

# ClimateWell™ 20



User Manual



## Thank you for choosing ClimateWell 20!

With Solar Cooling you will feel better...and so will the Environment!

### **Solar energy day and night**

Solar powered heating and cooling both day and night. This is what makes the ClimateWell 20 a unique product and that will enable you to enjoy comfort cooling and heating without compromising the environment. For the first time, a solar powered climate solution meets the requirements of a single family home. We made Solar Cooling possible and profitable.

### **Contribution**

Solar Cooling typical monthly savings for a single family home are 100-200 Euros. At the same time the family contributes to a better world by reducing CO<sub>2</sub> emissions by up to 15.000 kilos per year.

### **Independency**

With your own energy supply system installed you achieve high Independency of changes in energy prices at the same time as you get immediate savings thanks to the lower energy costs.

Some 25% of the world's CO<sub>2</sub> emissions come from heating and cooling of buildings. With ClimateWell this can now be done using everyone's own energy source. The Sun.



*Per Olofsson*

Per Olofsson  
CEO ClimateWell AB

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ClimateWell AB 2009-10-15

Article no: 700012

Version: **v9:32.1 EN**

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# User Manual

To prevent personal injury, damage to the machine or other property damages read the following information carefully before using your ClimateWell 20.



## Important Information

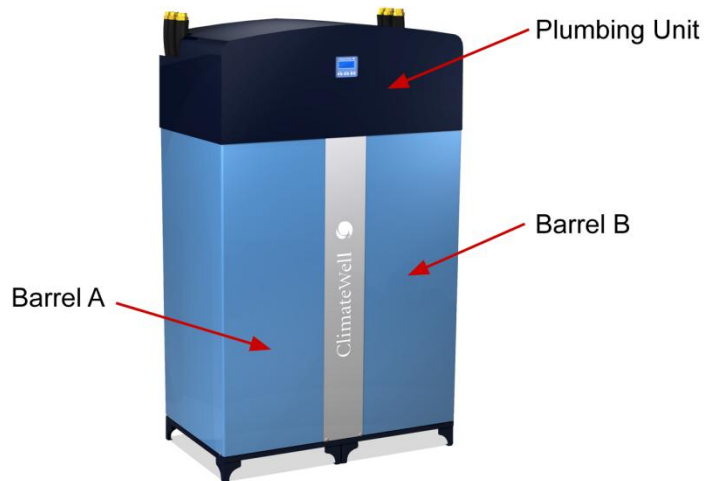
### Installation and Safety

- Only ClimateWell authorized installer are allowed to install, commission or in other ways change the machine.
- The inclination of the floor where the machine is finally placed and installed should be less than 1% or 10 mm per meter. Exaggerated tilting could cause irreparable damage to the machine.
- Never install or leave ClimateWell 20 outside without protection from rain and damp.
- Do not touch ClimateWell 20 with wet hands.
- Do not damage or otherwise modify the power supply cord.
- Make sure the supply cord is properly in place.
- If the supply cord is damaged, it must be replaced by the manufacturer, service agent or similarly qualified persons in order to avoid a hazard.
- If there is a strange smell or smoke coming from ClimateWell 20, turn it off and call an authorized installer.
- Do not wash ClimateWell 20 with running water.
- Keep children away from ClimateWell 20 at all times.
- Do not touch warm piping coming from or to the machine.
- Do not remove the covers of the machine or the screws holding them in place.
- ClimateWell's liabilities are restricted to the machine ClimateWell 20. For questions about the rest of the system please refer to the system installer.

## About Your ClimateWell 20

ClimateWell 20 is a highly efficient solar air conditioning unit with the unique ability to store energy and to deliver cooling and heating. The patented triple-state absorption technology allows ClimateWell 20 to be the first product to make efficient and integrated energy storage possible. ClimateWell 20 can operate in three modes – charging, heating and cooling. Charging mode stores energy by drying a salt (Lithium Chloride - LiCl) that subsequently can be used whenever required.

The ClimateWell 20 consists of three parts; two identical barrels that work independently and one plumbing unit that makes all the connections between the two barrels and the external system.



