User manual

Control box CulinaCup BD103

Code No. 99-97-4671 GB

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EC Declaration of Conformity

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In accordance with the EC directive:

- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- RoHS Directive 2011/65/EU

CE

The product named below was developed, designed and manufactured in accordance with the above mentioned EC / EU Directives and under the sole responsibility of Big Dutchman.

Description	Control box BD103
Serial number and year of construction	According to the customer order no.

The following harmonised standards were applied:

- DIN EN 61000-4-4:2004: Electrical fast transient / burst immunity test
- DIN EN 61000-4-5:2005: Surge immunity test
- DIN EN 61000-6-4:2011-09 Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments

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Vechta 15.04.19
PlaceDate

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1 About this manual

Observe the instructions in this manual to ensure correct and safe use of the system.

Keep this manual safe for future use.

All persons assembling, operating, cleaning and servicing this system must be familiar with the contents of this manual.

These persons must always have access to the manual. Keep this manual in the immediate vicinity of the system for this reason.

Observe the comprised safety instructions!

If this manual is damaged or lost, request a new copy from **Big Dutchman**.

The contents of this manual may be altered without prior notice.

If you find mistakes or unclear information in this manual, please do not hesitate to let us know.

For further information please contact:

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1.1 Structure of the safety instructions

⚠ DANGER!

This indicates risks that will lead to personal injury resulting in death or to serious injuries.

⚠ WARNING!

This indicates risks that could lead to personal injury resulting in death or to serious injuries.

⚠ CAUTION!

This indicates risks or insecure procedures that could lead to moderate or minor injuries.

NOTICE!

This indicates notes preventing property damage and leading to an effective, economic and environmentally-conscious handling of the system.

2 Safety

2.1 General safety regulations

Only work with suitable tools and observe the local accident prevention regulations.

⚠ WARNING!

Live parts may be bare when performing different types of tasks. Touching live parts can lead to injuries caused by electric shock and short circuits.

- ► Set the main switch to "Off" before starting any repair or maintenance tasks.
- ► Secure the system against reactivation.
- ► Attach a fixed sign to indicate that maintenance and repair tasks are in process!
- ► Never touch bare electrical components.
- ► Equipment with bare electrical components must not be used by the operating staff.

Check safety and function control devices to ensure safe and accurate operation after carrying out any tasks.

Observe the regulations of local water distribution and power supply companies.

⚠ WARNING!

Defective or disassembled safety devices can lead to serious injuries or to death!

- ► It is strictly forbidden to remove or put out of operation any safety device.
- ► If safety devices are damaged, immediately put the system out of operation. Lock the main switch in zero position and eliminate any damage.
- ► Make sure that all safety devices are properly mounted and function after work on the system has been completed and before putting the system into operation (again).

⚠ WARNING!

- ► Parts lying about on the system and in its vicinity can cause persons to stumble and / or fall and thus risk injuring themselves by contact with system components.
- ► Parts lying about in or on the components can lead to serious damage of the system.
- ► Never deposit objects (e.g. spare parts, replaced parts, tools, cleaning tools etc.) in the accessible areas of the system or in the surrounding areas after having worked on the system!
- ► **Before** putting the system into operation again, assure yourself that all loose or replaced parts have been removed from the system components!

⚠ DANGER!

Persons may be electrocuted or suffer serious electrical injuries if water from leaking hoses, seals and pipes reaches live parts.

- ► Disconnect the main power supply.
- ► Interrupt the main water supply.
- ► Only now may you enter the part of the house where large quantities of water have escaped.

NOTICE!

Leaking hoses, seals and pipes can cause structural damage or destroy electrical systems by short circuits.

- ► Check regularly whether large quantities of water are escaping and eliminate the leaks as soon as possible.

⚠ WARNING!

Children must not access the system. The safety distances for the system are not designed for children. A risk of injury cannot be excluded, even for supervised children.

2.2 Operator's responsibility

The operator is subject to the legal obligations regarding occupational safety and is responsible for the staff's safety. All safety, accident prevention and environmental protection regulations applicable for the area of use of the system must be observed. The following is especially important:

The operator must clearly specify responsibilities for operation, maintenance and cleaning.

The operator must provide the staff with the necessary personal protective equipment.

The operator is responsible for

- using the system in compliance with the designated use;
- ensuring that the system is only operated in an excellent state from the technical point of view and that maintenance intervals are observed;
- ensuring that his staff is trained to use the system;
- ensuring that operation instructions are prepared for the system.

