

Providing sustainable energy solutions worldwide

User Manual

CTC Select

Online energy and savings calculation tool
for heat pumps from CTC



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CTC Select



CTC Select is an online tool developed to provide HVAC installers, planners, and sellers a convenient means to calculate energy savings. Calculations are compiled into a report wherein material specifications, quotes and product information can be added and then sent to the customer's email address.

CTC Select has adapted methodology from EN 14825:2016, the standard on Ecodesign, and the calculation of Seasonal Coefficient of Performance (SCOP) for heat pumps for use in a calculation tool. The program allows input value parameters to be changed in the calculation so as to correspond to the customer's property. Product performance tests for 45 different operating conditions per product for speed-controlled heat pumps and 20 operating conditions per product for non-speed-controlled heat pumps provide a solid foundation, which enables interpolation of performance at the relevant operating points in the customer's property.

CTC works continuously to improve the calculation methods in the program. CTC Select is an online tool where the user automatically receives the latest version of the program, along with new products and updated product performance. The aim is for installers, planners, and sellers to quickly be able to perform savings calculations for CTC's various products and to provide the customer with the requisite support documentation when they purchase a heat pump.

5 Create quote or material specification (optional)

Specification of main components

Article no.	Pos.	Specification	Pos.	q	Cost
58730401		CTC GSi 12		1	72 350,00
587803001		CTC EcoZenith i350 H		1	36 750,00
587477303	G2	CTC Charge pump 25/70-130 6-8 kW		1	2 210,00
Total net cost					111 310,00
VAT					16 696,50
Total net cost					128 006,50

Installation includes return visits for connection/control of heat curve and settings during the forthcoming six months after installation.



Show on front page	Art.no.	Pos.	Specification	Number	Unit price (excl. VAT)
<input checked="" type="checkbox"/>	58730401		CTC GSi 12	1	72350
<input checked="" type="checkbox"/>	587803001		CTC EcoZenith i350 H	1	36750
<input type="checkbox"/>	587477303	G2	CTC Charge pump 25/70-130 6-8 kW	1	2210

Show price Include in report

SHOW COMBINATION MATRIX

Specification	Number	Unit price (excl. VAT)	Cost
CTC GSi 12	1	72350	72.350,00
CTC EcoZenith i350 H	1	36750	36.750,00
CTC Charge pump 25/70-130 6-8 kW	1	2210	2.210,00

6 Generate Report



Energy savings calc. ref: 3513 page: 1/3
Our reference: CTC Select - On behalf of: CTC (head office)

Example
Customer name: Klostergatan 4
621 45 Västerås

You're welcome, an offer for great energy savings!
The energy calculation is made from input in order to achieve great energy savings for your property, thanks to a heat pump from CTC.

We have the pleasure to recommend the following heating solution:

1 pcs CTC GSi 12
1 pcs CTC EcoZenith i350 H

Energy savings: 22 580 kWh/year

Best regards
CTC Select -



Calculation results

Specification of house

Final mean outdoor air temperature: 7.3 °C
Thermostatic heat in winter peak: 13.0 °C
Outdoor design temperature (DST): -18.0 °C
Heat demand at DCT: 9.0 kW
DHW demand: 9.0 kW
Heat demand (DHW): 3.0 kW
Total annual heating demand: 25.190 kWh/year
Corrected with ventilation heat recovery: 13.002 kWh

Input

Street: Nilsjögar 8
Postal code: 701 34
City: Västerås
Climate data station: Västerås
Country: Sweden
Latitude: 59.6377336
Longitude: 18.062111
Calculation mode: Heating curve
Heating area (m²): 400 m²
No. heating demand warmer (kW): 17.0
Thermal inertia: 17.0
Water inlet temperature: 65 °C
Heat demand at DCT: 9.0 kW
Total annual heating demand: 3.000 kWh
Min. supplementary heat for DHW: -90 W
Capacity of DHW production (l/h): %
DHW control mode (l/h): %
Peak water outlet temperature (mode): No
Type of ventilation: Nonreturn air
Date (year): 2018
Heat conductivity of roof: 0.16 W/mK
Roof area (m²): 234.0
Labor price (kWh/m²): 23.0
DHW production: 23.0
Type of installation: Most relevant
Type of installation (if separated registration area 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 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1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1

2. Get started

2.1 Download Google Chrome

1. Open www.google.com
2. Enter "Google Chrome" in the search field and click Enter.
3. Click the top result: "Chrome Web Browser – Google"
4. Click "Download Chrome"
5. Follow the instructions to install the web browser.

Always open CTC Select via Google Chrome, as it does not function correctly with other browsers.

2.2 Logging in

1. Connect to CTC Select via Google Chrome:
<https://intra.enertech.se>
2. Log in with the email address and password you received in the email from the CTC Select administrator.
3. Forgotten your password?
Click here (2), to reset your password.
Follow the instructions.
4. No login credentials?
Contact info@enertech.se
The CTC Select admin will check/create your login credentials and add your user to an existing or new company.

ctc
Enertech Group

Email
xxxxx@enertech.se

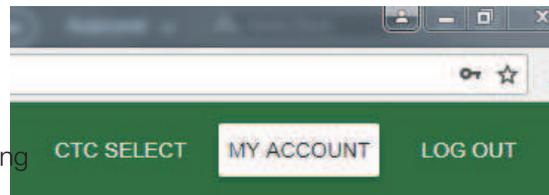
Password
.....

Log in

2 Forgotten your password

2.3 My account

1. View/edit user information
2. View company information
(send an email to info@enertech.se regarding changes).



Edit profile 1

USER INFORMATION COMPANY INFORMATION

E-mail
xxxxx@enertech.se

First name
XXXXXXXXXX

Phone
01230123

Language *
English

Password
.....

Surname
XXXXXXXXXX

Region *
▼ England

Edit profile

USER INFORMATION COMPANY INFORMATION 2

If some data is incorrect, please contact admin to change them.

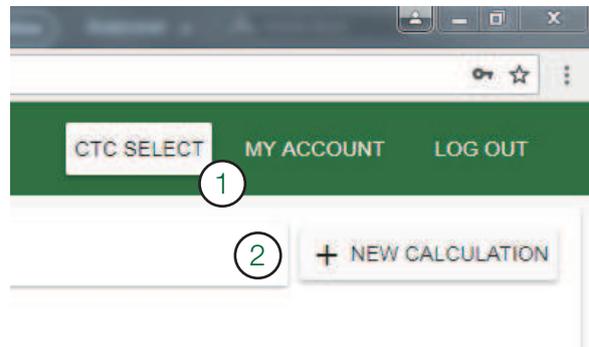
Name	CTC (Head office)
Company key	<input type="text" value="A56Hfg94ulao"/> 3
Corporate identity number	
Phone	+46 372-88 000
Fax	
E-mail	info@enertech.se
Website	http://www.ctc.se
Street	Näsvägen 8
Postal code	341 34
City	Ljungby
Country	Sweden

The company key (3) must be provided when creating new login credentials for an existing company. The company key ensures that the current user in a company permits the new user to be included in the same company. Users in the same company can share calculations with each other if this is permitted under Settings in the calculation.

