

500 ltr.



Original
Operating & Brewing Instructions
for
Speidels Braumeister

Art. no.: 46500



updated April 2013



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1 General Remarks

Dear Client,

You have acquired a brand-new device from our company. We thank you for the trust placed in our products. Quality and functionality are our priorities when manufacturing our products.

Specified Conditions of Use:

The Braumeister has been designed and produced for brewing a quantity of about 5 hectolitres of beer. Before every new brew, the Braumeister should be checked that it is safe and in good working order.



Operating Instructions

We have written these operating and brewing instructions in order to ensure reliable and safe initial operation and use of the Braumeister from the very beginning. Please read these through carefully and completely before you get going on your first brew. If you follow these notes and instructions to the letter, your Braumeister will work to your complete satisfaction and give you a long life of service.



Declaration of Conformity:

The manufacturer, SPEIDEL Tank- und Behälterbau GmbH hereby declares that the product named "Braumeister" in these Instructions to which this Declaration refers, complies with the following European Directives:
EMC 2004/108/EC, Low Tension 2006/95/EC

Manufacturer:

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Krummenstrasse 2
72131 Ofterdingen
Germany
www.speidels-braumeister.de
www.speidel-behaelter.de

2 Safety Instructions

2.1 General Safety Instructions



- The device and the mains cable must be regularly examined for signs of damage. If damage is found, the device should not be used.
- Always remove the plug from the socket (pull on the plug, not on the cable), if you are not going to use the device any longer, for cleaning or in the event of a malfunction.
- Lay the mains cable so that it cannot come into contact with sharp-edged objects. The cable must be completely uncoiled.
- If you use an extension lead, it should have the same current capacity. This must also be completely uncoiled. Do not use a multiple socket unit since this device is too powerful. Avoid overloading the electric fuse protection. Because of the Braumeister's heavy current requirements, do not switch on any other large current-consuming devices on the same circuit. **Fire hazard!**

- The Braumeister may only be used for the purpose intended and with its safety devices in flawless condition. Make sure every time before you use it, that it is in good working order.

Children and the infirm:



- For the sake of children's safety, do not leave any packaging materials (carton, polystyrene, etc) lying within reach. Do not allow small children to play with plastic foil. **Danger of asphyxiation!**
- This device is not intended for use by persons (including children) with limited physical, sensory or mental abilities or those with lack of experience and/or lack of knowledge, unless they are supervised by a person responsible for their safety or receive instructions from them on how to use the device.
- Children should be supervised to ensure that they are kept away from the device and do not play with it.

2.2 Special Safety Instructions



- The container, the lid and attached parts become very hot. At the end of the brewing process, the kettle contains boiling wort. Observe the instructions on setting up. Never move the Braumeister when it is hot. When working on and with the Braumeister you should always use an oven cloth or gloves. **Danger of burns!**



- When lifting the lid, care should be taken that the condensed water on the underside of the lid runs back into the container. Thus hold the lid slanted over the container. **Danger of scalds!**



- Always carry out cleaning work on the Braumeister only with the plug removed from the mains (disconnected from the electricity supply). Do not spray-clean the device nor spray near the electrical components. **Danger of electric shock!**



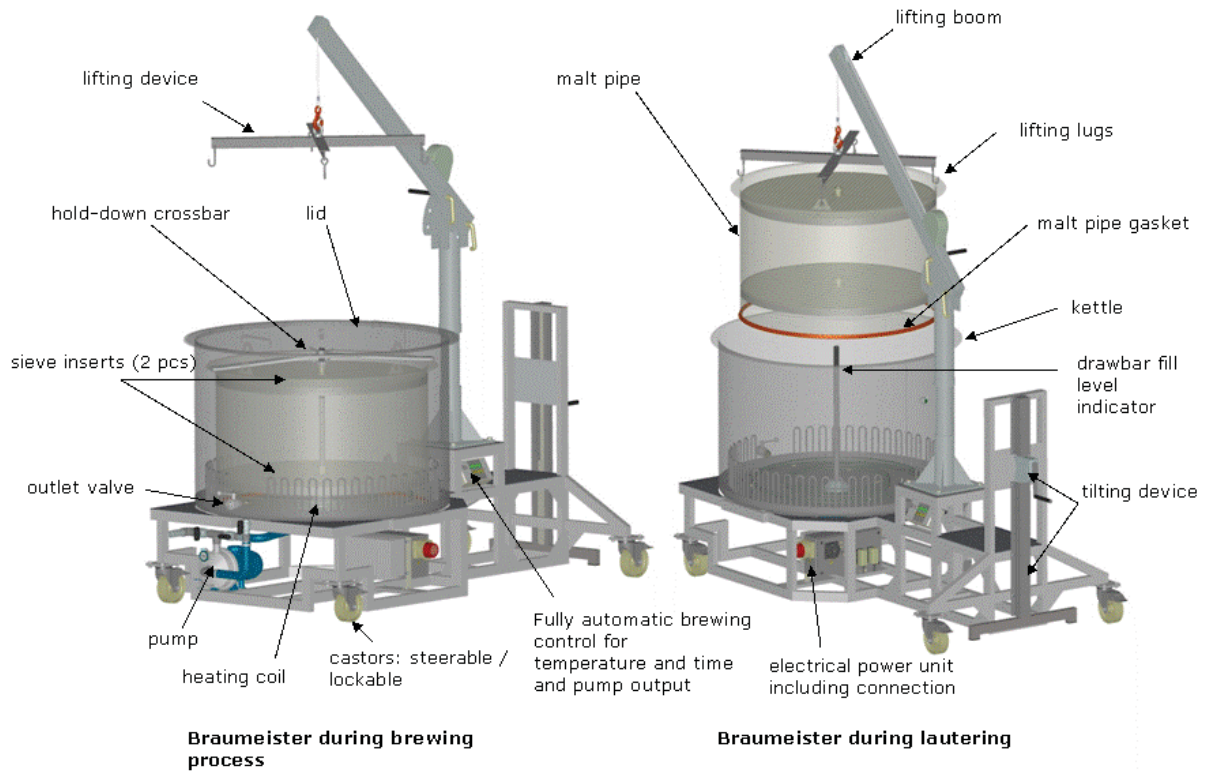
- Important note: When operating the control unit, it is compulsory that the snap couplings on the rear side of the power module (pump and heating) on the device are locked. Operating the device without the power unit couplings locked can lead to the danger of overheating. **Fire hazard!**



- For insulation purposes, please use the Thermo-Sleeve available as an accessory. If you use your own insulation, care should be taken that the electronics and the lower section of the Braumeister remain well ventilated, since otherwise a heat build-up can occur which might cause damage to the control system.
- Before each use, the pump needs to be primed to avoid it running dry. During automated operation, priming takes place of its own accord. During manual operation, the pump should be switched on and off several times until no more air bubbles are expelled.
- Observe the servicing and inspection notes in order to avoid dangers resulting from old, worn components.

