SOLAR COMMAND

The Solar Control System

- Online control and monitoring system
- Created energy savings – reported every day
- Long term history of usage pattern for optimization and analysis
- All systems connected to Service Center for preventive maintenance

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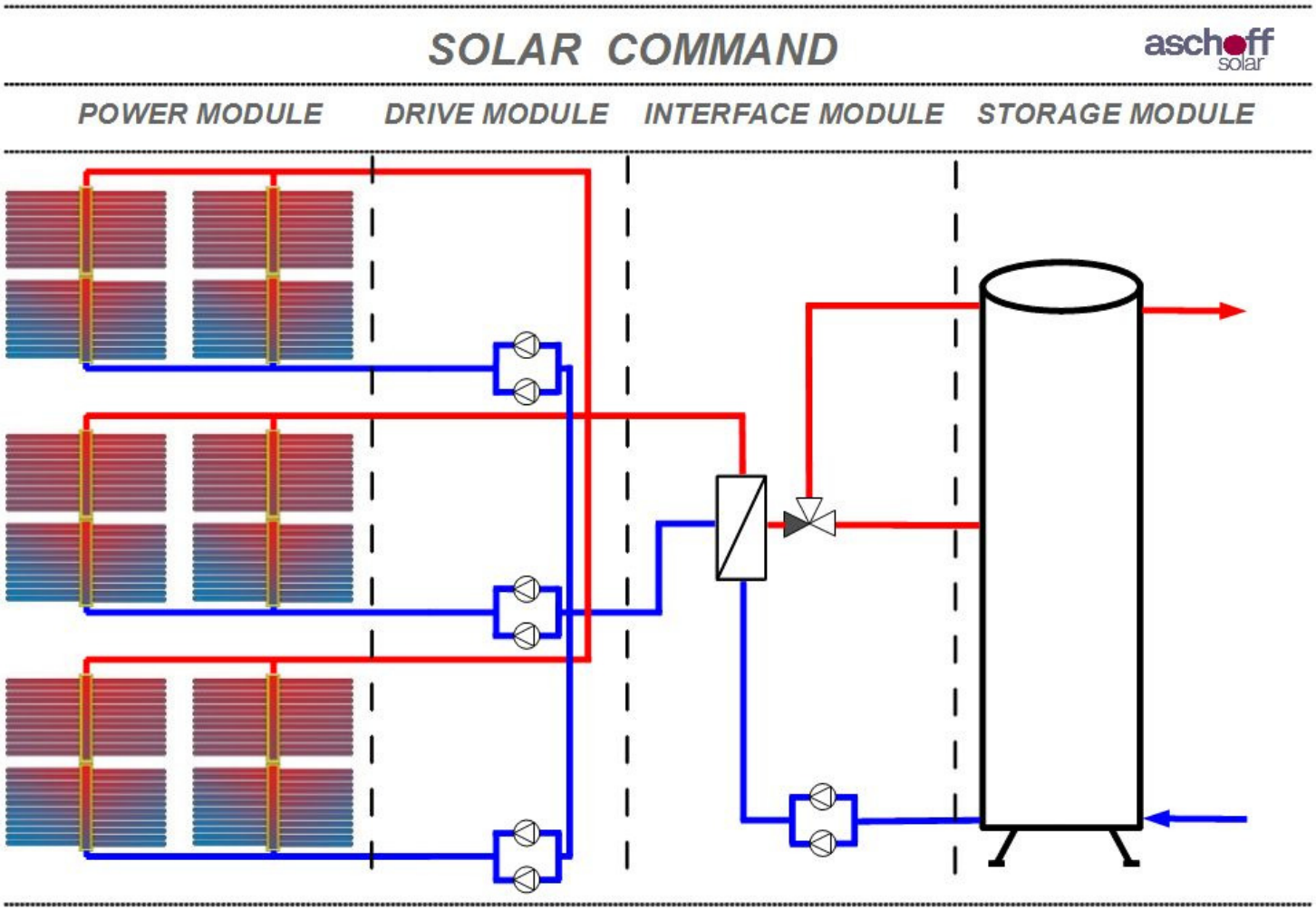
Aschoff Solar Thermal System