3. Create calculation

3.1 Open calculation

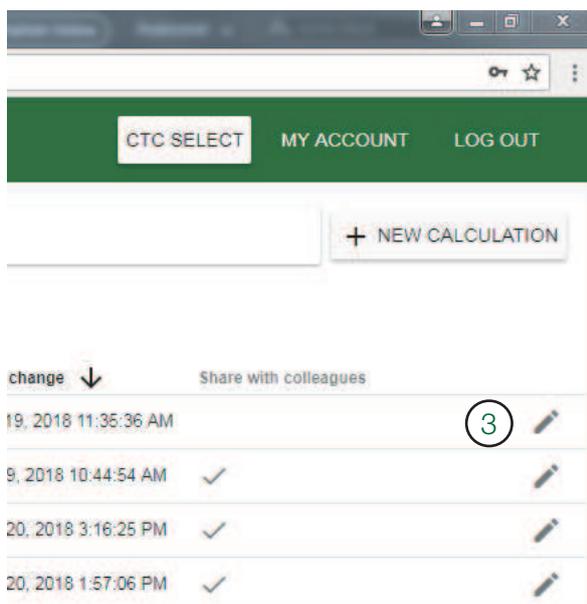
1. Click CTC SELECT.
2. Click NEW CALCULATION.
3. To edit a previous calculation or copy the calculation, click the pencil icon.



Calculations

Search + NEW CALCULATION

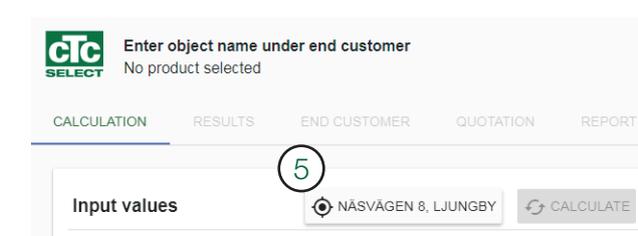
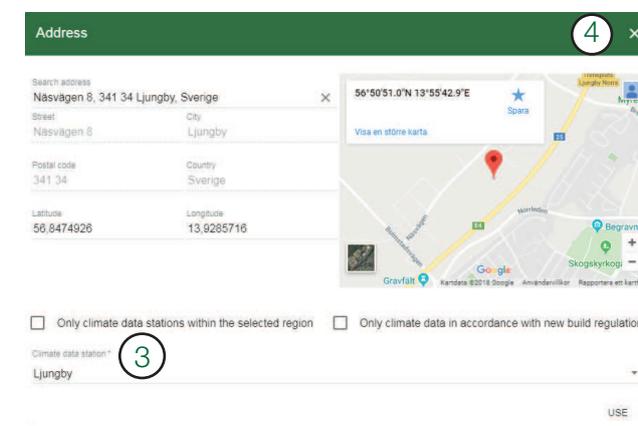
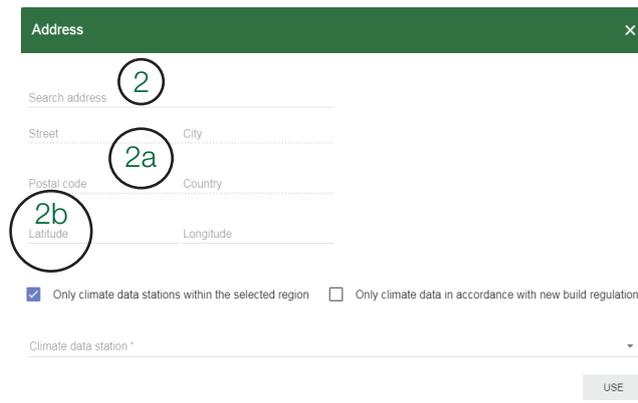
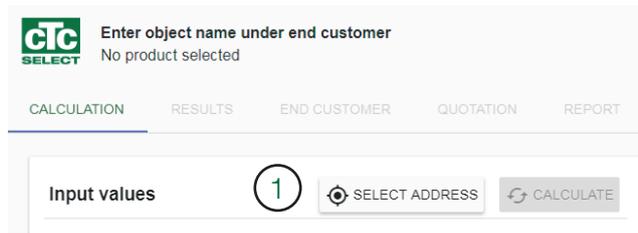
Shows 0 out of 0



3.2 Add address

1. Select address (the address function is linked to Google Maps; information is retrieved from there and may be incorrect).
2. Search address
 - 2a. If the address is found in Google Maps, the other fields are filled in automatically.
 - 2b. If the address cannot be found, search the coordinates on e.g. www.hitta.se. Manually enter the coordinates (latitude and longitude) into the fields. Otherwise the rock type cannot be found in the database. The fields can be left blank if a custom lambda value is selected under Advanced.
3. Check the selection of climate data station.
 - 3a. Climate data station correct.
 - 3b. Change to correct climate data station from the drop-down list.
 - 3c. Filter:
 - Only climate stations within the selected region
 - Only climate data in accordance with new build regulations

Only climate data in accordance with new build regulations – Only climate data corresponding to national regulations for new constructions will be displayed. This is only applicable to certain countries.
4. Click the X or click outside the window to finish.
5. The address is displayed on the button with the coordinate symbol.



3.3 Energy mode

1. Select energy mode [kWh] if previous annual energy demands for heating and DHW exist. Or if calculations for consumption in [kWh] for a newly-built property exist.

Heat 1 Energy mode [kWh] Power mode [kW]

Tempered Area (Atemp) [m²] * USE TEMPLATE HOUSE

Water outlet temperature at ODT [°C] * No heating demand warmer than [°C] *

55 17

Total annual energy demand heating and D... 2 CALCULATE ENERGY DEMAND

2. Calculate energy demands – the template converts previous energy consumption into kWh. Set the efficiency and energy content if other input values exist.

Calculate energy demand 2
✕

The calculation overwrites "Total annual energy demand heating and DHW [kWh]".

Oil		
Consumption [m ³ /år] *	Efficiency *	Energy content [kWh/m ³] *
0	80	10000
Gas		
Consumption [Nxm ³ / year] *	Efficiency *	Energy content [kWh / (N...]
0	75	11,2
Firewood		
Consumption [m ³ /år] *	Efficiency *	Energy content [kWh/m ³] *
0	70	1500
Pellets		
Consumption [tonnes / ye...]	Efficiency *	Energy content [kWh/ton] *
0	80	4800
Electricity/district heating		Calculated energy demand
Consumption [kWh/år] *	Efficiency *	
0	95	0 kWh

3. The calculated consumption overwrites the field for energy demands.

3 Total annual energy demand heating and D... CALCULATE ENERGY DEMAND

25500

I The energy demand is specified excluding household electricity, but including heat losses for ventilation. Alternatively, if heat recovery already exists, consumption including this must be specified. The "None/Exhaust air" option should be selected under Ventilation if the savings are already included in input values.