The ClimateWell 20 is always connected to three circuits:

- Thermal heat source (e.g. solar collectors)
- Air conditioning distribution system for cooling and heating (e.g. radiant floor, fan-coil units)
- Heat sink for charging and discharging (e.g. swimming pool, cooling tower, air cooled condenser or geothermal holes)

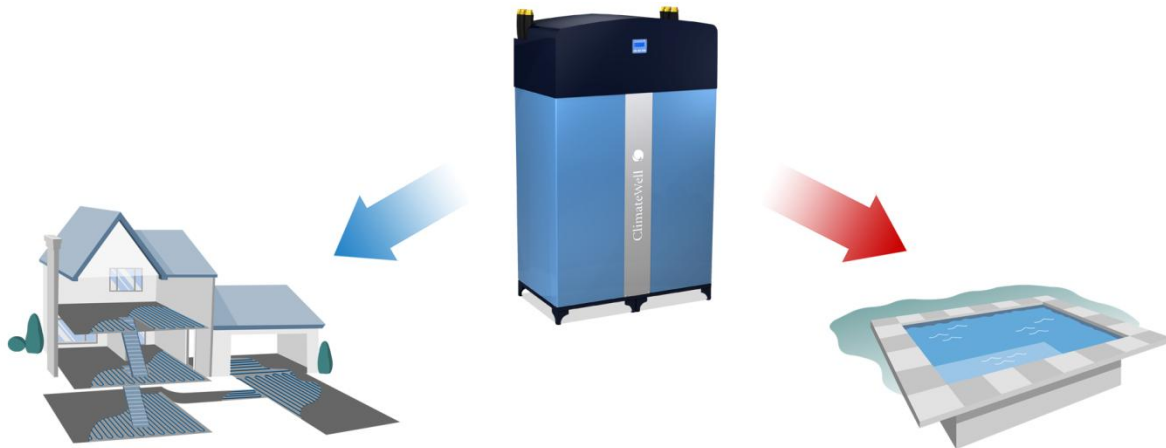
The two barrels work in two different states; charge or discharge. When a barrel is charging it is connected to the heat sink and the thermal source and when it is discharging it is connected to the heat sink and the air condition distribution system.

Normally the machine is working in normal mode which means that one barrel charges while the other one discharges. As a consequence the machine is always able to deliver cooling and use the delivered energy.

### Charge



## Discharge



When a barrel has charged until it cannot consume more energy or if the other barrel cannot deliver more cooling due to lack of charging, the ClimateWell 20 automatically makes a “**swap**”. This means that the barrel that was charging starts to discharge and the barrel that was discharging starts to charge.

The ClimateWell 20 has a control system which recognizes when the swap should take place. It then sends signals to the plumbing unit which automatically makes all the necessary connections. Read more about “swapping” later in this manual.

**! Please Note!** ClimateWell 20 cannot deliver any heating or cooling if both barrels are empty.

Should both barrels be fully charged, the ClimateWell 20 has a function that automatically dissipates energy to make further charging possible (when no heating/cooling delivery is needed).

The “**Level**” parameter also describes the level of charging. This level is determined by measuring the weight of the water in the barrels. For more information about “**Level**” and the “**Load Cell**” please see the Installation Manual.

## Operation Modes

ClimateWell 20 has four different operation modes; manual, normal, full cycles, double and timer.

The default setting is “**Normal**” which is the fully automatic mode and should always be used for normal operations in a standard installation. In this mode there is an automatic solar panel overheating protection. ClimateWell 20 automatically controls itself to deliver the set temperature to the indoor climate (e.g. air conditioning) circuit.

**! Please Note!** Always keep ClimateWell 20 in normal mode during normal usage.

For more information about the different modes please see page 10.

## Running the ClimateWell 20 in Normal Mode

When going into a new cycle, whether it is after changing mode, doing a restart or after a power failure the ClimateWell 20 will start discharging one barrel and charging the other barrel. This is decided by the barrel’s level (weight of the water in the barrel). The most charged barrel will start discharging.

## Control System Panel

The control system panel is located on the upper front of ClimateWell 20 and is where all the settings can be monitored, changed or adjusted.

### Navigation

The control system panel consists of one display and 6 buttons.



The two **MODE** buttons with arrows are used for moving up and down in the menus and also for increasing and decreasing values.



