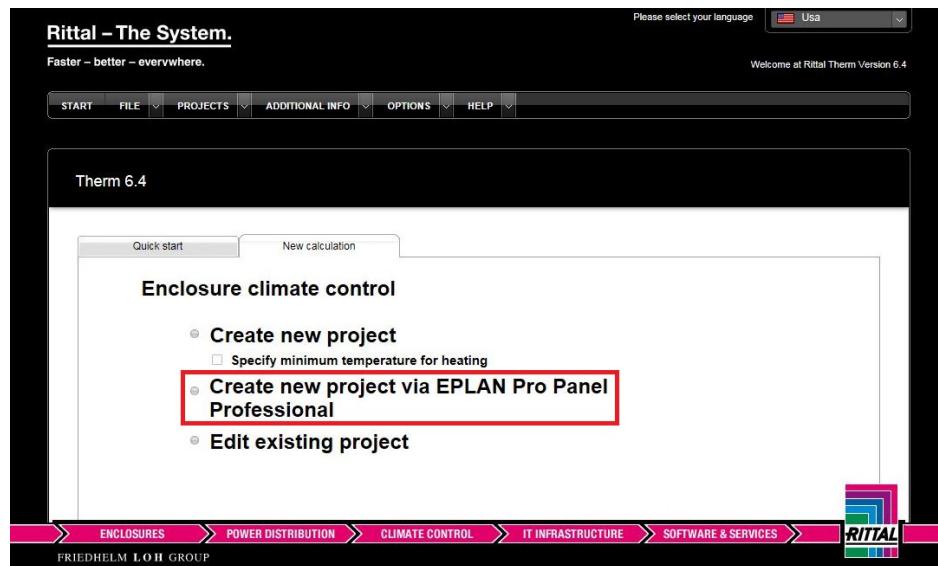
Climate area and project data in Rittal Therm

Select climate area in Therm
Select the desired climate area (Define climate area, see item 3.2). The selection appears automatically after selecting the **New project via EPLAN** menu item
Create ProPanel Professional
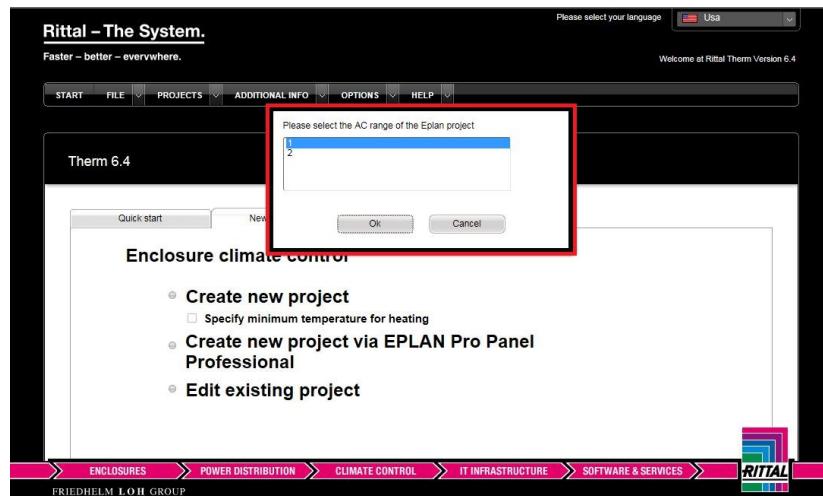
Import the main data of the project from ProPanel
The main data is taken automatically from the EPLAN project properties and the housing or enclosure properties. If the temperatures are not displayed, the unit was not specified for the properties of the housing in the installation space / climate area. **Caution:** If temperatures are changed in Therm, they are **not** written back to the ProPanel project!
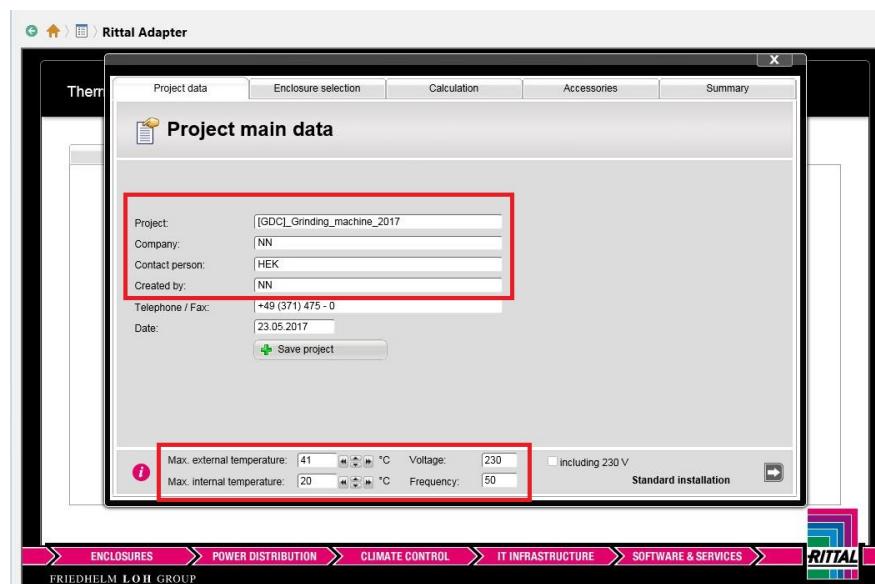
Configuring the climate control in Rittal Therm