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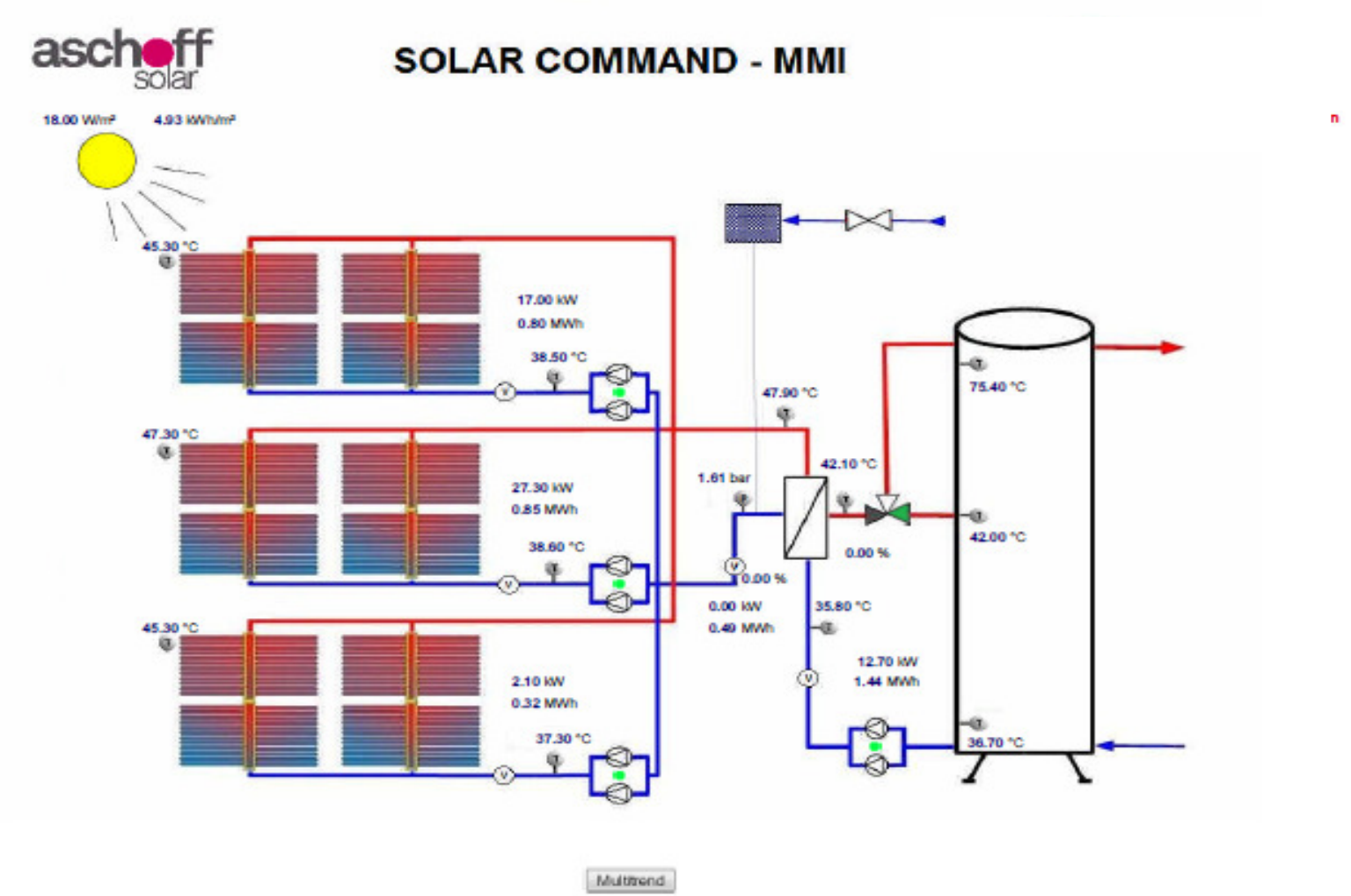
The Online Scheme of the System