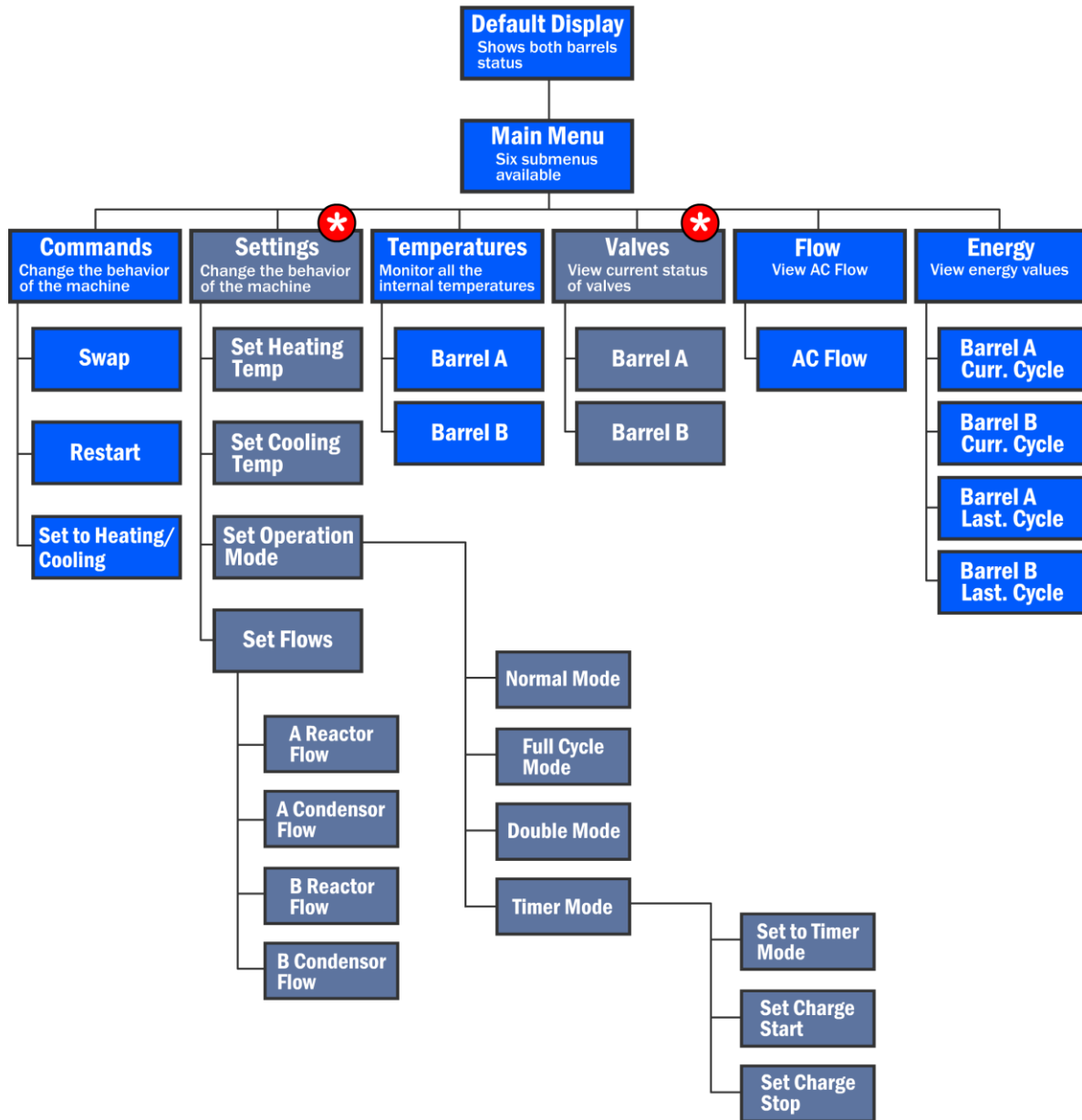
The **VALUE** buttons with a plus and a minus sign are used for increasing and decreasing the values and also for switching between barrel A and barrel B.



The **BACK** button is used for going back in the menus.  
The **ENTER** button is used for entering the different menus and also for confirming adjusted values.

