July 2002

Instruction Book
System-Machine Combi/Fresh Milk

As of Program Version 01.01

TAK5-SM2-27-F1 VDW5-SM2-27-F1
TAK5-SM2-28-P1 VDW5-SM2-28-P1
TAK5-SM2-30-P1 VDW5-SM2-30-P1
TAK5-SM2-32-P1 VDW5-SM2-32-P1
TAK5-SM2-38-P1 VDW5-SM2-38-P1

1 Introduction

1.1 Safety Instructions

Be sure to read and follow all instructions contained in this manual before connecting and using the automatic calf feeder.

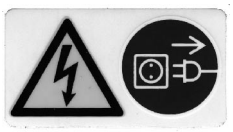
- Use the appliance only to feed calves.
- Servicing and installation of the automatic calf feeder has to be restricted to qualified and authorised service personnel.
- Read the user's manual carefully before installing or operating the machine.
  To facilitate customer service on the calf feeders, store the documentation accompanying the appliance near to the automatic feeder.
- The faultless functioning of the automatic calf feeder requires expert installation, correct handling, as well as careful care and maintenance.
- Incorrect data entries may have serious consequences. Therefore check the correctness of all data entries.
- The livestock owner is responsible for a regular and scrupulous control of his animals and the functioning of the appliance. If, for any reason, the system should break down or some calves should not make use of it, the livestock owner is responsible for choosing other feeding methods for those animals.
- The manufacturer accepts no responsibility for damages and their consequences caused by incorrect installation and operation, improper use, inadequate service and maintenance or false entries.
- Remove any projecting object from the stable (e.g. pipe ends), because Responder collars could get caught in it.
- You will find further safety instructions in the following chapters.

1.2 Danger Signs on the Automatic Calf Feeder

CAUTION!
This sign warns you of **rotating parts starting to work automatically.**

This sign is located on potential danger areas such as the milk powder hopper, the milk powder outlet, the mixer as well as the outlet for powder additives on the additive dispenser.

In order to avoid injuries, **before** carrying out any kind of operation on above listed parts, it is imperative to make the automatic feeder currentless by turning the main switch to position „0/OFF“ or by pulling the mains plug.



CAUTION!
This sign warns you of **electric shocks**.

In order to avoid injuries, **before** opening the control unit, it is imperative to make the automatic feeder currentless by turning the main switch to position „0/OFF“ or by pulling the mains plug.

1.3 Information Signs on the Automatic Calf Feeder

Before connecting the **automatic calf feeder** to the **mains supply** and **activating** the **heating** (see chapter 5 “Installing the Automatic Calf Feeder”, page 24), **carefully read** the **operating instructions**.

Any questions about this product? Then, feel free to get in touch with us. Before calling us, please write down the information (machine type, machine number) on the nameplate located at the left of the feeder chassis, as well as the program version (refer to chapter „Menu 1-99, Machine data“).
Our address:
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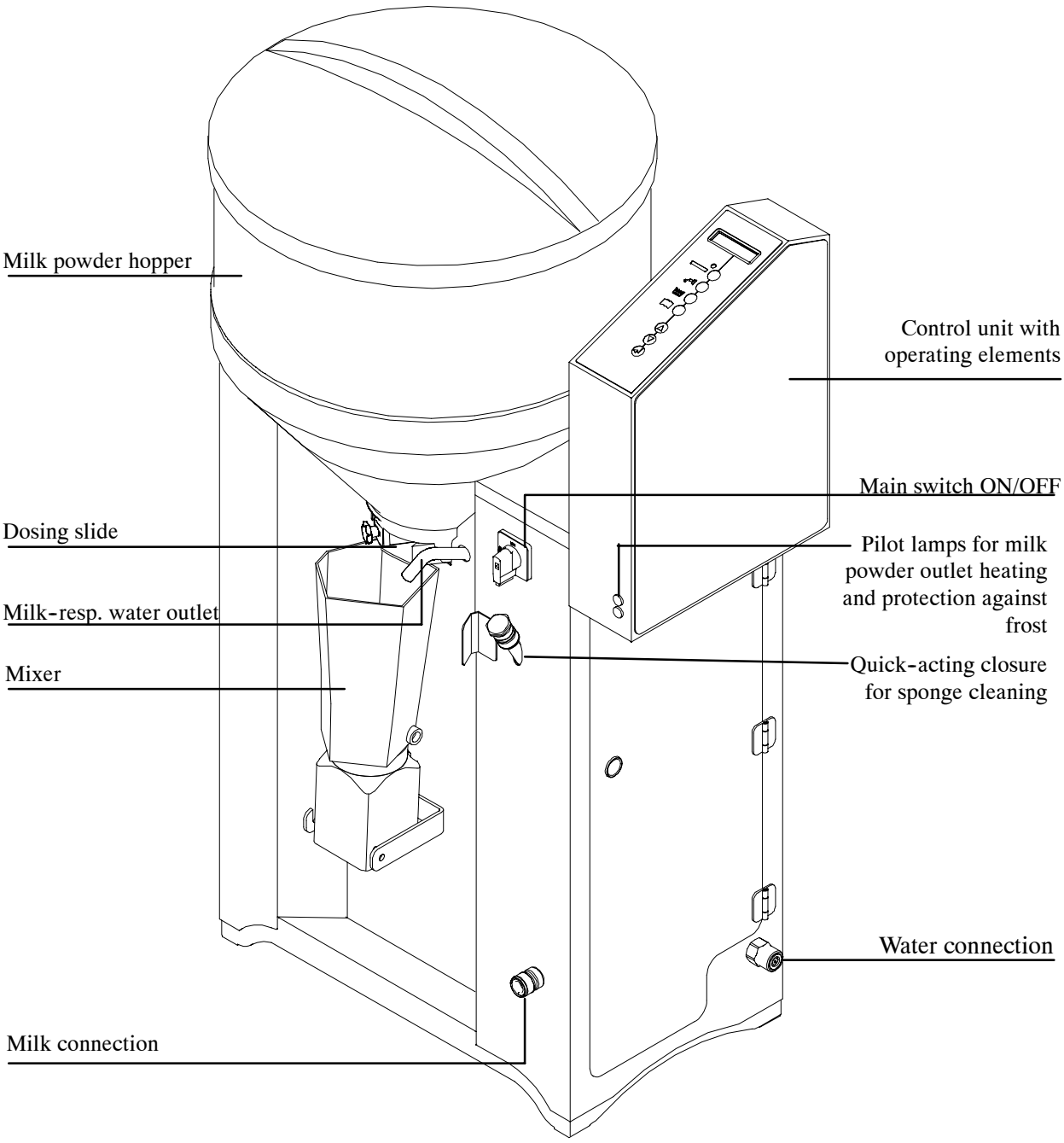
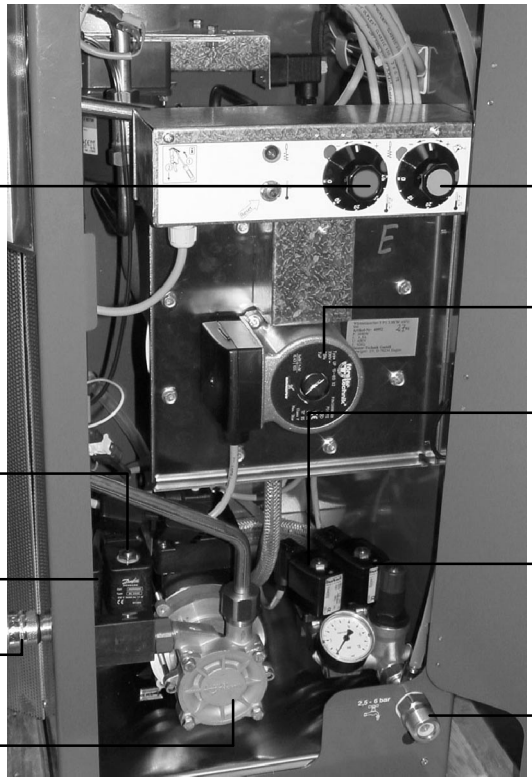
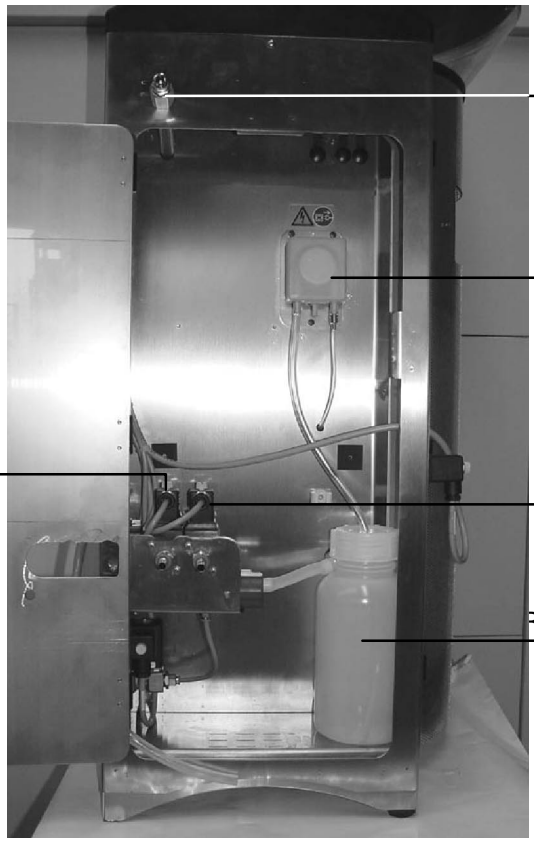
1.4 Construction Parts System-Machine Combi



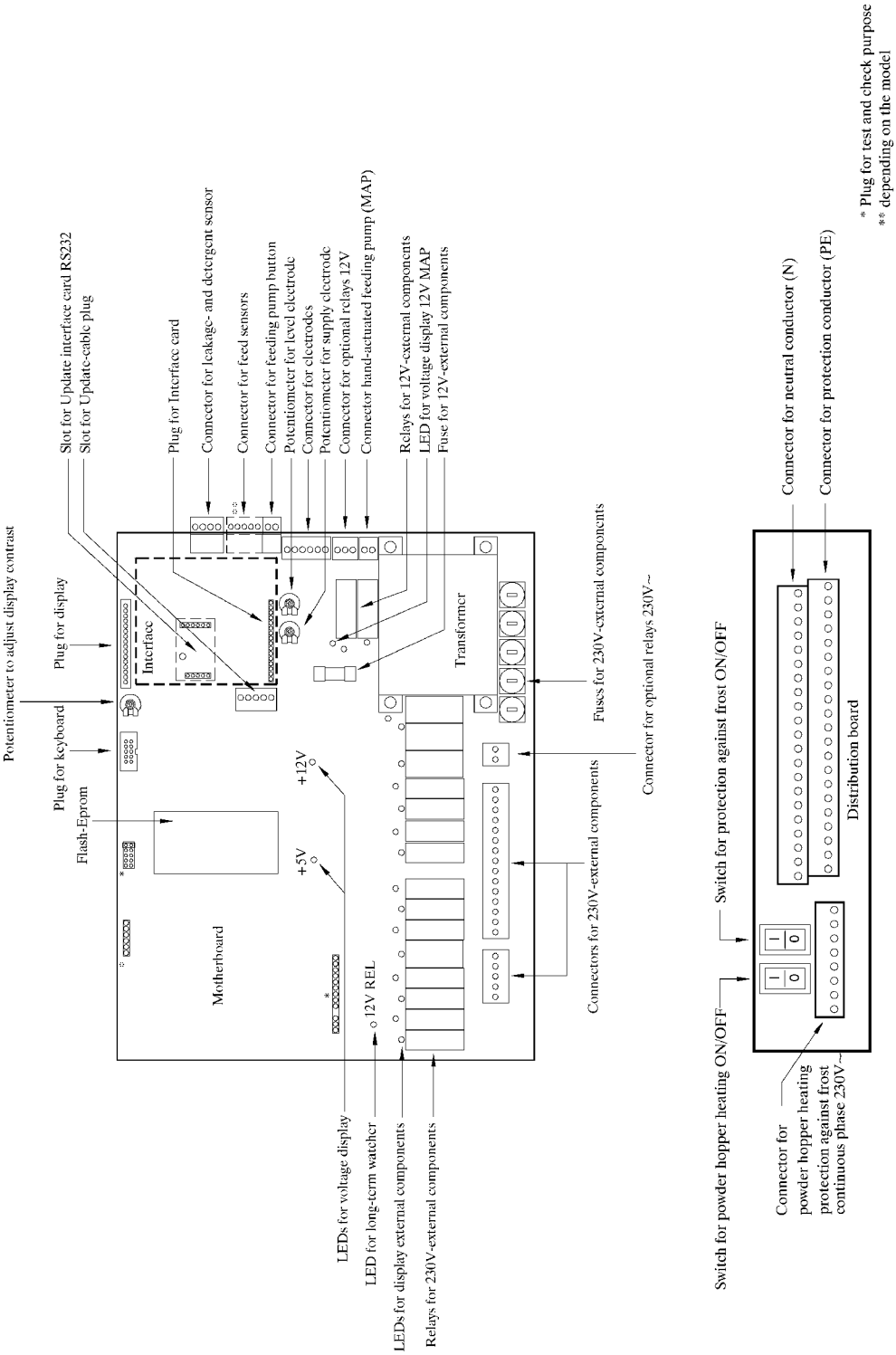




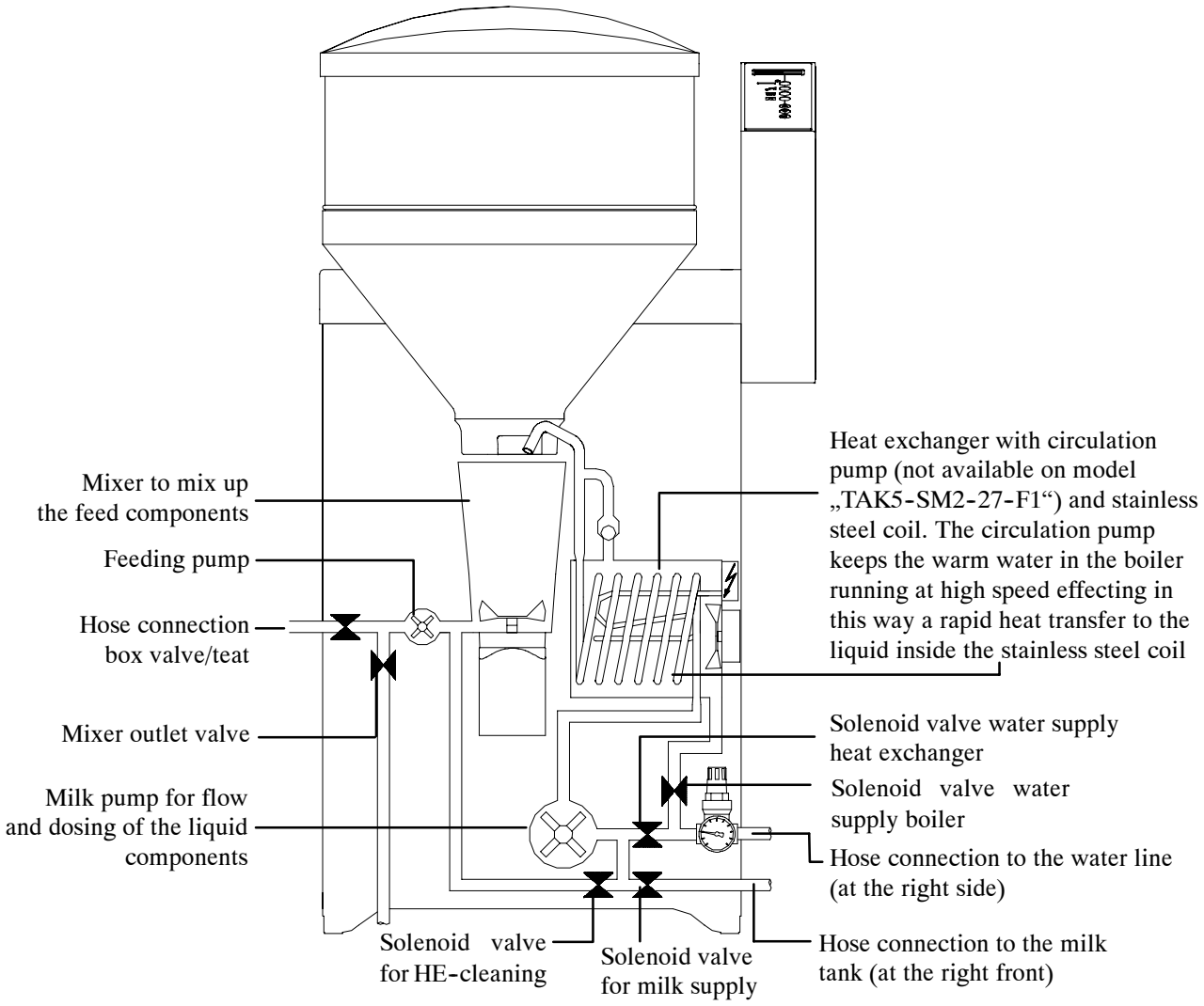
* not available on model TAK5-SM2-27-F1

1.4.1 Motherboard and Distribution Board SM 2 Plus

On the motherboard are located the transformer for weak current supply of the processor control, the relays, the connectors for external components, the fuses and LEDs.