All Sensors monitored

Multitrend Choice

Selecting variables for Multigraph

Start: 04.07.2011 End: 07.07.2011 SET

Select	Variable	Unit
☐	Buffer temperature bottom	°C
☐	Buffer temperature middle	°C
☐	Buffer temperature top	°C
☐	Current Heat Input Solar power primary	kW
☐	Efficiency heat exchanger secondary	%
☐	Efficiency solar plant primary	%
☐	Flow-Temperature secondary	°C
☑	Power solar unit 1	kW
☑	Power solar unit 2	kW
☑	Power solar unit 3	kW
☑	Release primarily solar pumps	On/Off
☑	Release secondary solar pumps	On/Off
☐	Return-temperature solar unit 1	°C
☐	Return-temperature solar unit 2	°C
☐	Return-temperature solar unit 3	°C
☐	Solar flow-temperature primary	°C
☐	Solar power current	kW
☐	Solar power secondary	kW
☐	Solar radiation	W/m²
☐	Solar return temperature	°C
☑	Solarpower from Sun	W
☐	System pressure	bar
☐	Temperature solar unit 1	°C
☐	Temperature solar unit 2	°C
☐	Temperature solar unit 3	°C
☐	Valve storage charge up	On/Off
☐	Valve storage charge below	On/Off
☐	Valve water replenishment	On/Off

Choice of any sensors for the graphic demonstration

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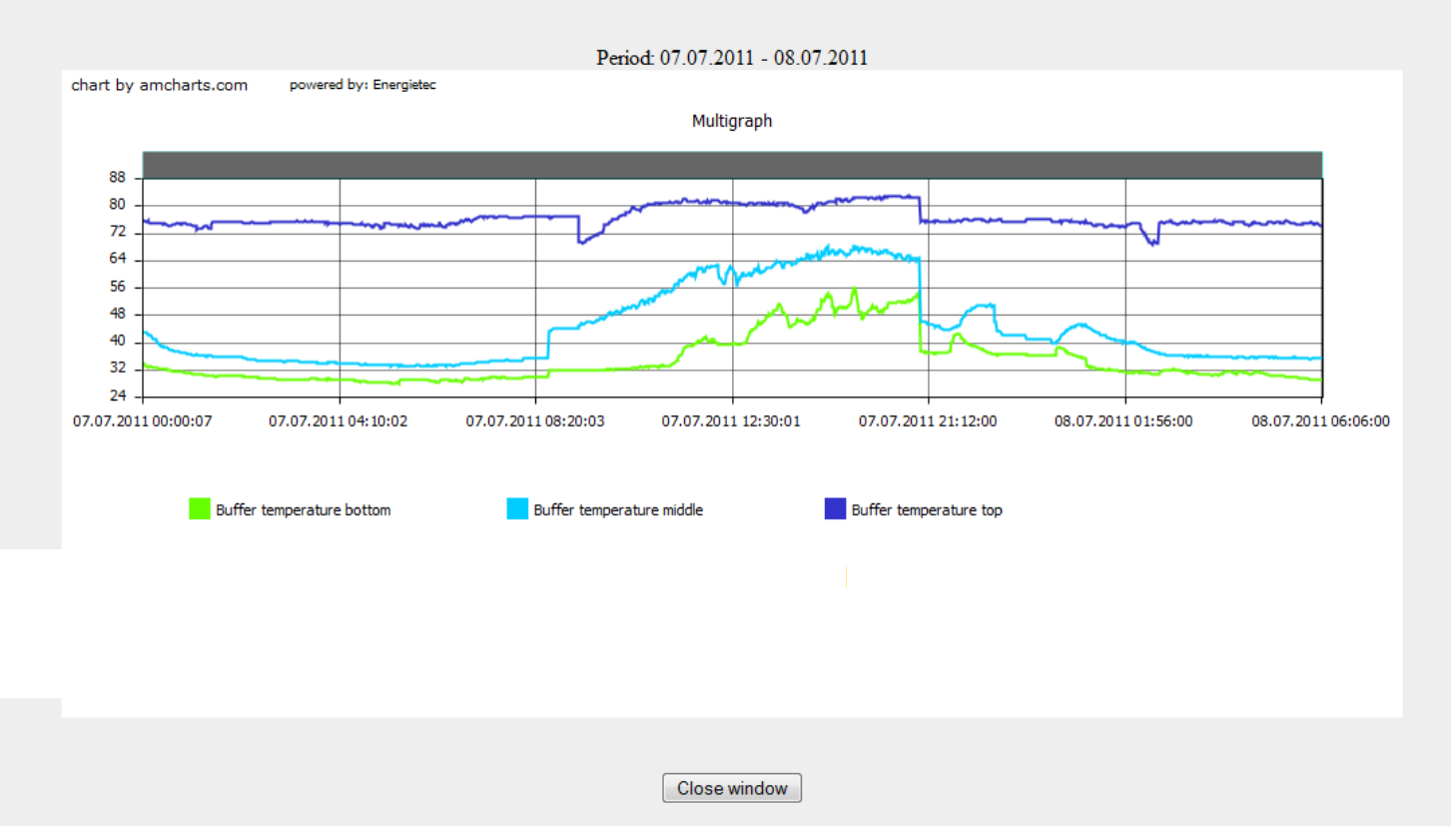
Multitrend Charts at Customers Choice



