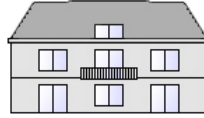


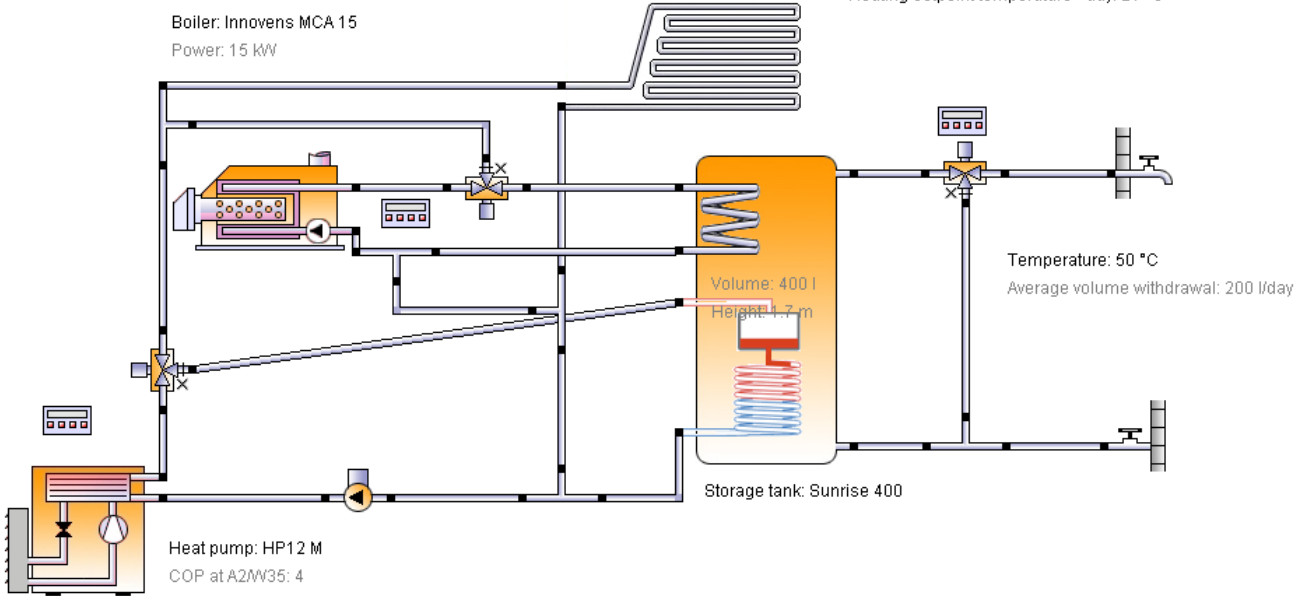
# Professional Report

Project

49b: Space heating (heat pump + boiler)



Building: Single family house, passive building  
Heated/air-conditioned living area: 210 m<sup>2</sup>  
Length of building : 10 m  
Width of building: 7 m  
Number of floors: 3  
Heating setpoint temperature - day: 21 °C



## Location of the system

Rapperswil SG  
Longitude: 8.82°  
Latitude: 47.23°  
Elevation: 417 m

## Map section

"Current report item is not supported in this report format."

## This report has been created by:

Vela Solaris AG

## System overview (annual values)

Total fuel and/or electrical energy consumption of the system [Etot]	2,565.9 kWh
Total energy consumption [Quse]	4,917.4 kWh
System performance (Quse / Etot)	1.92
Comfort demand	Energy demand covered

# Professional Report

## Overview heat pump (annual values)

Seasonal performance factor (without pump energy)	0
Seasonal performance factor for air-to-water heat pump	4.5
Total electrical energy consumption when heating [Eaux]	853.1 kWh
Total energy savings	3,025.6 kWh
Total reduction in CO2 emissions	1,622.9 kg

## Meteorological data-Overview

Average outdoor temperature	10.1 °C
Global irradiation, annual sum	1,103.5 kWh/m <sup>2</sup>
Diffuse irradiation, annual sum	578 kWh/m <sup>2</sup>

## Component overview (annual values)

<b>Boiler</b>		<b>Innovens MCA 15</b>	
Power	kW		15
Total efficiency	%		104.8
Energy from/to the system [Qaux]	kWh		1,784.9
Fuel and electrical energy consumption [Eaux]	kWh		1,703.5
<b>Heat pump</b>		<b>HP12 M</b>	
Heating power at A2/W35	kW		8
Electrical power at A2/W35	kW		2
COP at A2/W35			4
DeltaT at A7/W35	K		5
Performance factor			4.55
Energy from/to the system [Qaux]	kWh		3,878.6
Fuel and electrical energy consumption [Eaux]	kWh		853.1
Energy savings heat pump	kWh		3,025.6
CO2 savings heat pump	kg		1,622.9
<b>Building</b>		<b>Single family house, passive building</b>	
Heated/air-conditioned living area	m <sup>2</sup>		210
Heating setpoint temperature	°C		20.5
Heating energy demand excluding DHW [Qdem]	kWh		1,480.1
Specific heating energy demand excluding DHW [Qdem]	kWh/m <sup>2</sup>		7
Solar gain through windows	kWh		14,727
Total energy losses	kWh		26,197.2

# Professional Report

Heating element	Floor heating	
Number of heating/cooling modules	-	7
Power per heating element under standard conditions	W	1,000
Nominal inlet temperature	°C	35
Nominal return temperature	°C	30
Net energy from/to heating/cooling modules	kWh	1,473.2