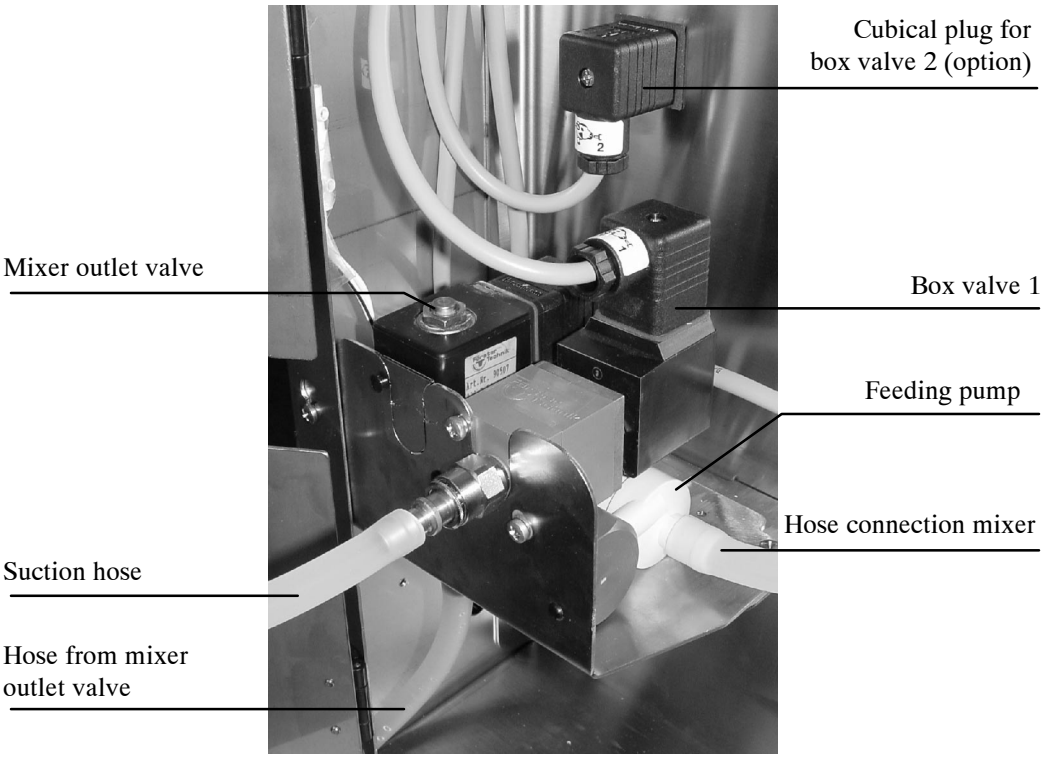
1.4.2 Heat Exchanger / Circulation Pump



1.4.3 Hand-Actuated Feeding Pump

Thanks to the hand-actuated feeding pump that is located below the valve unit, calves may easily get accustomed to the teat. You can activate the feeding pump either by pressing a key on the operating unit (stylized teat) or by pushing a button on the remote control. The milk is then delivered directly from the mixer via the valve unit to the teat and into the mouth of the calf.

You can also use the feeding pump e.g. to drain off manually the rinsing water in the mixer jar via the mixer outlet valve. To this end, press Menu key and select „Emptying Mixer“ in submenu „Hand Functions“.



Do not clean the feeding pump by means of the cleaning sponge!

2 Specifications Automatic Calf Feeder

Please observe the information on the nameplate located at the left of the chassis!

Electrical Connection
TAK5-SM2-38-P1, TAK5-SM2-27-F1 (400 V)

230V / 400V / 3 / N / PE, 50 Hz, 16 A

TAK5-SM2-27-F1 (230 V)

230V / L / N / PE, 50 Hz, 16 A

TAK5-SM2-28-P1 (only for U.S.A. and Canada)

240V / L1, L2 / Grd / 60 Hz, 15 A

TAK5-SM2-30-P1 (only for Japan)

200V / L1, L2 / Grd / 50/60 Hz, 20 A

TAK5-SM2-32-P1

230V / L / N / PE, 50 Hz, 20 A

VDW5-SM2-38-P1, VDW5-SM2-27-F1 (400 V)

230V / 400V / 3 / N / PE, 50 Hz, 16 A

VDW5-SM2-27-F1 (230 V)

230 V / L / N / PE, 50 HZ, 16 A

VDW5-SM2-28-P1 (only for U.S.A and Canada)

240V / L1, L2 / Grd / 60 Hz, 15 A

VDW5-SM2-30-P1 (only for Japan)

200V / L1, L2 / Grd / 50/60 Hz, 20 A

VDW5-SM2-32-P1

230V / L / N / PE, 50 Hz, 20 A

Dimensions of the automatic calf feeder (Combi version)

Height: 126 cm

Width: 67 cm in case of closed lateral doors
115 cm in case of open lateral doors

Depth: 57 cm without dispenser for powder additives
66 cm with dispenser for powder additives

Weight (with basic equipment): approx. 66 kg

Dimensions of the automatic calf feeder (Fresh milk version)

Height: 120 cm

Width: 67 cm in case of closed lateral doors
115 cm in case of open lateral doors

Depth: 57 cm without dispenser for powder additives
66 cm with dispenser for powder additives

Weight (with basic equipment): approx. 62 kg

Water connection

1/2“ hose with 3/4“ hose coupling.
The local water pressure has to be between 2,5 and 6 bar.

Heat exchanger

Boiler capacity: approx. 7 l.
Capacity of the stainless steel coil: 0,5 l

Milk powder hopper - storage capacity (with top section)

Approx. 35 kg

Number of sucking stations

Each calf feeder can provide approx. 20 – 30 rearing calves or 15 – 20 fattening calves with feed per sucking station. One calf feeder with 2 sucking stations can provide approx. 50 – 60 rearing calves, 20 – 30 fattening calves or 20 rearing calves and 15 fattening calves with feed.

Specifications are subject to change without prior notice.

3 Locating the Automatic Calf Feeder

3.1 Local Electrical Connection

- Refer installation of the local electrical connection to qualified electricians.
- Observe local recommendations and protective measures. To operate the automatic calf feeder, it is demanded to install an earth leak switch (30 mA) in the local power supply.
- The automatic calf feeder requires its own power supply: *refer to chapter 2, page 13, „Specifications“*.
- Observe rated voltage and frequency. The rated voltage indicated on the nameplate of the calf feeder must correspond to the one of the mains supply.
- In case of overvoltage risk, install an overvoltage limiter in the local main distribution frame.

Earth bonding

For animals' safety and to prevent electrical interferences, carry out an earth bonding of all metal parts such as water line, sucking station, race-way and automatic calf feeder. At the rear of the calf feeder is located the connection screw for the earth bonding which has to be connected to earth, such as e.g. an equipotential busbar, by means of a short coupling.

Lightning protection

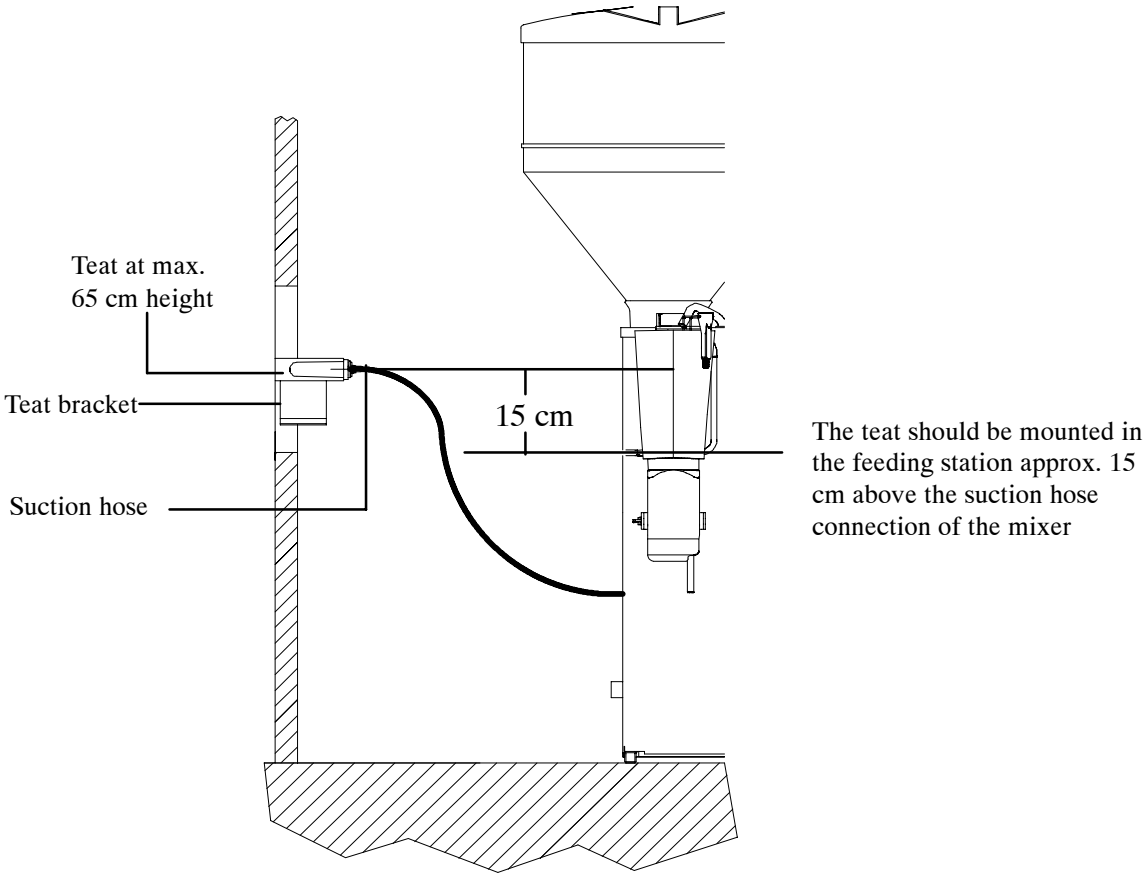
As it is technically impossible to protect the installation against lightning stroke separately, it is to the owner to install an adequate lightning protection, such as e.g. a lightning protection system for the entire building. We recommend to conclude a lightning protection insurance.

3.2 Installing the Automatic Calf Feeder

- It is advisable to place the calf feeder in a dry location, if possible, not in the animal area (e.g. in the fodder storage or similar detached room).
- A fence of planks protects the automatic calf feeder against dirt and flies. In summer, when flies occur with increased frequency, you can protect the mixer jar, the milk powder and the additive outlet by means of a large fly protection (accessory). Steam can easily escape through the openings of the fly screen grating.
- Frost does not cause any damages to the automatic calf feeder. In order to ensure a good functioning of the feeding process even in case of frost, you have to equip the calf feeder with an equipment for protection against frost (accessory). The owner is responsible for a reliable water supply.
- The suction hoses can be easily guided through a wall.
- If possible, place the milk storage tank next to the automatic calf feeder.

3.3 Mounting the Sucking Station

- Install the sucking station max. 65 cm above the stable ground.
  Mount the teat approx. 15 cm above the suction hose connection of the mixer.
- Fix the suction hose in such a way, that the mixer jar can easily be tipped in forward direction. The suction hoses should not exceed a length of 2 m.
- Mount the suction bracket with splash board towards the bottom.
- Make sure that there is no sag in the connecting hose between mixer and feeding pump, in order to prevent accumulation of water or milk.



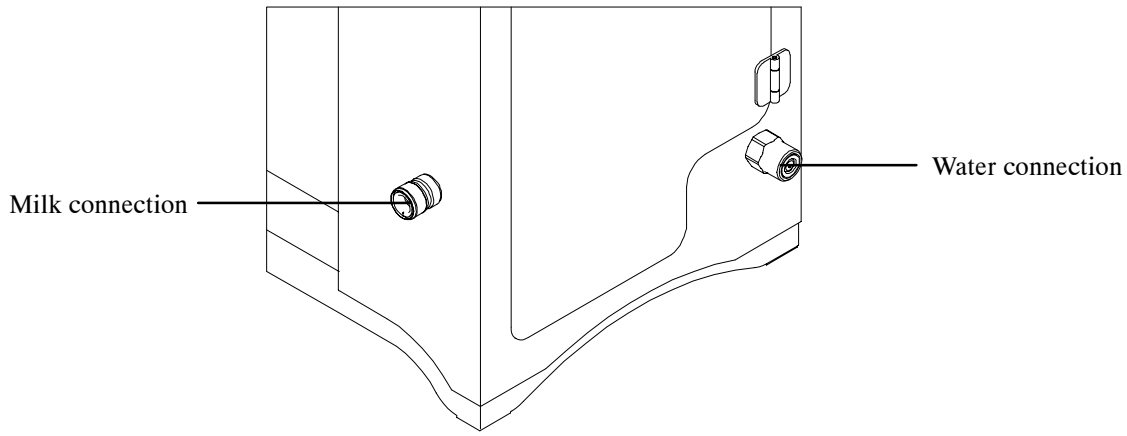
3.4 Mounting the Race-Way and Connecting the Identification

Mount an appropriate race-way in front of the sucking station, in order to prevent a calf from being pushed aside by other calves.

- Mount the race-way according to the mounting instructions.
- Connect the identification according to the mounting instructions.

Install the cable for the connection of the identification in such a way that the calves cannot touch it.

3.5 Water and Milk Connection



3.5.1 Water Connection

- Connect the 1/2“ water hose with a 3/4“ hose coupling at the right of the automatic calf feeder.

The water pressure supplied by customer has to be between 2,5 and 6 bar.

Note: To ensure troublefree functioning of the automatic feeder, take care that the water pressure does not fall below 2,5 bar!

Take care that there is no pressure variation of the water pipe.

In case of water pipes with small cross section it may happen that, in the feeding mode or when water is taken out of the same pipe simultaneously, the water pressure will drop.

When the water pressure is below 2,5 bar you have to use a header tank.

Install additional water stop valve.

Since September 1, 2000 the pressure reducer is factory-set to 1,5 bar.

Do not alter the setting of the pressure reducer!

In case the notes above should not be observed, there is no guarantee that the automatic feeder will run trouble-free!

3.5.2 Milk Connection

Convey the milk from the milk storage tank straight to the automatic calf feeder. In case long pipes are inevitable, use bigger diameters.

- To avoid air bubbles, do not hang the milk hose into the milk tank from above but install connection for milk pipe at the bottom of the milk tank.

Air-containing pipes, very long and thin, as well as thin-walled pipes being prone to contract, lead to untimely switching-off or change-over of the system.

Should the milk pipe be made of several sections, make sure that the connections - both at the milk tank and the automatic feeder - are reliably leakproof.

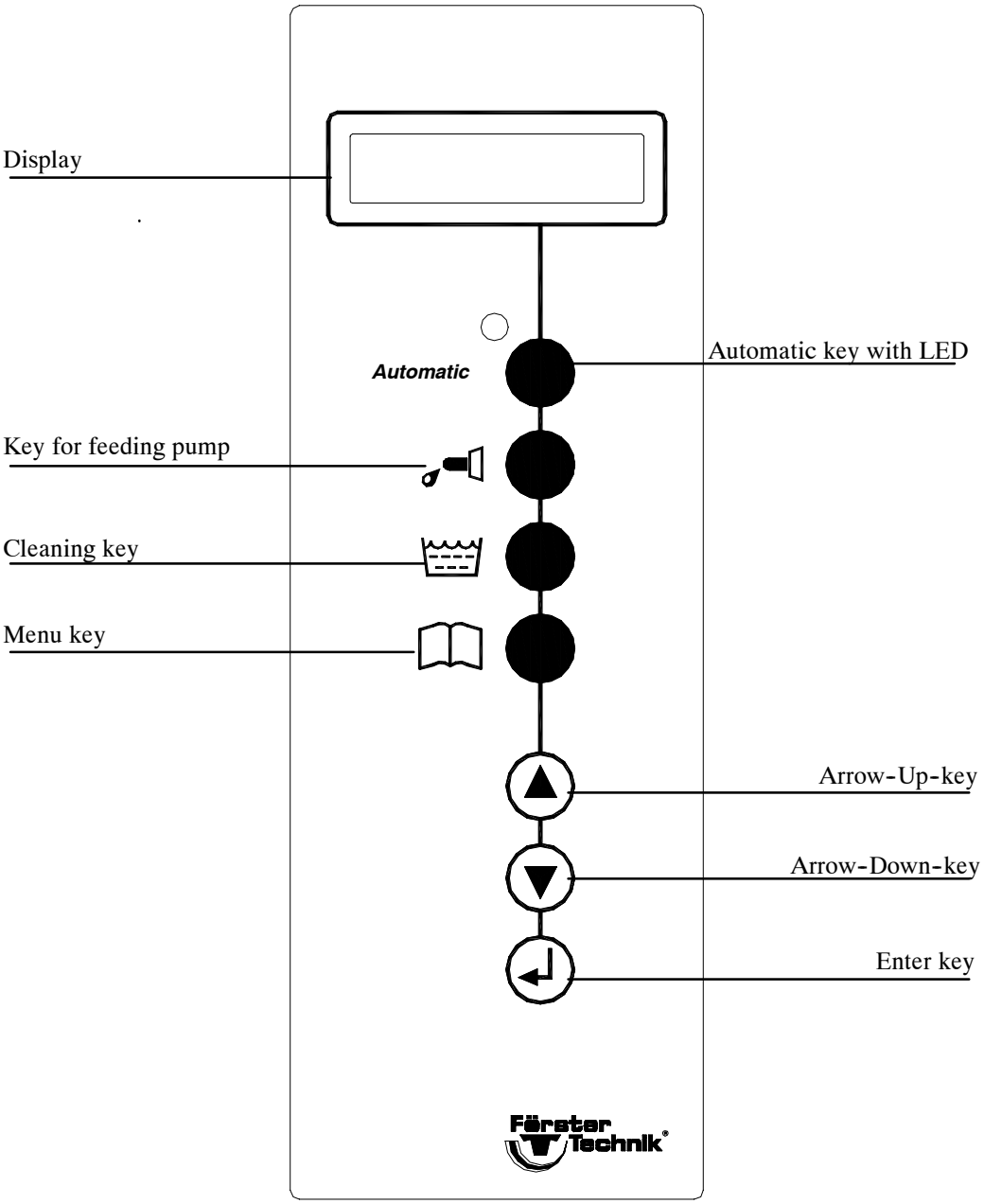
For hygienic reasons, avoid gross differences of diameter. Only use couplings and joining pieces easy to clean.