3 Components and scope of delivery

For the parts of the device and scope of delivery, please see the figure below:



4 Technical Data on the Braumeister

Braumeister 500 litre

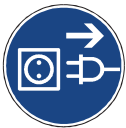
Weight:	380 kg with attached components and lifting device
Dimensions:	L 253cm x W 130cm x H 277cm
Heating coil:	6 X 3000 watt
Pump:	1 X 370 watt – with rotation speed control
Power supply connection	400 V ~
Minimum fuse protection:	32 amps
Total power consumption:	18.4 kW
Cooling:	Double jacket, surface area 1.8m ²
Contents:	Brew volume approx. 500 litres of finished beer (normal beer) = approx. 550 L of wort
Malt quantity:	maximum malt quantity 120 kg
Max. filling level:	top marking on the drawbar = 575 L

5 Setting up the Braumeister



The Braumeister should be set up before use or before brewing commences on a robust, stable and horizontal base. Note that when filled the Braumeister can weigh over 1000 kg and is filled with boiling hot wort. Recirculatory pumping of the contents during the brewing process assumes that the device is set up horizontally. Avoid an unstable, uneven base surface. During brewing, the Braumeister must not be moved. Keep children and the infirm well away from the device when in use. Equally, direct sunlight and extreme temperatures should be avoided.

6 Cleaning the Braumeister



The Braumeister should be cleaned immediately after brewing. Avoiding remains of wort and malt drying hard will make cleaning considerably easier. All stainless steel parts can be cleaned with a commercial household detergent. Abrasive sponges and brushes which cause scratches are not suitable. It is best to clean the heating coil with a washing-up brush. The pump and the piping including the valves must equally be thoroughly cleaned out. During cleaning with the recirculating pump on, open and close the valves. From time to time, the hoses/pipes should be removed and cleaned with a separate brush. When cleaning the kettle, care should be taken that no splashing water or damp gets into the electrical components. Disconnect the power supply to the Braumeister for cleaning. Before brewing, the Braumeister and its corresponding inner parts should merely be cleaned with warm water to remove dust and dirt. Likewise rinse the pump and pipes by circulating water. Warning: Remember to include the malt pipe gasket and the outlet valve. Ensure that there are no detergent traces left in the Braumeister which could have a negative influence on the maintenance of the foam. So that the valves can drip out and dry correctly, leave them open. To do this please observe the thorough cleaning instructions on Page 28 (cleaning kit available as accessory).

7 Storing the Braumeister

The Braumeister is to be stored dry. Avoid contact with objects containing iron or which are rusty.

8 Before the first use

Before the first use, the Braumeister is to be thoroughly cleaned with lukewarm water (See Section 6). Also observe the safe, upright mounting of the Braumeister as in Section 5. Make sure that the Braumeister is in good working order. Also note the Safety Instructions in Section 2. Otherwise the Braumeister is designed for immediate use.

9 Servicing and Maintenance

Observe the following servicing and maintenance notes and their recommended intervals.

Component	Before every brew	Every 12 months or after every 20th brew.	Every 24 months or after every 40th brew.
Lifting device	Inspect for damage	According to handbook for lifting device	
Crank mechanism for tilting (Art. No. 78030)		Oil as per separate instructions	
Hoses (Art. No. 77337)			Replace
Malt pipe gasket (Art. No. 77381)			Replace
Filter cloth (Art. No. 77350)		Replace	

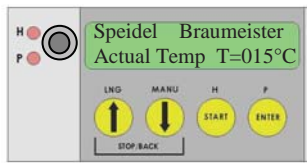
10 Waste disposal



Meaning of the "Rubbish Bin" symbol on the Braumeister: Take care of our environment; electrical components do not belong in the domestic refuse. For the disposal of electrical appliances use the collecting points provided and hand in your old appliances there. This way you help to avoid the potentially harmful effects of incorrect waste disposal on the environment and on human health. You contribute to recovering and recycling and to other kinds of re-use of old electric and electronic devices. Information on where to dispose of appliances can be obtained from your Local Authority.

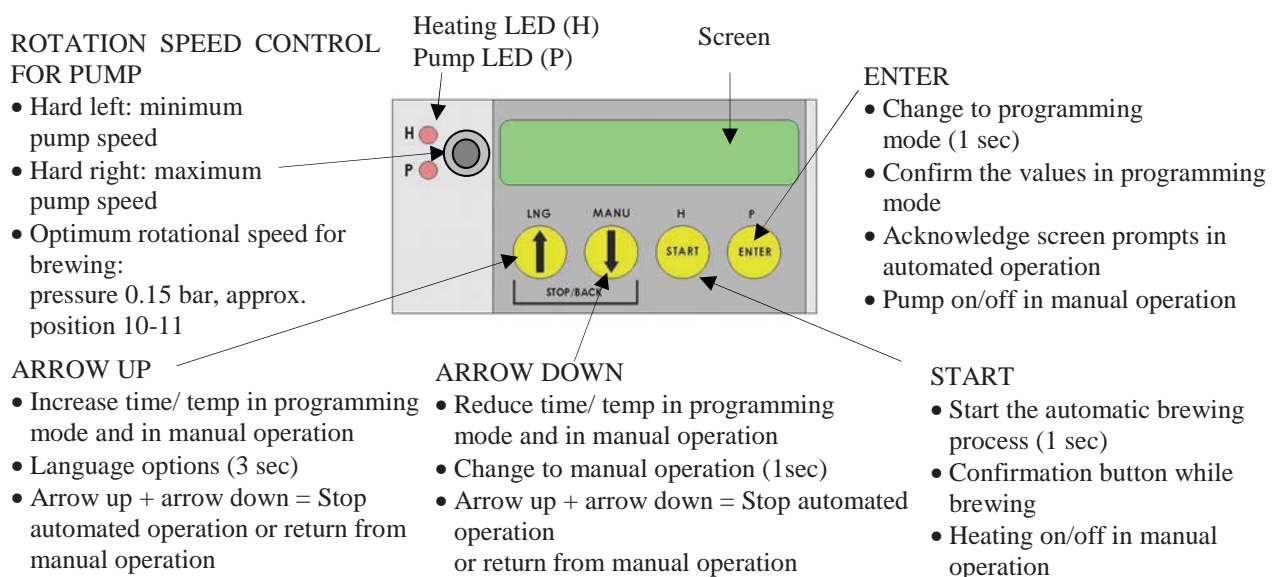
11 Working with the Braumeister

11.1 Choosing the language



From the start display you move to the language choice menu by pushing (3sec) the UP ARROW key (LNG). With the arrow keys you can choose between GERMAN, ENGLISH, FRENCH and SPANISH. ENTER confirms the language selected.

11.2 Notes on temperature control



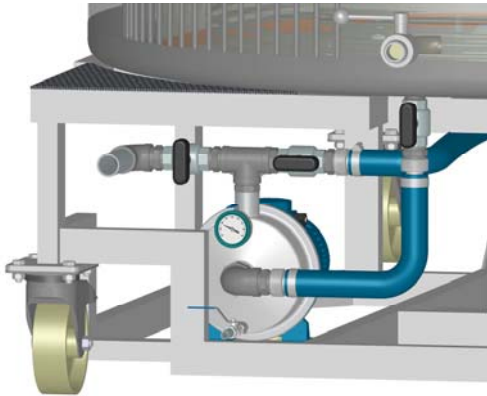
Automated operation: Begin with START (1 sec). The detailed description can be found in the following Section, "Brewing with the Braumeister".

Programming Mode: You move to programming mode with the ENTER key (1sec). The detailed description can also be found in the following Section, "Brewing with the Braumeister".

Manual operation: Press ↓ (1sec), to go to the Braumeister's manual operation. Using START, the heating (H) can be switched on/off. The pump (P) is switched on/off with ENTER. The temperature can be adjusted with the arrow keys. By simultaneously pressing ↓+↑, you return to the Braumeister's standby mode.

Program termination/Back: By simultaneously pressing ↓+↑, you jump back to the start screen from all operating modes (automated operation, programming mode and manual operation).