The heat loss determined in EPLAN ProPanel and the selected housing are transferred automatically to Therm.
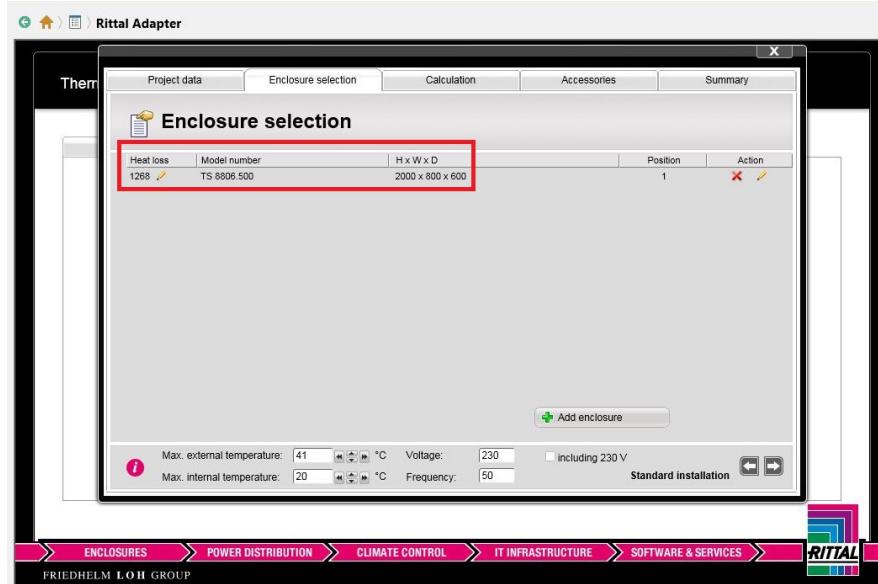
In the next step, the appropriate climate control solution can be selected and accepted in the **Calculation** tab:

Further notes for calculating the heat loss for Therm are provided in the **Calculation** chapter in the Rittal Therm User Manual.
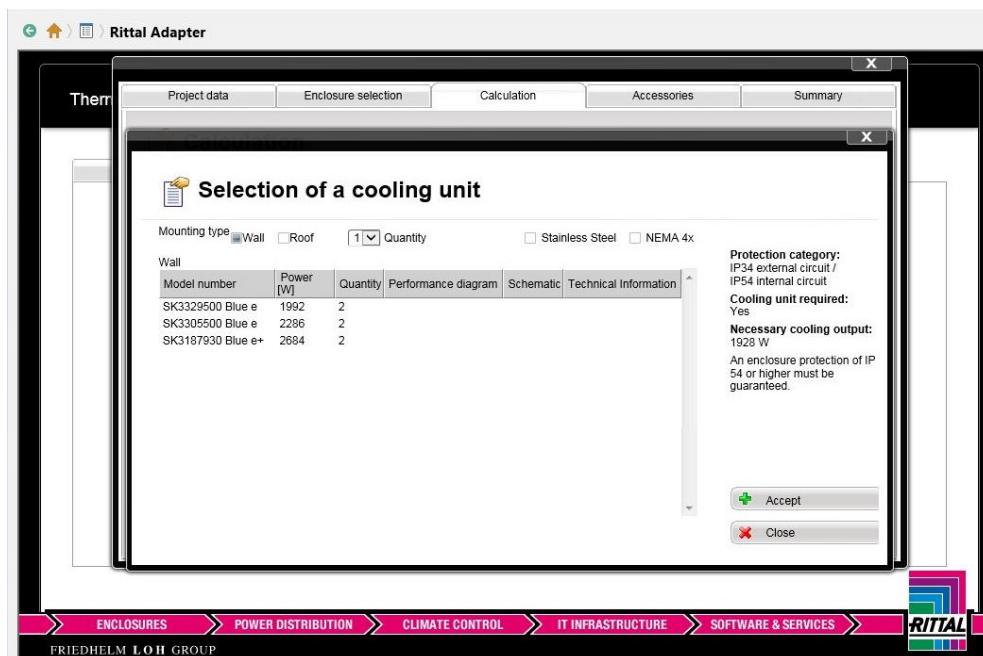
Accessories and exporting data into EPLAN Data Portal