When the automatic calf feeder only runs in the water mode, close the milk connection by means of a blind plug (part of the delivery).

4 Operating Elements

4.1 Keyboard

You can carry out all major settings and operations concerning e.g. operating mode, portion values, calibration, cleaning, diagnosis etc. via the keyboard. The display shows all current settings.



4.1.1 Operational Control Keys

Automatic Automatic key: the automatic calf feeder runs in the automatic mode. You will find more detailed information on the individual functions in chapter 9, page 54 ff.

Press this key to activate the feeding pump.

Press Cleaning key to access the cleaning menu. You will find more detailed information on the individual functions in chapter 10.3.3, page 63 ff.

Press Menu key to select several functions resp. main menus. For more detailed information, see chapter 8, page 38 ff.

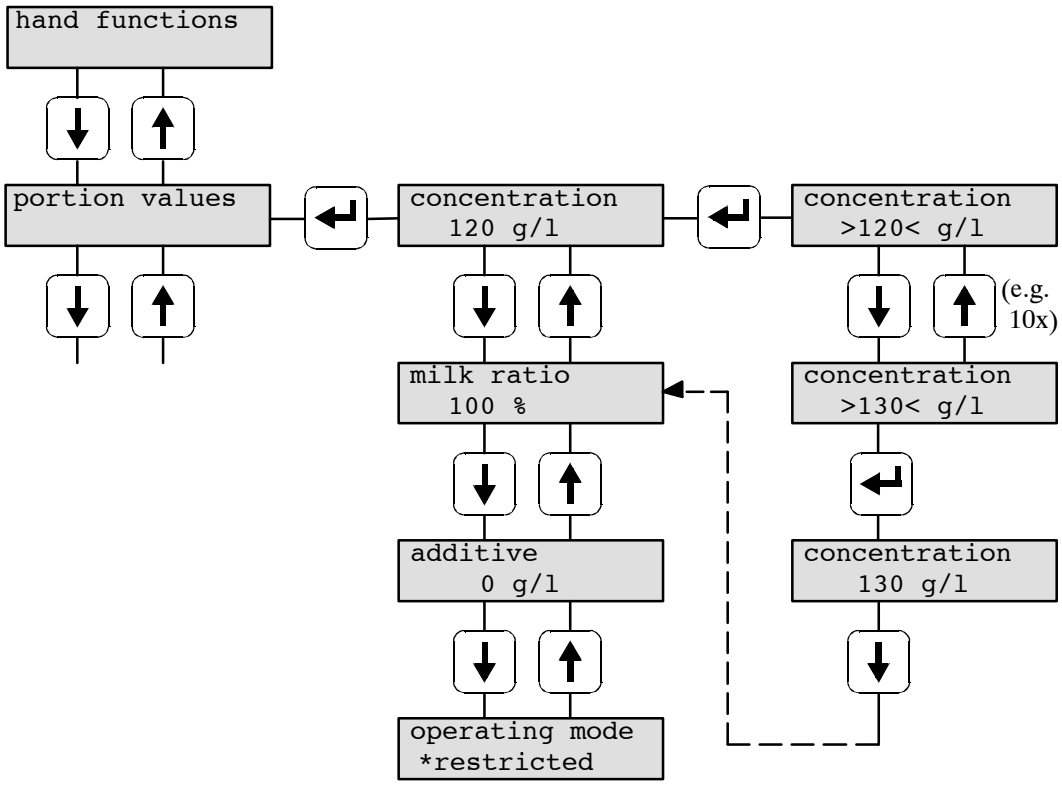
Press Arrow Up/Arrow Down to move through the different menus and to change the settings.

Press Enter key to open the menus and store the settings.

4.1.2 Entering the Values

Press Arrow Up/Arrow Down or Enter to enter, set or change the values concerning e.g. calibration, concentration, milk ratio, additive amount etc. Press the Menu key to access the main menus. Press Enter to change a value. The value displayed on the screen starts flashing (e.g. >120<). Arrow Up is used to increase and Arrow Down to decrease the set value. The longer you keep the relevant Arrow key pressed the faster you can change the displayed value. Once you set the correct value, press Enter to store it (the value stops flashing). In case you do not wish to change the value, press the Menu key to return to the main menu.

Example for the input of values within the functions of the Menu key:

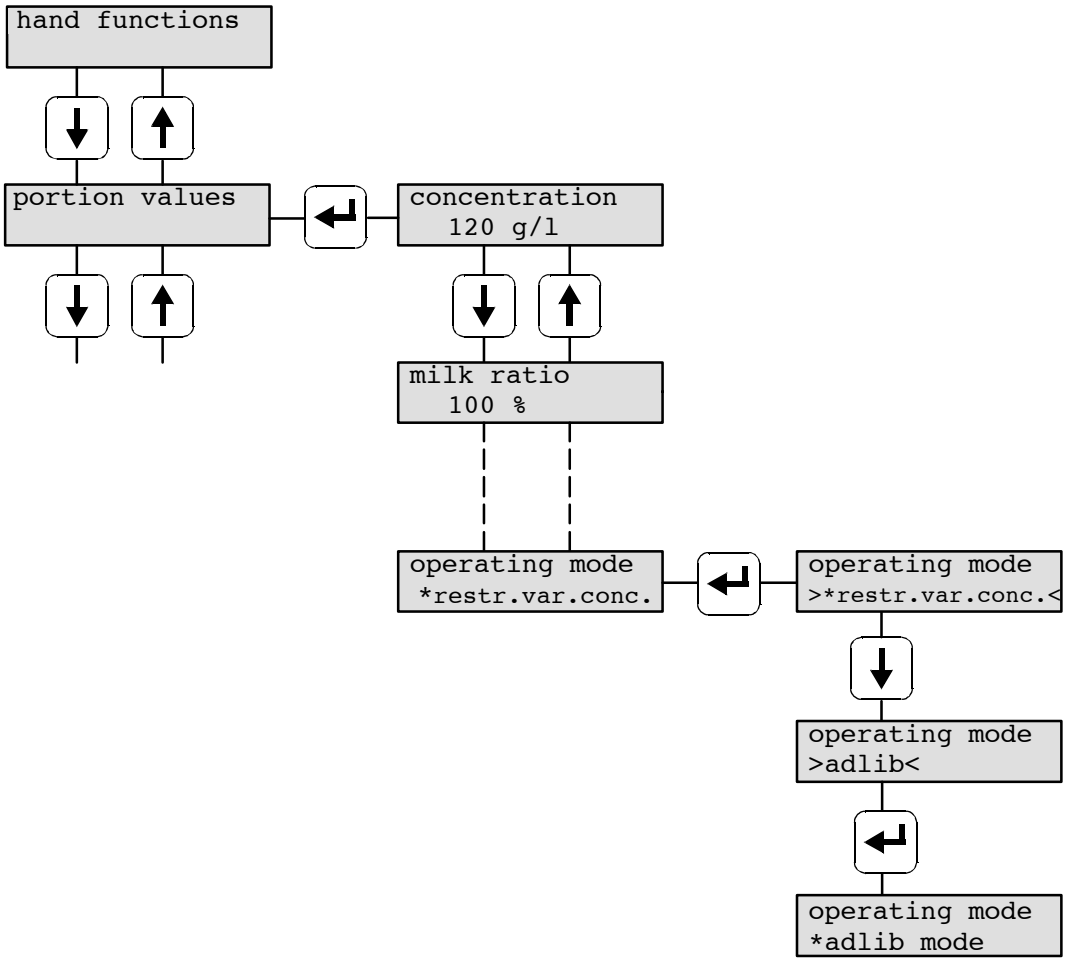


4.1.3 Selecting the Options

You can only select one of the available options. The automatic feeder can run either in the „ad libitum“ or in the „restricted“ mode. The selected option is marked by an asterisk in the second line of the display.

Press Enter to change the option. The selected option starts flashing. Press Arrow Up/Arrow Down to move to the available options. Press Enter as soon as the display shows the desired option. The option is then marked by an asterisk and subsequently stored. In case you do not wish to change the option, press the Menu key to return to the main menu.

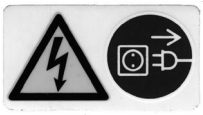
Example for the input of values within the functions of the Menu key:



5 Installing the Automatic Calf Feeder

5.1 Checking the Jumper in case of Relay Interface

When the System-Machine is connected to a feeding computer with relay interface, during installation you have to take care that the jumper for signal empty is in the correct position. The jumper has already been factory-set. Check the position of the jumper only in case a calf with drinking right is staying in the feeding station and the automatic feeder does not prepare a drinking portion, even if the mixer jar is empty.



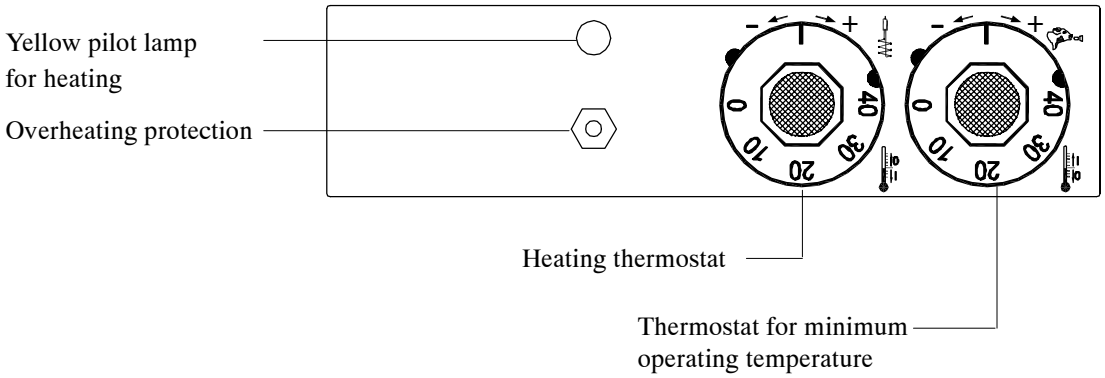
CAUTION! In order to avoid injuries due to electric shocks, **before** opening the control unit it is imperative to make the automatic feeder currentless by turning the program switch to position „0“/„OFF“ or by pulling the mains plug.

- Open the control unit and check the position of the jumper.

5.2 Connecting the Automatic Calf Feeder to the Mains Supply

Warning: Before switching the heating on, fill up the heat exchanger, otherwise the boiler will be damaged. There will be no guarantee for a reliable functioning of the automatic feeder.

- Open the door on the right-hand side of the chassis.
- Turn back both thermostats to zero.



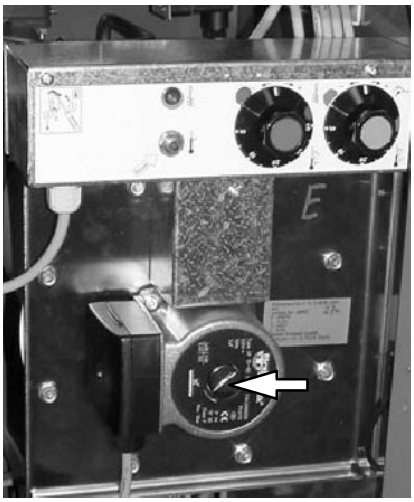
- Connect the mains plug and switch the automatic feeder on by turning the main switch to position „I“/„ON“. As soon as the display shows the program version, press the Menu-key and observe the instructions contained in chapter 5.3 „Filling the Boiler of the Heat Exchanger with Water“.

5.3 Filling the Boiler of the Heat Exchanger with Water

Press the **Menu key** on the keyboard, select submenu **„Hand Functions”** and subsequently menu **“Heat Exchanger, fill? Start”** to fill the boiler of the heat exchanger with water. After approx. two to three minutes some water will flow out of the water outlet. Only then the filling process will be completed.

5.4 Deaerating the Circulation Pump (if available)

- Open the door on the right-hand side of the chassis.
- Remove the cover, strip the deaeration screw and wait until some water comes out.



- Fasten the deaeration screw.
- Fix the cover.

After 1 - 2 days, deaerate the circulation pump once again.

5.5 Filling the Milk Powder into the Powder Hopper

CAUTION! In order to avoid injuries due to **rotating parts (inside the powder hopper)**, **before** carrying out any kind of operation on the milk powder hopper, such as e.g. filling milk powder into the powder hopper, it is imperative to make the automatic feeder current-less by turning the main switch to „0/OFF“ or by pulling the mains plug.

- Only fill in milk powder that is suitable for calf feeding. Do not put paper or other foreign matter into the powder hopper.

There is no warning in case the powder hopper should be empty! The automatic feeder continues working in the feeding mode without milk powder.

5.6 Filling the Milk Storage Tank

The milk has always to be clean. Straw, hay or other foreign material reduce the operational reliability considerably.

In case you should utilize cow milk and flaked milk, use a slow-running stirring device with intermittent action to avoid creaming of the milk. Continuously or fast running stirrers cause buttering. Animals getting too fat milk may suffer from digestive trouble.

Cool the milk or preserve it with formic acid (20 - 30 ml, concentration 10 % per liter milk). Do not feed the animals with milk starting to turn sour!

5.7 Calibrating the Feed Components

You have to calibrate all feed components otherwise the automatic feeder cannot prepare an exact feed mix in feeding mode.

Calibration is defined as the input into the computer of the amount of water, milk and milk powder (MP) distributed during a fixed period of time.

In case the automatic feeder is additionnally equipped with a detergent dosing pump or/and a dispenser for powder additives, it is imperative to calibrate both of them.

For more detailed information on calibration, see chapter 8.4, page 43, „Functions of the Menu key, Calibration“.

5.8 Setting the Heating

Switch the heating on only after you have filled the heat exchanger with water!

Thermostat for minimum operating temperature and heating:

The thermostat for minimum operating temperature prevents too cold milk or water from being distributed. When the temperature in the boiler falls below the set minimum temperature of the water in the heat exchanger, the preparation of the milk is interrupted until the minimum temperature is reached.

When the minimum operating temperature is not reached, the display shows the following message:

```
fault
temp. too low
```

Factory settings:

The minimum operating temperature is factory-set between 38°C and 39°C. The minimum operating temperature should always be set 3°C below the heating temperature, in order to avoid overlaps in the control range.

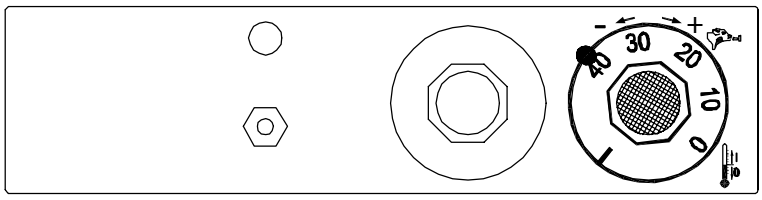
The heating temperature is factory-set between 42°C and 43°C.

The calibration menu helps you checking the water temperature.

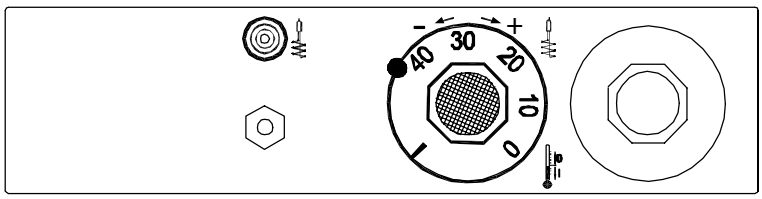
For calibration, refer to chapter 8.4, page 43, „Functions of the Menu key, Calibration“!

5.8.1 Adjusting the Thermostats

- Open the door on the right-hand side of the chassis.
- Turn the thermostat for minimum operating temperature (green) so far clockwise, until both green marks coincide.