2.3 Staff qualifications

Staff must consist of qualified persons who can be expected to perform their tasks reliably. Persons whose ability to respond is impaired, e.g. by alcohol, drugs or medication, must not work on the system. The operator is responsible for which persons he employs. **Big Dutchman** does not assume any liability for personal injury and property damage caused by insufficiently qualified staff.

2.4 Personal protective equipment

⚠ WARNING!

The following instructions apply to any task carried out on the system.

- ► Wear **close-fitting protective clothing** and **protective footwear**.
- ► Use **protective gloves** where there is a risk of hand injuries and **safety goggles** where there is a risk of eye injuries.
- ► Do not wear **any rings, necklaces, watches, scarves, ties or other items** which could get caught in parts of the system.
- ► Make sure that **long hair is always tied back**. Hair can get caught in driven or rotating working units or parts of the system, resulting in serious injuries.
- ► When working underneath the system **always** wear a **hard hat**!

2.5 Designated use

The **Big Dutchman** system may only be used for the purpose for which it is designated.

Any deviating use is considered non-designated use. The manufacturer shall not be liable for any damage resulting from such non-designated use. The user alone bears the risk. The designated use also includes the exact compliance with operating, maintenance and assembly requirements of the manufacturer.

2.6 Ordering of spare parts

⚠ CAUTION!

For you own safety, use original **Big Dutchman** spare parts only. For third-party products that have not been released or recommended and for modifications (e.g. software, control units), judging whether there is a safety risk in connection with **Big Dutchman** systems is not possible.

NOTICE!

The exact description of the spare parts to be ordered can be found by means of the position number in the spare parts list.

Indicate the following when ordering spare parts:

- the code number and description of the spare part;
- the customer number or order number;
- the current supply, e.g. 230 / 400 V – 3 Ph – 50 / 60 Hz.

2.7 Safety instructions when operating electrical appliances

NOTICE!

Only persons qualified according to electro-technical regulations (e.g. EN 60204, DIN VDE 0100/0113/0160) may install and work on electric parts / assembly groups.

WARNING!

If an electric part is open, dangerous electric tensions are bare. Be aware of the danger and keep staff of other professions away from the danger zone.

NOTICE!

Do not install control devices directly in the house but in the service room to prevent corrosion caused by e.g. ammonia gas.

2.7.1 Protective-equipotential bonding (earthing) of the system

The system must be earthed professionally by the operator or a company commissioned by him at suitable points and according to the valid local guidelines and standards (e.g. IEC 60364-7-705 mod. 2006 / DIN VDE 0100-705: Low-voltage electrical installations – part 7-705: Requirements for special installations or locations – Agricultural and horticultural premises) for protective-equipotential bonding.

The earthing points must be connected with the foundation earth electrode.

Recommended earthing points:

1 x per system row near the foundation earth electrode.

The material required for earthing is not included in the Big Dutchman delivery.

3 System description

The control box CulinaCup BD103 controls the CulinaCup system for the feeding of suckling pigs. The control box uses a software and is available for the following system versions, which differ only with regard to the mixing tank size:

System 300 litres / 500 litres

Code no.	Description
91-00-3671	Control CulinaCup BD103 pump 0.65 kW – agitator 3 Ph 0.55 kW

System 250 litres

Code no.	Description
91-00-3672	Control CulinaCup BD103 pump 0.65 kW – agitator 1 Ph 0.55 kW

Depending on the use of either milk and/or pre-starters, up to two mixing programs can be defined.

The control box is operated via the touch screen.

Figure 3-1: Control box BD103

3.1 Software version

Software version 1.20

3.2 Technical data

Control box CulinaCup BD103 single-phase

Code no.	91-00-3672
Supply voltage	230/400 V 50 Hz
Input power	approx. 4 kVA
Dimensions	284 mm x 364 mm x 120 mm
Housing / Protection rating	IP66
Weight	4.05 kg
Ambient temperature	0-50°

Control box CulinaCup BD103 three-phase

Code no.	91-00-3671
Supply voltage	230/400 V 50 Hz
Input power	approx. 4 kVA
Dimensions	284 mm x 364 mm x 120 mm
Housing / Protection rating	IP66
Weight	4.7 kg
Ambient temperature	0-50°

4 Electrical connection

The specific wiring diagram indicates how to connect the control box. The wiring diagram is enclosed with the control box.