3.4 Power mode

1. Power mode [kW] is selected if the energy consumption is unknown, but the maximum heating demand is known e.g. for new constructions. Alternatively, if the heating demands of the property for a specific outdoor temperature are known, this can be used as a reference for power distribution, or set as the ODT (Outdoor Design Temperature), which is the temperature estimated to have 100% heat output and the temperature for which power coverage and heating demands are reported.

Heat Energy mode [kWh] Power mode [kW]

Tempered Area (Atemp) [m²] *

Water outlet temperature at ODT [°C] * No heating demand warmer than [°C] *

Heating demand at ODT [kW]

Heating demand at ODT [W/m²] [kW] *

Heating demand at own temperature [kW]

Insulation standard (u-mean) [W/m²K]

2. Select Heating demand at ODT (Outdoor Design Temperature) – Type of input values.
 - 2a. Heating demand at ODT (Outdoor Design Temperature) [kW] incl. ventilation losses.
 - 2b. Heating demand at own temperature [kW] incl. ventilation losses.
Specify heating demand for the temperature to which the power output applies, and whether the temperature is to be enabled as ODT (Outdoor Design Temperature).
 - 2c. Heating demand at ODT (Outdoor Design Temperature) [W/m²] incl. ventilation losses.
 - 2d. U-value [W/(m²*K)], excl. ventilation losses – these are added automatically based on 0.4 l/(sm²) and the specified area. If supply air and exhaust air ventilation are enabled, any recovery can correct the heating demand during calculation.

Click CALCULATE HEAT DEMAND if you do not know the heating demand for the property.

Calculate heat demand

For each floor of the property, select:

1. Floor type: Ground floor or basement/upper floor/detached (e.g. garage).
2. Year of construction/Standard: Select the representative year for standard insulation, window type, and so forth.
3. Area.
4. Indoor temperature.
5. Add another floor.
6. Remove floor.
7. Click APPLY, heating demand at ODT (Outdoor Design Temperature) will be overwritten.

Calculate heat demand at ODT ✕

Note that the calculation is climate-dependent, so first select an address. The calculation will overwrite the fields "Tempered Area (Atemp) [m²]" and "Heat demand at ODT [kW]".

Floor 1 2 3 4

Floor type * Year of construction / insul... Area [m²] * Temperature [...]

5 6

This is a simplified tool for calculating the heat demand at outdoor design temperature in a property. The calculation is based on an example house with probable historical insulation values for the years selected. Geographical deviations occur, especially in colder climates, where traditional building standards can be higher even for older houses. The installer and customer need to jointly determine that the heat demand at outdoor design temperature seems reasonable and that correct input in kW is specified for further calculation.

7

Heating demand at ODT - Input type

Heating demand at ODT [kW]

7 Heating demand at ODT (ventilation heat loss incl.) [kW] *

3.5 The house heating curve

Select

1. Tempered Area.
2. Primary flow temperature – the maximum temperature to the radiators or floor heating coils at ODT (Outdoor Design Temperature).

Recommended primary flow temperatures:

Floor heating only	35 °C
Low temperature system (well-insulated houses)	40 °C
Normal temperature system (factory setting)	50 °C
High temperature system (older houses, small radiators, poorly insulated)	60 °C

Heat

① Tempered Area (Atemp) [m²] * 200

② Water outlet temperature at ODT [°C] * 48

③ No heating demand warmer than [°C] * 17

④ USE TEMPLATE HOUSE

3. Temperature heating from – the temperature at which the heat pump switches off in summer when there are no heating requirements depends on the preferred indoor temperature. For example, 21 °C:
Older houses: approx. 17 °C
Well-insulated, modern houses: down to 13 °C
4. Use Template House if you do not know the value for “Temperature heating from”.

Use template house ④ ×

Selection will overwrite "Temperature no heating demand" and "Thermal inertia".

Materials / Construction Standard	<1985	1985-2015	>2015
Wood	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brick	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Indoor temperature [°C] * 21

CANCEL USE

3.6 DHW

1. Enter DHW consumption in [kWh].
For Energy Mode this is a part of the total energy specified earlier.
2. Calculate DHW Demand, this is used to insert template values.
3. When you click an option, [Total energy demand for DHW] will be overwritten with the selected value.

DHW

Total energy demand DHW [kWh]*

4500

1

2

CALCULATE DHW DEMAND

DHW consumption ×

Select house or apartment template for "Total energy demand DHW [kWh]"

Single family house

Persons	Consumption [kWh/år]
2	3000
3-4	4500
4-5	5000

3

Apartment

Persons	Consumption [kWh/år]
1-2	2000
3-4	3000
5	3500

DHW

Total energy demand DHW [kWh]*

4500

3

3.7 Ventilation

1. Select “None/exhaust air” if the house has natural ventilation or exhaust air ventilation without heat recovery. Also select this if energy consumption has already been reduced with existing ventilation recovery.

Ventilation

Type of ventilation

None/exhaust air 1

2. Select “None/exhaust air” if ventilation recovery exists.
- 2a. Specify the ventilated area.
(Area with mechanical supply air and exhaust air ventilation).
- 2b. Specify temperature for exhaust air.
(Normally 21-23 °C depending on the indoor temperature).
- 2c. Specify ventilation requirement
(0.35 l/(sm) standard).
- 2d. Specify η_{FTX} – temperature efficiency of the heat recovery unit for ventilation.
(Between 60% for older units and 80-90% for new units).

Ventilation

Type of ventilation

Ventilation heat recovery system 2

Ventilated area [m²] *

2a

Temperature exhaust air [°C] *

2b

Ventilation requirement [l/sm²] *

2c

η_{FTX} [%] *

2d

3.8 Advanced settings

1. Click ADVANCED SETTINGS for additional options.
These normally do not need to be changed and have appropriate default values.

ADVANCED SETTINGS ▾

2 Fixed water outlet mode

Thermal inertia of the house [days] *
4 1

5 **DHW additional settings**

Supplementary heater DHW [kW]

Capacity HP available for DHW [%] DHW demand covered by HP [%]

6 **Energy source**

Delta Brine [°C] * 3	Borehole parameters in calc. PEM40 ▾
Brinehose parameters in calc. (lake) PEM40 ▾	Brinehose parameters in calc. (soil) PEM40 ▾
Rock type 7 Find value in database ▾	Heat conductivity rock [W/mK] * 3,4
Soil hose collector condition 8 Moist (normal) ▾	

3 Calculate all products

2. **Fixed water outlet mode**
CTC indoor modules and heat pumps with control operate with variable water outlet (variable primary flow temperature). In special cases, Fixed Water Outlet must be applied, but this negatively affects the heat pump's COP value and energy savings. If the heat pump will also operate with the same primary flow temperature, this box must be checked.
3. **Calculate all products**
CTC Select normally only calculates the products that are recommended for the specified heating/energy demands. Check "Calculate all products" to calculate all heat pump combinations. The waiting time will be longer, and non-relevant heat pump combinations will also be displayed.

4. **Time constant of building**

A measure of how good a property is at retaining heat. (1-12 days.) Used to select the value of the Outdoor Design Temperature (ODT).