Appropriate accessories can be added to the selected component in the **Accessories** tab. They are transferred later to the installation space and bill of materials of the EPLAN ProPanel project.
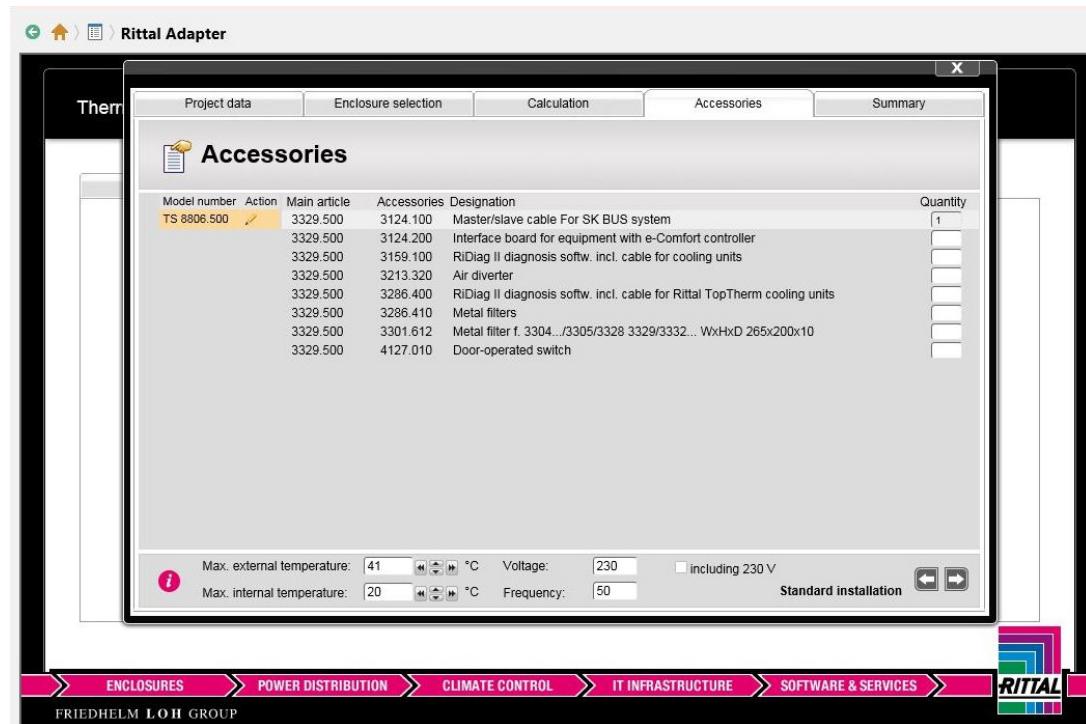
The selected climate control solution can now be transferred to the EPLAN Data Portal with **Send configuration to EDP**:
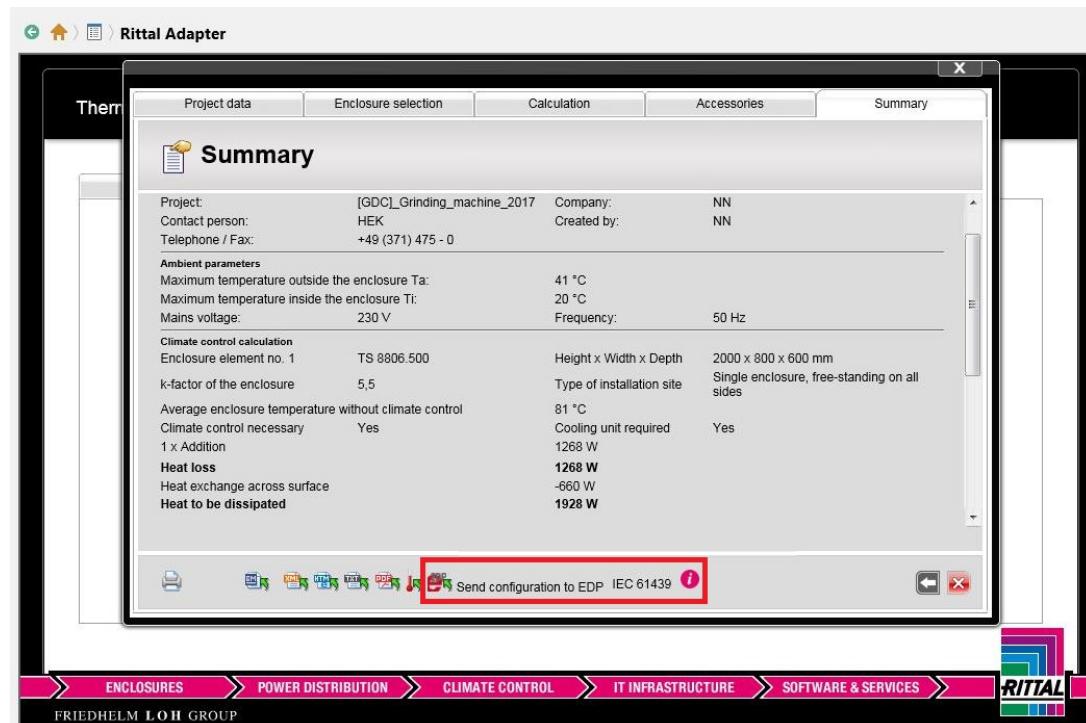
Adding data to the EPLAN project

The EDP shopping basket may need to be emptied beforehand. The components can now be imported from EDP into the EPLAN project and placed in the installation space.

Therm documentation in EPLAN

A documentation of the summary as well as proof of the heating according to DIN EN 61439 can be created as PDF document in the **Summary** tab of the Therm software.

The PDF files can be added as foreign document in the EPLAN pages navigator. After creating the foreign document page, an external file can be added to the project via the page properties.
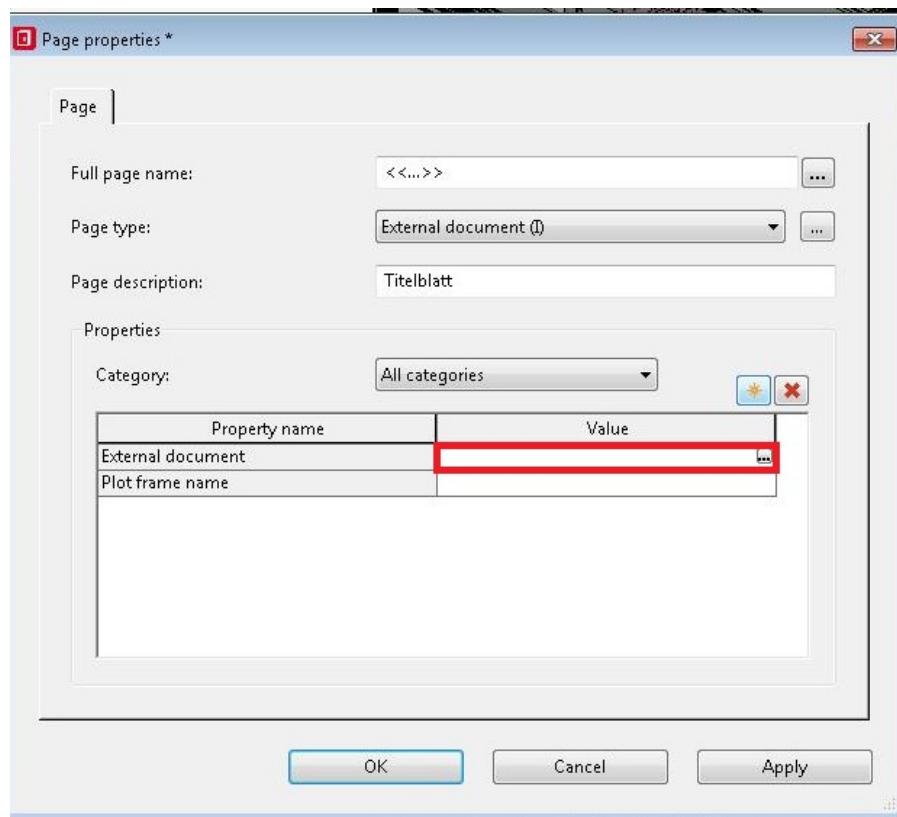
Documentation as EPLAN page

It is also possible to use a form (base article bill of materials *.f01) of the EPLAN master data to create documentation of the heat loss as EPLAN page.

Example:

"Overview" menu item

This menu item opens the "Project overview" tab with a tabular overview of all existing projects. Clicking the pen icon or double-clicking a row opens a project. Clicking the red cross deletes a project.