For an optimal analysis of the operation and conclusions of your processes and optimization possibilities

Continuous energy reports

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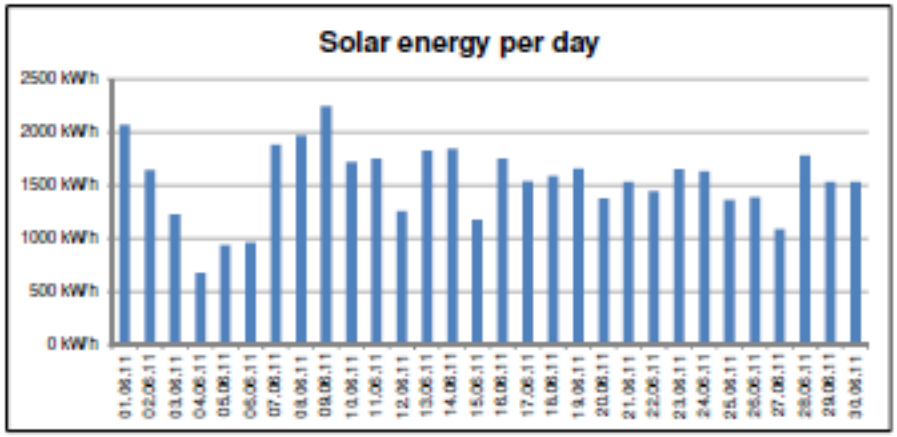
Data monitoring

Project:

June 2011	Solar irradiation (max.)	Solar outlet (max.)	Solar energy	Tank temperature		
				Bottom (max.)	Middle (max.)	Top (max.)
01.06.2011	737 W/m²	78.5 °C	2,069 kW/h	45.0 °C	66.0 °C	81.1 °C
02.06.2011	754 W/m²	73.7 °C	1,646 kW/h	53.7 °C	63.3 °C	82.1 °C
03.06.2011	626 W/m²	63.1 °C	1,224 kW/h	41.4 °C	55.4 °C	80.6 °C
04.06.2011	1001 W/m²	66.4 °C	676 kW/h	49.6 °C	57.9 °C	85.1 °C
05.06.2011	806 W/m²	61.7 °C	940 kW/h	48.7 °C	53.6 °C	80.7 °C
06.06.2011	494 W/m²	62.0 °C	962 kW/h	53.8 °C	57.6 °C	88.1 °C
07.06.2011	1027 W/m²	77.0 °C	1,881 kW/h	57.7 °C	68.0 °C	82.9 °C
08.06.2011	709 W/m²	83.6 °C	1,968 kW/h	57.7 °C	70.8 °C	81.4 °C
09.06.2011	802 W/m²	73.7 °C	2,244 kW/h	54.4 °C	65.9 °C	85.1 °C
10.06.2011	935 W/m²	68.4 °C	1,721 kW/h	41.0 °C	59.4 °C	82.5 °C
11.06.2011	786 W/m²	68.7 °C	1,751 kW/h	46.6 °C	62.1 °C	80.7 °C
12.06.2011	976 W/m²	73.1 °C	1,257 kW/h	56.9 °C	62.9 °C	81.2 °C
13.06.2011	826 W/m²	70.7 °C	1,827 kW/h	52.5 °C	62.6 °C	86.4 °C
14.06.2011	744 W/m²	78.0 °C	1,845 kW/h	38.2 °C	63.9 °C	86.7 °C
15.06.2011	457 W/m²	60.5 °C	1,177 kW/h	40.1 °C	52.8 °C	84.5 °C
16.06.2011	930 W/m²	69.8 °C	1,753 kW/h	49.2 °C	62.0 °C	86.4 °C
17.06.2011	817 W/m²	65.3 °C	1,539 kW/h	44.8 °C	56.4 °C	86.7 °C
18.06.2011	505 W/m²	69.0 °C	1,590 kW/h	61.8 °C	63.7 °C	85.9 °C
19.06.2011	699 W/m²	80.1 °C	1,659 kW/h	61.9 °C	70.3 °C	82.0 °C
20.06.2011	757 W/m²	64.8 °C	1,374 kW/h	53.8 °C	61.0 °C	87.6 °C
21.06.2011	743 W/m²	69.3 °C	1,530 kW/h	50.3 °C	60.9 °C	82.9 °C *
22.06.2011	650 W/m²	68.2 °C	1,445 kW/h	42.6 °C	58.3 °C	81.3 °C
23.06.2011	705 W/m²	73.5 °C	1,663 kW/h	57.8 °C	63.4 °C	81.7 °C
24.06.2011	919 W/m²	63.1 °C	1,634 kW/h	44.0 °C	55.9 °C	80.4 °C
25.06.2011	551 W/m²	59.0 °C	1,361 kW/h	43.5 °C	51.8 °C	80.5 °C
26.06.2011	709 W/m²	70.6 °C	1,388 kW/h	55.0 °C	63.4 °C	78.0 °C
27.06.2011	352 W/m²	60.8 °C	1,088 kW/h	50.3 °C	55.3 °C	80.7 °C
28.06.2011	796 W/m²	66.8 °C	1,785 kW/h	56.6 °C	59.7 °C	78.7 °C
29.06.2011	743 W/m²	69.3 °C	1,535 kW/h	50.3 °C	60.9 °C	82.9 °C *
30.06.2011	743 W/m²	69.3 °C	1,535 kW/h	50.3 °C	60.9 °C	82.9 °C *
Total June 2011:			46,060 kW/h			



* Monthly average of datas, because no internet access available

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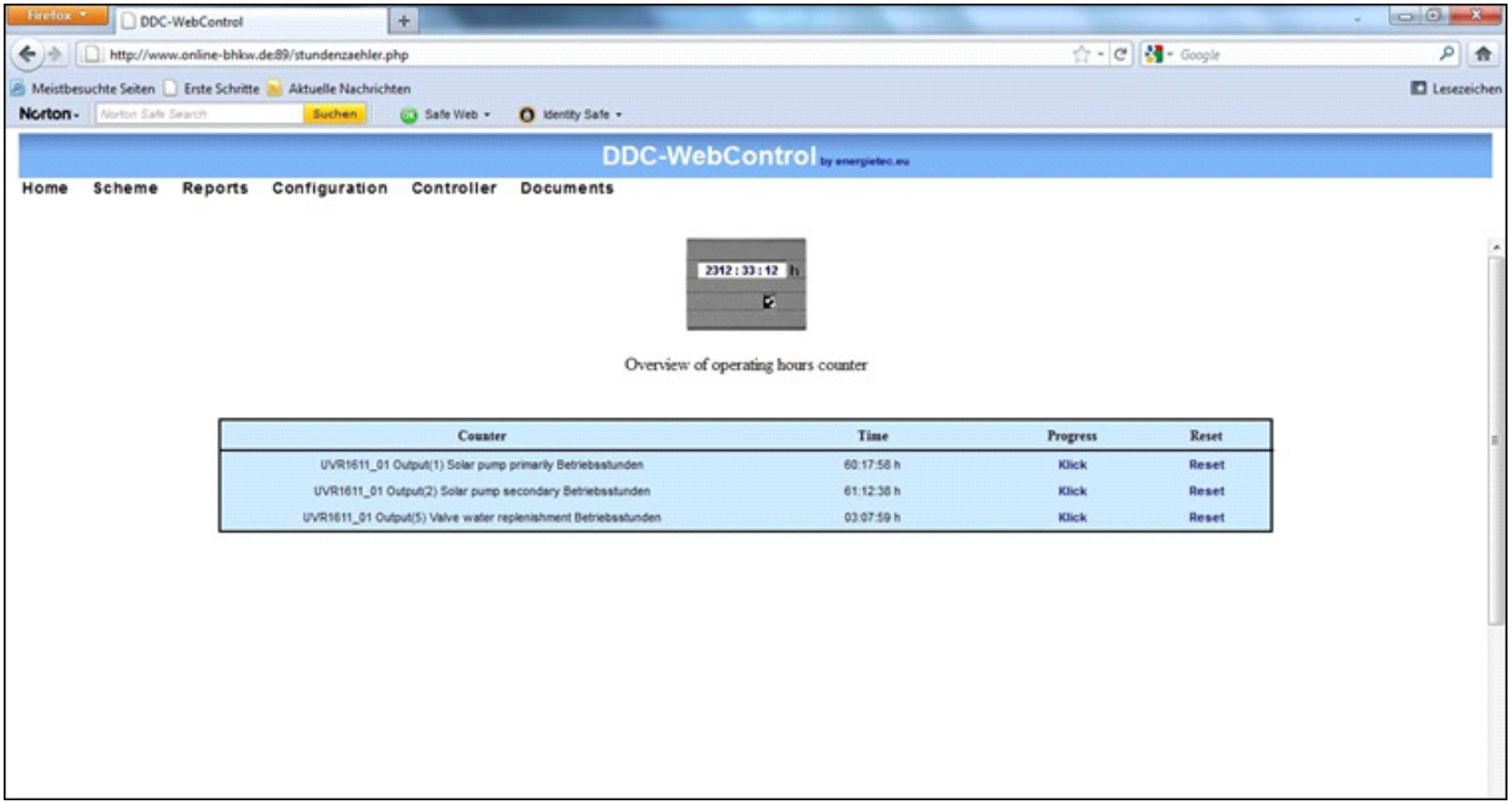
Report about Operation Hours