11.3 Notes on the circulation pump



In manual operation the circulation pump can be switched on and off with the "Enter" key or with "P". What is important is that after filling up with liquid, the pump is primed in manual operation, so that it operates at full output and that it does not run dry and become damaged. This is done by switching the pump on and off several times once it is filled with water (until no more bubbles are expelled). In automated operation this is done automatically. During brewing and in manual operation the pump switches off as a protective measure at a temperature of over 88°C of its own accord and only comes back on at 86°C. The rotational speed and thus the output of the pump can be regulated by the rotating knob on the control system. The optimum circulating pressure when brewing is just below 0.15 bar (which can be read off on the pressure gauge on the pump at the front during the mashing process). The pressure of 0.15 bar should not be greatly exceeded to avoid overpressure in the malt pipe. The pump output is restricted to approx. 0.2 bar.

11.4 Notes on the container lid.



During boiling, the lid helps to reach the temperatures quicker. At higher temperatures water condenses on the underside of the lid. When lifting the lid, care should be taken that the rim of the lid is held over the mouth of the kettle so that the condensation runs off (with lid held slanted) back into the kettle.

11.5 Notes on pipe layout and valve position

As standard the Braumeister has 3 stop valves and outlet valves on the underside as well as one valve on the kettle. The valves fitted at the bottom are to be turned to different positions depending on use and brewing phase. The top valve (outlet) on the kettle is to empty the wort and as an inlet for the whirlpool application. In the following description of the brewing process, the relevant valve positions are detailed once again.

11.6 Note on the lifting device

The lifting device consists of the boom, the winch, the cable and the cross beam with suspension hooks. Check these parts for damage before every brew or to ensure good working order. For more information and safety precautions, please read the separate manual supplied with the device. The cable is also to be checked for damage and needs to be monitored for deterioration due to aging (see also Section 9, Servicing and Maintenance). When the malt pipe has been hoisted out, the boom can be pivoted and lowered there. Once pivoted carrying the malt pipe, it should be lowered and relieved of the weight as soon as possible.

11.7 Notes on hygiene

Hygiene is the number-one rule when brewing beer. Above all during cold processes, (when cooling down, when decanting and when fermenting), the beer or the wort is



exposed to the danger of infection which can spoil the beer and means all the work was for nothing. So take particular care that containers (fermenting vessel, bottles) and utensils (ladle, valves, gaskets) are absolutely clean. Sulphurous acids or similar are particularly suitable for disinfecting these containers and utensils. These are available in specialist vintners' and home-brewing shops. The powder is mixed with water and diluted and is suitable for filling the airlock, for disinfecting the fermenting vessel, other tools and equipment and even one's hands. It is recommended to prepare, for example a bucket of sulphurous acid, where one's hands and the equipment can be disinfected during brewing and before decanting. The fermenting vessel is sealed with a little sulphurous acid inside and left standing for several hours. Now and then give the container a shake and before use empty it and allow to drip dry. Rinsing with water is not necessary. A few drops or remains of sulphurous acid in the beer are completely harmless. Disinfecting storage and maturing kegs is done the same way as with the fermenter. If the beer is bottled for maturing and storing in swing-top bottles after fermenting, the bottles are heated in the kitchen oven to disinfect them. The rubber seals are removed and boiled in water or washed in sulphurous acid. The bottles are heated in the kitchen oven to a temperature of approximately 130°C. Afterwards, let the bottles cool down to room temperature in the switched-off oven and close them with the disinfected seals. This guarantees that the fermented beer is bottled in absolutely clean bottles. This should be done several days before the fermentation finishes so that the bottling process can be carried out quickly but without fuss or rushing.

11.8 Notes on the double cooling jacket and water quality

In order to achieve optimum cooling, cold water should be used as the coolant. The greater the temperature difference between cooling water and wort temperature, the quicker cooling takes place. What is known as the "whirlpool effect" makes the wort move in a circle, which likewise accelerates cooling (on this see Section on "Cooling").

In order to avoid corrosion damage, blockages or bacterial growth in the double jacket, only clean water/cooling medium free of iron particles should be used. Consequently, avoid steel pipes/ fittings or similar in the feed line to the double jacket. Before use, it might be necessary to have the water analysed. You can protect your system against the entry of dirt or iron particles with sieves or filters.



12 Brewing with the Braumeister

12.1 Introduction

Making beer with the Braumeister can be subdivided into various phases, and here each phase is explained individually. These phases are first of all described in general terms as the brewing process applies to all types of beers and recipes. A concrete example of brewing for the beginner and a special recipe with the exact specifications on quantities, brewing times and temperature phases are given in the following Section. Before you start brewing beer, the best thing is first of all to get an overall idea of what the individual steps are which lead to the finished beverage. So that you leave no steps out, and looking back also have an overview of your brewing procedures, it is recommended that you keep notes. (See Brewing Record in the Annex or at www.speidels-braumeister.de). One more piece of advice: the first time you try brewing, you should give yourself a whole day and if necessary work with a second person, because it is just more fun, and you may well need the extra help. Bear in mind here that brewing beer also needs some experience and that you get better at it from one brew to the next. So don't be disappointed if the first beer doesn't quite come up to your expectations. A little verse expresses it well:

The first beer tastes so awful
that the farmer wets his trousers
as an example for the others.
The second beer is a mediocre score,
you drink three measures and then pee four.
The third beer is from the core,
men and women drink it gladly for ever more

12.2 Preparations

Getting hold of the ingredients

Acquire the necessary ingredients in time (hops, malt and yeast). Here it is important that the grain is freshly malted. After milling (crushing open the grains – not too fine) the malt should be used as soon as possible. The specifications on quantities vary somewhat depending on recipe, so that the malt quantity is around 90-110 kg and the hop quantity between 400-700 g. The hops are mostly available in compressed form (as pellets). Dried yeast is recommended for fermenting since it is easy to store and keeps for longer. These ingredients can be bought in home-brewing shops or on the internet. A third possibility for getting hold of the ingredients is from a brewery in your locality. Simply go and enquire!

Cleaning utensils

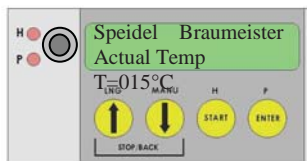
Before brewing, the Braumeister is rinsed out with warm water and the pump flushed through by switching on. The other utensils such as the hydrometer, ladle and fermenter are ready and waiting and likewise have been cleaned. On this, also see the notes in the Section "Notes on hygiene" and "Cleaning the Braumeister".

Softening the water for brewing

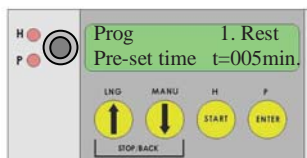
If necessary the brewing water can be softened. To do this, the water (cold tap water) is boiled in the Braumeister for 30 min, then cooled down and stored until brewing,

for example in the fermenter. The precipitated lime will have been deposited on the container bottom and is disposed of. The Braumeister has been designed for brewing approximately 500 L of finished beer (normal beer). So for this about 600-650 L of brewing water is needed. However, for the beginner or for the first trial brews, normal (hygienically acceptable, colour and smell-free) cold tap water is also perfectly useable, in order to keep the effort required at the start within reasonable limits. Generally speaking the brewing water should have a hardness below 14°dH [German water hardness scale]. The softer the water, the more suitable it is for brewing.

12.3 Programming/ Starting the automatic brewing process



Plug in the Braumeister and switch it "On" at the main switch at the bottom. The control system is then in start mode. To program a recipe and its time and temperature parameters, press the ENTER key for 1 sec.