⚠ WARNING!

Any connected tasks may only be carried out by authorized and qualified personnel and under consideration of local regulations (e.g. VDE)!

5 Initial installation of the software

After you have connected the control box according to the wiring diagram, you can install the control software. The control software is available on a USB flash drive that is enclosed with the control box. Open the control box to find the flash drive.

⚠ WARNING!

Installations and work on the electric components/structural groups may only be carried out by qualified personnel according to electro-technical regulations (e.g. EN 60204, DIN VDE 0100/0113/0160).

Dangerous electric tensions are bare in case of open control equipment. Please be aware of the danger and keep workers of other professions away from the danger zone!

The control box comes with a test software installed by the manufacturer for internal testing.

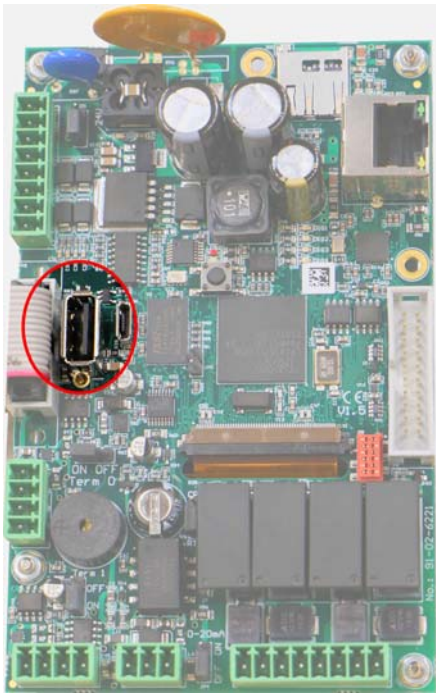
1. Switch the control box off (switch to OFF).

   The control box is now disconnected from power.

2. Open the control box by loosening the hinges on one side.

   Inside the control box, you will find the USB flash drive.

3. Insert the USB flash drive into the corresponding interface on the PCB.

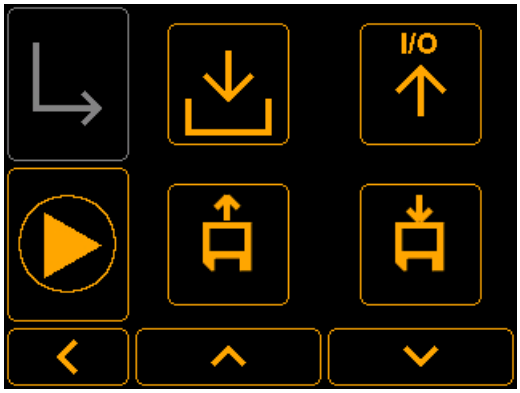


4. Switch the control box on (switch to ON).

The touch screen shows the start screen of the test software.

5. Tap on  to start the bootloader for the installation process.

6. In the bootloader, tap on  .



The installation file is displayed. The version of your installation file may deviate from the one shown in the screenshot.

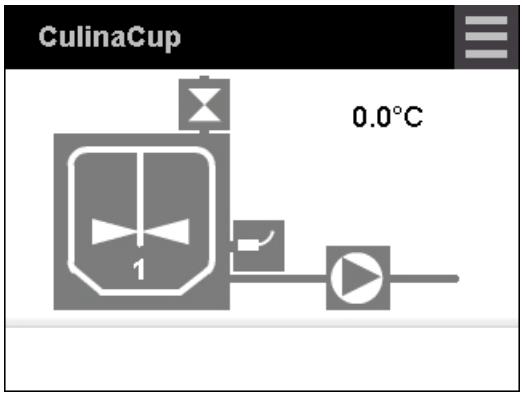
7. Tap on the installation file and start the installation process with  .

The installation process starts.

8. As soon as installation is complete, restart the control box by tapping on  .

   The following screen appears:

   After the restart, the start screen of the control software appears. Installation is complete.



9. Switch the control box off (switch to OFF).

   The control box is now disconnected from power.

10. Remove the USB flash drive and close the control box correctly using the hinges.
11. Switch the control box on (switch to ON).