"Additional info" main menu

"Humidity calculation" menu item

This menu item opens a new page with the title "Humidity calculation".
The required input values are the temperature in degrees Celsius and either the relative humidity as a percentage or the dew point in degrees Celsius. Clicking "Calculate" calculates the absolute humidity in grams per cubic metre, and depending on the selection, the relative humidity as percentage or the dew point in degrees Celsius is output.
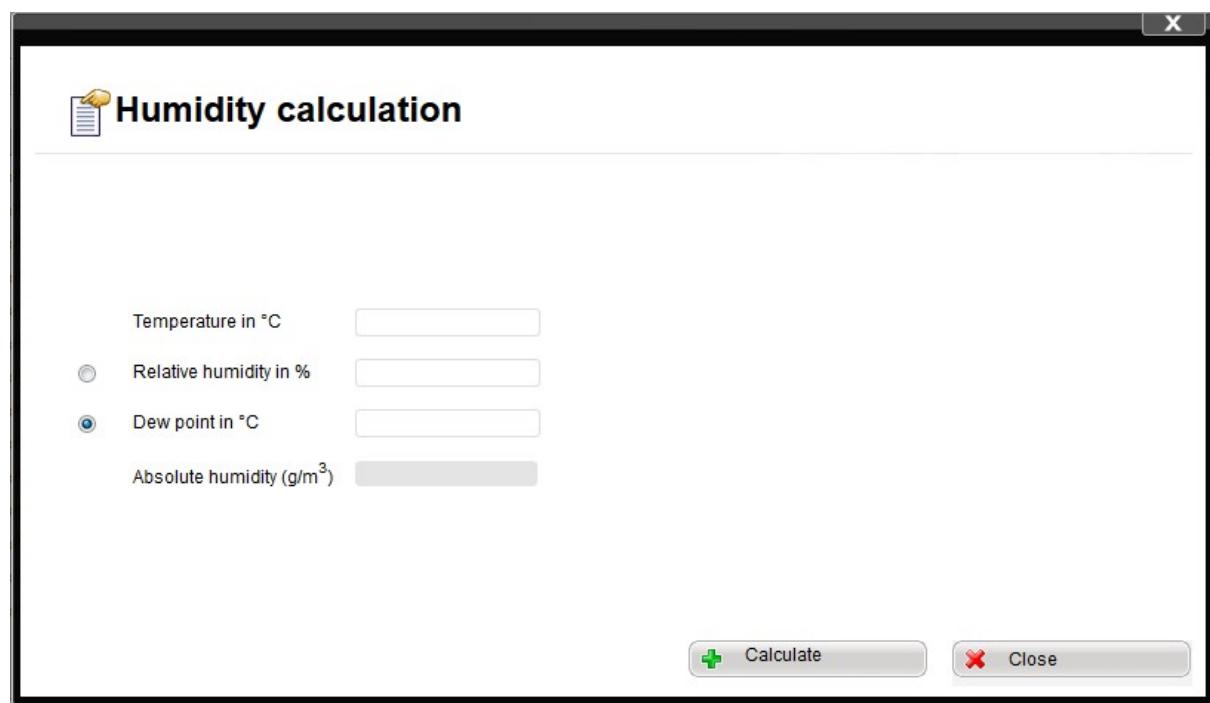
"Blue e+ efficiency calculator" menu item

This links to the Rittal home page
https://www.rittal.com/blue_e_plus
The energy saving of all Blue e+ devices as well as their individual amortisation time in the TCO calculator can be determined with this efficiency calculator.
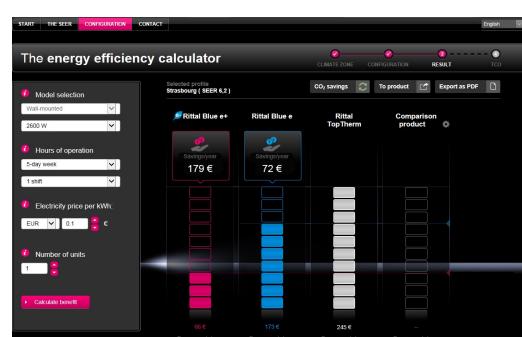
"RiDiag diagnostic software" menu item

This menu item provides diagnostic software for Rittal cooling units and chillers with which you can analyse and parameterise data.

"Safety data sheets" menu item

It is important that the associated safety data sheets are available, in particular for products that contain refrigerant. This menu item provides all required documents for R134a, R407C or R410A.

"Product environment protection" menu item

This menu item provides information concerning product environment protection, such as self-declarations.

"Options" main menu

"SI units" menu item

If you select this function, the following SI units are used in all data screens:
°C, mm, W, m², m³

"Imperial units" menu item

Clicking this menu item causes the following Imperial units to be used in all data screens:
°F, BTU, sqft, CFM