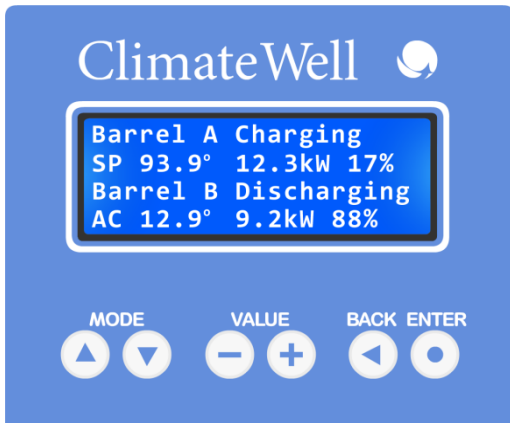
## Menus and Submenus

The following display map is an overview of the menus available in the control system display.



 *These menus are for advanced users and installers only.*

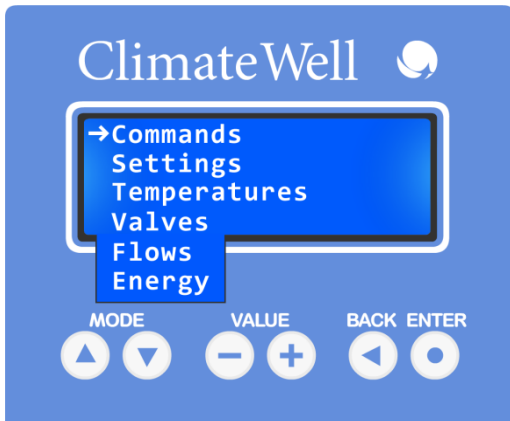
The *default display* shows both barrels charging/discharging status; SP/AC temperature and SP/AC power and level.



**SP** = Solar Panel/Thermal Source  
**AC** = Air Conditioning

### Main Menu

Go to the main menu from the default display by pushing one of the **MODE** buttons or the **ENTER** button. In the main menu there are six options available; Commands, Settings, Temperatures, Valves, Flows and Energy.



**MODE:** Move up and down in the menus.



**BACK:** Return to default display.  
**ENTER:** Open the selected submenu.

### Commands - Submenu

In the "Commands" submenu there are three options available; Swap, Restart and Set to Heating or Set to Cooling.





**MODE:** Move up and down in the menus.



**BACK:** Return to Main Menu.  
**ENTER:** Perform selected command.

**Swap**

When a barrel has charged until it cannot consume more energy or if the other barrel cannot deliver more cooling due to lack of charging, the machine automatically makes a **swap**. This means that the barrel that was charging starts to discharge and the barrel that was discharging starts to charge.

**! Please Note!** The ClimateWell 20 will automatically make a swap.

The machine’s control system recognizes when a swap should take place. It then sends signals to the plumbing unit which automatically makes all the necessary connections.

There are four control parameters that trigger a swap in normal mode:

1	<b>Charging barrel</b>	Level reaches 100% (LevelFull) will trigger a swap independent of discharging barrel status (Level).
2	<b>Charging barrel</b>	Level reaches above 80% (LevelLoaded) in combination with 3 or 4.
3	<b>Discharging barrel</b>	Level has reached below 40% and TC0/TR1 is higher than 0,67 (MaxTC0DivTR1) and TC0 is higher than 15°C (MaxTC0Temp) in combination with 2.
4	<b>Discharging barrel</b>	Level has been 3% (LevelEmpty) or less for 15 minutes (LevelEmptyCheckTime) in combination with 2.

**Restart**

Option to restart the ClimateWell 20 if necessary.

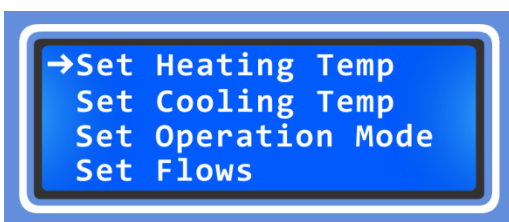
**Set to heating/Set to Cooling**

Option to set the ClimateWell 20 to heating or to cooling.