- The default value for CTC Select is 1 day.
- Lightweight house with low thermal inertia (e.g. lightweight wood construction): approx. 1-2 days
- Heavy house with high thermal inertia (e.g. brick house): approx. 2-4 days
- House with very high thermal inertia: > 4 days

5. **Supplementary DHW**

This is only selected for larger systems with separate peak heat/heat pump for DHW. Without the supplement, the amount of peak hot water calculated for temperatures colder than the bivalent temperature is equal to that calculated for heating at Outdoor Design Temperature, and the system alternates between producing hot water with 100% heating capacity and 100% DHW capacity.

- 5a. Specify the maximal peak output the system may use to produce hot water.
- 5b. Specify the proportion of the total heat pump capacity that has first priority to produce hot water. E.g. 5 x heat pumps, 1 of which primarily prioritises hot water, can produce heat if surplus capacity exists. In this case, 20% is specified.
- 5c. The proportion of hot water production that is generally covered by the heat pump (not peak electricity). For 30% peak electricity, specify 70% coverage. In addition to this, additional peak heating is added if necessary for temperatures colder than the bivalent point.

ADVANCED SETTINGS ▾

Fixed water outlet mode

Calculate all products

Thermal inertia of the house [days] *

1

5 **DHW additional settings**

Supplementary heater DHW [kW]

5a

Capacity HP available for DHW [%]

5b

DHW demand covered by HP [%]

5c

6. **Delta brine**

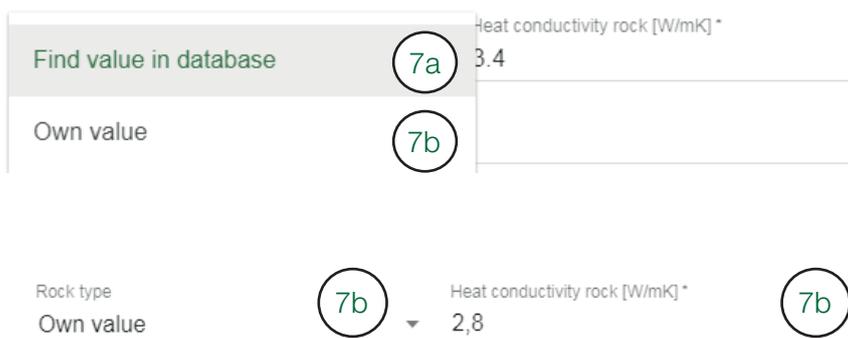
Set the temperature difference for incoming and outgoing brine for the heat pump. Default 0/3 °C. Only applies to brine/water products. A larger differential provides shorter minimum requirements for boreholes/soil hoses, but lower savings.

7. **Thermal conductivity of rock type**

7a. By default, rock type is selected from the GPS coordinates for the address for which the calculation will be performed. CTC has assigned different rock types with probable thermal conductivity coefficients.

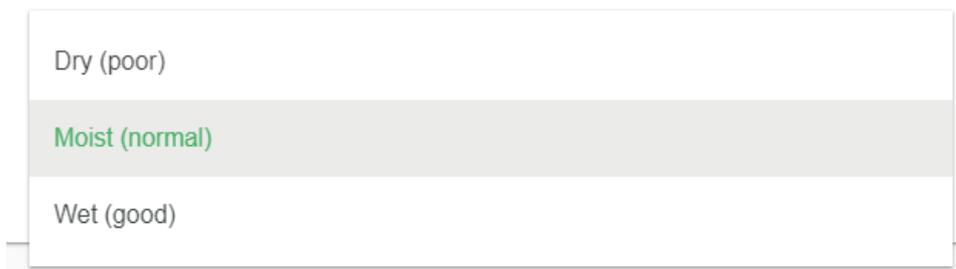
If the rock type is not available for the specified coordinates, select default value 3 W/(m*K) and "no data @ coordinate" is reported under input values.

7b. Select "Custom" from the drop-down list and manually enter the thermal conductivity for the rock type if this is known. (Values between 2-4 W/(m*K) are normal).



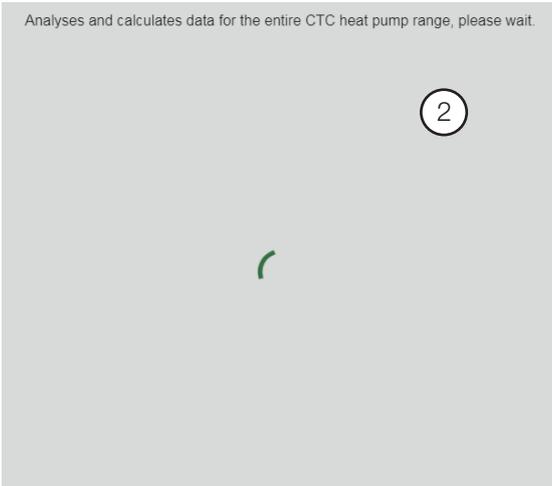
8. **Soil conditions**

The thermal conductivity of the soil is contingent on several factors. The moisture of the soil depends on, e.g. soil type, ground water level and shade. Water saturation also affects thermal conductivity. Select from three conditions.



3.9 Calculate

1. Click CALCULATE (a green button indicates accepted input values, while a grey button indicates incomplete input values).
2. Wait approx. 7 seconds.
3. View the results.
4. Filter the results – The recommended heat pumps for the calculated property will be displayed for each heat pump type.
5. Sort, click Parameter.
6. Compare.
7. Select a product by checking the box.
8. View compiled results for the selected product
The graph shows monthly savings over the year.



1

CALCULATE

Power mode [kW]

EMPLATE HOUSE

than [°C]*

ENERGY DEMAND

TE DHW DEMAND

ED SETTINGS >

Results

Air-water
 Brine-water, tank integrated
 Brine-water, without tank

Product	Savings [kWh]	SCOP	Energy coverage [%]	Power coverage [%]
<input checked="" type="checkbox"/> CTC EcoAir 510M	17,500	3.3	99.2	74.3
<input type="checkbox"/> CTC EcoAir 408	16,770	3.0	95.3	39.7
<input type="checkbox"/> CTC EcoAir 406	15,960	2.7	90.1	30.1

Shows 3 out of 3

House specification

Annual average temperature 7.1 °C

Tmin (coldest hour in climate data) -19.0 °C

Outdoor design temperature (ODT) -15.3 °C

Heating demand at ODT 7.3 kW

Power demand heating and DHW at ODT 7.9 kW

Savings

Total energy demand heating and DHW 25,500 kWh/year

Total energy savings 17,500 kWh/year

Total consumption 8,000 kWh/year

SCOP 3.3

Heat pump

Bivalent temperature -9 °C

Max. supplementary heater at ODT 2.1 kW

Max. total input at ODT 6.6 kW

Annual energy consumption [kWh]

Before installation After installation

For installers, planners, and sellers

- CALCULATION
- RESULTS
- END CUSTOMER
- QUOTATION
- REPORT
- DOCUMENT
- SEND
- SETTINGS

- Update input values and recalculate – enter new input values and click CALCULATE again.
- An orange warning is displayed if the input values are updated and no new calculation is performed. Click Calculate again.