Using the ARROW KEYS choose time and temperature, which you then confirm with ENTER. This is how to program the mashing, phases 1-5 and boiling the hops. Rest 5 is set to 0 and is only used for special recipes.

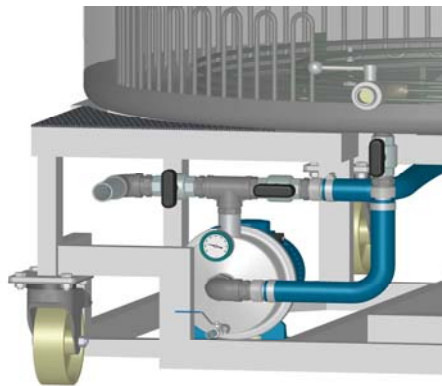


After confirming all the steps in the program with ENTER, you return to the start screen. From there you can start the automated brewing operation by pressing the START key (1 sec). Now follow the program's instructions!

12.4 Mashing

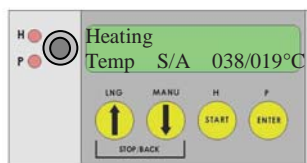
Mixing the crushed malt and water is known as mashing. The aim of the entire mashing process is to extract the starches stored in the malt and to transform them into sugar with the aid of the enzymes found in the malt. The different enzymes work at differing temperatures, which is why the various temperature stages follow one after another.

Mashing

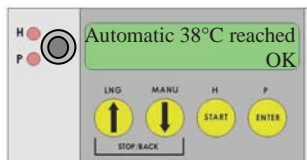


First of all the kettle is filled with 575 L of brewing water (up to the top mark). At this point, the malt pipe is not yet installed. The marks on the drawbar show the filling levels for 425 L, 500 L and 575 L. For the valve positions for the heating phase, please see the figure on the left.

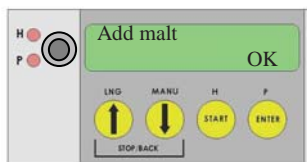
Confirm with START that you have added water.
The pump and the heating then switch on.
The pump switches on and off several times to prime.



The pump and the heating are switched on until the programmed mashing temperature is reached. The screen displays the Set/Actual temperature. Set the pump to approx. 80% of maximum setting (set to 10).

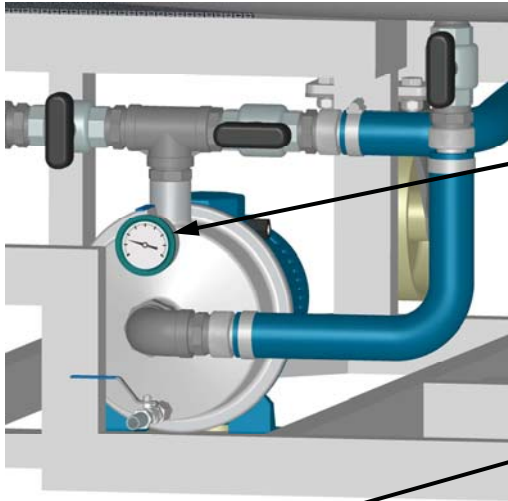


Once the mashing temperature is reached, a warning tone sounds which must be acknowledged with ENTER. This switches the pump off.

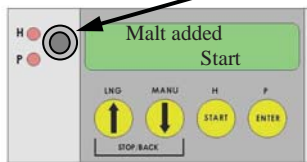


Now the malt pipe with the seal pointing to the bottom can be inserted in the kettle. Make sure that the pipe is clean, centrally inserted and standing horizontally on the bottom. Now insert the first strainer base (with the reinforcing cross facing downwards) in the malt pipe.

Now the entire malt quantity is poured into the malt pipe. Stir in the malt well with a ladle. Take care that the malt is poured in cleanly and is evenly distributed. Now lay the filter cloth over this and on top of this again the upper strainer insert (with the reinforcing cross downwards). To stop the sieve inserts floating upwards, the first wing nut is screwed on the thread of the drawbar and thus the sieve inserts are pressed downwards. Then the hold-down crossbar is laid on and tightening the second wing nut presses the malt pipe downwards to seal the malt pipe.



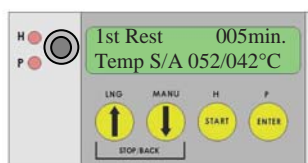
After adding the malt, set the valve positions as per the figure on the left (fully opened). Warning: The pressure in the malt pipe/pressure line may not rise significantly over 0.15 bar to avoid clumping of the malt with resultant limited agitation or even damage to the sieve inserts. For the ideal pressure set the rotation speed control to position 9-11 (dial position). The setting should be guided by the pressure in the pump, since this also varies depending on the malt quantity, the way it has been milled, and the recipe.



When you have added the malt, acknowledge with ENTER. For safety's sake, the question is repeated "Malt added?" By pressing START, you now start the actual brewing process with the Braumeister. The pump and heating switch on. The wort rises in the pipe and runs over. The cycle has started and during the next phases the important elements are extracted from the malt by the circulating wort.

Protein rest

At the protein rest the large protein molecules in the malt are broken down into smaller components. The protein rest is important for clearing and full-bodiedness, but particularly for the beer's foaming stability and capacity to bind carbonic acid. The temperature is approximately 52°C and is maintained for 0 to 10 min according to the recipe programmed.



The display now shows the rest, Set and Actual temperature and the time. After reaching the pre-set temperature, the time changes over to a countdown of the time remaining (flashing display) for this phase Further phases are processed fully automatically. The screen also shows the corresponding times and temperatures as in phase 1.

Maltose rest

During the second phase, the maltose rest, the starch molecules are converted into fermentable sugar by other enzymes that are present in the malt. This phase is an important stage of the brewing process for alcohol formation because this is when the largest amounts of sugar are formed. Extending the rest means gaining more sugar in the wort, which results in a stronger beer. Shortening the time means that the beer will have a fuller flavour due to having more dextrines. The temperature is approximately 63°C and is maintained for roughly 35 min. As in phase 1, the control system shows the relevant data on the screen. The rest of the process (phases 2 to 5) is handled completely automatically by the control system. During this the pump is switched off briefly every 10 min (PUMP PAUSE), in order to shift the malt to a new position and thus achieve a better yield. The Braumeister lid is kept on to save energy.

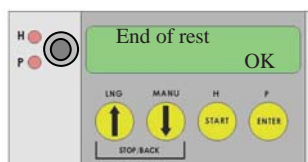
Sacchrification rest 1:

In the third mashing phase, other starch constituents are broken down with the aid of enzymes which become active at this temperature and are dissolved in the wort. The temperature level is approximately 73°C and is also maintained for 35 min.

Sacchrification rest 2:

In the final phase residual starches are saccharified and they thus form even more unfermentable extracts, which make the beer rather more full-bodied. During this phase the wort is heated up to 78°C and is continuously recirculated and held at this temperature for 10 - 20 min. An iodine test can determine whether there is any residual starch still in the wort. To do this, put some drops of wort on a white plate and add some iodine. If the sample turns brownish-red or yellow, the sacchrification level is sufficient. If this is not the case, the last temperature level must be maintained for longer.