- Turn the thermostat for boiler heating (red) so far clockwise, until both red marks coincide.



The marks facilitate temperature setting.
Yet, you have to check the settings regularly.

5.8.2 Recommendations for Temperature Settings

The heat exchanger is designed in such a way that also the cheaper milk powders with higher fat melting point can be used without problems. In this case, the outlet temperature has to be exactly between 42°C and 43°C.

Whole milk

In case you should only utilize whole milk or cold-soluble milk powders, a temperature of approx. 38°C will be enough.

The temperature has to be set very carefully. When reducing the heating temperature don't forget to reduce the minimum operating temperature accordingly.
Too low temperatures may cause indigestion whereas too high temperatures over a long period of time may lead to inflammation of the mucosa in the abomasum. Flatulence may indicate that the drinking temperature is too high.

5.8.3 Measuring the Temperature

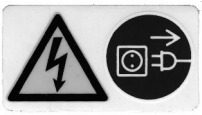
The setting of the heating is related to the portion size and the drinking speed of the calves. To measure the temperature do not extract more than 0.5 l. In case of further measurements, wait until the boiler has restored the temperature. Heat transmission time depends on the input and outlet temperature of the liquid and may vary between 10 and 25 seconds.

To measure the temperature procede as follows:

- Press Menu key.
- Press Arrow Down to move to menu „Calibration".
- Press Enter to go to submenu „Water HE, start".
- Make sure that the circulation pump is running (if available).
- Wait until the yellow pilot lamp of the boiler water heating has gone out.
- Hold a measuring vessel under the water outlet.
- Press Enter to start water distribution.
- Immediately afterwards, measure the temperature by means of a thermometer.

Wait for heat transfer time (approx. 30 seconds), prior to distribution of the next portion. After you have carried out careful measurement, correct the temperature, if necessary, until the desired temperature is reached. For further measurements, wait until the yellow pilot lamp for the heating has gone out.

5.9 Heating for Milk Powder Outlet and Protection against Frost



CAUTION! In order to avoid injuries due to electric shocks, **before** opening the control unit it is imperative to make the automatic feeder currentless by turning the main switch to position „0/OFF“ or by pulling the mains plug.

Inside the power unit is located a distribution board with integrated switches. The left switch is used for switching on and off the heating for the milk powder outlet. The right switch is used for switching the heating cable on and off.

In summer it is imperative to set both switches to „0“ (= OFF)!

The heating for the milk powder outlet prevents formation of condensate on the milk powder outlet.

The heating cable with temperature control is available as an accessory and can be retrofitted at any time. It is active when temperature falls below 3°C and protects hose pipes, solenoid valves and pressure reducer against frost. We recommend to mount a heating cable in case the calf feeder should be installed in an unprotected location exposed to extreme cold.

6 Functioning of the Automatic Calf Feeder

6.1 Preparing the Milk Portions

The warm water is taken from the boiler of the heat exchanger. The milk pump delivers the milk through the stainless steel coil of the heat exchanger into the mixer jar.

The circulation pump (not available on model TAK5-SM2-27-F1) keeps the warm boiler water moving at high speed causing a rapid heat transfer to the liquid inside the stainless steel coil.

In case no calf claims its milk portion 2 minutes after the last portion has been distributed, the circulation pump switches off automatically. The pump switches on automatically every 15 minutes for 60 seconds or in case a calf claims its milk portion or when the calibration or a cleaning process is carried out.

When the liquid jet hits the supply electrode located at the water-/milk outlet, a pre-set milk powder portion falls from the powder hopper into the mixer jar where it is mixed with the liquid.

The mixer is connected via a box valve to the sucking station by means of a suction hose. The milk runs through the suction hose to the teat in the sucking station.

You can interrupt the preparation of a feeding portion at any time by pressing the „Automatic“, „Cleaning“, „Menu“ or „Enter“ key.

6.2 Distributing the Milk

6.2.1 In the Restricted Mode

The rod (level) electrode is free:

When an animal with drinking right enters the feeding box and is identified, the automatic calf feeder prepares a milk portion as soon as the mixer jar is empty. The milk in the mixer jar grounds the rod electrode. When the calf has drunk the milk, the rod electrode is free again and the machine starts preparing the next portion in case the calf has still drinking right.

The rod (level) electrode is covered:

When an animal with drinking right enters the feeding box and is identified, the remaining portion in the mixer is stirred. After the calf has drunk the remaining portion, i.e. the mixer jar is empty and the rod electrode is free again, the automatic calf feeder starts preparing the next portion.

Two sucking stations:

When an animal with drinking right is identified, the relevant suction line opens. When the animal has no drinking right anymore, the suction line closes as soon as the rod electrode is free again and the entered draining time has lapsed. When the rod electrode is still covered, the suction line will close after approx. 2 minutes.

6.2.2 In the Ad Libitum Mode

In the ad libitum mode the automatic calf feeder operates without animal identification. As soon as the rod electrode is free, the machine starts preparing the next portion. In case of two sucking stations, both suction lines are open.

In case of prolonged ad libitum mode the 2-group valve unit heats considerably. Therefore, connect the suction hoses directly to the mixer and plug out the plug of the 2-group valve unit.

7 Settings in Setup

You have to set all basic functions of the automatic feeder in Setup.

Warning: Refer activation of these functions only to qualified personnel! The manufacturer has already provided the machines with the correct settings. The manufacturer accepts no responsibility for incorrect settings that have been carried out by the user.

7.1 Different selections in Setup

The Setup contains the following selections (see following table):

Language You may choose between the following languages: German, English, French, Netherlands, Italian, Norwegian, Swedish, Danish, Finnish, Polish, Japanese, Spanish and Czech.

The Eproms always contain the following languages: German, English and the target language.

EPROM
German
English
+ target language

Machine type In this menu please select the type of automatic feeder:
Powder- the automatic feeder only runs in the milk powder+water mode.
Combi- the automatic feeder works with fresh milk as well as with milk powder.
Milk- the automatic feeder only works with fresh milk.
KR- these automatic feeders run without feeding computer in the ad libitum (adlib) mode.

Interface Depending on the installed interface you have to set one of the following options:
Option **„No Interface“** - the automatic feeder runs in the adlib mode without connection to the feeding computer.
Option **„Relay signal“** - the automatic feeder is controlled by a feeding computer with Station Controller. The automatic feeder gets the relay and ready signals from the feeding computer.
Option **„Priority“** - this option indicates which feeding station or calf group should be fed as a matter of priority. The automatic feeder runs in the ad libitum mode with a two-group valve unit and feed sensors.
Options **„Alcom-Bus“** and **„VC3-Bus“** are reserved to the connection to Bus-systems.

Box 1
Box 2 In case the automatic feeder is equipped with a stop valve for one feeding station or with a two-group valve unit for two feeding stations, you have to select the box valves in Setup. In addition, here you have to enter whether box 1 or box 2 are equipped with servo- or gradient control. Select „no“ if you want to cancel or you do not want to register a box.

Additive dispenser In case an additive dispenser is connected and additives should be dispensed, select the additive dispenser in Setup.

Calibration scales Do not modify the standard setting „no“.

Heating system Do not modify the standard setting „Heating system, thermostat“.

Min.oper.therm. This option indicates whether the automatic feeder has a thermostat for minimum operating temperature.

Circulation pump Here you can enter whether the automatic feeder is equipped with a circulation pump.

Air valve Select „yes“ in menu „air valve“ when the automatic feeder is equipped with compressed air cleaning.

Circulation valve Enter „yes“ in case the automatic feeder is equipped with a circulation valve that is needed for heat exchanger cleaning.

Detergent pump In case the automatic feeder is equipped with a detergent pump and should the mixer be cleaned with detergent, you have to select the detergent pump in Setup.

7.2 Function Table „Setup“

Setup	Option
Language	deutsch
	english
	target language
Machine Type	Powder
	Combi
	Fresh milk
	KR
Interface	no Interface
	relay signal
	priority
	Alcom-Bus
	VC3-Bus
Box 1 / Box 2	yes/no/servo/gradient
Additive Dispenser	yes/no
Calibration scales	yes/no
Heating system	thermostat/electronic
Thermostat for Minimum Operating Temperature	yes/no
Circulation pump	yes/no
Air valve	yes/no
Circulation valve	yes/no
Detergent pump	yes/no

7.3 How to make entries in Setup

When switching the automatic feeder on, **only** press the „Menu“ key on the operating unit and keep it pressed until the display shows:

```
language
*deutsch
```

Press Enter, select the language by means of Arrow Up/ Arrow Down and confirm with Enter.

Now call up the other available menus by pressing Arrow Up/ Arrow Down. For modifications, press Enter to open the memory. Select the desired option by pressing Arrow Up/ Arrow Down. Confirm with Enter.

All selected options are marked by an asterisk*.

In order to leave Setup, switch the automatic feeder off and then on. In this way, all modifications will be activated.

7.4 Connecting the System-Machine to the Feeding Computer

You can connect the System-Machine to a feeding computer by means of the relay interface.

Set the operating mode in menu „Portion values“ of the System-Machine:

Switch the System-Machine off by turning the main switch to position „OFF“ and subsequently switch it on by turning the main switch to position „ON“. When switching the machine on, keep „Menu“ key pressed until the display shows submenu “Language”. Press Arrow Down to move to menu „Interface“. Press Enter. Press Arrow key until the display shows the option „Relay Signal“. Confirm with Enter. In order to activate the selected functions, switch the machine off and subsequently on.

```
interface
*relay signal
```

Set the operating mode in menu „Portion values“ of the System-Machine:

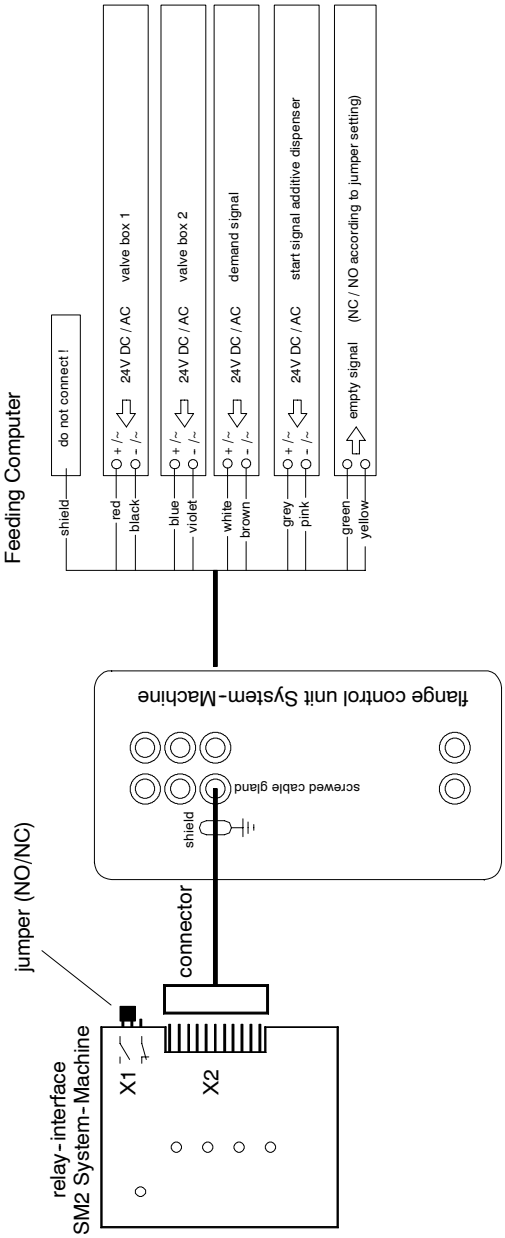
Press „Menu“ key. Press Arrow Down to move to menu „Portion values“. Press Enter to go to the submenus.

```
portion values
```

Press Arrow Down to go to submenu „Operating mode“ and select „restr. fix con.“ (restricted fix concentration) or „restr. var. con.“ (restricted variable concentration), depending on the feeding computer. The selected operating mode has to correspond to the one on the feeding computer.

```
operating mode
*restr.fix con.
```

Connecting the System-Machine to the Relay-Interface



8 Functions of the Menu Key

The functions of the „Menu“ key are summed up in the following main menus:
- Hand Functions,
- Portion Values,
- Milk Values,
- Calibration,
- Machine Values,
- Diagnosis.

Press Enter in the desired main menu and access the various available submenus or subfunctions.

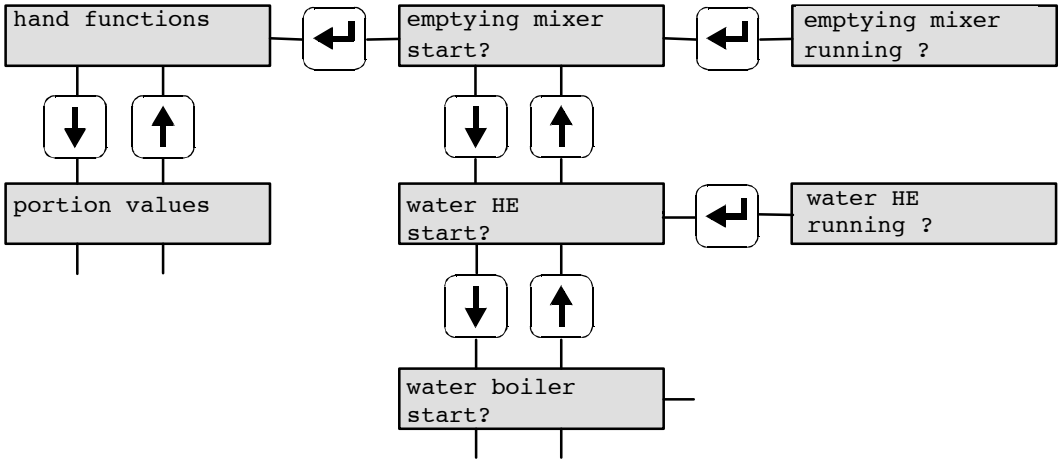
Press Arrow Up/Arrow Down to move to the different submenus within a main menu. In case you are in a submenu yet, press Menu key to return to the main menu level.

Depending on the basic settings carried out in Setup, particular menus are not displayed on the screen.

8.1 Hand Functions

In the main menu level you can access the first main menu „Hand functions“ by pressing the Menu key once again. In this menu you can activate the functions of the automatic feeder individually and manually.

You may choose between the following functions:
- Emptying Mixer
- Water HE (HE = Heat Exchanger) Start
- Water Boiler Start
- Milk Start
- Milk Powder Start
- Additive Start
- Mixer Start
- Box Valve 1/2 Open
- Heat Exchanger Fill



Release the Enter key to complete the operation.

8.2 Portion Values

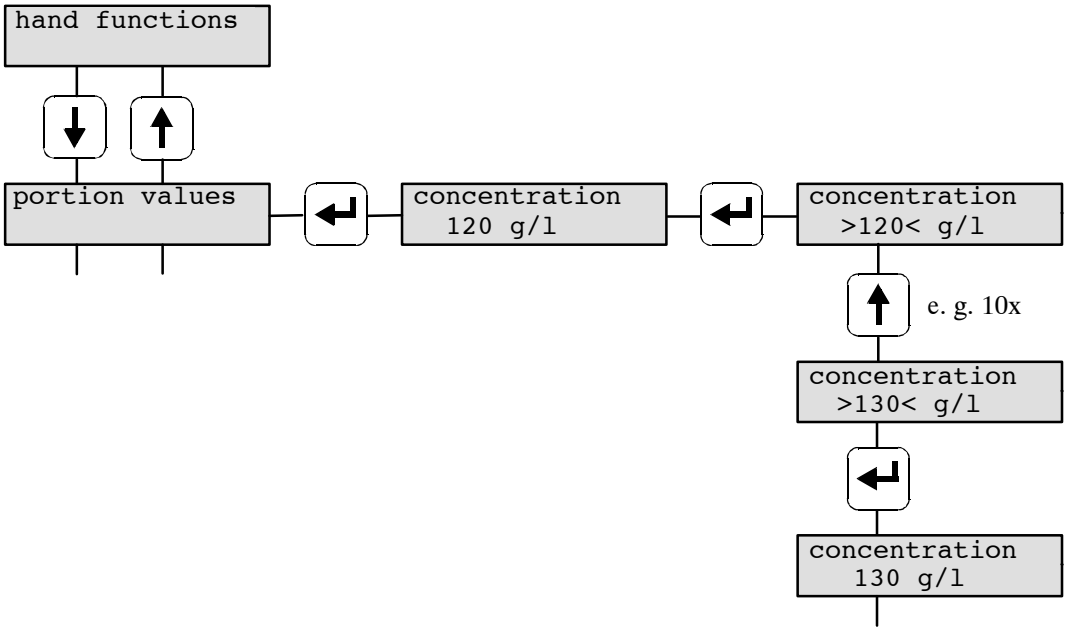
In the main menu „Portion values“ you can enter the operating mode as well as the values of the portion that should be prepared.