Enter object name under end customer
CTC EcoAir 510M

10 INPUT UPDATED

9 10

Input values

NÄSVÄGEN 8, LJUNGBY

Heat

Energy mode [kWh] Power mode [kW]

Tempered Area (Atemp) [m²]
200

Water outlet temperature at ODT [°C]
55

No heating demand warmer than [°C]
17

Heating demand at ODT - Input type
Heating demand at ODT [kW]

Heating demand at ODT (ventilation heat loss incl.) [kW]
9

DHW

Total energy demand DHW [kWh]
5000

Ventilation

Type of ventilation
None/exhaust air

Results

Air-water Brine-water, tank integrated Brine-water, without tank

Product	Savings [kWh]	SCOP	Energy coverage [%]	Power coverage [%]
<input checked="" type="checkbox"/> CTC EcoAir 510M	17,500	3.3	99.2	74.3
<input type="checkbox"/> CTC EcoAir 408	16,770	3.0	95.3	39.7
<input type="checkbox"/> CTC EcoAir 406	15,950	2.7	90.1	30.1

Shows 3 out of 3

House specification

Annual average temperature 7.1 °C
Tmin (coldest hour in climate data) -19.0 °C
Outdoor design temperature (ODT) -15.3 °C
Heating demand at ODT 7.3 kW
Power demand heating and DHW at ODT 7.9 kW

Savings

Total energy demand heating and DHW 25,500 kWh/year
Total energy savings 17,500 kWh/year
Total consumption 8,000 kWh/year
SCOP 3.3

Heat pump

Bivalent temperature -9 °C
Max. supplementary heater at ODT 2.1 kW
Max. total input at ODT 6.6 kW

Annual energy consumption [kWh]

Before installation After installation

- Calculation performed again.

Results

Air-water Brine-water, tank integrated Brine-water, without tank

Product	Savings [kWh]	SCOP	Energy coverage [%]	Power coverage [%]
<input checked="" type="checkbox"/> CTC EcoPart 408	21,930	3.8	99.5	79.9
<input type="checkbox"/> CTC EcoPart 406	20,830	3.4	94.4	54.1

House specification

Annual average temperature 7.1 °C
Tmin (coldest hour in climate data) -19.0 °C
Outdoor design temperature (ODT) -15.3 °C
Heating demand at ODT 9.0 kW
Power demand heating and DHW at ODT 9.6 kW

Savings

Total energy demand heating and DHW 30,190 kWh/year
Total energy savings 21,930 kWh/year
Total consumption 8,250 kWh/year
SCOP 3.8

Heat pump

Bivalent temperature -10 °C
Max. supplementary heater at ODT 1.9 kW
Max. total input at ODT 4.4 kW
Min. rec. active borehole 151 m
Min. rec. soil hose 397 m
Min. rec. lake hose 305 m

Annual energy consumption [kWh]

Before installation After installation

3.10 Save & copy calculations

- 1.a Save calculation: possible after calculation (CALCULATE) performed.
- 1.b When changing input values, the calculation (CALCULATE) must be performed first. Save is re-enabled.

Product	Savings [kWh]	SCOP	Energy coverage [%]	Power coverage [%]
<input checked="" type="checkbox"/> CTC GSI 12	22.580	4.3	100.0	100.0
<input type="checkbox"/> CTC GS 8	21.620	3.6	99.4	78.2
<input type="checkbox"/> CTC EcoHeat 408	21.240	3.5	99.5	79.9
<input type="checkbox"/> CTC GS 6	20.590	3.3	95.2	55.6
<input type="checkbox"/> CTC EcoHeat 406	20.260	3.2	94.4	54.6

- 2. Open earlier calculations from the first page
- 3. Copy calculation –
 - 3.a Change input values
 - 3.b Save under new name

Tempered Area (Atemp) [m²] *
200

Water outlet temperature at ODT [°C] * 3a
55

Heating demand at ODT - Input type
Heating demand at ODT [kW]

Heating demand at ODT (ventilation hea

CALCULATION RESULTS **END CUSTOMER**

End customer information

The user of CTC Select is responsible for informing the info@enertech.se

Object 3b
Example - copy

4. Results

1. View all results from the calculation with selected product.
2. Select parameter to be shown in report
3. Check input values – displays confirmation of data added in previous tab.

Results 1

House specifications	Include in report	Savings	Include in report
Annual average temperature	7.1 °C	SCOP	3.8
Tmin (coldest hour in climate data)	-19.0 °C	Seasonal space heating energy efficiency, ηs, ηs	148 % <input checked="" type="checkbox"/>
Outdoor design temperature (ODT)	-15.3 °C	Total energy demand heating and DHW	30,190 kWh/year
Heating demand at ODT	9.0 kW	Total energy savings	21,930 kWh/year
Heating demand at ODT per area	45.0 W/m ² <input type="checkbox"/> 2	Total consumption	8,250 kWh/year
Power demand heating and DHW at ODT	9.6 kW	Primary energy before (PET)	241 kWh/m ² year <input type="checkbox"/>
Power demand DHW	0.6 kW	Primary energy after (PET)	66 kWh/m ² year <input type="checkbox"/>
Total annual energy demand heating, corrected with ventilation heat recovery	25,190 kWh/year		

Borehole specifications	<input checked="" type="checkbox"/> Include in report	Soil collector specifications	<input checked="" type="checkbox"/> Include in report
Min. recommended active borehole	130.0 m	Min. recommended soil hose	397.0 m
Specific energy extraction	169.0 kWh/m	Min. C-C collector	1.2 m
Specific power extraction mean	19.0 W/m	Min. depth collector	1.1 m
Specific power extraction max	40.0 W/m	Annual heat extraction	46.0 kWh/m ² /year
		Specific energy extraction	55.0 kWh/m
		Specific power extraction mean	6.0 W/m
		Specific power extraction max	13.0 W/m

Input 3

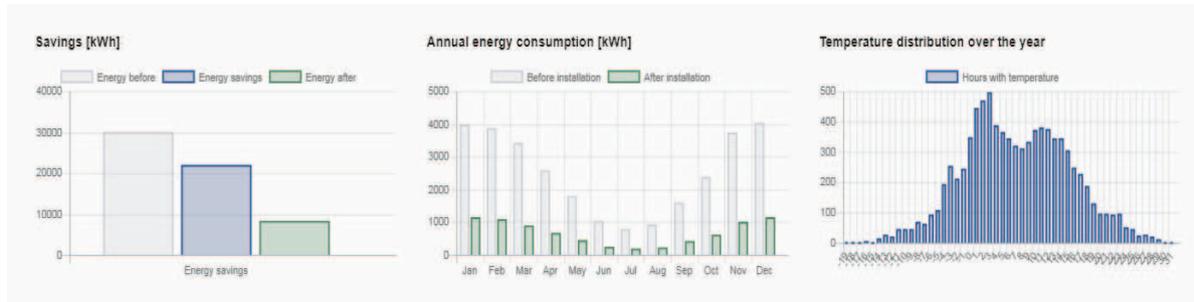
Street	Nasvagen 8	Product	CTC EcoPart 408	Delta Brine	3.0 °C
Postal code	341 34	Calculation mode	Heating power [kW]	Rock type	Granitoid till syenitoid migmatisk gnejs (1,7 miljarder år)
City	Ljungby	Tempered Area (Atemp) [m ²]	200 m ²	Heat conductivity rock	3.4 W/mK
Climate data station	Ljungby	No heating demand warmer than	17.0 °C	Borehole parameters in calc.	PEM40
Country	Sverige	Thermal inertia of the house	1.0 days	Soil hose collector condition	Moist (normal)
		Water outlet temperature at ODT	55.0 °C	Brinehose parameters in calc. (soil)	PEM40
		Heating demand at ODT	9.0 kW	Brinehose parameters in calc. (lake)	PEM40
		Total energy demand DHW	5,000.0 kWh		
		Supplementary heater DHW	- kW		
		DHW demand covered by HP	- %		
		Capacity HP available for DHW	- %		
		Fixed water outlet mode	No		
		Type of ventilation	None/exhaust air		