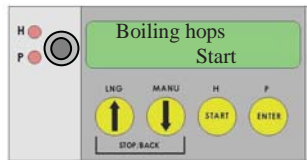
12.5 Lautering



On completion of the programmed brewing phases, a warning tone sounds again. This is also acknowledged with ENTER. The pump switches off and the control requests you to carry out what is known as lautering ("Remove malt pipe"). Lautering is the process of separating the crushed malt from the wort. In comparison with many other home-brewing methods, lautering with the Braumeister is a relatively simple, rapid and clean matter and represents one of the main design concepts of the Braumeister. Remove the wing nuts along with the hold-down crossbar as well as the second wing nut above the sieve insert. Using the boom, the winch and the crossbeam, hoist the malt pipe carefully and slowly out of the kettle until the malt pipe is suspended completely free of the wort and the residual wort drips back into the kettle through the spent grain. By subsequent sparging (rinsing) of the spent grain by pouring more water over it, it is still possible to dissolve the last remaining extracts and so increase the yield (ideal would be 2x20l with some time between them). This procedure of adding sparge water during the lautering is not absolutely necessary. Sparging is done by pouring water at 78°C (maximum 78°C ! - not boiling water) into the top of the malt pipe. During lautering the temperature remains constant at the preset temperature of 78°C. After 15-20 min of lautering, remove the malt pipe entirely by pivoting the boom forwards and lowering the malt pipe with the winch into a catchment tray or similar. For safety reasons, it is recommended you wear heat-resistant gloves at all times, since all parts are now extremely hot.

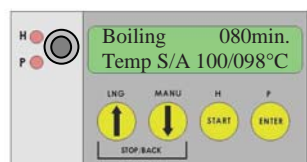


After removing the malt pipe, acknowledge this with ENTER. To start the hop boiling, press START. The pump and heating are switched on and the automatic process continues.



After the lautering process is completed, the wort content needs to be checked. This test is important in order to bring the wort up to the desired original gravity and thus to be able to adjust the beer's alcoholic content later on. Take a sample by filling a measuring cylinder (accessory) and determine the level of wort when the sample was taken. To do this, take the three upper level rings marking 425, 500 and 575 litres on the drawbar as an aid. Estimate the liquid level between them accordingly. The removed wort must be cooled down to 20°C so that the original gravity can be measured with a hydrometer (accessory), in order to obtain an exact measurement. A water bath with ice cubes, or similar, is ideal. However, since the original gravity has a certain relationship to the liquid level, there is no need to wait before taking the measurement. Continue with the next phase of boiling the hops and then carry out the corrections or adjust the original gravity afterwards.

12.6 Boiling the hops



As described in the previous section, the automatic process has continued, and boiling the hops has started. At a temperature of 88°C, the pump switches off automatically (and only starts up again below 86°); the screen again displays the time and temperature of the phase. Since the pre-set temperature of 100°C cannot always be reached under real conditions, the boiling time begins after a standby period of 3 min after reaching at least 95°C. In this phase the wort is boiled. On the one hand, coagulable proteins are separated, and on the other, the wort is sanitised, i.e., all the bacteria that might otherwise spoil the fermentation are destroyed. As already stated in the description of the previous phase, the original gravity can be adjusted by evaporating water or by topping up with water. During the boiling time of 80-90 min, the hops are added which give the beer its requisite bitterness and also a certain spiciness. Depending on recipe and preference, the quantity of hops added can vary. After the wort that has been sampled at the end of the preceding phase has been measured for its original gravity, this content is adjusted with the liquid level. If the original gravity content corresponds to the set value, then the level must be maintained the same right to the end by topping up with boiling water. If the original gravity is too high, the wort will be diluted by the topping up and the liquid level will rise accordingly. Care should be taken that the water evaporating is replaced. Conversely, if the original gravity is too low, the liquid level is reduced (by evaporating water) which leads to a higher concentration of sugar and so to a higher alcohol content, too. It is absolutely essential that boiling is carried out with the lid removed. On one hand, this prevents the wort boiling over and is necessary particularly when boiling the hops so that unwanted aromatic substances from the hops which can leave an unpleasant taste in the beer can evaporate. Adding hops to the beer originally served to keep the beer for longer. Depending on the kind of hops and bitterness, add the first hops to the boiling wort 10 to 15 min after boiling starts.

The hops remain in the wort until the end of the boiling time, since their substances only produce their effect after a prolonged boil time and transfer the intended bitterness to the beer. In the process, resins and oils in the hops will also be released which are what finally gives the wort its full-bodiedness together with the malt aroma. More hops can be added then roughly 10 min before flame out which only contributes to the aroma. In the remaining time no more bitterness is released. The quantity of hops varies depending on the recipe and type of beer. Furthermore, this also depends on the hops themselves as they can be different depending on the year and where they are grown. Hops can be added as pellets or as dried hops. The bitterness of beers is specified in bitter units (BE); for wheat beers it is between 10 and 20 BEs and for Pilsen beers between 25 and 45 BEs. Detail on the bitterness of the hops is stated in % alpha acids, which can vary between 2-4% (pellets around 8%). The quantity of hops can be calculated with the following formula:

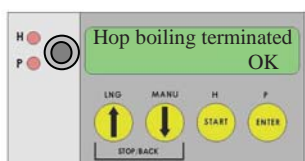
$$\text{Hopquantity in grams} = \frac{\text{Bitterunits (BE)} \times \text{Litres Beer} \times 10}{\% \text{ Alpha acids} \times \% \text{ Bitterness utilisation}}$$

It can be assumed that 30% of the bitterness will be utilised during a total boiling time of between 80 and 90 min.

Example:

It is intended to brew 500 L of wheat beer with a bitterness of 15BE. The available hops have an alpha acid content of 6%. This results in the following quantity of hops, which are added at the beginning of the boil. The hops which are added shortly before flame out are not taken into consideration in this calculation, since in this short time no appreciable bitterness is transferred to the wort.

$$\text{Grams Hops} = \frac{15 \text{ BE} \times 500 \text{ Litres} \times 10}{6\% \times 30\%} = 416 \text{ g}$$



When the boiling time expires, a warning tone sounds again which indicates the end of the brewing process. This is acknowledged with ENTER. The heating is switched off.

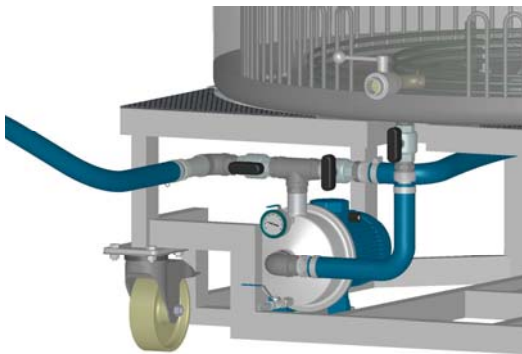
12.7 Cooling

From now on you must work in completely sterile conditions because, in all further process steps, contamination by bacteria in the air or on dirty utensils can ruin your efforts. All devices needed from now on must be thoroughly cleaned and disinfected. Observe the notes in the Section, "Notes on hygiene". After connecting the cooling jacket to a cold water source (cold tap water), we recommend hot sediment precipitation by means of the "whirlpool effect" which promotes the precipitation of trub (sediment) contained in the wort and thus clears the wort.



To do this, connect up the hoses and position the valves as per the figure on the left. With a low pump speed (dial position 6-8) you achieve a smooth rotation of the wort in the kettle. Caution! The pump only switches back on at 86°C. In addition, the rotation helps to optimise cooling. In this case, a cooling time of roughly 90 min is required to go from 100°C down to 20°C.