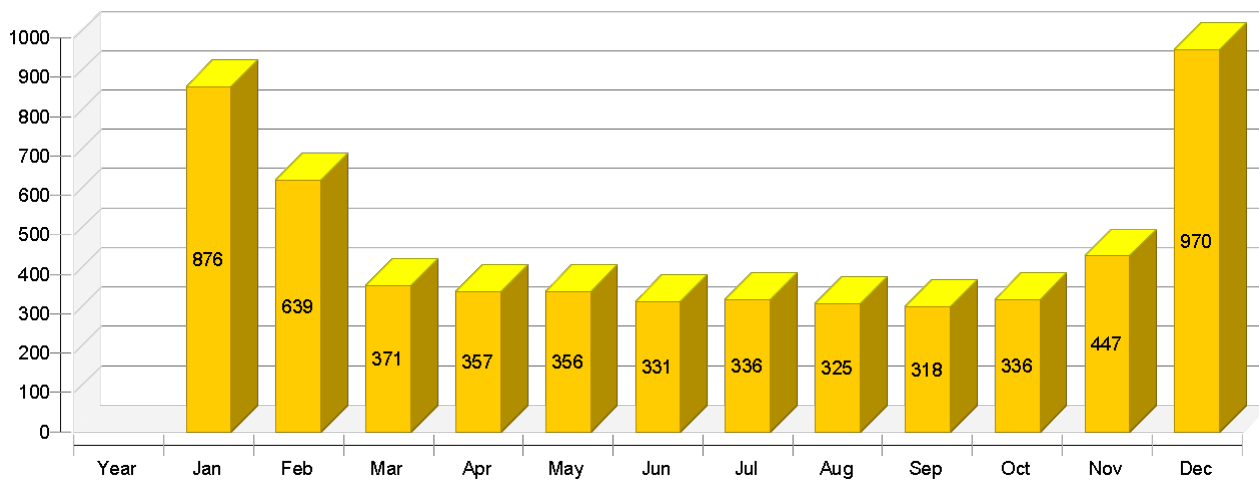
Hot water demand	Constant	
Volume withdrawal/daily consumption	l/d	202.1
Temperature setting	°C	50
Energy demand [Qdem]	kWh	3,421

Pump	Eco, medium	
Circuit pressure drop	bar	0.14
Flow rate	l/h	2,400
Fuel and electrical energy consumption [Epar]	kWh	9.3

Storage tank Potable water tank	Sunrise 400	
Volume	l	400
Height	m	1.7
Material		Stainless steel
Insulation		Rigid PU foam
Thickness of insulation	mm	80
Heat loss	kWh	294.6
Connection losses	kWh	275

Heat generator energy to the system (solar thermal energy not included) [Qaux]

kWh

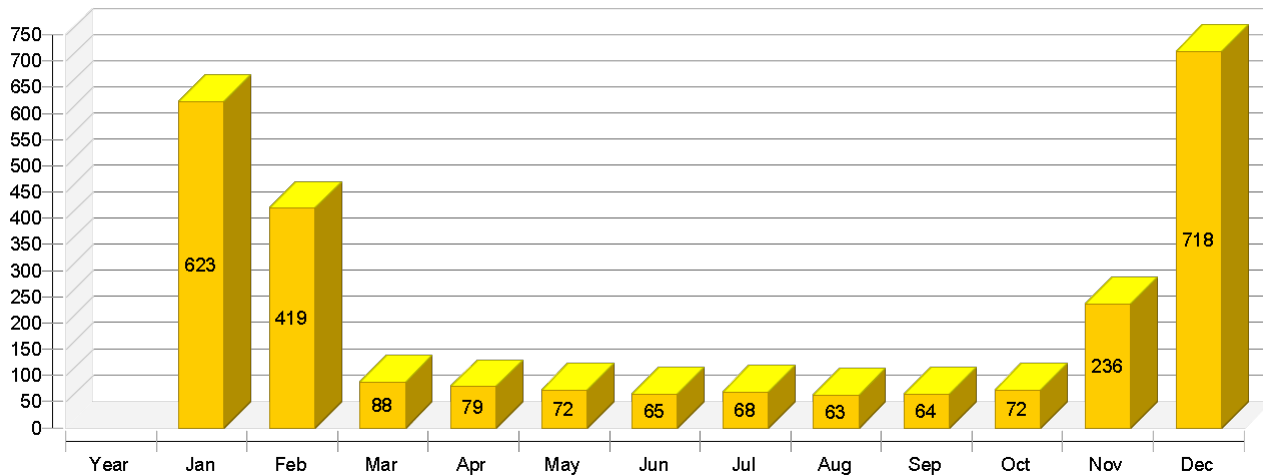


Demo Version

# Professional Report

Total fuel and/or electrical energy consumption of the system [Etot]

kWh



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Heat generator energy to the system (solar thermal energy not included) [Qaux]

kWh	5663	876	639	371	357	356	331	336	325	318	336	447	970
-----	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Heat generator fuel and electrical energy consumption [Eaux]

kWh	2557	622	419	87	78	71	64	67	63	63	71	235	717
-----	------	-----	-----	----	----	----	----	----	----	----	----	-----	-----

Total fuel and/or electrical energy consumption of the system [Etot]

kWh	2566	623	419	88	79	72	65	68	63	64	72	236	718
-----	------	-----	-----	----	----	----	----	----	----	----	----	-----	-----

Electrical energy consumption of pumps [Epar]

kWh	9	1	1	1	1	1	1	1	1	1	1	1	1
-----	---	---	---	---	---	---	---	---	---	---	---	---	---

Total energy consumption [Quse]

kWh	4917	809	580	314	297	294	273	270	264	255	271	385	907
-----	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Heat loss to indoor room (including heat generator losses) [Qint]

kWh	679	38	43	61	59	63	61	67	66	63	66	65	28
-----	-----	----	----	----	----	----	----	----	----	----	----	----	----

Demo Version

Demo Version

## Energy flow diagram (annual balance)