Error messages on screen and by mail

from: message from DDC-WebControl
to: Carsten Aschoff
ref: Error from XXXXX: 10.07.2011 11:56:35
sent: 10. Jul. 2011 16:56

Attention, following error has occurred: System pressure failure

from: message from DDC-WebControl
to: Carsten Aschoff
ref: Error from XXXXX: 10.07.2011 11:58:15
sent: 10. Jul. 2011 16:56

Attention, an error from XXXXX has been eliminated

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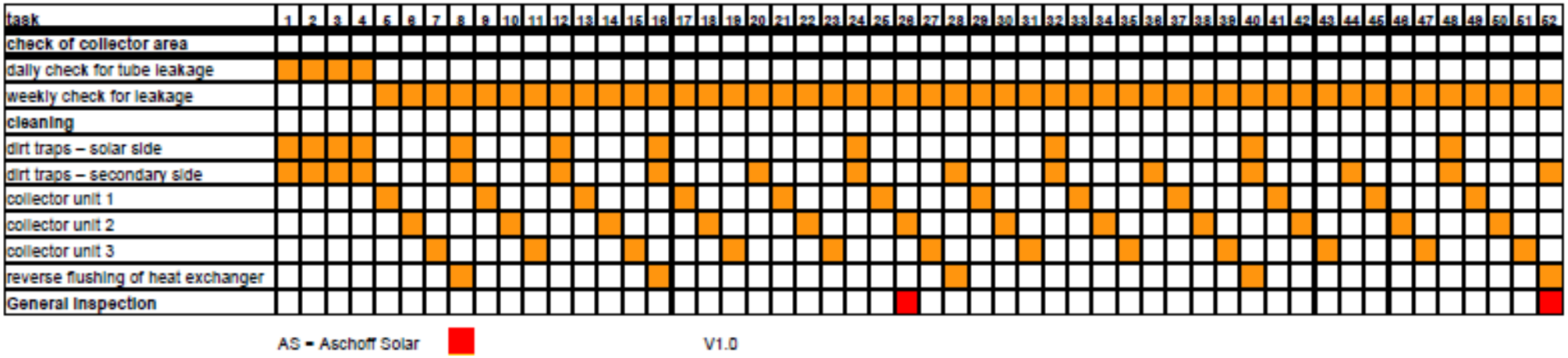
Maintenance Schedule

project:

Start of operation



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