4.1 Graph

①

②

③



1. Savings and requirements per year.
2. Energy consumption per month before and after installation.
3. Temperature distribution/climate data for selected locality. The graph shows the number of hours per year (y-axis) with a certain temperature (x-axis).

4.2 Explanation of calculated values

House specifications

Shows the property's calculated attributes.

Annual mean temperature [°C]

Average annual temperature for the climate data station for the representative year. The last 10 years in the climate database have been analysed to determine the 10-year mean temperature. The year with a mean temperature that corresponds most closely to this value has been selected and the minimum, average, and maximum temperatures for each day of this year have generated the number of hours with a certain temperature.

Tmin [°C]

Coldest temperature during an hour for the climate data station. Hours colder than ODT (Outdoor Design Temperature) are also calculated in the savings calculation. Then 100% heating demand is calculated and the outdoor temperature affects the air-to-water heat pumps' performance.

ODT (Outdoor Design Temperature) [°C]

Outdoor winter design temperature – depends on climate data station and time constant (thermal inertia) for the house, selected in input values. Normally selected as the temperature that is not exceeded only 1% of the year; outdoor design temperature 99%. You are able to change ODT in power mode under input values.

Heating demand at ODT (Outdoor Design Temperature) [kW]

(100% of specified power load).

Heating demand at ODT (Outdoor Design Temperature) per area [W/m²]

100% power load / number of square metres in the property.

Heating demand and DHW at ODT (Outdoor Design Temperature) [kW]

heating demand – heating at 100% power load + average demand DHW output.

Total heating demand per year supplemented with heat recovery ventilation [kW] Energy demand for heating supplemented with heat recovery ventilation.

Savings

Shows the energy demands of the property before and after installation of the heat pump.

Seasonal coefficient of performance [-]

Corresponds to SCOP (Seasonal Coefficient of Performance) in

EN-14825:2016 for the selected property (energy demand/consumption).

Seasonal space heating energy efficiency η_s [%]

Corresponds to η_s in EN-14825:2016.

Total energy demand, heating and DHW [kWh]

Total calculated heating energy needed for heating and DHW in the property.

Total energy saving [kWh]

Total energy saving with the help of a heat pump and heat recovery ventilation.

Total consumption [kWh]

Total energy consumption for operation of heat pump and supplementary heater.

Primary energy before installation (PET) [kWh/(m²year)]

Energy per square metre per year without a heat pump according to regulation for new construction, calculated for selected climate data station.

Primary energy after installation (PET) [kWh/(m²year)]

Energy per square metre per year with a heat pump according to regulation for new construction, calculated for selected climate data station.

CALCULATION

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Heat pump

Displays key parameters that describe the heat pump's operation for selected demand.

Energy coverage [%]

The proportion of the heating energy demand supplied by the heat pump, not including peak electricity/supplementary power.

Power coverage [%]

The proportion of the heating power demand at ODT (Outdoor Design Temperature) supplied by the heat pump, not including peak electricity.

Max. supplementary power at ODT (Outdoor Design Temperature) [kW]

Highest supplementary power in addition to the heat pump during the year at ODT.

Max. electricity output HP at ODT [kW]

Electricity output consumed for compressor, etc. in the heat pump at maximum demand.

Max. total supplied power at ODT (Outdoor Design Temperature) [kW]

Supplementary power as well as electricity output, heat pump, total at demand.

HP TOL Primary flow temperature [°C]

Highest primary flow temperature for selected heat pump. At a higher primary flow, the heat pump shuts down. For air-to-water heat pumps, this is corrected for outdoor temperatures.

Bivalent temperature (supplementary heating colder than temperature) [°C]

Temperature when the maximum heating capacity from the heat pump is equal to the heating demand for the property. For colder outdoor temperatures, supplementary heating is needed to cover the heating demand.

On/Off mode warmer than [°C]

Temperature when the minimum heating capacity from the heat pump is equal to the heating demand for the property. For warmer outdoor temperatures, the heat pump cannot run continuously and needs to turn off and on.

Peak electricity DHW energy [kWh]

Heat energy from supplementary heating needed for DHW over the year.

Peak electricity DHW energy percent [%]

Proportion of energy for hot water production that requires supplementary heating.

Max. supplementary heating DHW [kW]

Calculated supplementary heating for DHW for external supplementary heating solely for DHW.

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Rock (only for Brine/water)

Shows requirements for minimum recommended active borehole and power and energy extraction for this.

Min. recommended active borehole [m]

The minimum recommended active borehole depth required to achieve savings in the calculation. Depth may need to be distributed over several boreholes according to CTC specs for different products.

Specific energy extraction [kWh/m]

Energy extraction per metre active borehole per year. This number is used to check whether the borehole has the correct dimensions.

Specific power extraction mean [W/m]

Power extraction per metre active borehole per year. This number is used to check whether the borehole has the correct dimensions.

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Specific power extraction max. [W/m]

Power extraction per metre active borehole at maximum power extraction from the borehole (at ODT (Outdoor Design Temperature)). This number is used to check whether the borehole has the correct dimensions.

Soil (only for Brine/water)

Shows requirements for minimum recommended soil hose and power and energy extraction for this.

Min. recommended soil hose [m]

The minimum recommended soil hose length required to achieve savings in the calculation. Length may need to be distributed over several hoses according to CTC specs for different products.

Min. C-C collector [m]

Minimum C-C distance between collector depending on annual mean temperature.

Min. depth collector [m]

Minimum recommended depth of collector depending on annual mean temperature.

Annual heat extraction [kWh/m²/year]

Calculated annual heat extraction per square metre, for comparison with permafrost limit.

Specific energy extraction [kWh/m]

Energy extraction per metre active soil hose per year. This number is used to check whether the length is correct.

Specific power extraction mean [W/m]

Power extraction per metre active soil hose per year. This number is used to check whether the length is correct.

Specific power extraction max. [W/m]

Power extraction per metre at maximum power extraction from the soil hose (at ODT (Outdoor Design Temperature)). This number is used to check whether the length is correct.