6 Operation of the system

6.1 Switching on

Figure 6-1: Switching on the control box

6.2 Start screen

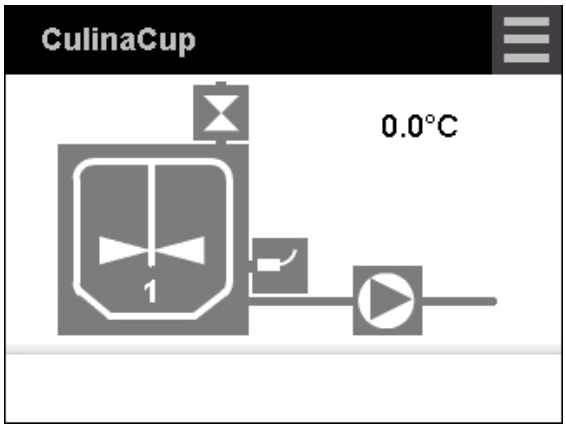
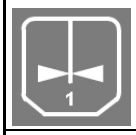


Figure 6-2: Start screen

Icon	Explanation
	Mixing tank with agitator The number indicates which feed type is mixed.
	Pump
	Water valve
	Sensor to measure the mixing tank's fill level If the sensor is active  , this is indicated automatically as soon as the input is switched.
	System settings
0.0 °C	Temperature in the mixing tank

Active system components are always coloured (orange).

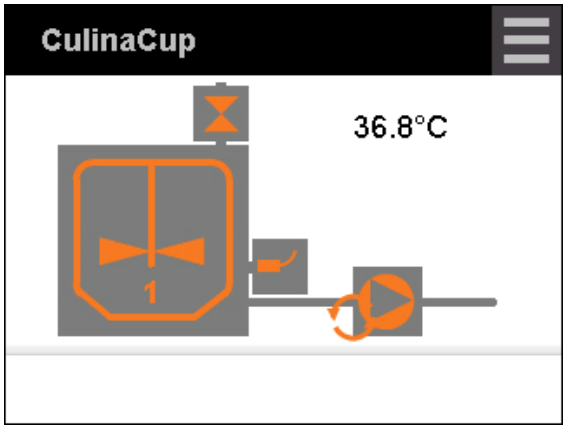
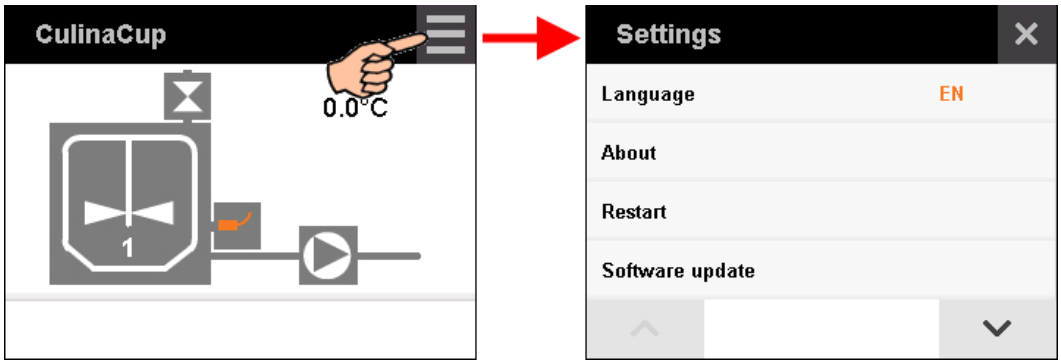


Figure 6-3: All system components active

6.3 System settings



- **Language:** The languages English and German are pre-installed. Other languages can be added via USB flash drive, if necessary. The PCB of the control box is equipped with the respective USB interface. When the USB flash drive is inserted, the icon appears.

  Save the selected language by tapping on .

- **About:** Software version of the control box
- **Restart:** Restarts the software, e.g. after an update.
- **Software update:** Installs a new firmware.
- **Factory settings:** Resets the control box to factory settings. Existing data is deleted.
- **Burst pipe factor:** This value is used to determine a possible burst pipe when the water valve is in automatic mode. The factor is multiplied with the value **Dosing time water** (see chapter 6.4.2):

  Burst pipe factor x dosing time water = time period for a new request for water

  If water is requested again within the calculated period, the control box recognizes this request as burst pipe and issues an error message.
- **System time**
- **System date**

6.4 Settings in the selection menu

Open the selection menu by tapping on one of the system components. A selected system component is inverted in the selection menu, i.e. displayed with inverted colours, figure 6-4.