"Heat loss" menu item

This menu item opens a window in which the heat loss data for devices can be entered, edited and deleted. This provides the tabs: "Device list" and "Group list".
Three hierarchy levels are used on the "Device list" tab": The first level distinguishes the device manufacturers, the second level specifies device types, e.g. frequency converters, and the third level displays the individual devices with the heat loss data. When you call the device list, the display is automatically switched to the level of individual devices; the two higher hierarchy levels can be modified via the group list.
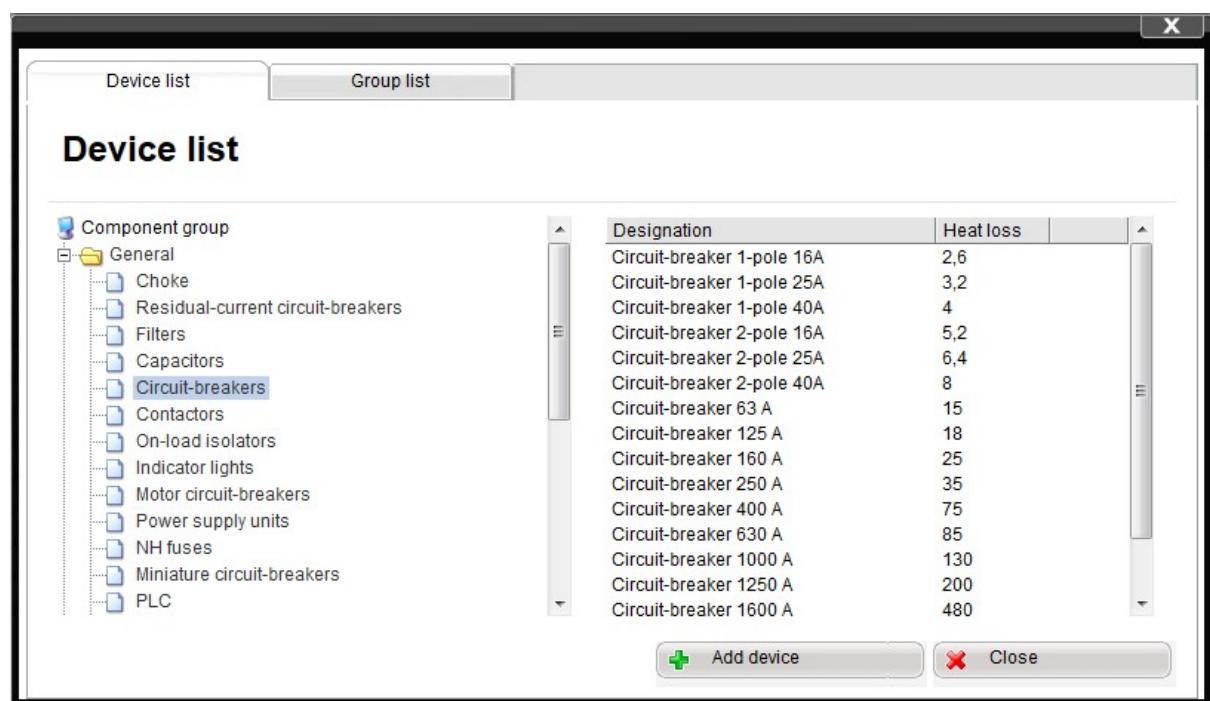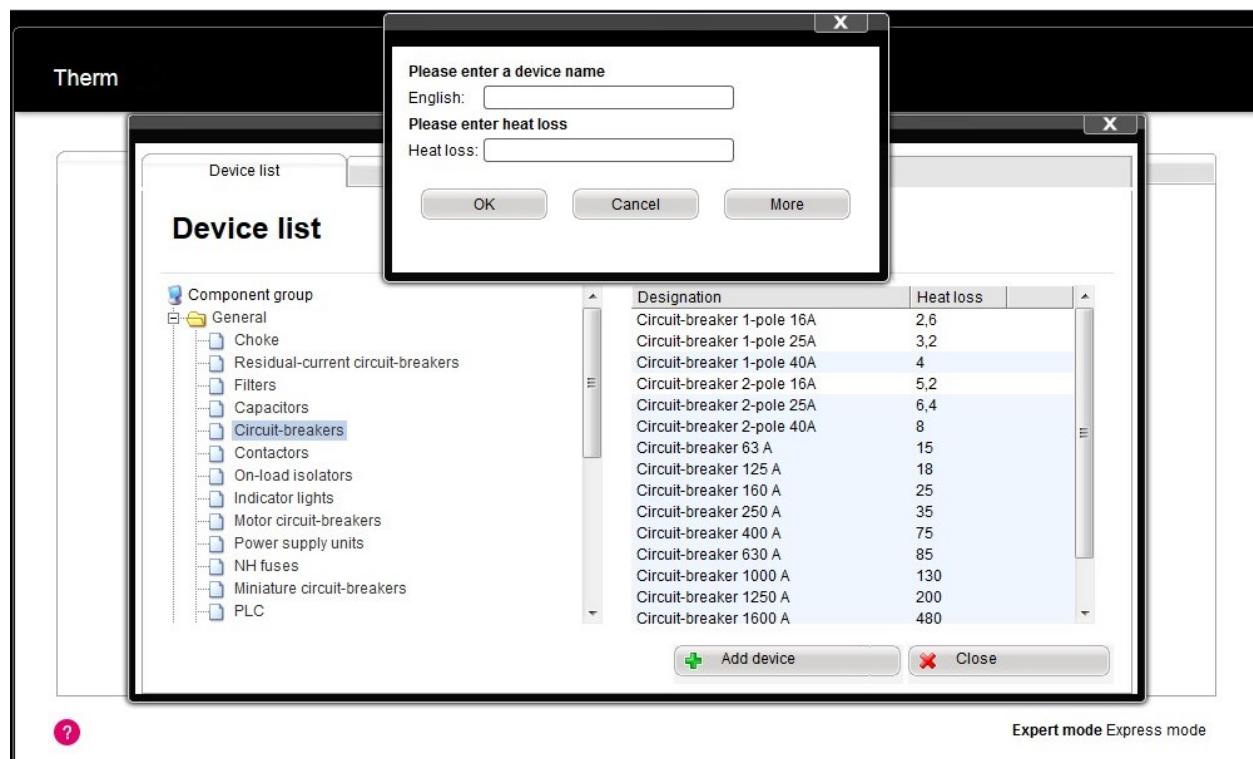
The data entered here is added directly to the database and is thus available immediately in all projects.

To ensure that the device designations are shown correctly after switching to another language, it is important always to enter at least an English designation. English is the fall-back language which is used if no entry exists in the selected language.

> *Note:*
> You must first create a group before you can create the individual components.

"Update via the Internet" menu item

Clicking the menu item checks for the current Therm version. It also specifies where the latest version can be found and downloaded.

> *Note:*
> This check requires an active Internet connection.