During cooling the fine solids settle out slowly on the bottom and remain on the container bottom when the clear wort is run off. Stirring or moving the cooled wort should be avoided at all costs, since otherwise the precipitated trub is stirred up again and is run off into the fermenter. Warning: To start with, almost boiling water flows from the cooling jacket outlet (Danger of scalds!); this can be re-used later for cleaning. It is particularly important to achieve rapid cooling between 40° and 20°, where the wort is especially liable to infection. When the wort has cooled down to 20°C, pump it into a suitable fermenter. As an option, beforehand approx. 4-8% (20-40 L in the case of 500 L of wort, bottom-fermenting beer approx. 4%, top-fermenting beer up to 8%) are run off into a sealable container and after that stored in a cool place. This can be added later to the beer to help achieve sufficient carbonic acid formation during the secondary fermentation. Better still is racking at the right time at the end of the primary fermentation. You will find more information on this in the Section on "Maturing".



For decanting, use a suitable, clean hose. The hose connection as well as the valve positions can be seen in the figure. (Caution! if the device is not level, the wort runs straight out as soon as the stopcock is opened!). Now you can switch the pump over to manual mode (to change to manual mode, hold down the first and second buttons from the left at the same time) and pump off the wort at your convenience.

Using the pump speed control, to start with you can pump off at high output and later reduce speed so as to draw off as little fine sediment as possible.

The fermenting keg or fermenter should be about 20% larger than the quantity of wort in order to leave sufficient fermentation space and to avoid a resulting overflow of the fermentation froth. The remaining liquid and the trub on the bottom of the Braumeister can be poured away. The Braumeister is now no longer needed, so please clean it as soon as possible so that remaining solids do not dry on hard; this makes the cleaning process considerably easier.



Place the Braumeister in the cleaning position by cranking down the rear support and thus tilt the Braumeister. Connect the hose to the waste water system and position the valves as per the figure on the left. Now you can clean the Braumeister from the top with a suitable brush and water and at the same time pump the waste water (in manual mode) away into the drain.

12.8 Primary fermentation

After the cooled wort has been decanted into a fermenter, the yeast is added ("pitched") to the wort. Here dry yeast is recommended which is simply added to the fermenter. This phase is when you decide whether you want to prepare a bottom-fermented or a top-fermented beer. For the fermentation process, top-fermenting yeast needs some 15-23°C, whereas bottom-fermenting yeast is active at 4-12°C. So adding the yeast also depends on the recipe in question and on the type of beer desired. Wheat beer and Koelsch are top fermenting beer types. Bottom-fermenting types are those like Maerzen and Pilsener. The alcoholic fermentation of the beer is set in motion by the activity of the yeast organisms in which the fermentable sugar is converted into alcohol and carbonic acid. After adding the yeast, the container is immediately closed with a lid and an airlock. The airlock should be filled with sulphurous acid, so that no foreign organisms can find their way into the fermenter. Remember here too, that you should be working in absolutely sterile conditions to avoid contamination of the beer by foreign organisms. The fermenter should never be entirely closed, so that the CO₂ produced during fermentation can escape. Place the fermenter in a dark room which has the necessary temperature for the yeast. The fermentation of bottom-fermenting beer can be done in a cooling tank, whilst top-fermenting beer can be allowed to ferment at room temperature. Maintaining the temperature is particularly important. Too low a temperature slows down the yeast cells' activity or they are not active at all. At too high a temperature the yeast cells can die off. The fermentation should be well under way 12 hours after adding the yeast, which is easy to see by the gas bubbles escaping from the airlock. The fermentation period takes 7-10 days. During the fermentation process dark patches of yeast can form on the fermenting froth which can be scooped off with a sterile ladle. If you remove wort via the outlet valve during the main fermentation (e.g. for taking measurements with the hydrometer), the valve must be cleaned immediately and disinfected by applying sulphurous acid with a swab of cotton wool in order to prevent the wort from drying on and to avoid it becoming subsequently infected by bacteria clinging to it.

12.9 Maturing

During secondary fermentation or maturing, the sugars remaining from the primary fermentation or those subsequently added are fermented – the new beer is enriched with carbonic acid which is important for subsequent formation and maintenance of the head, and matures to a full-bodied flavour. The beer also clears naturally during maturing. Once fermentation is coming to an end (no or only limited escape of fermentation gases), you can prepare for racking. To do this, the following preparations need to be made: prepare the conditioning vessel or bottles, warm up the



cool, stored wort or better still, determine the exact time to decant by constantly measuring the remaining extract. In the case of bottom-fermenting beer, this is at about 0.4 °Plato and with top-fermenting beer at about 0.8 °Plato above the final fermentation figure (this can be determined by a rapid fermentation test outside the vessel). The colder the primary fermentation, the more carbon dioxide is already bound during the main fermentation. Likewise, there is more carbon dioxide present in a stainless steel tank compared to a plastic tank. This is why the information stated above needs to be adjusted upwards or downwards.

The best option for the secondary fermentation is using bottles, but particularly beer kegs. At this stage, too, sterile work conditions are essential. Therefore before use, all utensils must be thoroughly cleaned and disinfected. These preparations should take place during the fermentation process or even earlier, so that on the day chosen for racking you do not have to rush unnecessarily and can concentrate on what is important.

If you are using thawed wort (as an alternative to precisely timed racking), this is now carefully added to the freshly-brewed beer in the fermenter 1-2 hours before racking. This allows stirred-up sediment to settle again. Racking can be done with a hose which is pushed onto the outlet valve and which reaches to the bottom of the fermenter. This avoids too much frothing and not too much carbonic acid is lost. The containers are filled 90-95% full (fermentation head space) and immediately sealed. Also take care here that the sediment is not disturbed in the fermenting vessel and then decanted with the beer. After racking, store the beer for another 1-2 days at the same temperature as for the primary fermentation. Afterwards it is stored at 0-10°C. Important note: During secondary fermentation it is essential to briefly relieve the pressure in the bottles after roughly 12 hours and then once more in the first 2-3 days to avoid excess pressure due to CO₂ build-up. Store the bottles upright so that cloudy sediment can settle on the bottom. This method of beer production results in a naturally cloudy beer. In earlier times, a nourishing beer was always naturally cloudy and even nowadays is still to be preferred because it contains the valuable B vitamins locked up in the yeast cells. The first tasting can be enjoyed after a storage period of from 4 to 6 weeks. A somewhat longer storage period leads to a more fully-developed taste.

Your personal home-brewed beer is now ready and you can pour it out suitably cooled and enjoy it with your friends! Cheers!

13 Example brew / Brief Instructions

Below we wish to demonstrate brewing with the Braumeister on the basis of a specific recipe and lead you through the first brewing process, step by step:

Beer type: Light wheat beer, top-fermented.
 Quantity of beer: 500 L of finished beer
 Original gravity: 11-12 °Plato

Ingredients:

- 100 kg of coarsely crushed brewer's malt (50% wheat malt, 50% barley malt, and some Carapils®, if desired).
- 650 L of medium-hard brewing water or tap water (575 L to start with and the rest for topping up)
- 500g of hops with 3% alpha acid (roughly 350g immediately after boiling starts and roughly 150g 10 min before flame out)
- Top-fermenting dried yeast



Obtain the ingredients according to the details above.

Clean the Braumeister and if necessary set it up in a suitable space. Lay out the electricity cables, fresh water and waste water hoses.

Likewise clean and keep close at hand any other utensils necessary, such as malt shovel, ladle, wort hydrometer, cooling coil, fermenting vessel with accessories, etc.

Programming the recipe – Press ENTER for 1 sec. In programming mode you can set times and temperatures depending on the recipe. A useable standard recipe is already stored in the memory. After confirming all values with ENTER, you return to the start screen. Start automated operation with START (1sec). The Braumeister guides you through the subsequent brewing process.