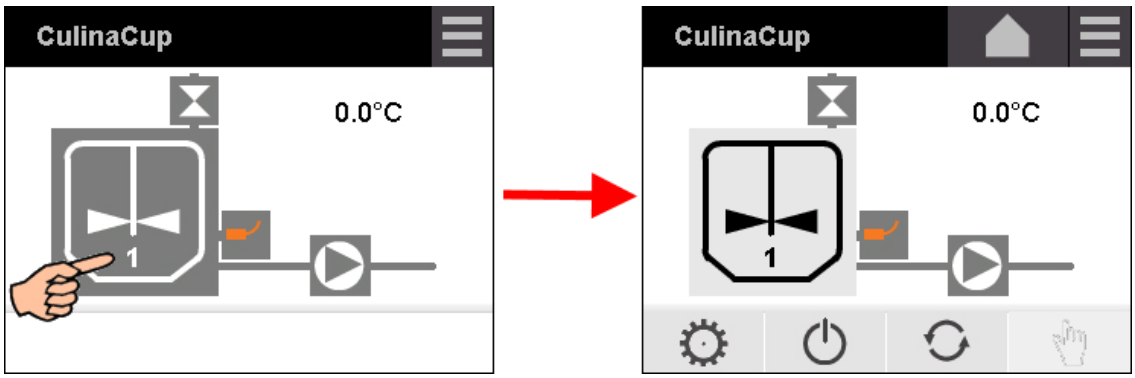


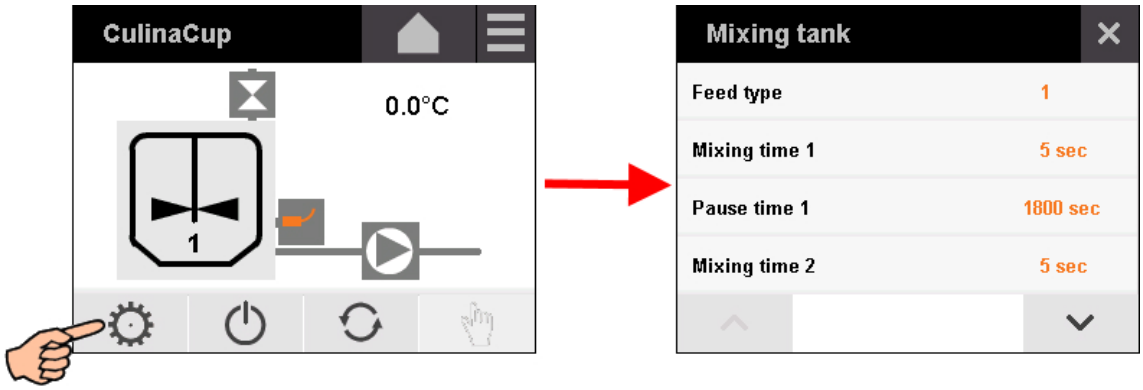
Figure 6-4: Example: Opening the selection menu via the mixing tank

In the selection menu, you may

- toggle between the system components,
- define settings for the automatic mode of every system component,
- switch system components into automatic mode,
- switch system components into manual mode and operate them manually.

6.4.1 Mixing tank with agitator

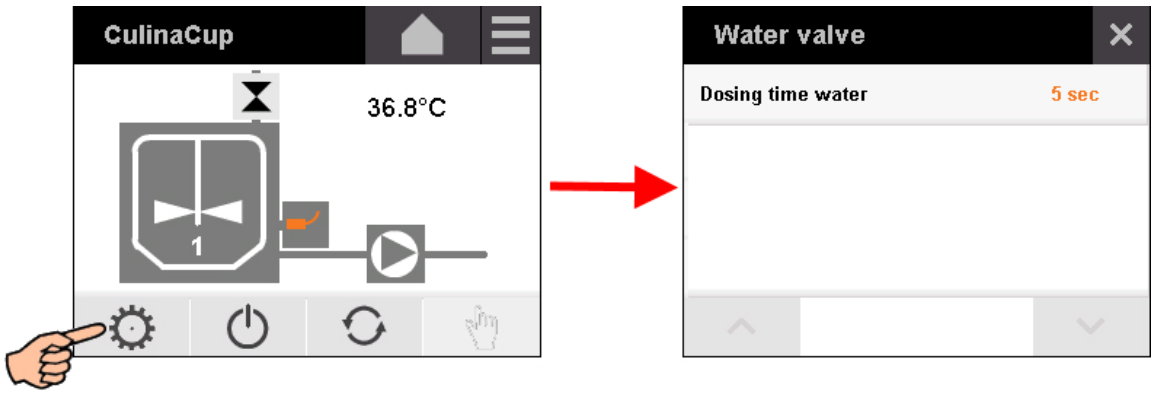
1. Select the mixing tank and tap on ⚙ .