You may choose between the following submenus:
- Concentration
- Milk ratio
- Additive
- Operating mode

8.2.1 Selecting the Concentration

The concentration of the milk is defined as the amount of milk powder distributed to each calf per liter milk. When the entered concentration value is below or above the dry matter of the milk, the milk is either diluted with water (the minimum water share corresponds to 10 % approx.) or milk powder is added to the milk. In the mixed milk/water operating mode, milk powder is automatically added to the water share until the entered concentration is reached.

Generally the dry matter content of whole milk is 120 - 130 g/l. Enter the amount of dry matter in main menu „Milk Values“ (see chapter 8.3.2, page 41, „Milk Values“).



Thanks to particular feeding computer programs you can enter an animal-specific, variable concentration. In this case, the System-machine does not display submenu „Concentration“ anymore. You have to enter the concentration value into the feeding computer.

8.2.2 Entering the Milk Ratio

In submenu „Milk Ratio“ you can enter the proportions of a mixture (freshmilk and milk powder + water). Milk and water can be mixed from 30 % to 90 % in 1 % steps. In case the automatic feeder is equipped with a heat exchanger with circulation pump, milk and water can be mixed from 10 % to 90 % in 1 % steps. You can always enter 0 % and 100 %.

Thanks to particular feeding computer programs you can enter an animal-specific, variable milk ratio. In this case, the System-Machine does not display submenu „Milk Ratio“ anymore. You have to enter the milk ratio value into the feeding computer.

8.2.3 Entering the Additive

Calves can be treated either with powder or with liquid additives. In submenu „Additive“ you have to enter the amount of additive in grams per liter that should be added to each drinking portion. The feeding computer determines which drinking portion should be prepared and distributed with or without additive.

Thanks to particular feeding computer programs you can enter an animal-specific, variable additive share. In this case, the System-Machine does not display submenu „Additive“ anymore. You have to enter the additive value into the feeding computer.

8.2.4 Restricted/Adlib-Mode

The automatic calf feeder runs as a standard in the restricted mode but you can also commute to the ad libitum mode.

Restricted In the restricted mode the automatic calf feeder operates with animal identification, i.e. calves are fed individually and in a restricted way.

Ad Libitum In the ad libitum mode the automatic calf feeder operates without animal identification and without connection to the feeding computer. In the feeding mode, a new portion is prepared each time the electrode in the mixer jar is free. Should two sucking stations be connected to the automatic calf feeder, both feeding boxes are open. All calves get the concentration set in the menu „Portion values, Concentration“.

Press Menu key to enter the operating mode. Press Arrow Down to move to menu „Portion Values“. Press Enter once again to move to the submenus. Press Arrow Down to go to submenu „Operating mode“. Press Enter. Press Arrow Up/Arrow Down to select the desired operating mode and confirm with Enter. The selected operating mode is marked by an asterisk.

8.3 Milk Values

In the main menu „Milk values“ you can carry out all settings concerning fresh milk feeding. You may choose between the following submenus:
- Operating mode
- Milk value
- Switch to MP-operating mode
- Switch to 1-circle-operating mode in case milk ratio < 30 %

8.3.1 Selecting the Operating Mode

In submenu „Operating mode“ you can select whether the automatic feeder should run in the MP-mode or in the MP-/fresh milk mode. Press Arrow Up/Arrow Down to select the desired operating mode.

In the MP-mode the automatic feeder only distributes milk powder+water.

```
operating mode
*MP-mode
```

In the MP-/fresh milk mode the automatic feeder distributes milk powder+water and fresh milk.

```
operating mode
*MP/fresh milk
```

In case you select the option „MP-mode“, no further submenus are displayed anymore. In case you select the option „MP-/fresh milk mode“, the display shows the submenus „Milk Value“ and „Switch to MP-mode“.

8.3.2 Entering the Milk Value

In submenu „Milk Value“ you can enter the solid matter content (SM-content) of the milk. Depending on the entered concentration and the selected milk value, the automatic feeder calculates whether and how much milk powder should be added to the milk or whether the milk should be diluted with water. In case the concentration is above the milk value, milk powder is added to the milk. In case the concentration is below the milk value, the milk is diluted with water (the minimum water proportion is approx. 10 %).

When you enter the milk value in main menu „Portion values“, the milk is mixed with the MP drinking, i.e. MP is added to the milk until the entered concentration is attained.

Example: when you enter a milk value of 120 g/l, a milk share of 50 % as well as a drinking concentration of 120 g/l, the automatic feeder dispenses for each portion 0,25 l water with 30 g MP and 0,25 l milk (= 30 g solid matter).

```
milk value
120 g/l
```

8.3.3 Commuting to MP-mode

When the milk tank is empty, the automatic calf feeder switches off or commutes to milk powder mode.

When you select „Switch to MP-mode“, the machine runs in the MP-mode when the milk storage tank is empty.

```
when milk empty
*switch to MP
```

Take care that the powder hopper is always filled with milk powder!

When you select „Machine stop“, the machine switches off when the milk storage tank is empty.

```
when milk empty
*machine stop
```

8.3.4 Commuting to 1-Circle-Mode

For portions with a low milk ratio: in order to avoid that the milk stays too long inside the stainless steel coil, in submenu „1-circle-mode, < 30% milk share“ you can enter up to which milk share the heat exchanger has to operate in the 1-circle-mode.

Press Arrow Up/Arrow Down to move to submenu „1-circle-mode, < 30 % milk“. Confirm with Enter. Press Arrow Up/ Arrow Down to select the desired value. Confirm with Enter. (Standard value: 30 % milk).

```
1-circle-mode
 < 30 % milk
```

When the milk ratio is 10 - 30 % the water is taken out of the stainless steel coil in the heat exchanger (1-circle-mode).

When the milk ratio is 0 % or > 30 % the complete water amount is taken out of the boiler (2-circle-mode).

Automatic feeders in the Combi version without circulation pump only operate in the 2-circle-mode. It is not possible to switch over to the 1-circle-mode. Therefore these feeders cannot run with a milk ratio between 10 - 30%.

8.4 Calibration

8.4.1 Calibrating Water, Milk, MP

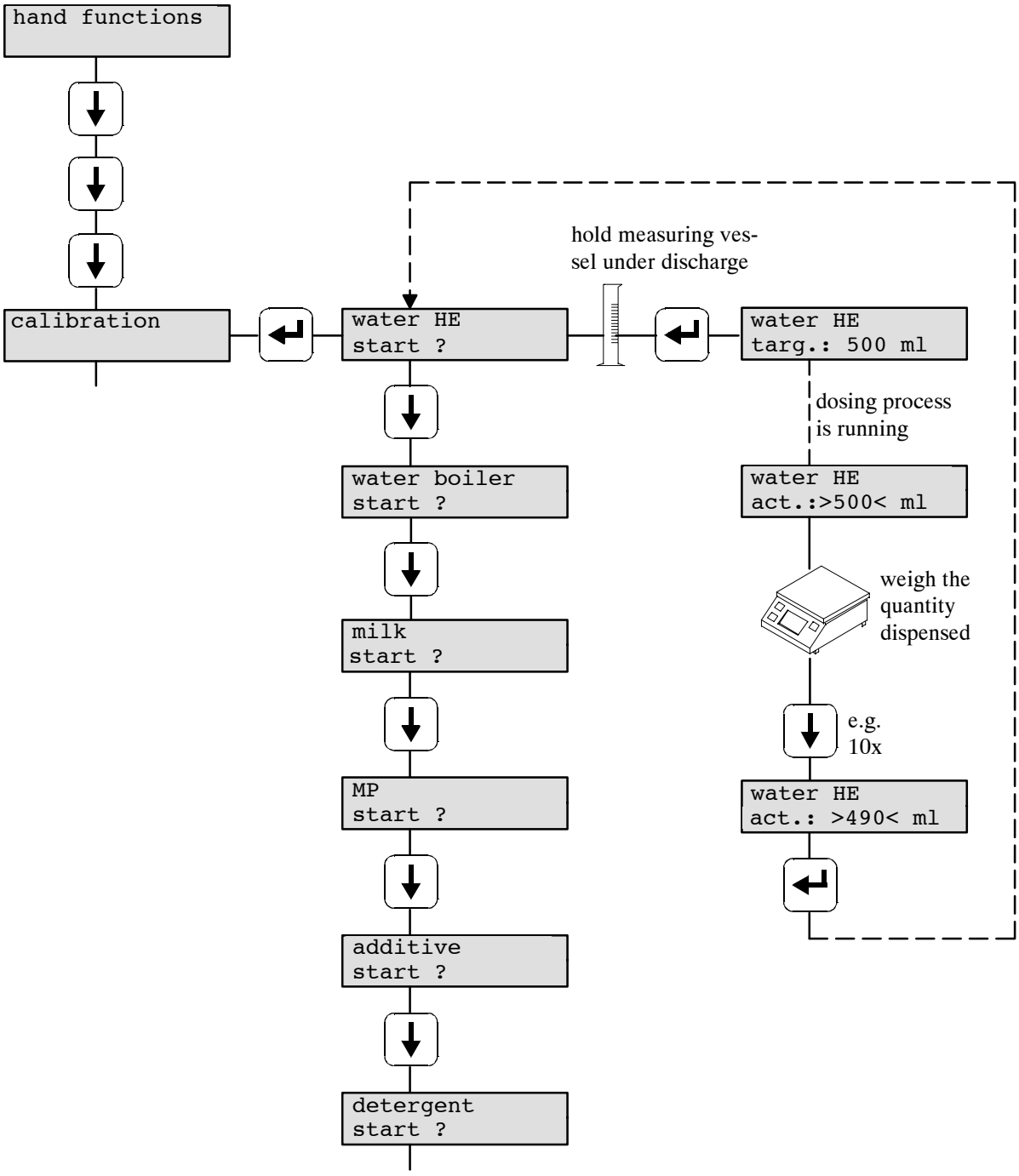
Calibration is defined as the input into the computer of the amount of water, milk and MP distributed during a fixed period of time. Only enter the value corresponding to the amount that has actually been distributed. The machine type determines which submenus are displayed.

In case the feed components have not been calibrated at all or only inaccurately, the automatic feeder cannot prepare the exact feed mix in feeding mode. The manufacturer does not accept any responsibility for errors due to inadequate calibration.

The calibration process of the feed components is always the same:
First press the „Menu“ key and move to menu „Calibration“ by means of Arrow Down. Then press Enter to access the submenus. Hold an empty measuring vessel under the discharge. Press Enter. The automatic feeder distributes the quantity of – e.g. – water that has been calibrated. The set quantity is displayed on the screen. The displayed message changes as soon as the water has been distributed. Now press Arrow Up/Arrow Down to enter the amount dispensed and measured and confirm with Enter. The message „Water start“ is displayed again.

Repeat the calibration process, in order to be sure that the target quantity has been attained.

Example for the calibration of water:



Calibrate all components that can be selected in the submenus!

8.4.2 Calibrating Additives and Detergent

When the automatic feeder is equipped with an additive dispenser or with a detergent pump and should the mixer be cleaned with a detergent, you have to calibrate the additives and the detergent, too.

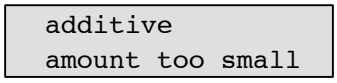
Weigh out the powder additives with precision scales (e.g. electronic scales). The weighing accuracy has to be 1/10 g. Hold the measuring vessel under the discharge. Press Start/Stop key. Weigh the dispensed quantity and enter the measured, resp. weighed value.

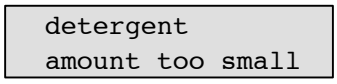
In case there are no available precision scales, repeat calibration a number of times, in order to get a larger quantity of additive. Then divide the measured quantity by the number of calibration processes and enter the value.

Measure liquid additives and detergent by means of a cylinder.

Repeat the calibration procedure, in order to be sure that the target quantity has been attained.

The warning „Amount too small“ indicates that the dispensed amount was too small and the target amount has not been reached. Repeat calibration process once again.





8.5 Machine Values

The main menu „Machine Values“ contains the following submenus:
- Intermediate Mix
- Afterrun Mixer
- Emptying Mixer
- Press Out Milk
- Distribution Pause
- Box 1/Box 2

8.5.1 Intermediate Mix

Press „Menu“ key. Press Arrow Down to move to the main menu „Machine values“.

```
machine values
```

Press Enter. The display shows:

```
intermediate mix
 0 min
```

In this menu you can enter whether and after which time an intermediate mix has to be carried out. You may enter 5 to 60 minutes. The figure 0 means that the intermediate mix is not active.

The intermediate mix only takes place when the level electrode is covered.

8.5.2 Mixer Afterrun

In this menu you can enter how many seconds the mixer has to run after the last feed portion has been dispensed.

Press Menu-key. Press Arrow Up/Arrow Down to move to main menu „Machine values“.

```
machine values
```

Press ENTER and then Arrow Down. The display shows the following message:
Press ENTER again. Press Arrow Up/Arrow Down to enter the desired time and confirm with ENTER. You can enter 3 to 12 seconds.

```
afterrun mixer
 3 s
```

8.5.3 Emptying Mixer

Press Menu-key. Press Arrow Down to move to main menu „Machine values“.

```
machine values
```

Press ENTER and Arrow Down. The display shows „Emptying mixer“. Here you can enter after which time the mixer has to be emptied. You can enter between 0 (=the mixer is not emptied) and 60 minutes.

```
emptying mixer
0 min
```

When a calf does not claim its milk portion at all or in case it only claims it partially, the milk can be drained off into the mixer jar via the mixer outlet valve after the entered time has lapsed.

8.5.4 Press out the Milk

In the milk mode the heat exchanger always contains a portion of warm milk ready for demand. After a set time this milk can be replaced with a water portion. The heat exchanger is then filled with water and not with milk any more.

Press Menu-key. Press Arrow Down to move to main menu „Machine values“.

```
machine values
```

Press ENTER. Press Arrow Down to move to submenu „Press out milk“. Press ENTER once again.

```
press out milk
3 hours
```

Press Arrow keys to select duration of the intervals. You can enter 0 (= the function „press out milk“ is not active) to 9 hours. Confirm with ENTER.

```
press out milk
3 hours
```

Interval time begins after the last milk portion has been distributed. After this time, the milk portion in the heat exchanger is replaced with a water portion.
This water portion is distributed and drained off via the mixer outlet valve as soon as a calf with drinking right is identified.

8.5.5 Entering the Distribution Pause

The distribution pause regulates milk distribution. As soon as the automatic feeder starts to prepare the milk portion, the stop valve or the two-group valve unit close for the duration of the entered distribution pause. It is advisable to set a distribution pause only in case of not readily soluble milk powders or in case of very high concentrations (> 200 g/l) and extreme drinking speed (> 2 l/min).

For model „TAK5-SM2-27-F1“ the distribution pause is automatically set to 10 seconds, as this model type is not equipped with a circulation pump effecting that heat transmission lasts a little bit longer.

Press Menu-key. Press Arrow Down to access main menu „Machine values“.

```
machine values
```

Press Arrow Down to move to submenu „Distribution Pause“. Confirm with ENTER.

```
distrib.pause
 0 sec
```

Press Arrow Up/Arrow Down to select the distribution pause. Only enter values between 0 and 16 seconds (Standard value: 0 s).

```
distrib. pause
 0 sec
```

8.5.6 Box 1 / Box 2

When the feeding station is additionnally equipped with **servo-** or **gradient control**, here you can enter **turn-on** and **turn-off** delay. Possible entry: 0 to 2 seconds.

Press Menu-key. Press Arrow Down to move to main menu „Machine values“ and confirm with ENTER.

```
machine values
```

Press Arrow Down to move to submenu „Box 1 / Box 2“. Press ENTER.

```
box 1
```

Press Arrow Down to move to „turn-on delay“. Press ENTER. Press Arrow Up/Arrow Down to select turn-on delay and confirm with ENTER.

```
turn-on delay
1.2 sec
```

Same procedure for turn-off delay.

```
turn-off delay
0.8 sec
```

8.6 Diagnosis

The main menu „Diagnosis“ facilitates trouble shooting. In addition, motors, valves and pumps can be controlled individually.

Press Menu key. Press Arrow Down to move to the main menu „Diagnosis“:

```
diagnosis
```

8.6.1 Valves/Motors

In the following submenus each output can be controlled individually. The function of each individual output is displayed on the screen. In this way it is possible to check whether the output and the control are running well.

Press Arrow Down to go to the submenus.
The display shows:

```
water valve HE
open ?
```

Press Enter to open the water valve. The water valve is open so long as you press the Enter key.

```
water valve HE
opened !
```

The same applies to

the other valves:
- Water valve Bo. (Bo. = Boiler)
- Milk valve
- Mixer outlet valve
- Circulation valve
- Air valve
- Box valve 1/2

and the motors:
- Milk pump
- Mixer
- Powder motor
- Additive dispenser
- Detergent pump
- Feeding pump
- Circulation pump

8.6.2 Sensors

The sensors, such as e.g. the supply and the rod (level) electrode as well as the thermostat for minimum operating temperature are part of the inputs. The display shows each change of the state of the sensors limiting the occurence of faults.