Fill up the kettle with 575 L of brewing water – up to the top mark on the drawbar or alternatively on the filling level sensor. Follow the instructions on the brewing control by acknowledging with ENTER that water has been added. The pump primes itself and the programmed mashing temperature is started.



Once the mashing temperature is reached, a warning tone sounds which you acknowledge with ENTER. Now insert the malt pipe (with seal fitted, facing downwards). Take care that the seal with the malt pipe is centred and is sitting absolutely level on the kettle bottom. Insert the first sieve insert as far as the bottom edge.

Pour the malt into the malt pipe and stir in well. Then put in the filter cloth and on top the upper sieve insert, fix securely with wing nut and then press the malt pipe slightly downwards with the hold-down crossbar and the second wing nut. The important thing is that no malt falls outside which could block the pump.



Now continue automated operation with START. Light-coloured brewing water rises up the pipe and runs over. The cycle has started. The next brewing phases are run through fully automatically in line with the program. During some of the brewing phases a short pump pause is ordered by the control system in order to reposition the malt. The screen displays the actual and pre-set temperatures as well as the remaining time, which after reaching the pre-set time starts to count down backwards (flashing). Set the pump speed so that the circulating pressure is just under 0.15 bar (dial position roughly 9-11).

On completion of the programmed brewing phases, a warning tone sounds again. Acknowledge this with ENTER. Remove wing nuts and hold-down crossbar. Since all parts are now very hot, it is absolutely essential to use oven gloves. Hoist the malt pipe with the lifting device and the winch out of the kettle and leave the malt to drip in the topmost position. Thrust the ladle several times to the bottom of the malt so that the wort can run off more easily. Sparge if necessary. After 15-20mins., remove malt pipe completely including malt.



Continue with START, to start boiling the hops. Do not put the lid on. Avoid boilover. Add the first hops (350g) 10 min after start of boiling. Do not put the lid on even when boiling the hops. Vapours must be able to escape. Top up the evaporated water or adjust the original gravity. The last hop addition (150g) takes place 10 min before flame out.

To clear the wort of hot trub and to cool the wort quickly, connect the pump with the hose via the outlet valve (see detailed instructions). This way you generate the whirlpool effect. At the same time run cold water through the cooling jacket. Warning: To start with, boiling hot water starts to flow from the cooling jacket. Cool the wort down to 20°C (takes roughly 90 min). From now on you must work under sterile conditions because of the danger of infection.



Using the pump (see valve positions in detailed instructions) and hose, rack the wort into a sterile fermenter. Disinfect the fermenter and decanting utensils beforehand with sulphurous acids. Do not transfer the sediment precipitated on the kettle bottom.

Pitch 34 g of dried yeast (3 packets) into the wort and seal the fermenting vessel with an airlock filled with sulphurous acid.

Store the container in the dark at 18-20°C. Fermentation will start after about 12 hours. Fermentation period: 5-7 days. The racking time has been reached when the residual extract is still about 0.8° Plato above the final fermentation figure (rapid fermentation test). During fermentation, the conditioning bottles and kegs need to be prepared.

1 hr. before bottling/racking, carefully pour the reserved wort into the fermenting vessel. Beforehand, skim off any floating foam with a kitchen scoop. Do not move the fermenter again before racking. Use a hose to run off the wort into bottles, kegs or maturing barrel (accessory). Fill bottles only 90-95% full. Leave the bottles at the same temperature for 1-2 days and each day quickly release the gas (only if there is a pressure build-up). After this, leave the beer to mature for another 3-4 weeks in a cool place.



Prost !!!

You can find more recipes at www.speidels-braumeister.de



14 Brewing mistakes/Possible remedies

Do not repair the device yourself; it is preferable to find an approved repairman. To avoid hazards, defective control systems, mains cables or other electrical components may only be repaired or replaced by the manufacturer, our After-Sales Service or a similarly qualified person.

Brewing problems:	Possible remedy
<i>Wort spurts upwards during circulation</i>	Malt is too finely crushed If necessary, mill the grain yourself (just broken open) Close the inlet valve more and reduce inflow.
<i>Pump clogged</i>	Pour malt more carefully into malt pipe. No malt in the kettle! Clean pump
<i>Reaching temperature takes very long</i>	Put lid on when heating. Use Thermo-Sleeve. Set up Braumeister protected from the wind.
<i>Condensation on the lid drips outside</i>	Set up Braumeister on horizontal surface.
<i>Circulation does not work properly.</i>	Check whether the pump is working and is primed. Check even seating of malt pipe and that the seal is functioning.
<i>When lautering, wort runs off too slowly or not at all</i>	Thrust a kitchen spoon from above right through to the bottom sieve insert several times. Malt is too finely crushed -> only break grains up, do not mill too finely.

Problems with the beer:	Possible remedy
<i>Beer smells and tastes sour</i>	Bacteria have got into the brew: throw beer away. More hygiene needed in the cold phase. Brewing time possibly too short, and so too much starch remaining in beer. Leave out sparging phase. Sparging too hot (> 80°C)
<i>Alcohol content too high</i>	Reduce gravity by adding water when boiling the hops.
<i>Alcohol content too low</i>	Increase gravity by boiling longer (water evaporates).
<i>Strange smells of any kind</i>	Better hygiene. Avoid contact with mould and no metals other than stainless steel. Avoid light affecting the beer in store.
<i>Fermentation does not get going.</i>	Add more yeast. "Activate" the yeast. Check fermentation temperature. Oxygenate the wort by stirring.



<i>Beer is cloudy</i>	Store beer longer. Continue to ferment at colder temperature. Avoid losses when racking.
<i>Too little carbonic acid</i>	Too much carbonic acid lost when racking or transferring with hose. Freeze more wort and add before racking.
<i>Too much carbonic acid– beer foams over</i>	Too much pressure – release pressure from swing-top bottles more often. Bottled too early - fermentation still not finished. Too much wort added before racking.
<i>Head collapses quickly</i>	Too little carbonic acid. Shorten protein rest. Mash at higher temperature. Remove hot trub more carefully. Ferment at lower temperatures.



15 Legal aspects of home brewing (German legislation)

Hobby brewers who make beer at home for their own consumption are permitted to produce up to 200 L of beer per year free of tax. This beer may not be sold. The home brewer must notify this before starting brewing to the nearest Main Customs Office. This is laid down in the Directive on Implementation of the Law on Beer Tax (BierStV).

If more than 200 L of beer is brewed, the beer is liable to tax. This must also be notified to the Main Customs Office and the quantities brewed are to be detailed and tax paid. Please contact your Customs Office for more detailed information.

For your own use, or for retail sales on your own premises, or for direct sales, up to 500 hL (50,000 L) per year may be brewed without a formal qualification as a Master Brewer. Larger quantities require training as a Master Brewer.

A permit is required to sell beer. This is independent of the Regulations stated above.

We accept no liability regarding the completeness and accuracy of the named legislation and regulations stated above. Please ask your Main Customs Office for the exact regulations in your Federal State.

The Customs Office responsible for your area can be found at www.zoll-d.de.