**Settings - Submenu**

**! Please Note!** This menu is for advanced users and installers only.

The Settings submenu contains four options to change the behaviour of the machine; Set Heating Temp, Set Cooling Temp, Set Operation Mode and Set Flows.



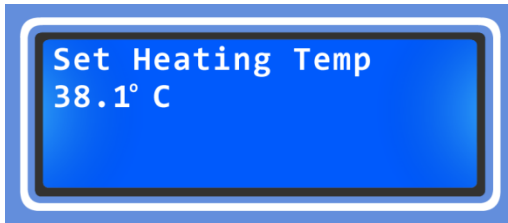
**MODE:** Move up and down in the menus.



**BACK:** Return to Main Menu.  
**ENTER:** Go to the selected setting.

**Set Heating Temp** is used for adjusting the temperature that ClimateWell 20 sends to the cooling/heating circuit during heating.

**Set Cooling Temp** is used for adjusting the temperature that ClimateWell 20 sends to the cooling/heating circuit during cooling.



Increase/decrease temperature by **1°**.



Decrease/increase temperature by **0.1°**.



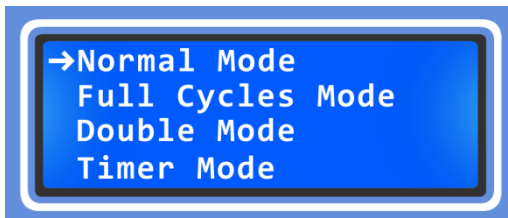
**BACK:** Return to Settings submenu *without* changing the temperature.

**ENTER:** Set the temperature and return to Settings submenu.

**Set Operation Mode** is used for changing the operation mode.



**Important!** Always keep your ClimateWell 20 in normal mode during normal usage.



Use the **MODE** buttons for moving up and down in the menus.



**BACK:** Return to Settings submenu.

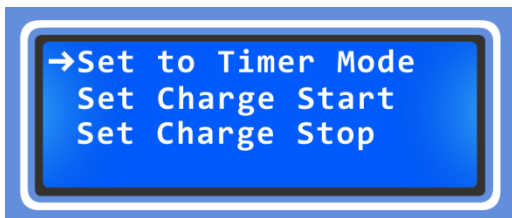
**ENTER:** Set the machine to the selected operation mode.

*Normal Mode* is the default and the fully automatic mode, where the barrels alternate in charging and discharging and are always ready to receive hot water from the heat source.

*Full Cycles Mode* is a special mode to use when not charging directly with solar panels, since there is no overheating protection in this mode.

In *Double Mode*, both barrels are charged and discharged at the same time. This results in higher cooling/heating power when discharging and higher charging power when charging.

In *Timer Mode* it is possible to set a time period for charging and discharging. For example when there is a need to charge in nighttime and discharge in daytime.



**MODE:** Move up and down in the menus.



**BACK:** Return to *Set Operation Mode* options.  
**ENTER:** Set the machine to *Timer Mode* or set charge start/stop time.



Use the **MODE** buttons to increase/decrease time by **10** hours.



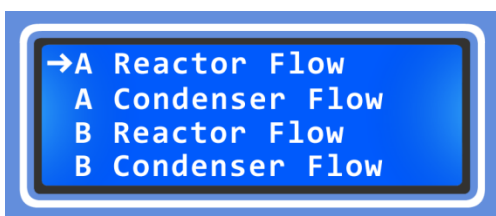
Use the **VALUE** buttons to decrease/increase time by **1** hour.



**BACK:** Return to *Timer Mode* options without changing the start/stop time.  
**ENTER:** Set the start/stop time and return to *Timer Mode* options.

**! Please Note!** For more detailed information about the different modes see under *Operation Modes*.

**Set Flows** is used to set the different flow values if no flow meters are present.

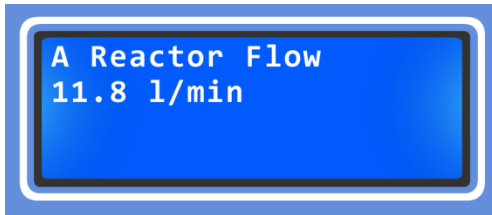


**MODE:** Move up and down in the menus.



**BACK:** Return to Settings submenu.  
**ENTER:** Go to the selected flow setting.

The flow values will be used to calculate power.