2. Tap on the correct parameter and change the value:
   - **Feed type:** selection of feed type 1 or 2.
   - **Mixing time:** time for which the agitator runs.
   - **Pause time:** time for which the agitator is idle (between the mixing times).
3. Save your input by tapping on 💾 .

6.4.2 Water valve

1. Select the water valve and tap on ⚙.



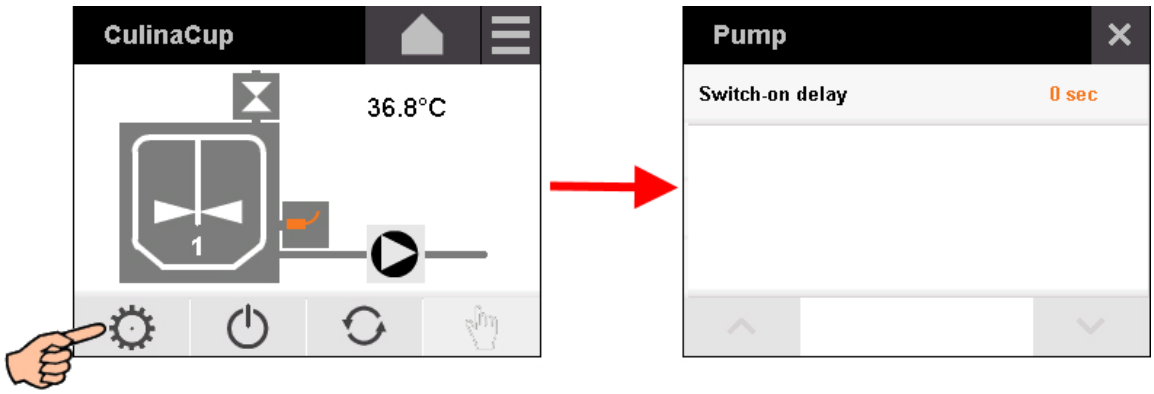
2. Tap on the parameter and change the value:

   Dosing time water is the residual flow time for water in automatic mode. When the tank is empty, a corresponding amount of water is retrieved during the set time.

3. Save your input by tapping on 💾.

6.4.3 Pump

1. Select the pump and tap on ⚙.



2. Tap on the parameter and change the value:

   The **switch-on delay** prevents continuous on/off operation in specific situations.

3. Save your input by tapping on 💾.

6.4.4 Manual mode: agitator / water valve

1. Tap on the correct system component.
2. Tap on the button for manual mode to operate the system component manually.

   If this button is grey, manual mode is already active.
3. Tap on the button to switch the selected system component on or off manually.

   The state ON / OFF is indicated by colours, see figure 6-5 and figure 6-6.

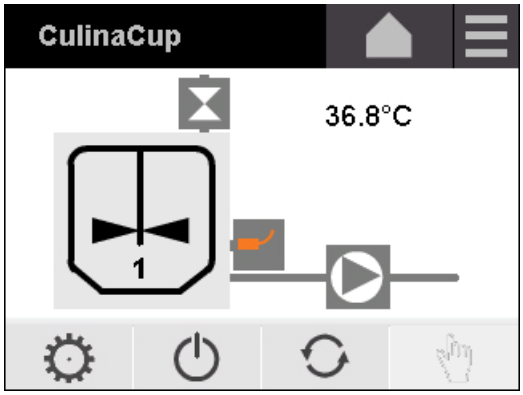


Figure 6-5: Example manual mode: agitator OFF

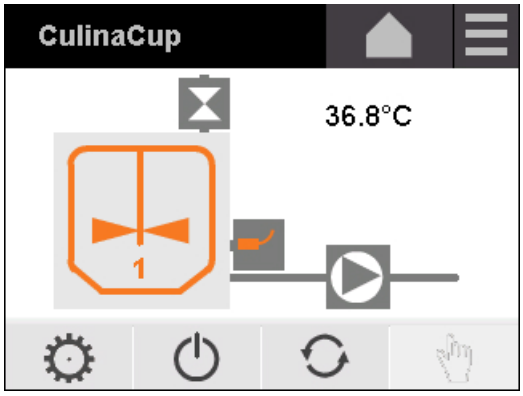


Figure 6-6: Example manual mode: agitator ON

6.4.5 Manual mode: pump

The pump can be controlled manually to pump the remaining amount of feed from the mixing tank.

