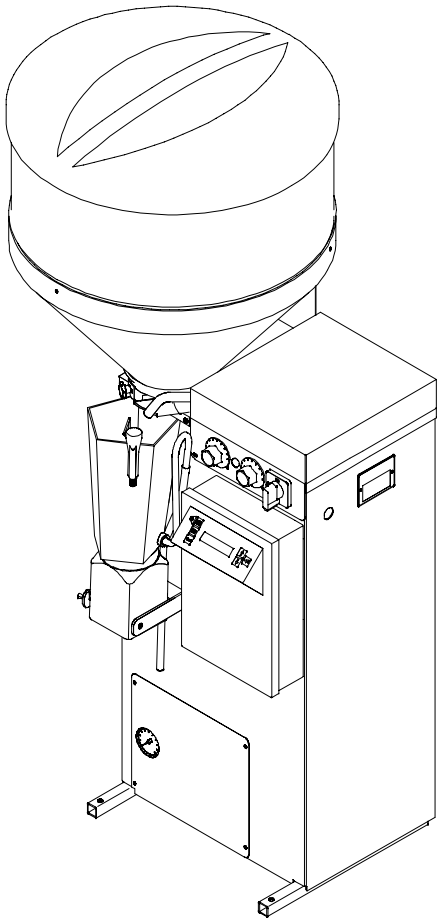
March 2000, as of version 00.20

User Manual for System-Machine Powder

TAP2-SM1-50-P
TAP1-SM1-38-P
TAP1-SM1-32-P
TAP1-SM1-30-P
TAP1-SM1-28-P
TAP1-SM1-27-F



1 Introduction

1.1 Guidelines for the user manual

For a better understanding of the user manual graphic symbols are used.

Attention: absolutely observe the contents of the user manual, to avoid injury and damage to persons, animals and installation.

Symbol for important instructions and additional explanations to operate the feeder.

Symbol for examples in the user manual.

Symbol for measuring cylinder for collecting and weighing the drinking components.

Symbol for scales used to weigh the drinking components during calibration.

In case you need more
information, please contact us:
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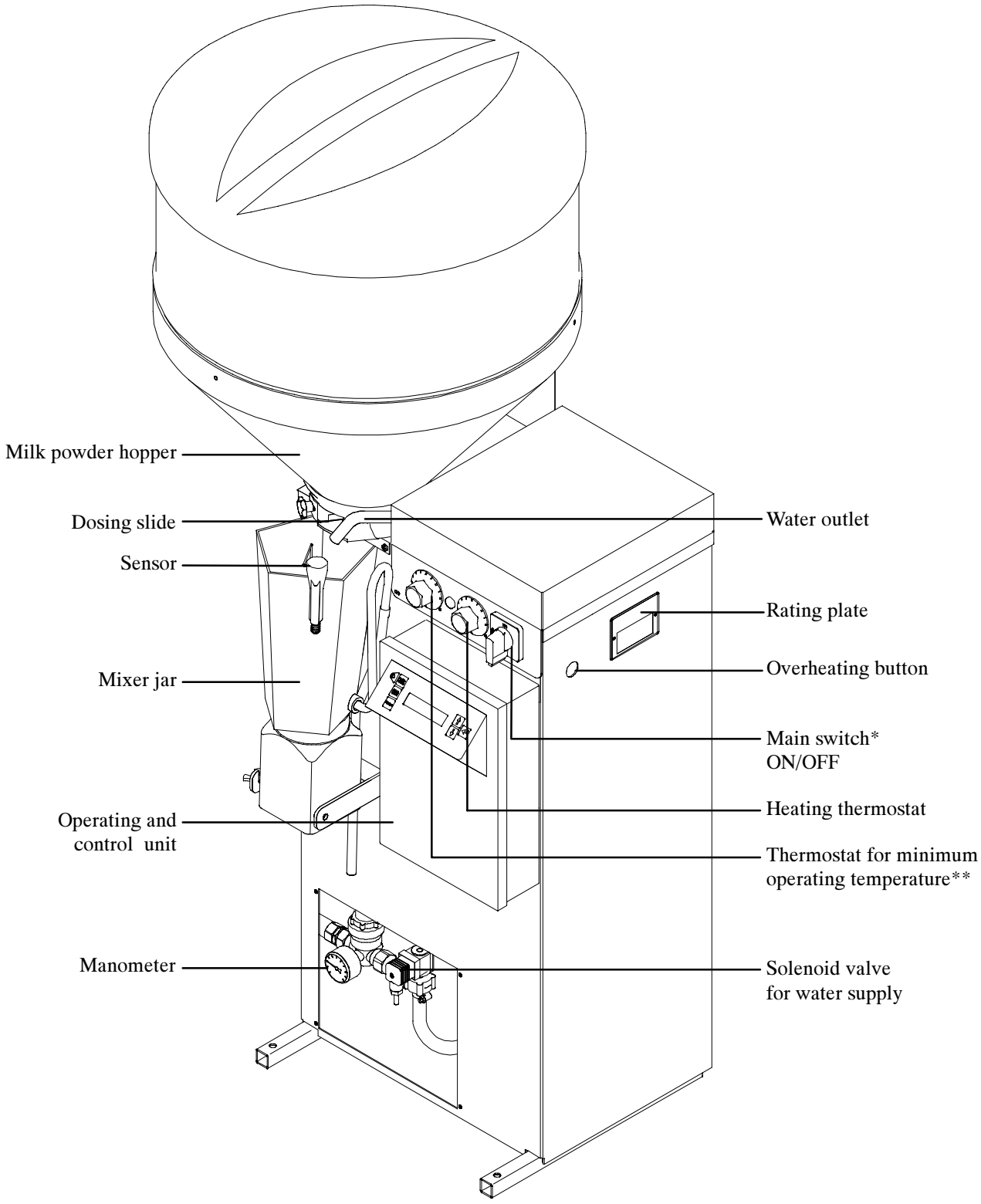
1.2 Safety instructions