"Settings" menu item

This menu item opens the "Settings" window with the input fields: "Welcome", "maxTemp", "minTemp" and "Save file as".
The time (in seconds) that the start screen with the flash animation is displayed can be entered for "Welcome". If a time of 0 seconds is set, the Welcome screen is skipped.
The "maxTemp" and "minTemp" fields define the permissible range for the temperature inputs.
"Save file as" specifies the path for the directory in which the heat loss data and projects are to be saved.
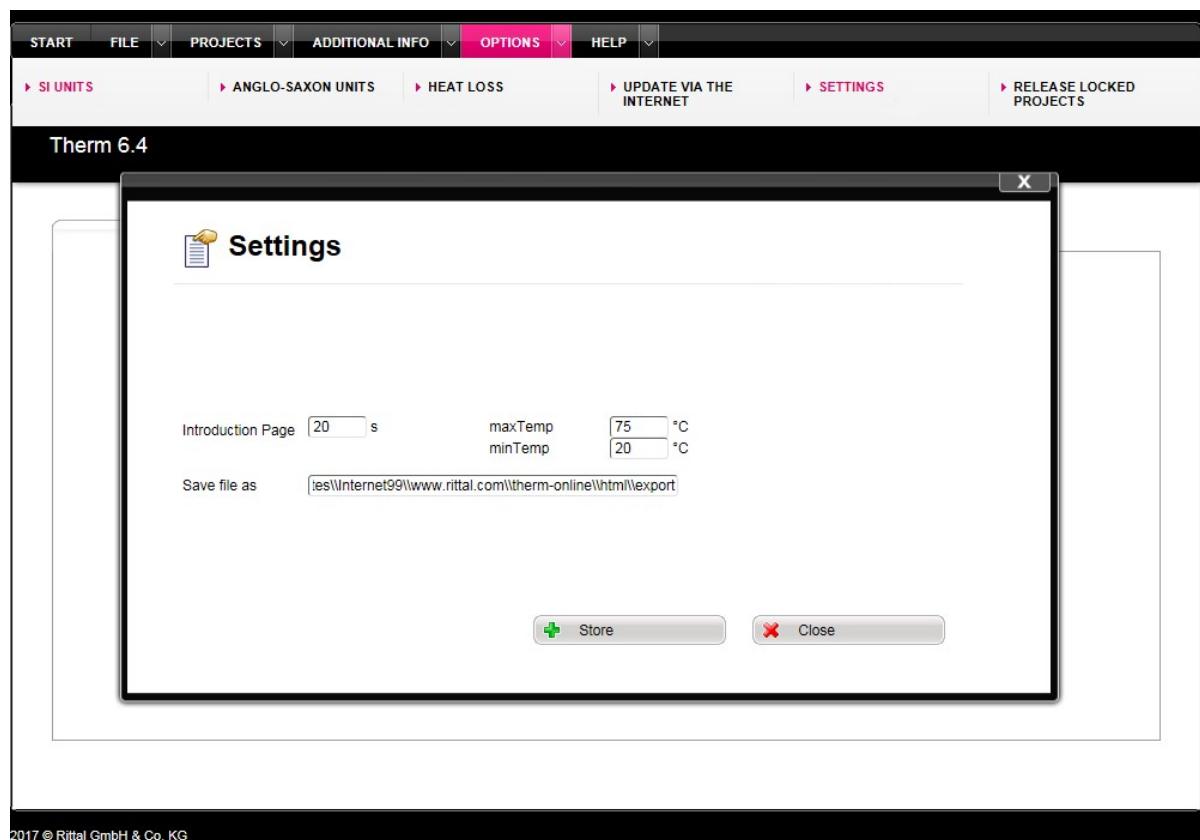
"Release locked projects" menu item

If your browser closes during a calculation, the last project used is locked because it is still active. The "Release locked projects" menu item releases this lock and you can continue working in the project.

In case you cannot go to "Release locked projects" because of a locking, use the "release.bat" file in the Therm directory to release all locks.

ENCLOSURES   POWER DISTRIBUTION   CLIMATE CONTROL   IT INFRASTRUCTURE   SOFTWARE & SERVICES

"Help" main menu

"Info" menu item

Clicking this menu item displays the current version number and further information relating to the program.

"Therm manual" menu item

Clicking this menu item creates the current Therm manual as PDF.

"Contact" menu item

This menu item shows the contact e-mail address should you have any questions concerning Rittal Therm: therm@rittal.com

"Logout" menu item

This menu item is available only in the online version of Therm. It closes the program. After a successful logout, you must login with your stored data.

Calculation

The calculations to determine the suitable climate control units for a particular cooling problem take into account not only the ambient conditions and the specified heat losses, but also the geometry specifications of the selected housing. Each calculation involves the following tabs: Project data, Housing selection, Calculation, Accessories, Summary.
The "Max. external temperature", "Max. internal temperature", "Voltage" and "Frequency" parameters can be edited at any time during the calculation. The "Project data" tab contains general project information to enable the project to be identified in the overview table and in the results summary.

The following special cases are taken into account at "Housing selection":