1. Tap on the pump  .
2. Tap on the button for manual mode  to operate the pump manually.

   If this button is grey, manual mode is already active.
3. Tap on the button  to switch the pump on or off manually.

   For the pump, the button  is operated differently than with the agitator and water valve: By holding the button, the pump is switched on and stays active for as long as the button is pressed. Releasing the button switches off the pump.

6.4.6 Automatic mode: agitator / water valve / pump

1. Tap on the correct system component.
2. Tap on the button to switch to automatic mode.

   If this button is grey, automatic mode is already active and the system component is marked with the corresponding icon.

   The active / inactive state of the system component is shown by colours, see figure 6-7 and figure 6-8.

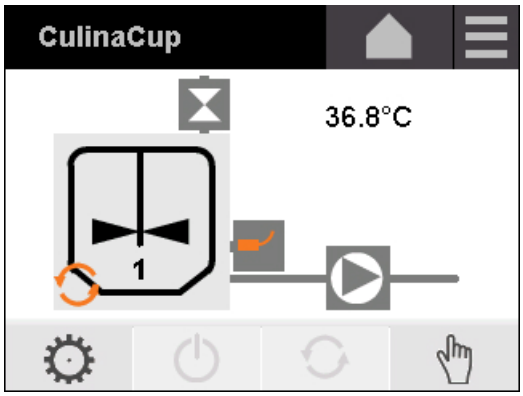


Figure 6-7: Example automatic mode: agitator inactive

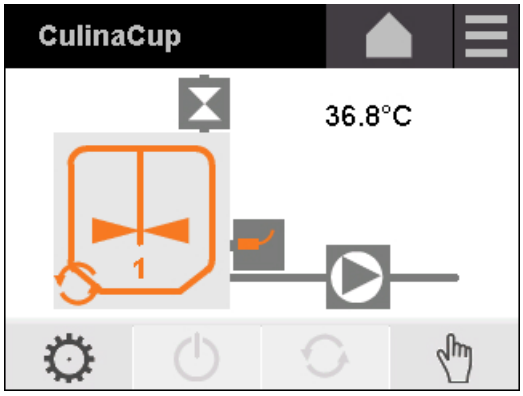


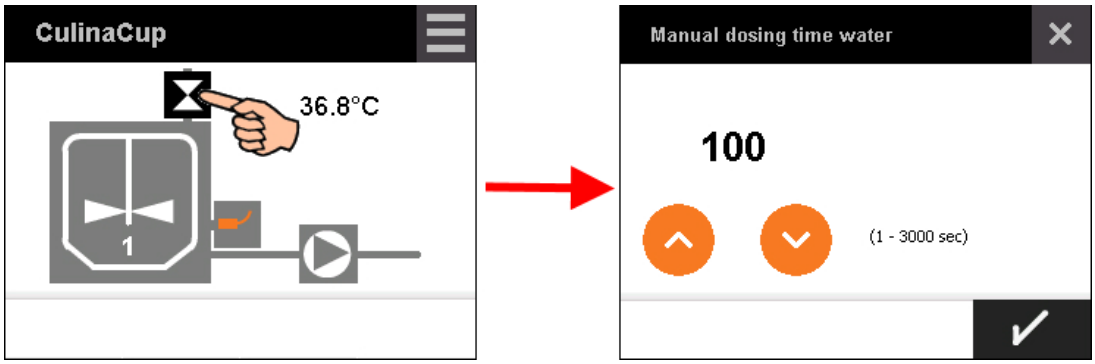
Figure 6-8: Example automatic mode: agitator active

6.5 Retrieving water for mixing

To mix a specific amount of feed, you can set the dosing time for the required amount of water. The corresponding setting is called **Manual dosing time water** and can only be used when the water valve is in manual mode.

1. Set the water valve to manual mode.

2. Press the button for the water valve until the window **Manual dosing time water** opens.



3. Enter the desired time using the arrows pointing upwards and downwards.

NOTICE!

The relation between time and required amount of water depends on the situation on site, e.g. the water source.

4. Confirm the entered time with ✓.

   This (last) entered time is saved and can be used again or changed with the next retrieval.