The display shows e.g.:

```
rod electrode
hit !
```

The same applies to:
- Point electrode
- Supply electrode

- Temperature
- Detergent

8.6.3 Calibration

In this submenu you can check duration of dispense of the relevant feed component resp. of detergent (HE water; Boiler water; Milk; MP; Additive; Detergent). The following example concerns boiler water but it also fits to all other components:

Press Arrow Down to move to submenu „Calibration“.

```
calibration
```

Press ENTER twice...

```
water HE
```

...until the display shows running time.

```
running time
   x:xx sec
```

Same procedure for boiler water, milk, MP, additive and detergent.

8.6.4 Interface

In this submenu you can check whether

- the feeding computer transmits a signal to the automatic feeder for the request of a milk portion. The display shows: „Signal portion active/not active“
- the feeding computer transmits a signal to the automatic feeder for the request of a milk portion with additive. The display shows: „Signal additive active/not active“
- the feeding computer transmits a signal to the automatic feeder for the selection of a feeding station. The display shows:„Selection box 1/2“
- the automatic calf feeder transmits a signal to the feeding computer when the mixer jar is empty. The display shows: “Signal ready, activate”.

8.6.5 Checking

In menu „Checking“ the second line of the display shows the number of power failures, data backups on the memory chip, cleaning faults as well as water and milk checks.

In submenu „Power failures“ you can view the number of reboots of the automatic feeder after power failure:

```
power failures
 2
```

In case of memory data error, the computer can fall back upon an internal backup in submenu „Backup“. Each backup is counted.

```
back-up
 1
```

In submenu „Cleaning fault“ you can view faults that occurred during automatic cleaning.

```
cleaning fault
 2
```

In submenu „Check water“ you can view the number of water checks that have been carried out because the electrode has not been hit at all or not enough by the water jet.

```
check water
 0
```

Submenu „Check milk“ shows the number of milk checks that have been carried out because the electrode has not been hit at all or not enough by the milk jet.

```
check milk
 0
```

Clear fault messages as follows: Press ENTER. Press Arrow Up/Arrow Down and select „0“. Confirm with ENTER. Then press ENTER again, in order to confirm the input.

8.7 Version

Here you can read EPROM’s version number.

```
System-Machine
 xxxx-xx x.xx
```

8.8 Function Table of the Menu Key for Connection to Feeding Computer

In case the System-Machine is connected to a feeding computer, you can select the following functions (as of program version 01.01):

Menu	Submenu	
Hand Functions	Emptying mixer start?	
	Water HE start?	
	Water boiler start?	
	Milk start?	
	MP start?	
	Additive start?	
	Mixer start?	
	Box valve 1 open?	
	Box valve 2 open?	
	HE fill?	
Portion Values	Concentration	xxx g/l
	Milk ratio	xxx %
	Additive	x g/l
	Operating mode	Restr. fix conc.
		Restr. var. conc.
		Ad libitum
Milk Values	Operating mode	MP-/milk mode
		MP-mode
	Milk value	xxx g/l
	When milk empty	Switch to MP
		Machine stop
	1-circle-mode	< xx% milk
Calibration	Water HE start?	Targ.: 500 ml
	Water boiler start?	Targ.: 500 ml
	Milk start?	Targ.: 500 ml
	MP start?	Targ.: xxx g
	Additive start?	Targ.: xx g
	Detergent start?	Targ.: xx ml
Machine Values	Intermediate mix	x min
	Afterrun mixer	x sec
	Emptying mixer	x min
	Press out milk	x hours
	Distribution pause	xx sec

Machine Values	Box 1/2	Turn-on delay
		Turn-off delay
Diagnosis	Valves	Water valve HE open?
		Water valve boiler open?
		Milk valve open?
		Mixer valve open?
		Circulation valve open?
		Air valve open?
		Box valve 1/2 open?
	Motors	Milk pump start?
		Mixer start?
		Powder motor start?
		Additive dispenser start?
		Detergent pump start?
		Feeding pump start?
		Circulation pump start?
	Sensors	Rod electrode covered/free?
		Point electrode
		Supply electrode covered/ free?
		Temperature ok/too low?
		Detergent
	Calibration	Water HE, water boiler, milk, MP, additive, detergent
	Interface	Signal portion active/not active
		Signal additive active/not active
		Selection box 1/2 active/not active
		Signal ready, activate?
	Checking	Power failures
		Backup
		Cleaning fault
		Check water
		Check milk
	Version	System-Machine

Depending on the basic settings carried out in Setup, some particular menus are not displayed on the screen of the System-Machine.

9 Functions of the Automatic Key

After pressing the Automatic key, the feeder runs in the automatic mode. The green pilot lamp lights. The automatic feeder starts preparing a milk portion as soon as the feeding computer transmits the corresponding signal.

In case faults should occur in the automatic-mode, the green pilot lamp will go out. See chapter 12, page 73, „Fault messages“.

9.1 Display in the Automatic-Mode

When the automatic feeder runs in...

...MP-mode...

```
MP-mode
mixer:       full
```

...Combi-mode, i. e. with milk powder and fresh milk....

```
MP-/ milk mode
mixer:       full
```

....ad lib-mode....

```
adlib-mode
mixer:       full
```

...milk mode...

```
milk mode
mixer:       full
```

the above information is displayed on the first line of the screen. In the second line you can view the mixer status: „full“=the rod (level) electrode is covered or „empty“=the rod electrode is free.

Please note: Press Arrow Down to scroll the text on the display. The information displayed last in the second line of the screen will appear in the first line of the following screen.

...Combi-mode, i. e. with milk powder and fresh milk....

```
MP-/ milk mode
mixer:       empty
```

When the level electrode in the mixer is free, the display shows „Empty“. When the electrode in the mixer is covered, the display shows „Full“.

```
  mixer:     empty
  calf: xxxx
```

When an animal is in the feeding station, the display shows the relevant Responder number.

```
  calf: xxxx
  entitl.: xx.x l
```

When an animal is in the feeding station, the display shows the feed entitlement of the relevant calf.

```
  entitl.: xx.x l
  box:   1*   2-
```

In case the automatic feeder is equipped with a two-group-valve unit that has previously been activated in Setup, the

display shows the following message:
The open box valve is marked by an asterisk*.

```
box: 1*     2-
feed:    xx.x l
```

After that, the display shows the feed quantity that has been dispensed until then.

```
feed: xx.x l
cl. mix.: n. act.
```

Keep the Automatic-key pressed for approximately 2 seconds, in order to set the feed amount to zero.

The next screen displays the cleaning activities of the automatic feeder. In case „clean mixer“ has not been activated in the cleaning settings (clean mixer = 0 hours), the display shows „n. act.“ (not active) in the first line. The second line shows the following time for heat exchanger cleaning.

```
cl. mix.: n. act.
clean HE: xx:xx
```

When at the beginning of heat exchanger cleaning there is still some milk in the HE (m.i.HE = milk in the Heat Exchanger), the display shows the following:

```
cl. mix.: m.i.HE
clean HE: xx:xx
```

„Mix. f.“ (= Mixer full) means that the time for mixer cleaning has come but the mixer jar is not empty yet and the level electrode is earthed.

```
cl. mix.: mix.f.
clean HE: xx:xx
```

Draining time (= d.time) starts as soon as the calf has drunk its milk portion and the level electrode is not earthed (covered) anymore. After draining time has lapsed, the automatic feeder starts mixer cleaning.

```
cl. mix.: d.time
clean HE: xx:xx
```

As feed distribution has priority over cleaning, a „pause“ has been incorporated into the SM2Plus-system. This means: if, within five minutes after dispense of the last portion, no further calf requests its milk portion, the automatic feeder starts mixer cleaning.

```
cl. mix.: pause
clean HE: xx:xx
```

After mixer- or/and HE cleaning has been completed, the display shows the following message:

```
cl. mix.: clean
clean HE: clean
```

When air cleaning is active at box 1, the display shows the following:

```
air cl.1: act.
air cl.2: n.act.
```

As soon as the level electrode is free, a milk portion is prepared. The second line on the screen shows - starting from the left - the values relating to the currently prepared portion: concentration (g/l), milk ratio 1 (%), milk ratio 2 (%), additive (g/l). *When the automatic feeder runs exclusively in MP-mode both milk ratios are not displayed anymore.*

```
distribution
120g 30% 40% 2g
```

9.2 Releasing an Extra-Portion

In the Automatic-mode a milk portion can be released as soon as the rod electrode is free.

Keep ENTER pressed for about 2 seconds. The displayed concentration value starts flashing. Press Arrow Up/Arrow Down to set the required concentration. Immediately afterwards confirm with ENTER.

```
extra-portion
  >120 g/l<
```

Same procedure for the milk ratio.

```
extra-portion
    >50 %<
```

A milk portion is mixed up. Meanwhile the display shows the values of the portion that is being prepared.

```
distribution
120g/l  50%  0g/l
```

After the milk portion has been mixed up, press Arrow Up / Arrow Down to enter the number of the feeding station where the milk portion should be distributed. Confirm with Enter.

```
extra-portion
  >*box 1<
```

After draining time has lapsed, the automatic feeder returns automatically to the Automatic-mode.

10 Functions of the Cleaning Key

Particularly when fresh milk is fed you have to clean the automatic feeder regularly.

When pressing the Cleaning key, the automatic feeder commutes from the automatic mode to the cleaning menu.

Press the Automatic key to return to the automatic operating mode.

Type and frequency of the cleaning process depend on composition and germ-content of the milk.

You can interrupt the cleaning processes at any time by pressing any main menu key or the Enter key. In case you have utilized some detergent during the main cleaning process, you can switch back to the automatic operating mode only after the automatic feeder has carried out afterrinsing.

The **Cleaning Menu** contains the following functions:

- Cleaning mixer
- Cleaning HE
- Cleaning HE/hose
- Air cleaning
- Sponge cleaning
- Settings

In **submenu Settings** you can set all values needed to carry out time-controlled, automatic cleaning processes.

- Cleaning mixer
- Cleaning HE
- Air cleaning
- Cleaning HE/hose
- Detergent

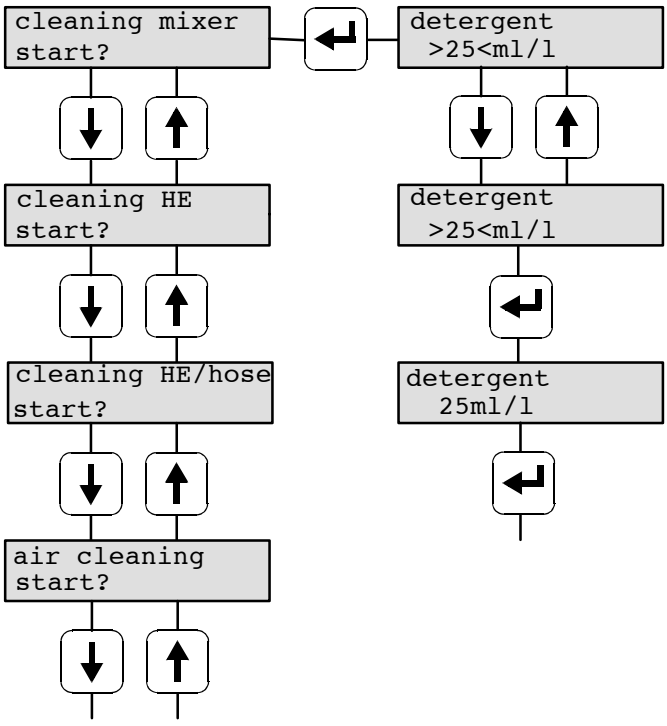
10.1 Entering the Figures

Press Arrow Up/Arrow Down and then ENTER in order to enter figures. In case of **manual activation** of „Cleaning Mixer“, in menu **„Cleaning“** you can enter the detergent amount provided that you have previously selected the detergent pump in Setup (see following illustration). In submenu **„Settings“** you can set the number of daily **automatic** mixer-, HE- and air cleaning processes as well as the corresponding detergent- and water amount for pre- and afterrinsing.

In order to access this submenu, press the Cleaning key located on the panel and subsequently Arrow Down.

Press ENTER to modify a figure. The displayed figure starts flashing (e.g. >20<). Arrow Up is used to increase and Arrow Down to decrease the figure. The longer you keep the relevant Arrow key pressed the faster the displayed figure is going to be modified. Once you set the correct figure, press ENTER again to store it (the figure stops flashing). In case you do not wish to modify the figure, press the Menu key to return to the main menu level.

Example for the input of figures within the functions of the **Cleaning** key:

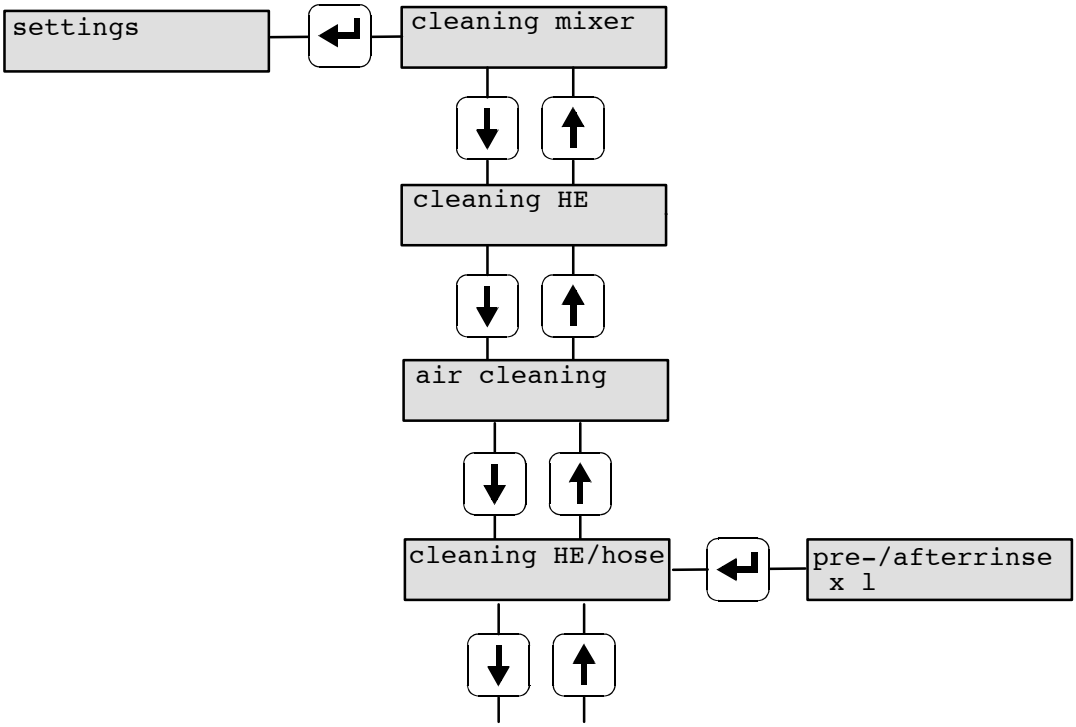


10.2 Selecting the Options

You can only select one of the available options. The selected option is marked by an asterisk in the second line of the display.

Press ENTER to change the option. The displayed option starts flashing. Press Arrow Up/ Arrow Down to scroll the available options. Press ENTER to confirm the desired option. This option is marked by an asterisk and stored. In case you do not wish to modify the option, press the Cleaning key once to return to the corresponding submenu.

Example for the selection of options within the functions of submenu **„Settings“:**



10.3 Cleaning

CAUTION! In order to avoid injuries, **before** carrying out any kind of operation on the mixer, such as e.g. manual evacuation of rinsing water, it is imperative to make the automatic feeder currentless by turning the main switch to position „0/OFF“ or by pulling the mains plug.

10.3.1 Mixer Cleaning

Press the Cleaning key to call up automatic mixer cleaning manually at any time.

Press ENTER to confirm „Cleaning“. The display shows:

```
cleaning mixer    ➔
start?
```

In case you have not activated the detergent pump in Setup, the automatic cleaning cycle starts running without detergent. If necessary, add some detergent manually to the water.

In case you have activated the detergent pump in Setup, the display shows the following message:

```
detergent
10 ml/l
```

Change or maintain the pre-set detergent amount. You may enter values between 0 and 25 ml. Confirm with ENTER. Automatic cleaning starts running.

When the rod electrode is covered, the remaining portion in the mixer jar is drained off via the mixer outlet valve before each cleaning. **Prerinsing** starts running with 0,5 liters of water.

```
cleaning mixer
prerinsing
```

The main cleaning process is carried out with 1,3 liters of water and the entered detergent amount.

```
cleaning mixer
remain. 3:00
```

After the mixer has run for 3 minutes (time runs backwards from 3 to 0 minutes), the liquid in the mixer jar is drained off via the mixer outlet valve. The display shows:

```
cleaning mixer
emptying mixer
```

After the mixer jar has been emptied completely, afterrinsing is carried out with 1,5 liters of water being delivered into the mixer jar where they are stirred for 20 seconds and subsequently drained off via the mixer outlet valve.

```
cleaning mixer
afterrinsing
```

When mixer cleaning has been completed, the display shows:

```
cleaning mixer
finished!
```

In case the water cannot be drained off via the mixer outlet valve within 2 minutes (the rod electrode is still covered), the alarm message „Emptying Mixer“ is displayed. If neces-

sary, check whether the suction hose or the mixer outlet valve are blocked. Tip out the rinsing water in the mixer jar (refer to above-mentioned safety instructions).