Increase/decrease value by 1 l/min.



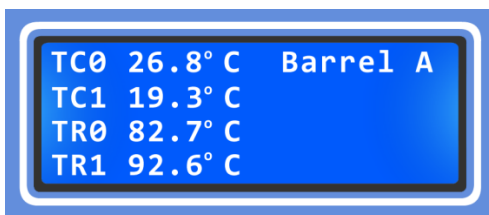
Use the **VALUE** buttons to decrease/increase value by 0.1 l/min.



**BACK:** Return to *Set Flows* without changing the flow value.  
**ENTER:** Set the flow value and return to *Set Flows*.

## Temperatures - Submenu

This submenu shows all the internal temperatures in ClimateWell 20. The correspondence of the temperatures depends of the state of the machine, if charging or discharging.



To change from barrel A to barrel B, simply use the **VALUE** buttons.



**MODE:** Move up and down to scroll through the temperatures.

## Charging


TC0	Heat sink circuit temperature from ClimateWell 20
TC1	Heat sink circuit temperature to ClimateWell 20
TR0	Thermal source (e.g. solar panels) circuit temperature from ClimateWell 20
TR1	Thermal source (e.g. solar panels) circuit temperature to ClimateWell 20

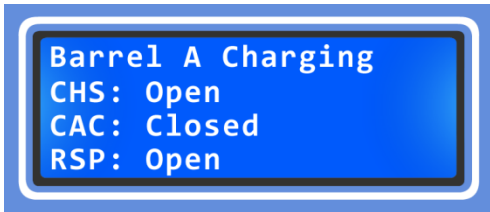
## Discharging

TC0	Air conditioning circuit temperature from ClimateWell 20
TC1	Air conditioning circuit temperature to ClimateWell 20
TR0	Heat sink circuit temperature from ClimateWell 20
TR1	Heat sink circuit temperature to ClimateWell 20

## Valves - Submenu

This submenu shows the current state of the valves and pumps, together with the state of the machine and if it is in cooling or heating mode.

 **Please Note!** This menu is for advanced users and installers only.



The reactor and condenser valves open or close the flow to two heat exchangers that exist in both barrels.

List of valves:

<b>CHS</b>	Condenser – Heat Sink
<b>CAC</b>	Condenser – Air Condition
<b>RSP</b>	Reactor – Solar Power
<b>RHS</b>	Reactor – Heat Sink
<b>RAC</b>	Reactor – Air Condition

## Flows - Submenu

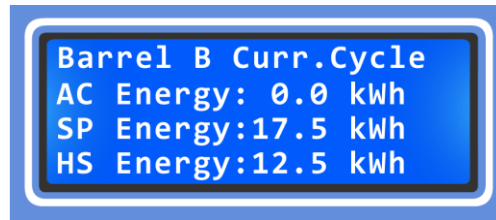
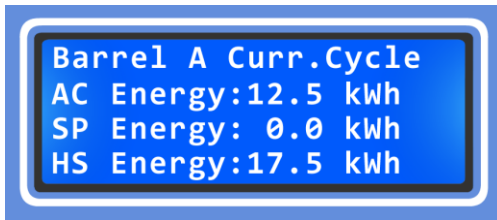
This submenu shows the different flows.



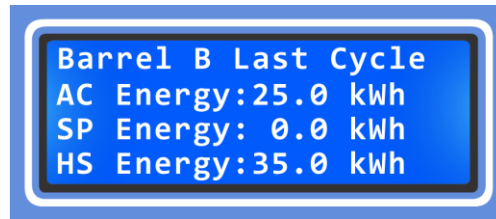
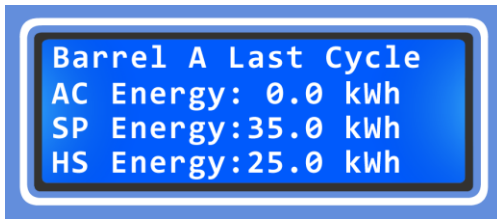
## Energy - Submenu

This submenu shows the different energy levels during cycles.

The *current cycle* display windows show the current energy levels going from 0 kWh and counting up. A swap is performed and a new cycle begins, starting from 0 kWh.