6.6 Switching off

Switch off the control box when working on the system, especially the mixing tank:

> Turn the main switch to OFF to disconnect the control box from power. **All entered values will be saved!**

When you switch the control box back on – by turning the main switch to ON – the system restarts operation at the point where it was switched off.

Figure 6-9: Switching off the control box

7 Troubleshooting

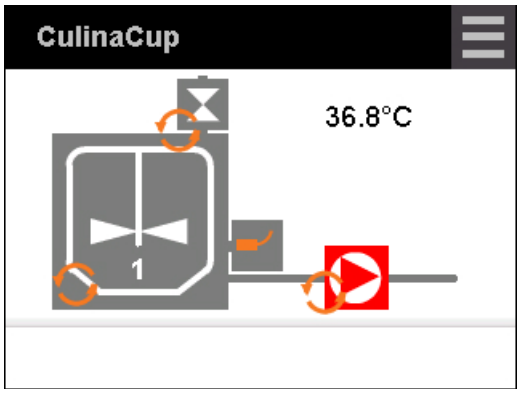
⚠ WARNING!

Switch off the system before performing any repair, maintenance or cleaning tasks and before eliminating functional errors. Disconnect the system from the power supply and secure it against reactivation.

Secure the system by fixing a sign to the main switch reading "Do not put into operation!" and add a note about ongoing maintenance work, if necessary.

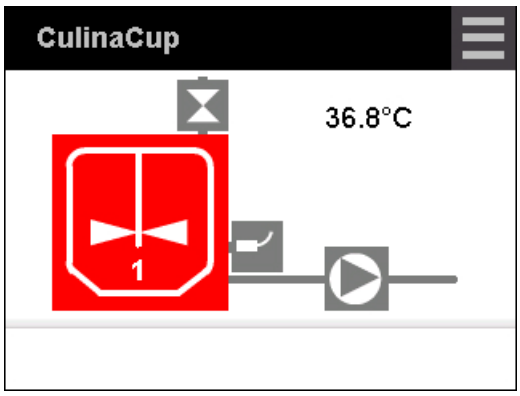
The following error messages may appear in manual or automatic mode, depending on the fault:

Error: Pump overloaded



Fault / Error	Possible cause	Remedy
The pump's motor is overloaded.	The feed mixture is too viscous. Foreign objects are caught in the pump body.	Check the pump and remove foreign material, if applicable.

Error: Agitator overloaded

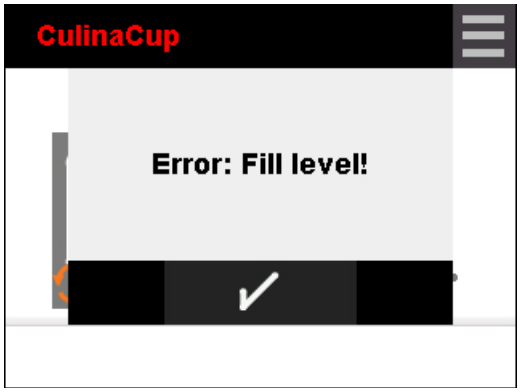


Fault / Error	Possible cause	Remedy
The agitator's motor is overloaded.	The feed mixture is too viscous. Foreign objects are caught in the agitator.	Check the agitator and remove foreign material, if applicable.

Error: Burst pipe

Fault / Error	Possible cause	Remedy
The burst pipe error is generated based on the value **Burst pipe factor**, see chapter 6.3.	Milk consumption is very high. The ring line has broken and milk is escaping.	Check the ring line for leaks.

Error: Sensor for the mixing tank's fill level / protection against running dry



Fault / Error	Possible cause	Remedy
The error is generated if no water reaches the mixing tank despite a request for water.	The litre output of the water supply is too little. The water supply has been interrupted.	Check the water supply.

8 Cleaning

Clean the exterior of the control box with a damp cloth in case it is dirty.

NOTICE!

Make sure that the control box is not damaged by a high-pressure cleaner.

9 Dismantling and disposal

NOTICE!

When disposing of the system, commission experts only.

The operator is responsible for disposing of the system at the end of its service life. Observe the applicable statutory provisions when disposing of the system.

NOTICE!

Incorrect disposal can lead to environmental damage.

► The system and individual parts must be disposed of properly!

► If necessary, commission a specialised company with the disposal.

NOTICE!

Observe system-specific safety instructions during dismantling.