In case detergent has been added to the cleaning water, feeding mode is interrupted until the fault has been cleared.
In case no detergent has been added to the cleaning water, the fault message on the screen disappears as soon as a calf drinks up the liquid in the mixer jar.

Make sure that there is a water discharge next to the automatic feeder. If that is not the case, hang the mixer outlet hose into a bucket.

Empty the bucket regularly. Do not dip the mixer outlet hose into the cleaning water.

After mixer cleaning has been completed, press Automatic key to return to the Automatic-mode.

Notes on automatic mixer cleaning (time-controlled)

When the rod electrode is covered, the automatic mixer cleaning is deferred for 1 hour at most so that a calf has the opportunity to drink up the liquid in the mixer jar. In case the calf does not drink up the liquid within this time, the liquid is drained off via the mixer outlet valve and prerinsing starts running. As soon as the mixer jar is empty again, the main cleaning cycle with detergent starts running.

Mixer cleaning may become unnecessary as during automatic heat exchanger cleaning the mixer jar is cleaned too.

Automatic mixer cleaning with detergent takes place up to nine times/day - provided that the automatic feeder is equipped with a detergent pump that has previously been selected in Setup. In case automatic heat exchanger cleaning has been activated, 3 hours before and 3 hours after heat exchanger cleaning no mixer cleaning will take place regardless of the amount of cleaning processes that have already been entered.

10.3.2 Cleaning the Heat Exchanger

The heat exchanger cleaning consists of prerinsing, main rinsing and afterrinsing and has to be carried out every day. During heat exchanger cleaning, all milk-supplying parts of the automatic feeder (except for the suction hoses) are thoroughly rinsed to prevent formation of milk deposit or other dirtying.

Press Cleaning key and confirm with Enter

```
mixer cleaning
start?
```

Press Arrow Down to move to the next screen.

```
cleaning HE
start?
```

In case the automatic feeder is equipped with a detergent pump that has previously been selected in Setup, press Enter to view the following screen:

```
detergent
10 ml/l?
```

Before prerinsing starts running, the mixer jar is emptied (when requested) and the automatic feeder checks whether the valves are operative and tight.

```
cleaning HE
check valves
```

For that, the circulation valve to the HE as well as the milk solenoid valve close automatically while the milk pump runs. The cleaning process is interrupted as soon as the display shows the fault message „Milk/circulation valve“.

Prerinsing

During prerinsing the display shows:

```
cleaning HE
prerinsing
```

In order to be sure that there is no remaining milk in the coil of the heat exchanger anymore, 800 ml of water are automatically delivered into the coil and pumped out via the mixer outlet valve. The mixer is then rinsed with a 500 ml water portion that is subsequently drained off. The coil is rinsed for 5 seconds with 500 ml of water, i.e. the water in the mixer jar circulates to the coil and is pumped out immediately afterwards. Now 800 ml of water are delivered once again into the mixer jar via the coil and are drained off again via the mixer outlet valve. Finally the mixer jar is rinsed with a 500 ml water portion that is subsequently pumped out.

Main rinsing

During the main rinsing process, 1,3 liters of water and some detergent (in case the automatic feeder is equipped with a detergent pump that has been activated in Setup) are delivered into the mixer jar. The water starts circulating. The display shows:

```
cleaning HE
main rinsing
```

Time starts running backwards from 10 to 0 minutes. Press Start/Stop to cut off the cleaning process at any time.

```
cleaning HE
remain.:10:00min
```

After 10 minutes have lapsed, the liquid in the mixer jar is pumped out via the mixer outlet valve.

```
cleaning HE
emptying mixer
```

Afterrinsing

In order to be sure that there is no detergent in the coil of the heat exchanger anymore, afterrinsing starts running. 800 ml of water are automatically delivered from the coil into the mixer jar and are then pumped out via the mixer outlet valve. The mixer is then rinsed with a 500 ml water portion that is subsequently drained off. The coil is rinsed for 5 seconds with 500 ml of water, i.e. the water in the mixer jar circulates to the coil and is pumped out immediately afterwards. Now 800 ml of water are delivered once again from the coil into the mixer jar and are drained off again via the mixer outlet valve. Finally the mixer jar is rinsed with a 500 ml water portion. This water too is subsequently pumped out.

During afterrinsing the display shows:

```
cleaning HE
afterrinsing
```

Electrodes and valves are checked automatically. 1,5 liters of water are delivered into the mixer jar where they are stirred for 20 seconds. After that, they are drained off via the mixer outlet valve. This process should remove all residual foam inside the mixer jar.

```
cleaning HE
check valves
```

When afterrinsing has been completed, the display shows:

```
cleaning HE
finished!
```

After heat exchanger cleaning has been completed, the stainless steel coil is filled with water. When a calf that is entitled to get a milk portion enters the feeding station, the water portion in the heat exchanger is delivered into the mixer jar and drained off via the mixer outlet valve. Only then the automatic feeder starts to prepare a milk portion.

Notes on the automatic heat exchanger cleaning (time-controlled)

When the rod electrode is covered, the automatic heat exchanger cleaning is deferred for 1 hour at most so that a calf has the opportunity to drink up the liquid in the mixer jar. In case the calf does not drink up the liquid within this time (the rod electrode is still covered), the liquid is drained off via the mixer outlet valve and the cleaning cycle starts running.

When there is still milk in the stainless steel coil, the automatic heat exchanger cleaning is deferred for 1 hour as a maximum, too. Should a calf with drinking right enter the feeding station within this time, the automatic feeder starts to prepare at least two portions of water + milk powder. After the calf has drunk up the liquid in the mixer jar the valve control closes the corresponding suction pipe and the heat exchanger cleaning starts running. In case no calf with drinking right is identified within 1 hour, the milk is pressed out of the stainless steel coil by some water and subsequently drained off via the mixer outlet valve.

In case in menu „Milk Values“ you selected „when milk empty, machine stop“, the milk in the stainless steel coil is fed to the following calf.

In case the calf does not drink up the milk in the mixer jar within 1 hour (the rod electrode is covered), the liquid in the mixer jar is pumped out via the mixer outlet valve and prerinsing starts running. As soon as the mixer jar is empty once again the automatic feeder carries out the main cleaning process with detergent.

10.3.3 Heat Exchanger with Suction Hoses

In this menu you can activate heat exchanger cleaning including the suction hoses and the milk hose from the milk tank to the automatic calf feeder. The cleaning process is carried out with detergent in case the automatic feeder is equipped with a detergent pump that you have previously activated in Setup.

Press Cleaning key and confirm with Enter.

```
cleaning mixer
start?
```

Press Arrow Down twice.

The display shows submenu „Cleaning HE/hose“.

```
cleaning HE/hose
start?
```

In case you have not activated the detergent pump in Setup, the cleaning process starts running immediately without detergent after you pressed Enter. If required, add some detergent manually.

In case you have activated the detergent pump in Setup, after pressing Enter the display shows the following message:

```
cleaning HE
detergent 10g/l
```

Enter the detergent amount and confirm with Enter.

When the mixer is empty, the display shows:

```
cleaning HE/hose
ready?
```

In order to prepare the suction hoses to the cleaning process, proceed as follows:

- Disconnect the suction hoses from the teat.
- Disconnect the milk hose from the automatic feeder.
- In case the milk hose should be cleaned too, disconnect it from the milk tank. Before, close the stopcock of the milk tank.
- Put the suction hoses onto the cleaning adaptor but do not connect them yet.
- Should the milk hose be rinsed too, connect it to the quick coupler of the cleaning adaptor.

As soon as the suction hoses are ready for cleaning, confirm with ENTER in order to activate prerinsing.

```
cleaning HE/hose
prerinsing
```

Prerinsing

During prerinsing the milk is pressed through the coil by the incoming water and is subsequently drained off via the mixer jar, the box valves (box 1 and box 2 in turn) and the connected hoses.
Before starting prerinsing, enter the amount of water (max. 10 liters) used for prerinsing, in menu “Settings, HE/hose cleaning, Pre-/afterrinsing”.

After prerinsing has been completed, the automatic feeder control invites you to connect the cleaning adaptor with the hoses to the milk connection of the automatic calf feeder:

```
cleaning HE/hose
connected?
```

Milk connection
automatic feeder
(front at the lower right)

Main rinsing

Once you confirm “Cleaning HE/hose, connected?” the main cleaning process starts running. In case the automatic feeder is equipped with a detergent pump that you have previously selected in Setup, some detergent is added to the water.

```
cleaning HE/hose
main rinsing
```

Time starts running backwards from 10 to 0 minutes.

```
cleaning HE/hose
remain.09:55
```

Afterrinsing

After the main cleaning process has been completed you have to disconnect the cleaning adaptor with the hoses from the milk connection of the automatic feeder and place the hoses on the water discharge. Only then you can start afterrinsing. In order to remove residual detergent, during the first prerinsing phase, some water is pressed through the coil and is subsequently drained off via the mixer jar, the box valves (box 1 and box 2 in turn) and the connected hoses.
The amount of water used for pre- and afterrinsing is the same and has to be set in menu “Settings, HE/hose cleaning, Pre-/afterrinsing”).

```
cleaning HE/hose
completed!
```

In order to remove residual foam from the mixer jar, 1,5 liters of water are delivered into the mixer jar where they are stirred for about 20 seconds and drained off via the mixer outlet valve.

In case no disturbance should occur, the display shows: “Cleaning HE/hose, finished!”. Now you can disconnect the hoses from the quick-acting closures of the cleaning adaptor and connect them to the mixer jar, the milk tank (if available) and the milk connection of the automatic calf feeder.

```
cleaning HE/hose
finished!
```

10.3.4 Air Cleaning

Compressed air cleaning (hereinafter called air cleaning) facilitates cleaning of the suction hoses up to the top of the teat without detergent. In order to ensure perfect cleaning, make sure that air pressure is between 2 and 2,5 bar. Compressed air should be supplied by an oil free compressor with pressure reducer and a liter output >= 100 l/min.

Please note: Air pressure exceeding 2,5 bar may damage the diaphragm inside the milk solenoid valves.

In this menu you can activate air cleaning manually at any time, provided that the automatic feeder is equipped with a device for air cleaning that has previously been registered in Setup.
Proceed as follows:

Press Cleaning key. The display shows:

```
 cleaning mixer
 start?
```

Press Arrow Down to select submenu „Air cleaning“.

```
air cleaning
start?
```

Press ENTER to move to the next screen. Enter the number of the box where air cleaning should take place. Press ENTER to start cleaning.

```
air cleaning
*box 1
```

10.3.5 Heat Exchanger with Sponge

CAUTION! In order to avoid injuries, **before** carrying out any kind of operation on the mixer, such as e.g. manual evacuation of rinsing water, it is imperative to make the automatic feeder currentless by turning the main switch to position „0/OFF“ or by pulling the mains plug.

Clean the heat exchanger regularly with a cleaning sponge, in order to remove possible milk deposits inside the stainless steel coil. The cleaning sponge is used as a mechanical cleaning aid. Insert the cleaning sponge via the easily accessible quick-coupling into the milk-supplying pipe. The cleaning sponge is then pressed through the heat exchanger by the water. After the cleaning process has been completed, take the cleaning sponge out of the mixer jar (refer to above-mentioned safety instructions).

In case the cleaning sponge pushes forward dirt or deposits, repeat the cleaning process until clear water comes out of the water outlet.

Proceed as follows:

Press Cleaning key and confirm with Enter.

```
cleaning mixer
start?
```

Press Arrow Down three times and confirm with Enter.

```
sponge cleaning?
start?
```

After the mixer has been emptied, the display shows:

```
sponge cleaning?
inserted?
```

- Open the quick-acting closure for sponge cleaning.
- Dip the cleaning sponge into some detergent (when requested) and insert it into the quick-acting closure.

- Close the quick-acting closure.

Press Enter to start the cleaning process.

The cleaning sponge is pressed through the stainless steel coil into the mixer jar by the incoming water. In order to complete the cleaning process, press Enter to confirm “Sponge Cleaning, taken out ?”.

```
sponge cleaning
taken out?
```

As soon as afterrinsing has been completed, the following message is displayed:

```
sponge cleaning
finished
```

In order to increase the cleaning effect, dip the cleaning sponge into some cleansing agent. In this case, you have to rinse with some clear water.

Procede as follows: Press Menu-key and confirm with Enter.

```
hand functions
```

Press Arrow Down: the display shows menu “Water HE, start”. Keep the Enter key pressed until some clear water comes out of the water outlet of the mixer jar. Empty the mixer jar (refer to above-mentioned safety instructions) or drain off the water via the mixer outlet valve. Check whether there is some residual detergent in the mixer jar.

```
water HE
start?
```

10.4 Settings

Menu „Settings“ contains all settings relating to automatic cleaning (with or without detergent) of the heat exchanger, the mixer and the suction hoses as well as to air cleaning.

10.4.1 Mixer Cleaning

Press Cleaning key and then Arrow Down. The display shows:

```
settings
```

Confirm with ENTER. You can only enter whole numbers: 0 (automatic mixer cleaning will not take place) or 6 to 24.

```
cleaning mixer
  x hours
```

10.4.2 HE Cleaning

Automatic heat exchanger cleaning can take place hourly. Carry out the relevant settings in „Cleaning HE“.

Press Cleaning key and subsequently Arrow Down.

```
settings
```

As soon as „Cleaning HE“ is displayed on the screen, confirm with ENTER and then press Arrow Down. You can enter 0 (HE cleaning is not active) to 24 hours.

```
cleaning HE
2 times/day
```

The cleaning process takes place as soon as the milk in the stainless steel coil in the heat exchanger has been fed to the calves. When cleaning time has come and there is still milk in the coil, the automatic feeder tries to feed the milk (= 0,5 liters) for one hour. A calf being entitled e.g. to 1,5 liters of milk gets the first portion with milk and the following with milk powder + water.

In case the calf does not drink the milk, the automatic feeder carries out automatic cleaning 1 hour after the entered time, at the latest. The milk is then pressed out of the coil into the mixer jar by the incoming water and subsequently pumped out via the mixer outlet valve.

10.4.3 Air Cleaning

Press Cleaning key and then Arrow Down until „Settings“ is displayed. Press ENTER to open the submenu.

```
settings
```

Press Arrow Down to move to „air cleaning“ and then press ENTER. Enter the time that has to pass by after distribution of the last portion before air cleaning starts running.

```
air cleaning
  x min
```

10.4.4 HE/Hose Cleaning

In „HE/hose cleaning“ you can enter the water amount needed for pre- and afterrinsing. As soon as a calf has consumed the last portion of its entitlement, 1/4 liter of water is dosed

into the mixer jar after draining time has lapsed.
As a calf usually stays a little bit longer in the feeding station suckling at the teat, this function is intended to facilitate simple suction hose cleaning.

Press Cleaning key and then Arrow Down until the display shows „Settings“. Press ENTER to open the submenu.

```
settings
```

Press Arrow Down until „cleaning HE/hose“ is displayed.

```
cleaning HE/hose
```

Press ENTER and enter the water amount needed for pre- and afterrinsing of the suction hoses.

```
pre-/afterrinse
  x l
```

10.4.5 Detergent

In menu „Settings, detergent“ you can enter the detergent amount that should be added to the water during automatic cleaning of mixer, HE and HE/hoses.

Press Cleaning key and then Arrow Down until „Settings“ is displayed on the screen. Press ENTER to open the submenu.

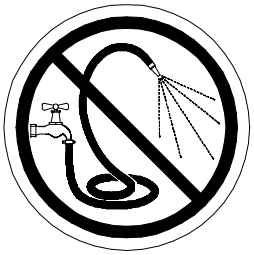
```
settings
```

Press Arrow Down until the display shows „detergent xx ml/l“. You can enter 0 (no detergent is added to the water) to 25 ml/l.

```
detergent
10 ml/l
```

11 Service and Maintenance of the Automatic Calf Feeder

- Always keep the automatic calf feeder clean and dry. Never spray it with water!

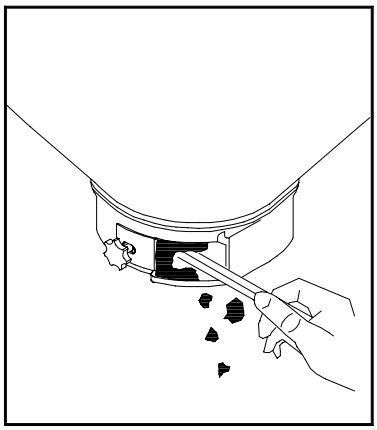


- When the automatic calf feeder runs in milk mode you have to clean it regularly with a cleaning sponge. Approx. 1 – 2 times per week carry out heat exchanger and suction hose cleaning with a detergent that is usually utilized in dairy industry.
- Clean the milk storage tank thoroughly twice a day each time before filling it. Thoroughly clean the milk supply hose regularly.

CAUTION! In order to avoid injuries, **before** carrying out any kind of operation on the milk powder outlet, it is imperative to make the automatic feeder currentless by turning the main switch to position „0/OFF“ or by pulling the mains plug.

- Carry out daily check of the milk powder outlet and, if necessary, remove incrustations. Incrustations impair dosing precision.