The last “performed” cycle for barrel A and barrel B can always be displayed by using the **MODE** buttons.



Use the **VALUE** buttons to change between Barrel A and Barrel B to see the energy values.



**MODE:** Move up and down to scroll switch between current and last cycle.

## Maintenance



**Please Note!** The machine does not require periodical maintenance but we recommend a review by your authorized ClimateWell installer after the first year. Please contact the sales representative to schedule the review.

## CE

ClimateWell 20 is certified according to the following EC directives:

89/336/EEG Electromagnetic Compatibility (EMC)  
2006/6/95/EG Low Voltage Directive (LVD).



Please see the “Declaration of Conformity” in Appendix A.

## Technical Data and Specifications

ClimateWell™ 20		
Measurements (H x W x D)	mm	2038 x 1211 x 807
Weight Total (with covers)	kg	990
Weight Plumbing Unit and Control Unit (with cover)	kg	78
Weight Barrel (with cover)	kg	456
Maximum Pressure in Circuits	bar	10
Total Volume in Circuits	liter	74,5
The Continuous Maximum Temperature	°C	120
Pressure Drops SP circuit 25l/min HS circuit 50l/min AC circuit 25l/min	kPA	30 38 45
Average Power Consumption over a Year	kWh	200
Freeze Protection Liquid		Use non-toxic antifreeze to protect the system in temperatures down to at least -5°C. For example using Propylene Glycol 1,2 L ≥ 15% concentration.
Energy Storage Capacity - Cooling	kWh	56 ( 28 per barrel )
Energy Storage Capacity - Heating	kWh	64 (32 per barrel ) *73 kWh if combined (both charging and discharging).
Energy for Charging (One Cycle)	kWh	57 per barrel

## Troubleshooting

If the ClimateWell 20 should stop delivering cooling, there are some simple tests to be made to make sure it behaves as it should. This is because there could be several reasons for the ClimateWell 20 to stop deliver cooling or stop consuming energy even when it is functioning correctly. One example is that it could be empty of energy.

Before you call for service please read the following:

PROBLEM	POSSIBLE CAUSE	SOLUTION
ClimateWell 20 does not deliver cooling/heating	<p><i>Has it been sunny the last couple of days?</i> If not the machine has probably not been able to charge and have no energy to use for producing cooling/heating.</p> <p><i>If it has been sunny, what is the level on the discharging barrel?</i> This is another measurement of the energy left in the machine. If the level is less than 10 % the barrel is empty.</p>	<p>If all these criteria are met wait 30 minutes to see if things change. In the beginning of the discharging cycle it could take up to 30 minutes before the barrel starts to deliver cooling/heating. If the machine has not begun delivering cooling/heating still after 30 minutes try choosing "Restart" in the command submenu. But only once!</p> <p>If the problem remains call an authorized installer for help, see Reference chapter.</p>
ClimateWell 20 does not swap although the barrel is full.	If the level is below 100 % the machine is not fully loaded.	

# Appendix

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Appendix A. Declaration of Conformity

## Appendix A

### *Declaration of Conformity*

The undersigned, representing the following manufacturer

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Herewith declares that the product

ClimateWell 20

is in conformity with the provisions of the following EC directives

89/336/EEG Electromagnetic Compatibility (EMC-directive)  
2006/6/95/EG Low Voltage Directive (LVD)

To which this declaration relates in conformity with the following standard:

EN 60 335-1 (2002)  
EN 50 366 (2003) + A2 (2005)  
EN 61 000-3-2 (2000) + A2 (2005)  
EN 61 000-3-3 (1995) + A1 (2001)  
EN 55 014-1 (2000) + A1 (2001) + A2 (2002)  
EN 55 014-2 (1997) + A1 (2001)

Documentation references;

EMC Test Report No 614612-1  
Verification of conformity with European Directive – Test Report 61469-01, EMF  
Verification No 614569/M – Test Report No 614569/M1

made by Intertek Semko AB and ITACA

Hägersten



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CEO

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ClimateWell

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## Reference

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ClimateWell

Due to our policy of ongoing development and improvement ClimateWell AB reserves the right to vary configurations, dimensions, availability, etc without prior notice.

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