

## Results of Annual Simulation

Installed Collector Power:	10,54 kW	
Installed Gross Solar Surface Area:	15,06 m <sup>2</sup>	
Collector Surface Area Irradiation (Active Surface):	14,92 MWh	1.066,95 kWh/m <sup>2</sup>
Energy Produced by Collectors:	4,60 MWh	329,03 kWh/m <sup>2</sup>
Energy Produced by Collector Loop:	4,23 MWh	302,83 kWh/m <sup>2</sup>
DHW Heating Energy Supply:	5,08 MWh	
Space Heating Energy Supply:	10,14 MWh	
Solar Contribution to DHW:	3,38 MWh	
Solar Contribution to Heating:	856,22 kWh	
Energy from Auxiliary Heating:	11,69 MWh	

<b>Natural Gas (H) Savings:</b>	<b>496,2 m<sup>3</sup></b>
<b>CO2 Emissions Avoided:</b>	<b>1.049,30 kg</b>
<b>DHW Solar Fraction:</b>	<b>58,4 %</b>
<b>Total Solar Fraction:</b>	<b>26,6 %</b>
<b>Fractional Energy Saving (EN 12976):</b>	<b>26,2 %</b>
<b>System Efficiency:</b>	<b>28,4 %</b>

## Basic Data

### Climate File

Location:	Uccle
Climate Data Record:	"Uccle"
Total Annual Global Radiation:	958,8 kWh
Latitude:	50,8 °
Longitude:	-4,35 °

### Domestic Hot Water

Average Daily Consumption:	300 l
Desired Temperature:	50 °C
Load Profile:	Detached House (evening max)
Cold Water Temperature:	February:8 °C / August:12 °C
Circulation:	No

### Space Heating

Standard Building Peak Heating Load:	6 kW
Standard External Temperature:	-7 °C
Design Temperatures :	40 °C/25 °C

## System Components

### Collector Loop

Manufacturer:	Viessmann Werke GmbH & Co
Type:	Vitosol 200-FM
Number:	6,00
Total Gross Surface Area:	15,06 m <sup>2</sup>
Total Active Solar Surface Area:	13,98 m <sup>2</sup>
Tilt Angle:	30 °
Azimuth:	0 °