CALCULATION

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END CUSTOMER

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SETTINGS

Lake (only for Brine/water)

Shows requirements for minimum recommended lake hose

Min. recommended lake hose [m]

The minimum recommended active lake hose length required to achieve savings in the calculation. Length may need to be distributed over several hoses according to CTC specs for different products.

Specific energy extraction [kWh/m]

Energy extraction per metre active lake hose per year. This number is used to check whether the length is correct.

Groundwater (only for Brine/water)

Shows requirements for minimum flow and water consumption.

Flow requirements for groundwater [m³/år]

When ground water is not a closed circuit, a sufficient water reservoir is needed (depending on whether the water is fed back after use or if other inflow is sufficient). This figure shows how much water needs to be pumped up over the year for the specified property.

Operating flow [l/s]

Shows the operating flow needed under high load, for which the pump and access to groundwater must be dimensioned.

5. End customer

1. Fill in the name for the calculation.
2. Fill in customer information.
3. Copy address from calculation if the invoice address is the same address as the property from the calculation.
4. Search another address if not the correct address from the calculation.
5. If the address cannot be found in Google Maps, fill in manually.
6. Make sure the email address is filled in (required for sending mail later).

Example
CTC EcoPart 408

CALCULATION RESULTS **END CUSTOMER** QUOTATION REPORT DOCUMENT SEND SETTINGS

End customer information

The user of CTC Select is responsible for informing the end customer about storage of customer information as well as referring the customer that information can be removed on request. Contact: info@enertech.se

1 Object: Example

2 Customer name: Customer name

6 E-mail: customer@example.com

Phone: 01230123

3 COPY FROM ADDRESS

4 Search address: Klostergatan 4, 621 45 Visby, Sverige

Street: Klostergatan 4	City: Visby
Postal code: 621 45	Country: Sverige
Latitude: 57,6341133	Longitude: 18,2981757

5

57°38'02.8"N 18°17'53.4"E

Google Maps widget showing location in Visby, Sweden.

6. Quotation

1. See list of products
2. The price can be added/amended directly in this row.
3. View compatible tanks for heat pump in combination matrix.
4. Add row.
5. Search for product/tank by name and article number. Accessories for the heat pump are marked with * in the list and are displayed at the top.
6. Some regions allow tax deductions which can be activated using the checkbox.
7. Add your own discounts/installation cost to new rows.
8. Select whether to show price.
9. Select to whether to include in report.
10. Specify position number compared to principle schematic for the heating system.
11. Add notes.
12. Select whether to show on front page of report, max. 5 items in addition to the heat pump.

ctc #3513: Example
SELECT CTC EcoAir 510M

CALCULATION RESULTS END CUSTOMER **QUOTATION** REPORT DOCUMENT SEND SETTINGS

Quotation

Specification of main components Show price Include in report

+ ADD ROW Show on front page Art.-no. Pos. Specification Number Unit price (excl. VAT) Cost

Show on front page	Art.-no.	Pos.	Specification	Number	Unit price (excl. VAT)	Cost
<input checked="" type="checkbox"/>	587600001	VP A1	CTC EcoAir 510M	1	54340	54.340,00
<input checked="" type="checkbox"/>	587803001		CTC EcoZenith 1350 H	1	36750	36.750,00
<input type="checkbox"/>			Installation plumbing	16	700	11.200,00
						Total net 102.290,00
						VAT Excluded
						Total cost 102.290,00

Specification contains main components Prices listed according to current pricelist 2018-07-04

Notes
Installation includes return visits for correction/control of heat curve and settings during the forthcoming six months after installation.

CALCULATION RESULTS END CUSTOMER QUOTATION REPORT DOCUMENT SEND SETTINGS

Combination matrix

3



	CTC EcoZenith i250	CTC EcoZenith i350	CTC EcoZenith i550	Pro CTC EcoLogic Family/Pro
CTC EcoAir 406	✓	✓		✓
CTC EcoAir 408	✓	✓	✓	✓
CTC EcoAir 410	✓		✓	✓
CTC EcoAir 415				✓
CTC EcoAir 420				✓
CTC EcoAir 510M	✓	✓		
CTC EcoAir 520M	✓	✓	✓	✓
CTC EcoPart 406	✓	✓	✓	✓
CTC EcoPart 408	✓	✓	✓	✓
CTC EcoPart 410	✓	✓	✓	✓
CTC EcoPart 412	✓	✓	✓	✓
CTC EcoPart 414			✓	✓
CTC EcoPart 417			✓	✓
CTC EcoPart 425			✓	✓
CTC EcoPart 430			✓	✓
CTC EcoPart 435			✓	✓

QUOTATION REPORT DOCUMENT SEND SETTINGS

8

9

Show price Include in report

3

SHOW COMBINATION MATRIX

Pos.	Specification	Number	Unit price (excl. VAT)	Cost
VP A1	CTC EcoAir 510M	1	54340	54,340.00
	CTC EcoZenith i350 H	1	36750	36,750.00
	Charge pump			0.00
			Total net	91,090.00
			VAT	Excluded
			Total cost	91,090.00

5

Prices listed according to cu

- * CTC Charge pump 25/75-130 10-12kW
- * CTC Charge pump 25/85-130 14-22 kW
- CTC Charge pump 15/75-130 10-20 kW
- CTC Charge pump 25/70-130 6-8 kW

7. Report

1. Add/remove parameters from the report.
2. Select declarations. Edit them and add you own versions.
3. Preview report.
4. Control logo - the company logo should appear, if not - send a mail to info@enertech.se and ask if they can upload a logo on the company account. Only administrators can upload logos.
5. Upload report to calculation. (You have to save before doing this).
6. Select the next tab - Documents.

Report

Components 1 Include in report

Heating demand at ODT per area	<input type="checkbox"/>
Seasonal space heating energy efficiency, ns	<input checked="" type="checkbox"/>
Primary energy before (PET)	<input type="checkbox"/>
Primary energy after (PET)	<input type="checkbox"/>
HP TOL outdoor temperature	<input type="checkbox"/>
HP TOL water outlet temperature	<input checked="" type="checkbox"/>
Bivalent temperature	<input checked="" type="checkbox"/>
On/off mode warmer than	<input type="checkbox"/>
Supplementary heating energy DHW	<input checked="" type="checkbox"/>
Supplementary heating energy DHW %	<input type="checkbox"/>
Max. supplementary heater for DHW at ODT	<input type="checkbox"/>
Quotation	<input checked="" type="checkbox"/>

Declarations 2 Include in report

When calculating, xx kWh / year has been withdrawn for electricity consumption of household appliances.	<input checked="" type="checkbox"/>	<input type="button" value="edit"/>
The calculation assumes installation with CTC EcoLogic	<input type="checkbox"/>	<input type="button" value="edit"/>
The calculation assumes installation with CTC EcoZenith i 250	<input type="checkbox"/>	<input type="button" value="edit"/>
The calculation assumes installation with CTC EcoZenith i 350	<input type="checkbox"/>	<input type="button" value="edit"/>
The calculation assumes installation with CTC EcoZenith i 550pro	<input type="checkbox"/>	<input type="button" value="edit"/>
Energy consumption seems to be low. Theoretically, a property of the specified size consumes approximately xx m³ of oil kWh / year.	<input type="checkbox"/>	<input type="button" value="edit"/>
Energy consumption seems to be high. Theoretically, a property of the specified size consumes approximately xx m³ of oil kWh / year.	<input type="checkbox"/>	<input type="button" value="edit"/>
The calculation is based on an assumed heat demand of xx W / m² at ODT, DHW is expected to be added with xx kWh / year	<input type="checkbox"/>	<input type="button" value="edit"/>
If other conditions apply, a new calculation should be made.	<input type="checkbox"/>	<input type="button" value="edit"/>

3

4



Energy savings calc. no: 3513
2018-06-20 page: 1/3
Our reference: CTC Select -
On behalf of: CTC (Head office)

Example
Customer name
Klostergatan 4
621 45 Visby

You're welcome, an offer for great energy savings!