- The "SO" product group denotes special housings whose dimensions and k factor can be specified freely
- TS housings can be bayed if the heights and depths of the housings are identical
- CP 6372.009, 6382.009, 6292.009, 6292.109 and 6392.209 are operating panels with variable depths and surfaces.
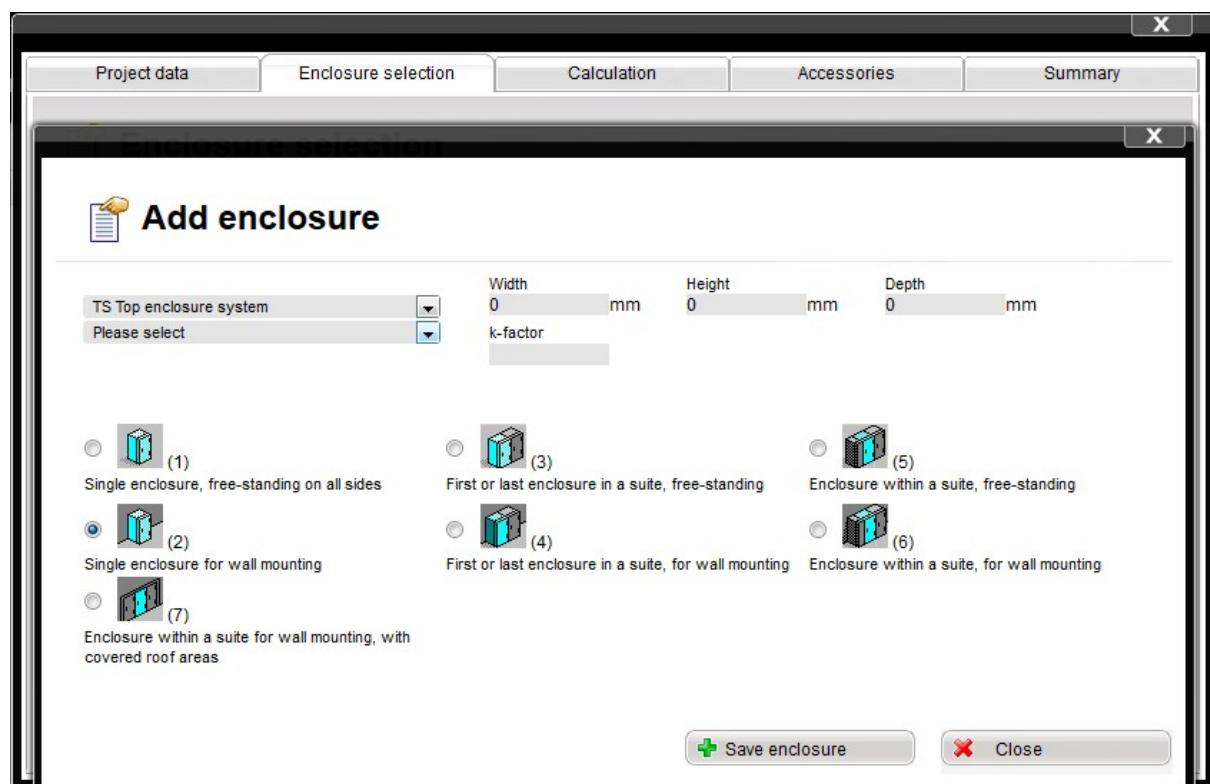
When you click the "Save housing" button, a message box prompts whether the heat loss data is to be assigned to the selected housing. If no data is to be entered, you must select "Cancel". When you click "OK", a new window opens with three tabs:

- Direct input
- Measured temperature
- Device list selection
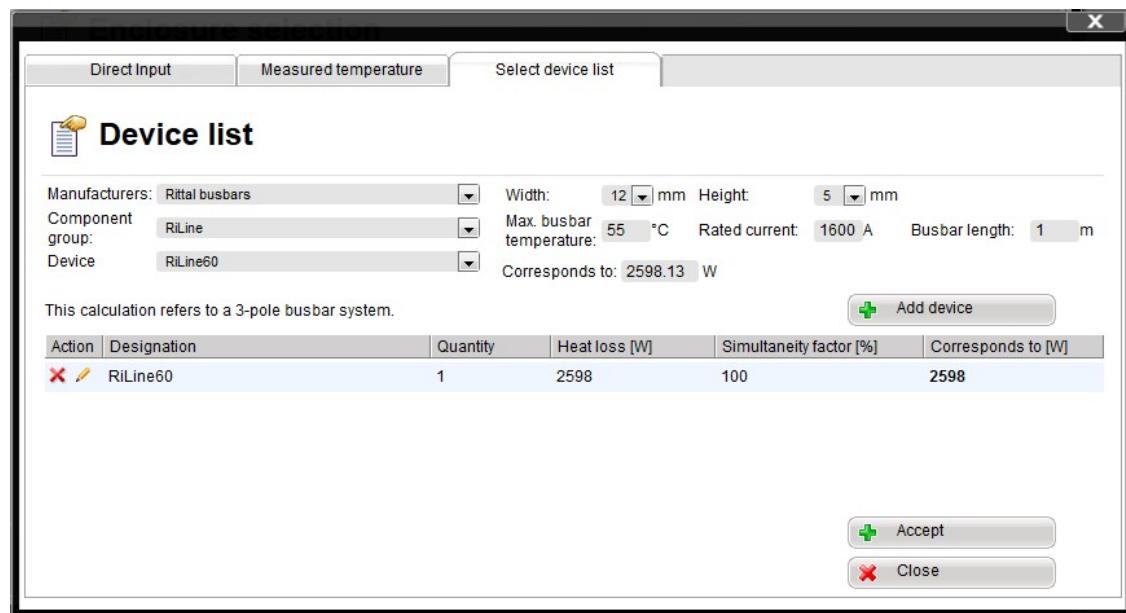
Subsequently, you can select further housings and – if appropriate – then bay them in a new window. Such an enclosure bay requires the TS housing group, identical enclosure height and width, and the correct position of the enclosures (end or centre housing).

The calculated results are displayed on the "Calculation" tab. Clicking the associated group of climate control devices outputs a recommendation based on these results.
Fans and air/air heat exchangers can only be selected if the maximum external temperature is colder than the maximum permissible internal temperature. Otherwise, the external air would not be able to cool the housing interior to the desired temperature.
Furthermore, no climate control units are displayed if no cooling is necessary, i.e. the prescribed internal temperature is already observed without climate control.