### Combination Tank (int HE)

Manufacturer:	Viessmann
Type:	Vitocell 340-M
Volume:	950 l

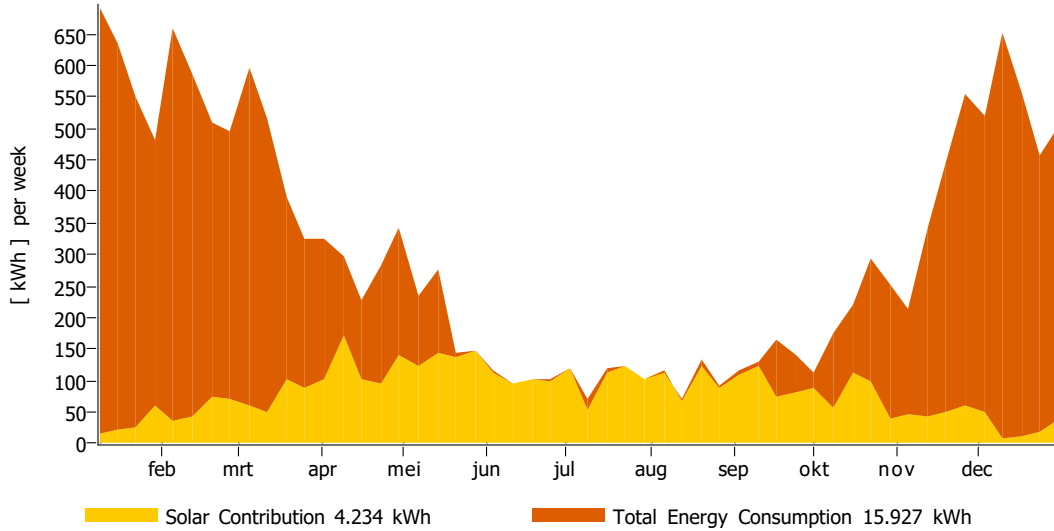
### Auxiliary Heating

Manufacturer:	 Viessmann
Type:	 Vitodens 200 8 - 32 kW
Nominal Output:	32 kW

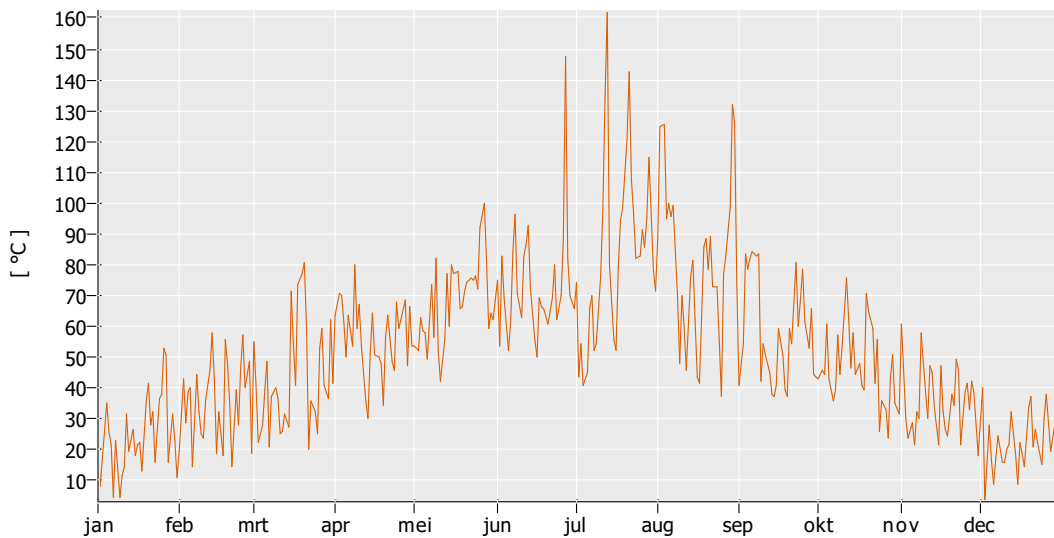
### Legend

	Original T*SOL Database
	With Test Report
	Solar Keymark

### Solar Energy Consumption as Percentage of Total Consumption

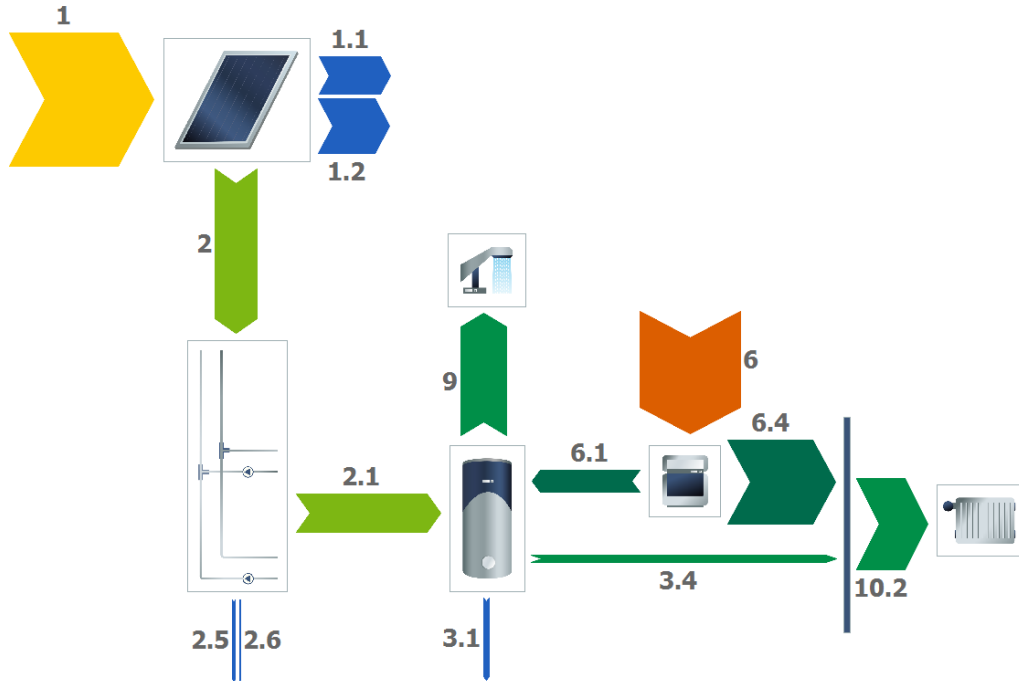


### Daily Maximum Collector Temperature



These calculations were carried out by T\*SOL Expert 4.5 - the Simulation Programme for Solar Thermal Heating Systems. The results are determined by a mathematical model calculation with variable time steps of up to 6 minutes. Actual yields can deviate from these values due to fluctuations in climate, consumption and other factors. The system schematic diagram above does not represent and cannot replace a full technical drawing of the solar system.

### Energy Balance Schematic



#### Legend

1	Collector Surface Area Irradiation (Active Surface)	14.916 kWh
1.1	Optical Collector Losses	4.147 kWh
1.2	Thermal Collector Losses	6.169 kWh
2	Energy from Collector Array	4.600 kWh
2.1	Solar Energy to Storage Tank	4.234 kWh
2.5	Internal Piping Losses	293 kWh
2.6	External Piping Losses	74 kWh
3.1	Tank Losses	704 kWh
3.4	Tank to Space Heating	856 kWh
6	Final Energy	11.267 kWh
6.1	Supplementary Energy to Tank	2.405 kWh
6.4	Supplementary Energy to Space Heating	9.288 kWh
9	DHW Energy from Tank	5.077 kWh
10.2	Heat to LT Heating	10.145 kWh

**Glossary**

- 1 **Collector Surface Area Irradiation (Active Surface)**  
Energy Irradiated onto Tilted Collector Area (Active Solar Surface)
- 1.1 **Optical Collector Losses**  
Reflection and Other Losses
- 1.2 **Thermal Collector Losses**  
Heat Conduction and Other Losses
- 2 **Energy from Collector Array**  
Energy Output at Collector Array Outlet (i.e. Before the Piping)
- 2.1 **Solar Energy to Storage Tank**  
Energy from Collector Loop to Storage Tank (Minus Piping Losses)
- 2.5 **Internal Piping Losses**  
Internal Piping Losses
- 2.6 **External Piping Losses**  
External Piping Losses
- 3.1 **Tank Losses**  
Heat Losses via Surface Area
- 3.4 **Tank to Space Heating**  
Heat from Tank to HT/LT Heating. For tanks with circulation, there is a solar contribution and a contribution from the temperature mix in the tank.
- 6 **Final Energy**  
Final Energy Current into System. This can flow in as natural gas, oil or electricity (not including solar energy) taking efficiency levels into account
- 6.1 **Supplementary Energy to Tank**  
Supplementary Energy (e.g. Boiler) to Tank
- 6.4 **Supplementary Energy to Space Heating**  
Supplementary Energy (e.g. Boiler) to HT/LT Heating
- 9 **DHW Energy from Tank**  
Heat for DHW Appliances from Tank (Excluding Circulation)
- 10.2 **Heat to LT Heating**  
Heat to Low Temperature Heating