The energy calculation is made from input in order to achieve great energy savings for your property, thanks to a heat pump from CTC.

We have the pleasure to recommend the following heating solution:

1 pcs CTC EcoAir 510M
1 pcs CTC EcoZenith i350 H

Energy savings: 20 680 kWh/year

Best regards
CTC Select -



The calculation is made from input & assumptions about the property listed in the following page.
Due to deviations from input there are no commitments for the results to be fulfilled.
ctcselect@enertech.se - 0072-68000 - http://www.ctc.se
CTC (Head office) - Nånsvägen 8, 341 34 Ljungby

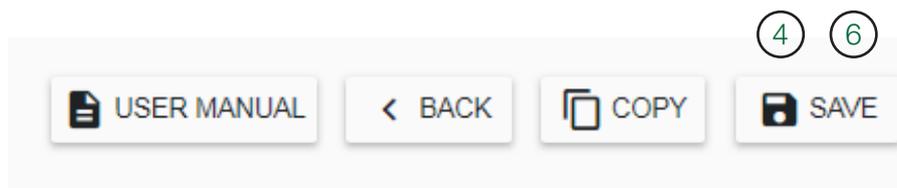


8. Document

This is where documents pertaining to the products listed in the quotation are shown.

You can choose to:

1. Download document.
2. Include link to document in email to customer.
3. Generate Ecodesign labels – a new window to download the Ecodesign labels is opened.
4. Save calculation – required to upload document.
5. Upload Ecodesign label and convert files to customer mail.
6. Save calculation again.



Document

Product documents
Only documents in the language selected in settings are displayed. Document type

1 2 3 Ecodesign

4 6

CTC EcoAir 510M

Article	Name	Type	File	Link in mail
16220186	Cover EcoAir	Assembly instructions	↓	<input type="checkbox"/>
16250003	Mounting Instructions Capillary tube kit	Assembly instructions	↓	<input type="checkbox"/>
17003507-en	CTC EcoAir 510M-520M	Leaflet	↓	<input type="checkbox"/>
F0006	CTC EcoAir 510M	Ecodesign produktdatablad	↓	<input checked="" type="checkbox"/>
16210599	CTC ECOAIR 520 3x400	Installation and Maintenance Manual	↓	<input checked="" type="checkbox"/>
16210597	CTC EcoAir 510M 3x400	Installation and Maintenance Manual	↓	<input type="checkbox"/>

5 Upload file

Name *

No file chosen

Select files to attach to mail

Report 3513 - 2018-06-20 - 10-24-11 325.9 kB

CTC EcoZenith i350 H

Article	Name	Type	File	Link in mail
16210568	CTC EcoZenith i350	Overview end customer	↓	<input type="checkbox"/>
16210569	CTC EcoZenith i350	Overview Electrics, HVAC & Plumbing	↓	<input checked="" type="checkbox"/>
16220194	CTC GSI 12 - Important about air venting	Informationsblad	↓	<input type="checkbox"/>
17005198-en	CTC EcoZenith i350	Leaflet	↓	<input checked="" type="checkbox"/>
16230139	Blpack CTC EcoZenith i350	Assembly instructions	↓	<input type="checkbox"/>
F0028	CTC EcoZenith i350 1x230V	Ecodesign produktdatablad	↓	<input type="checkbox"/>
F0029	CTC EcoZenith i350 3x230V	Ecodesign produktdatablad	↓	<input type="checkbox"/>
F0030	CTC EcoZenith i350 3x400V	Ecodesign produktdatablad	↓	<input type="checkbox"/>
16220522	CTC EcoZenith i350-en	Installation and Maintenance Manual	↓	<input checked="" type="checkbox"/>

CALCULATION RESULTS **1** END CUSTOMER QUOTATION REPORT DOCUMENT SEND SETTINGS

9. Sending email

1. Make sure that the email address is provided under CUSTOMER.
2. Send a copy to your own email address.
3. Write a personal message to the customer.
4. Send to customer.
5. View previous mails sent.

Send to customer

Send 4 **SEND** **Previous mails sent** 5

2 Copy to mail (Separate multiple addresses with space)
customer@example.com Copy to me

3 Personal message
Hello customer! Here's the calculation we talked about over the phone, let me know if you have any questions.

Preview
Note that the message will be sent in the language selected under settings.

Hello!

CTC Select , CTC (Head office) has on behalf of CTC (Head office) made an energy savings calculation in CTC Select calculation program based on your heat pump request and specified data for the property.

Attached to this mail you will find CTC energy savings calculation.

Here are links with additional information about the heating solution selected:

[CTC EcoZenith i350 - Leaflet.pdf](#) (1.4 MB)
[CTC GSi 12 - Leaflet.pdf](#) (1.3 MB)
[CTC GSi 12 3x400V - Ecodesign_produktdatablad.pdf](#) (182 kB)
[CTC EcoZenith i350 1x230V - Ecodesign_produktdatablad.pdf](#) (106 kB)
[CTC EcoZenith i350 3x230V - Ecodesign_produktdatablad.pdf](#) (106.9 kB)
[CTC EcoZenith i350 3x400V - Ecodesign_produktdatablad.pdf](#) (106.5 kB)

Hello customer! Here's the calculation we talked about over the phone, let me know if you have any questions.

CTC Select , CTC (Head office)
Näsvägen 8, 341 34 Ljungby
ctcselect@enertech.se

For removal or modification of the customer information specified in the calculation, contact the installer or info@enertech.se.

Attached files (325.9 kB):
[Report 3513 - 2018-06-20 - 10-24-11.pdf](#) (325.9 kB)

CALCULATION RESULTS END CUSTOMER QUOTATION REPORT DOCUMENT SEND **SETTINGS**

10. Settings

1. Select whether to share the calculation with colleagues.
2. Check box if quotation accepted.
3. Select language for calculation. The set user language is automatically used for a new calculation.
4. Select the region. Region includes country or market region. The region filters climate data and special rules that are activated when calculating. The set user region is automatically used for a new calculation.

Example
CTC EcoAir 510M

CALCULATION RESULTS END CUSTOMER QUOTATION REPORT DOCUMENT SEND **SETTINGS**

Calculation settings

Language* **3** English

Region* **4** England

1 Share with colleagues

2 Quotation accepted