If you choose an air/water heat exchanger, Therm shows which chiller can efficiently provide it with water.
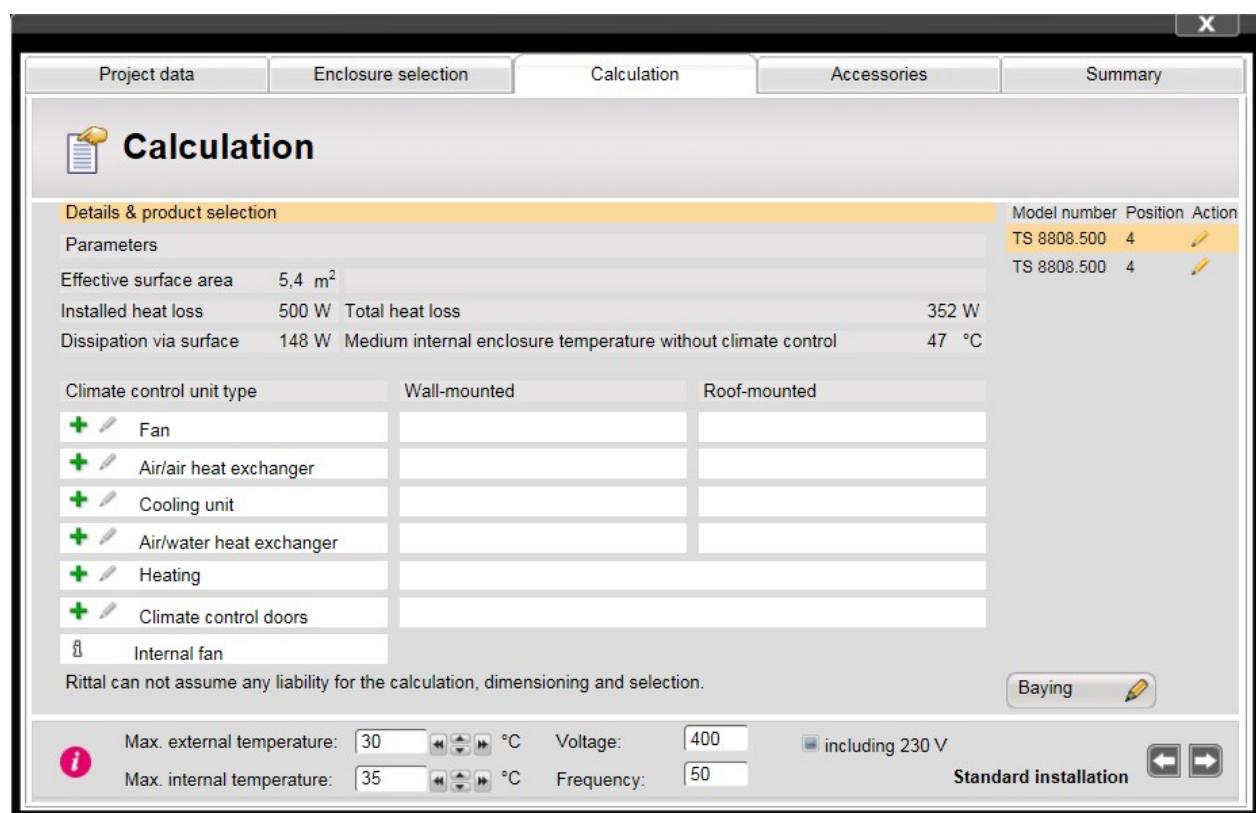
The "Accessories" tab offers only compatible accessories.

The "Summary" tab documents the project. The "GM" button creates a file in a special file format used by General Motors. The remaining buttons output the calculation results in various formats.

The "Temperature-rise proof DIN EN 61439/60890" button calculates the over-temperature for low-voltage switchgear assemblies in accordance with IEC 61439. For switchgear assemblies up to 1600 A, IEC 61439 permits verification via the determination and calculation of heat losses in the operating equipment used.
Successful verification requires proof that dissipation of the heat loss is guaranteed, to prevent excessively high temperatures in the enclosure interior.
As an optimum addition for the verification according to IEC 61439 the total heat loss of the busbar system, the adaptors and equipment mounted on it, and other heat loss producers can be calculated with the software Rittal Power Engineering beforehand.

Interface

The "htdocs/interface" subdirectory contains three example files: "data.txt", "data.xml" and "startdatatransfer.bat". These three files contain comments describing the interface for data transfer to Therm.

You can open either the "data.txt" or "data.xml" file with a text editor of your choice and can then enter data for use in Therm. The "data.txt" file possesses a simpler data structure, but is limited to one enclosure and a maximum of 20 devices with heat loss data. The "data.xml" file must be used for more complex projects.

The data transfer to Therm is started with the "startdatatransfer.bat" file. This file specifies from which of the two text files the data is to be read. This bat file then starts the Therm software and displays the project overview.

"microweb.ini" file

The "microweb.ini" file is located in the root directory of Therm. It is a text file that contains the setting parameters and can be opened in the text editor with a double-click. The following parameters can be edited there:

- The name of the Web page in the browser:
  - **hostName=localhost**
    The real host with this name will then be temporarily unattainable, however, because the IP is saved intermediately by the browser. The value **hostname=default** instructs Microweb to take the host name of the computer on which it is currently running.

- The port number of the Web page:
Normally, Microweb always assigns a port number not being used. It is also possible, however, to assign a specific port number: **port=4001**

- Browser selection:
  - Microweb starts the default browser. It is also possible, however, to select a different browser with one of the following entries:
    browser=ie
    browser=netscape
    browser=none

Furthermore, you can start a browser from the command line with one of the following commands:
-browser=ie
-browser=netscape
-browser=none

If no browser is selected, the only way to close the Web server is to press CTRL-ALT-DEL or else to terminate the program via the Task Manager menu. A warning message will be displayed, but can be ignored in this case.
You can also start a specific different browser using the following command line:
browserpath=<browser path>

The path can be specified either as an absolute path or relative to the server root directory. To start the browser in kiosk mode, use the following entry:
browseroptions=-k

- Use a MySQL database:
  - If the mysql/data directory cannot be written, to create a working copy, Microweb copies automatically the content of the mysql\data directory to the temporary %TEMP%\microweb-dataVVV directory when it starts for the first time. VVV is the DatabaseVersion parameter that can also be changed in "microweb.ini".

The working copy of the data is only created when Microweb is used for the first time. To cause Microweb to copy the data again, the version number of the database must be changed: **DatabaseVersion=0043**

The value can be any valid directory name. It is appended to the path to the working copy of the database.

If a MySQL database server is already running on the target computer, you must use an alternative port. To change the MySQL server port number, use the following entry:
OnStart=%%$server_root\mysql\bin\mysqld%% --skip-innodb --standalone -- basedir=%%$unix_server_root/mysql%% -- datadir=%%$mysql_data_dir%% -- port=3000
OnExit=%%$server_root\mysql\bin\mysqladmin%% --user=root --port=3000 shutdown
Note that pairs of percentage characters must be used in place of a quotation mark in the INI file.

- Permit display of the directory contents:
  - **AllowListing=1**

- Permit remote access from other computers:
  - By default, a Web page can only be viewed on the PC on which it is running. The following entry also permits viewing from other computers on the network: **allowRemoteAccess=1**

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