16 Brewing record

Basic details					
Date:		Start of brewing process – time:		End of brewing process – time:	
Recipe					
malt kg – hops g – water lts:					
Brewing process					
Phase		Temperature		Duration	
Mashing					
1 st Phase: protein rest:					
2 nd Phase: maltose rest					
3 rd Phase: sacchrification rest no. 1:					
4 th Phase: sacchrification rest no. 2:					
Iodine test:		Lautering:		Sparging – lts.:	
Measurement: Actual wort content		- °Plato		Litres:	
Measurement: Pre-set wort content:		- °Plato		Litres:	
Wort boiling:		Total time:	1st hops added:	2nd hops added:	3rd hops added:
Protein filtration:	Cooling:	Removing wort for priming:	Racking:	Gravity - °P:	Pitching the yeast
Fermentation / Maturing					
Start of fermentation – date:		Fermentation temperature:		Remaining starch test-rapid fermentation test - °P:	
Racking – date:		Actual extract, racking - °P:		Priming wort, lts.:	
				Conditioning vessel:	
Tasting					
taste, colour, head, carbonic acid; Faults:					
Improvements					

17 Cleaning instructions



Immediately after brewing, it is best to place the Braumeister in the cleaning position (see figure, left) and to pump off all the fine solids diluted with water. Observe the correct valve positions.

Now the residues from brewing can be removed with a brush and water (use a hose) from the inside surfaces of the kettle and the heating coil. Keep pumping off the dirty water as you work. Also pump clean water through the inlet to the kettle, to rinse out this connection and the valve, too. Remember to clean the outlet and inlet.

The malt pipe and the sieve inserts can be removed and cleaned separately.



Once the Braumeister seems to be clean, to disinfect it, it is filled with water several centimetres above the heating coil and the water is heated to about 30°C. The water is circulated during this. Add some Halapur (alkaline cleaner - see Accessories below). Also rinse the hoses and all the valves by connecting the hose to the outlet valve as for the "whirlpool". While circulating the cleaning fluid, all the valves should be alternately opened and closed several times so that all are rinsed. This also includes the valves on the pump.

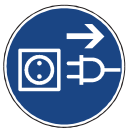
After doing this for roughly 15-20 min, empty the lye from the kettle and rinse the whole device through yet again several times with clean water as above. Ensure that there are no alkaline remains in the kettle.

Finally, open all the valves including those on the pump, so that all water can drain out and the parts can dry (if necessary, open and close the valve a number of times)

From time to time, the hoses at the bottom should be removed and cleaned with a brush.



Accessory: Cleaning kit (Art. No.: 78027)



For cleaning the outside of the Braumeister, simply use a damp cloth. Do not spray the Braumeister using a hose. Avoid water getting into the electrical components. Unplug the Braumeister from the mains before cleaning the outside.



18 Conditions of warranty and settling complaints

Conditions:

- The legal warranty conditions apply. The warranty period for consumers is limited to that stipulated for commercial customers, insofar as they are using a device suited to commercial use – even though it be only to a limited extent.
- An indispensable pre-condition for warranty claims against our company or against one of our agents is to remit a copy of the proof of purchase. The settlement terms stated below apply to checking the Warranty.
- In order to process rights to claims under warranty as rapidly as possible, defects, in so far as they are discernible, must be notified to us in writing with a description of the defect and where possible with photos.
- Performance of Warranty shall not apply to defects caused by failure to observe the instructions for use, inappropriate handling or normal wear and tear on the device. Furthermore, rights to claims under warranty are excluded for fragile parts or wear parts such as gasket seals, or similar. Finally, rights to claims under warranty are excluded if persons not authorised by us have undertaken work on the device.

Procedure:

In the event that your device shows a defect within the Warranty period, we would request you to notify us of your claim under warranty. The quickest and most convenient method is to return the device or to notify the defect to the agent responsible or directly to our company:

e-mail to: verkauf@speidel-behaelter.de
or by fax to: **0049 – (0)7473 -9462-99**

Please send us your **complete address with contact details**. Besides this, we need the **Type Identifier** of the device concerned, a short **description of the fault if possible with photos**, the **purchase date (copy of the invoice)** and the **name of the agent** where you bought the device.

After checking your claim, we will contact you as soon as possible with instructions on how to proceed. Please do not return the device carriage paid.





de	Sollte die beiliegende Betriebsanleitung nicht in einer für Sie verständlichen Sprache vorliegen, so kontaktieren Sie diesbezüglich bitte Ihren zuständigen Händler.
en	If the accompanying instructions are not in a language which you can understand, please contact your local dealer.
fr	Si les instructions accompagnant dans une langue qu'ils comprennent, vous donc s'il vous plaît contacter votre revendeur local.
It	en local.
pt	Se as instruções que acompanham estar em uma linguagem que eles entendem, você por favor contacte o seu revendedor local.
pl	Jeśli instrukcje towarzyszące są w języku, który rozumieją, tak, proszę skontaktuj się z lokalnym dealerem.
no	Hvis instruksjonene som følger med være på et språk de forstår, du så ta kontakt med din lokale forhandler.
fi	Jos ohjeet mukana olevan he ymmärtävät, olet niin ota yhteyttä paikalliseen jälleenmyyjään.
sv	Om instruktioner vara på ett språk de förstår, behaga dig så kontakta din lokala återförsäljare.
da	Hvis anvisningerne ledsager være på et sprog, de forstår, så du bedes kontakte din lokale forhandler.
it	Se le istruzioni che accompagnano in una lingua che capiscono, ti prego pertanto di contattare il rivenditore locale.
el	Εάν οι οδηγίες που συνοδεύουν να είναι σε γλώσσα που κατανοούν, σας γι 'αυτό παρακαλώ επικοινωνήστε με τον τοπικό σας αντιπρόσωπο.
hu	Ha a mellékelt használati utasításnak kell olyan nyelven, amit megértene, akkor ezért kérjük, forduljon a helyi forgalmazóhoz.
nl	Als de instructies die bij in een taal die zij begrijpen, je zo kunt u contact opnemen met uw lokale dealer.
ro	În cazul în care instrucțiunile care însoțesc să fie într-o limbă pe care o înțeleg, vă rugăm să vă contactați distribuitorul local.
ru	Если инструкции сопровождающих быть в понятном для них языке, вы поэтому, пожалуйста, обратитесь к вашему дилеру.
sk	Ak Návody priloženej byť v jazyku, ktorému rozumie, si tak obráťte sa na miestneho predajcu.
sl	Če navodila, ki spremljajo, so v jeziku, ki ga razumejo, zato vas prosimo, obrnite na lokalnega prodajalca.
bg	Ако инструкциите, придружаващи се в разбираем за тях език, можете да се обърнете към местния дилър.
sr	Ако се прате упутства бити на језику који они разумеју, тако да вас молимо да се обратите свом локалном дистрибутеру.
hr	Ako upute prate se u jeziku koji razumiju, pa vas molimo da se obratite svojem lokalnom zastupniku.
cs	Pokud Návody přiložené být v jazyce, kterému rozumí, jsi tak obraťte se na místního prodejce.
tr	talimatları anladıkları bir dilde olması eşlik ederseniz, bu nedenle yerel satıcınıza başvurun.
zh	如果指示随行在他们理解的语言，所以请您联系当地的经销商。
ja	命令は、彼らが理解できる言語になるに伴う場合は、そのお近くの販売店に連絡してください。
ko	지침 그들이 이해하는 언어에 동행하는 경우, 당신은 귀하의 지역 대리점에 문의하시기 바랍니다.
th	หากคำแนะนำการประกอบอยู่ในภาษาที่พวกเขาเข้าใจคุณตั้งนั้นโปรดติดต่อตัวแทนจำหน่ายในประเทศของคุณ
vi	Nếu các hướng dẫn đi kèm có trong một ngôn ngữ mà họ hiểu, bạn nên xin vui lòng liên hệ đại lý địa phương của bạn.