Always remove incrustations of the powder outlet by means of a small piece of wood or similar. Never use your fingers!



11.1 The Day after the First Commissioning

In case the automatic calf feeder is equipped with a circulation pump, carry out the following function check:

- Deaerate the circulation pump.

- Check whether the circulation pump is running or not.

The circulation pump switches off automatically 2 minutes after the last portion has been distributed.

- General function check:
  - check calibration values
  - measure the temperature of the milk
  - make sure that the calves are identified reliably.

11.2 Carrying Out a Regular Check Routine

- Measure the temperature of the milk by using a precision thermometer.
- Check calibration of the milk powder at least after each new delivery.
- Check calibration of the components:
  Deviations of the amount of milk and water:
  - in case of deviations with rising tendency (more than 500 ml are dispensed), carry out a new calibration.
  - in case of deviations with falling tendency (clearly less than 500 ml are dispensed) due to milk deposit in the heat exchanger, repeat circulating cleaning process. If necessary, use another cleansing agent, but do not overdose it!
    Carry out cleaning by using the cleaning sponge or a hose-cleaning pistol. When the cleaning sponge gets stuck, connect a high-pressure cleaner. Use the high-pressure cleaner only with cold water and slowly raise pressure.
    In case these measures do not show any improvement, check whether the milk pump is running. Insufficient pump pressure can reduce the liquid amount, too.

11.3 Shutdown

Before shutdown:

- Carry out heat exchanger cleaning.
- Remove all residual milk or rinsing water from the system. Turn the thermostat for minimum operating temperature and the heating thermostat entirely counter clockwise.
- Switch the calf feeder off by turning the main switch to position „0/OFF“ and pull the mains plug.

After shutdown:

- The automatic calf feeder has to be in a dry location.
- Keep the connections on the control unit closed by means of closing caps.
  If not, moisture may penetrate the control unit.
- Let the water flow out of the boiler in the heat exchanger. To this end, remove the water hose located between the solenoid water valve and the boiler of the heat exchanger and

open the de-aeration screw of the circulation pump (if available) in order to make the water run out.

In case of frost risk:

- Let the water flow out of the solenoid valves and the pressure reducer.
- Remove the water inside the stainless steel coil of the heat exchanger by means of compressed air (1 bar). For that, put the nozzle for compressed air before the milk valve and select submenu „Diagnosis“ in main menu „Hand Functions“. Move to menu „Milk valve, open?“ and keep the Enter key pressed until just air comes out of the water resp. milk outlet.

Commissioning the automatic calf feeder once again:

- When commissioning the feeder again, check whether there is enough water in the heat exchanger.
- Proceed as for first commissioning.
- Fill the boiler of the heat exchanger with water.
  - You do not need to top up the boiler regularly in case some calves are fed with milk that has been diluted with water or when mixer- or HE cleaning has been activated. In case calves are only fed with milk, top up the boiler of the heat exchanger with water approx. every 3 months. Proceed as for first commissioning *(refer to chapter 5.3, page 24, „Installing the Automatic Calf Feeder, Filling the Boiler of the Heat Exchanger with Water“).*

12 Fault Messages

In case fault messages should occur, in main menu „Diagnosis“ you can control each individual actuator. *See chapter 8.6, page 49, „Functions of the Menu Key, Diagnosis“.*

As soon as a fault message occurs, the green pilot lamp indicating that the automatic feeder is working in the automatic mode goes out.

12.1 Memory Error

When starting the System-Machine, all program data stored in the memory chip will be checked.

In case of faulty data, the display shows:

```
memory error
```

Switch the System-Machine off. Press the three keys „Automatic“, „Cleaning“ and „Menu“ simultaneously while switching the System-Machine on. Keep the keys pressed until the following message is displayed:

```
initial memory
```

Immediately afterwards, carry out new programming of Setup. Carry out calibration once again. Check portion values and machine values. See chapter 14, page 80, „Replacement of the program chip“.

12.2 Heat Exchanger

During installation, the automatic feeder checks whether the heat exchanger with separate heating circuits is filled with water. Immediately after you switched the System-Machine on, the automatic feeder carries out a water check, in order to find out whether the supply electrode is hit in water mode. The automatic feeder tries to find out (up to 5 times) by means of a repeat handle whether the water really does not come out of the outlet. After 5 vain attempts the automatic feeder is out of action.

The display shows:

```
fault
HE not filled
```

- Fill the heat exchanger with water. In main menu „Hand Functions“ select submenu „Heat exchanger, fill“. Confirm with ENTER.
- Check whether the water jet has hit the supply electrode.
- Check the water supply of the automatic feeder.

This fault message only appears when starting the automatic feeder. It disappears automatically after you have filled the heat exchanger. If you press the Menu-key immediately after having switched the automatic feeder on, no water check will take place. If, after that, you press the Automatic key the automatic feeder will display a fault.

12.3 Temperature

When the feeding mode is cut off because the minimum operating temperature has fallen below the standard figure, the display shows:

```
fault
temp. too low
```

- Check position of the thermostats.
- Check the heating.
- Check setting of the minimum operating temperature. See chapter 5.8.1 „Adjusting the thermostats“, page 27.

The fault message disappears automatically as soon as the fault has been removed.

12.4 Electrode Fault

When the supply electrode is grounded before a portion is mixed up, the feeding mode is cut off:

```
fault
supply electrode
```

- Check whether the supply electrode located at the water-/milk outlet is grounded.

12.5 Milk Empty

When the milk jet does not hit the supply electrode, milk distribution is cut off after starting. This process takes place up to 5 times at short intervals.

After 5 attempts the automatic feeder switches off or commutes to the milk powder mode.

In the operating mode the display shows either:

```
fault
milk empty
```

or:

```
milk empty → MP
mixer     full
```

Fill the milk storage tank and press the Automatic key in order to return to the milk mode.

12.6 Lack of Water

When the water does not hit the supply electrode in water mode, the automatic feeder starts a water check. The automatic feeder tries to find out (up to 5 times) by means of a repeat handle whether the water really does not come out of the outlet. After 5 vain attempts, identification as well as the preparation of the milk portions are cut off.

The display shows:

```
fault
lack of water
```

- Check whether the water jet hits the supply electrode.
- Check the water supply to the automatic feeder.
- Press the Automatic key, in order to delete the alarm message.

12.7 Emptying Mixer

In case the liquid inside the mixer jar does not drain off because the mixer outlet is e.g. clogged, the display shows the following error message:

```
fault
emptying mixer
```

- Check whether the mixer outlet is clogged.
- Check the mixer outlet hose and clean it, if necessary.
- Check electrodes.

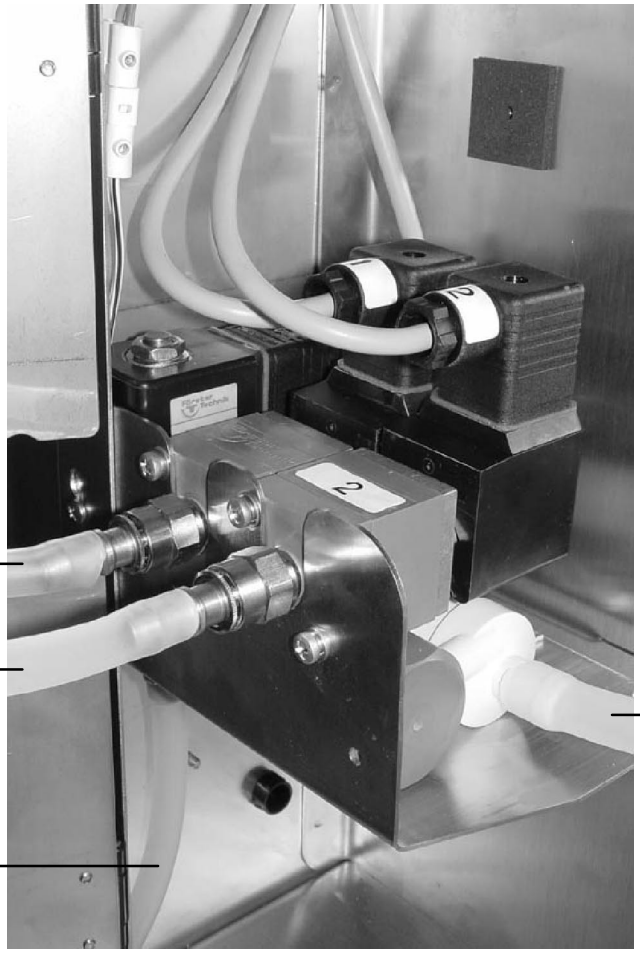
In case before the detergent has automatically been added to the water, operation of the automatic calf feeder is cut off until the fault has been removed and afterrinsing could be completed. In case no detergent has been automatically added to the water, the fault message on the display will disappear as soon as a calf has drunk up the liquid in the mixer jar.

13 Accessories

13.1 Two-Group-Valve-Unit

Thanks to the priority control with two-group-valve-unit, System-Machines can provide, in succession, two feeding stations with milk, i.e. when a calf with drinking right enters the feeding station the available milk amount for this calf is distributed without interruption while the other feeding station is blocked during this time. Change-over to the other feeding box takes place via the two-group-valve-unit.

The milk hose leads from the mixer outlet to the hose connection of the feeding pump that is located below the solenoid valves. The feeding pump is connected to the box valves by means of a PVC-joining piece. The box valves are connected to the feeding stations via suction hoses.



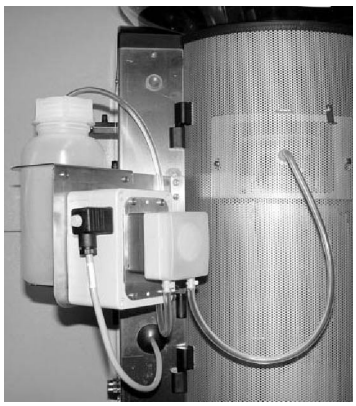
Take care that suction hose connection 1 runs to feeding station 1 (identification 1) and suction hose connection 2 runs to feeding station 2 (identification 2). In case you should not observe this order, a calf trying to get its milk portion at feeding station 1 will get no milk because the milk portion will be distributed at feeding station 2 instead.

13.2 Additive Dispenser

CAUTION! In order to avoid injuries due to **rotating parts on the powder outlet of the additive dispenser**, **before** carrying out any kind of operation on the additive dispenser, it is imperative to make the automatic feeder currentless by turning the main switch to „0/OFF“ or by pulling the mains plug.

You can only connect **one** additive dispenser to the automatic feeder (either for powder **or** for liquid additives). The automatic feeder is equipped as a standard with a cable with cubicle plug for the additive dispenser.

For mounting or installation of the additive dispenser, refer to instructions manual „Precision Doser for Powder Additives or Dosing Pump for Liquid Additives“.

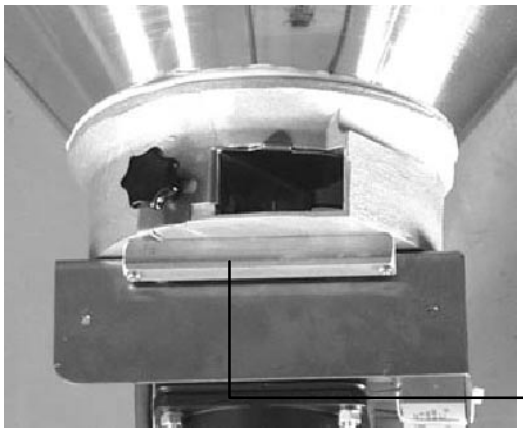


13.3 Fully Automatic Heat Exchanger Cleaning

The fully automatic heat exchanger cleaning facilitates fully automatic time-controlled cleaning with detergent (up to 2 times/day) of all milk-supplying parts of the automatic calf feeder except for the suction hoses. In this way, milk deposits or similar dirtying are removed. *Refer to chapter 10.3.3, page 63 „Cleaning, Cleaning Values Heat Exchanger“*.

13.4 Electrical Vapour Screen for MP- and Powder Additive Outlet

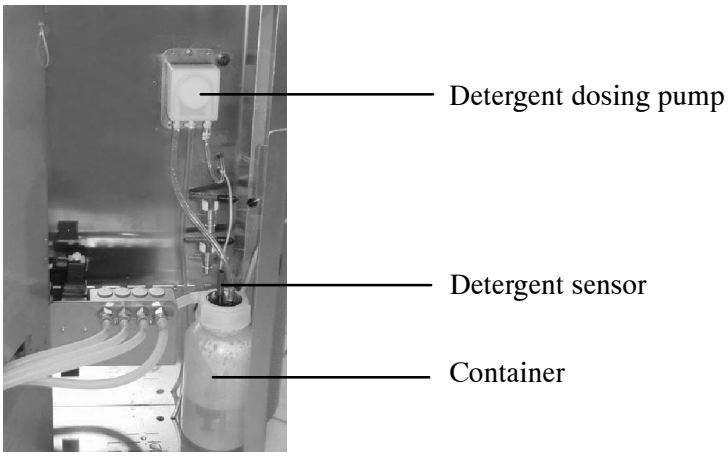
The electrical vapour screen consists of a heating element located right below the outlet for milk powder resp. powder additive. In case of bad weather conditions, such as e.g. too high atmospheric humidity, the electrical vapour screen should prevent the milk powder and the powder additive from sticking to the outlet.



13.5 Detergent Dosing Pump

Thanks to the detergent dosing pump, liquid additives are added automatically to the water during the various cleaning cycles. There is no need anymore to add the detergent manually.

The detergent dosing pump is located in the left interior of the automatic calf feeder below the two-group-valve-unit. The detergent is taken from a container with a storage capacity of 1,5 liters and is conducted via a thin hose into the mixer jar. Before installing the detergent dosing pump you have to calibrate it.



13.6 Protection against Flies

In case of fly infestation occurring particularly in summer we recommend to protect the mixer jar by means of a large fly screen. Water vapour can escape through the openings of the fly screen. You can attach the fly screen together with the dispenser for powder additives to the automatic calf feeder.

14 Replacement of the Program Chip

Refer replacement of the program chip only to qualified personnel.

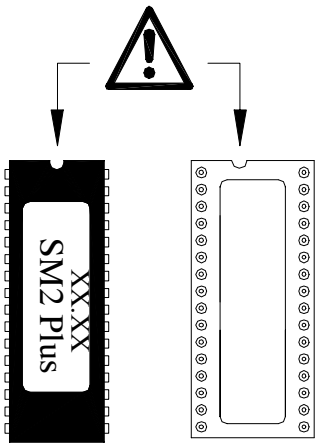
Proceed as follows:

1. Before replacing the program chip, write down all machine settings. To this end, switch the System-machine off, press the Menu key while switching the machine on once again. Keep the Menu key pressed until the new program version is displayed. Note down all machine settings previously selected, such as e.g. language, machine type, interface etc.

2. Disconnect the System-machine and make it currentless.

3. Open the control-unit box and remove the old program chip (chip with adhesive label „SM2 Plus XX.XX“). Use appropriate tools, in order not to damage the strip conductors on the main circuit card. If necessary, remove the main circuit card.

4. Put in the new program chip with the notch upwards.



5. Close the control-unit box.

6. Connect the System-Machine. When starting the machine, the display shows the new program version. In case the message „Fault Memory error“ is displayed, disconnect the machine once again.

7. Press the three keys „Automatic“, „Cleaning“ and „Menu“ simultaneously and connect the System-Machine. Keep them pressed until the display shows the number of the program version. Carry out a new programming of the Setup.

8. Carry out new calibration.

9. Check portion values, milk values and machine values.

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EC DECLARATION OF CONFORMITY

We, **Förster Technik GmbH**
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declare that our products with the designation:

TAK*-SM2-27-F1	TAP*-SM2-27-F1	VDW*-SM2-27-F1
TAK*-SM2-28-P1	TAP*-SM2-28-P1	VDW*-SM2-28-P1
TAK*-SM2-30-P1	TAP*-SM2-30-P1	VDW*-SM2-30-P1
TAK*-SM2-32-P1		VDW*-SM2-32-P1
TAK*-SM2-38-P1		VDW*-SM2-38-P1

including all accessories, * with chassis size 5

to which this declaration relates are in conformity with the following relevant regulations:

EN	292-1 / 11.91	Basic concepts of general design of machines, part 1
EN	292-2 / 06.95	Basic concepts of general design of machines, part 2
EN	294 / 8.92	Safety clearance for upper limbs
EN	349 / 6.93	Minimum clearance for avoiding crushing upper limbs
EN	50081-1 / 3.93	Norm concerning electromagnetical emissions on residential areas, business districts and industrial areas
EN	50082-1 / 11.97	Norm of the resistance to jamming against line directed disturbances, induced by highfrequency fields above 9 kHz
EN	563 / 08.94, 01.95	Temperatures of touchable surfaces
prEN	1070 / 6.93	Safety of machines, terminology
EN	60204-1 / 11.98	Electrical components of machines

per the provisions of Council Directives 89/392/EEC, Annex II A, 89/336/EEC, 73/23/EEC and 93/68/EEC.

Date: 01. 01. 2002

Wolfgang Latz Alfred Steiner

Signatory: M. Latz, Head of Production Management
M. Steiner, Head of Production, Department Electrical Components