- Installation of the automatic calf feeder must be carried out by qualified personnel.
- Before starting the machine, thoroughly read the user manual.
- Professional installation and operation as well as maintenance are required for a perfect functioning of the automatic feeder.
- Faulty operation and incorrect data entries may have serious consequences.
- The livestock owner is responsible for a steady and scrupulous control of his animals and the functioning of the automatic calf feeder. If, for any reason, the system should break down or some calves should not make use of it, the owner has to choose other feeding methods for those animals.
- The manufacturer accepts no liability for damages and their consequences resulting from faulty installation and operation, improper treatment, inadequate service and maintenance or incorrect data entries.
- Remove any projecting object (p.ex. pipe ends) from the stable, so that Responder collars cannot get caught on it.
- The machine can only be used for calf feeding.
- In the following chapters you will find further safety instructions.

1.3 Construction parts of the System-Machine Powder



* not available on model „TAP1-SM1-27-F“

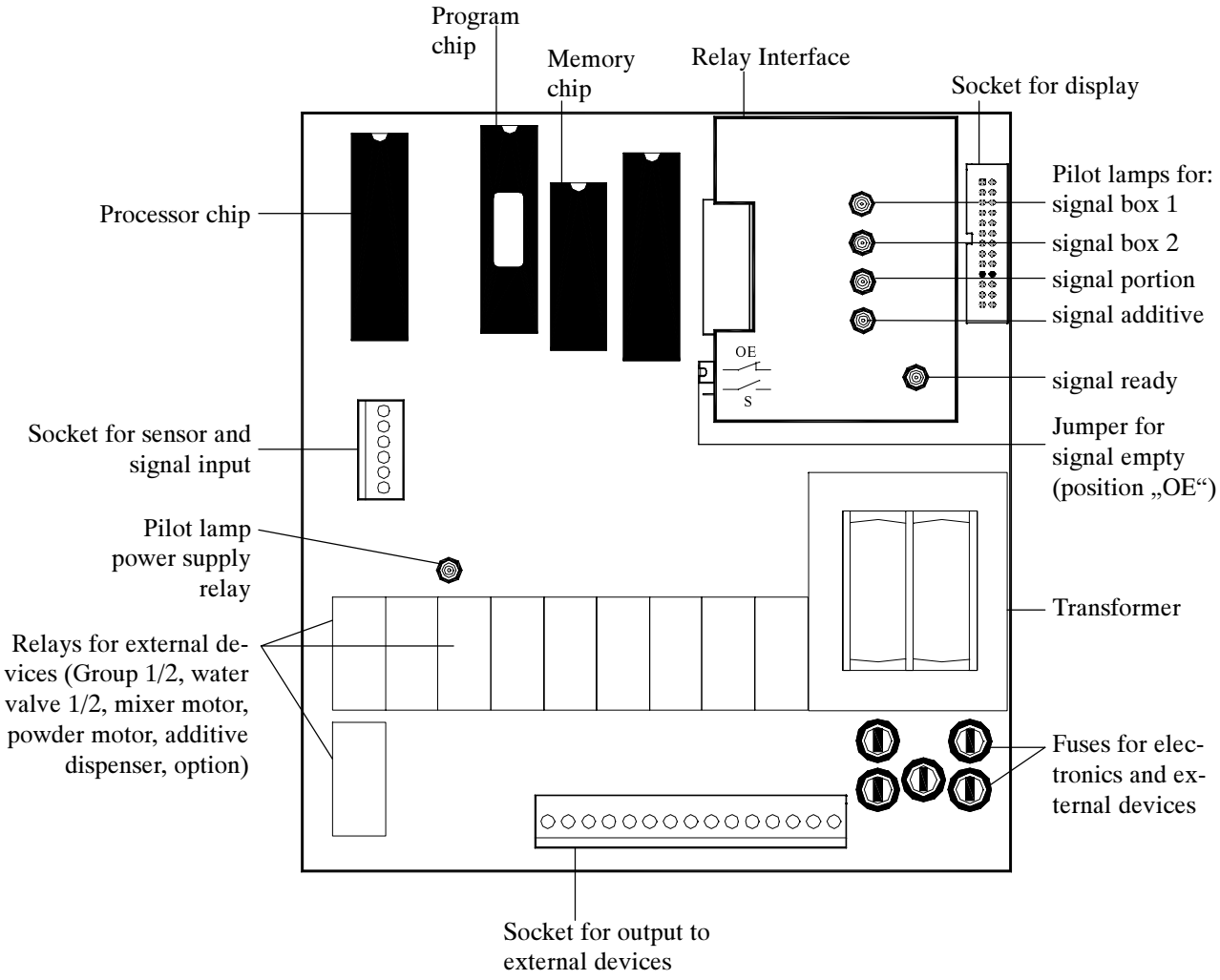
** available as an option on model „TAP1-SM1-27-F“

1.3.1 Circuit card SM1 - Powder for connection to transceiver

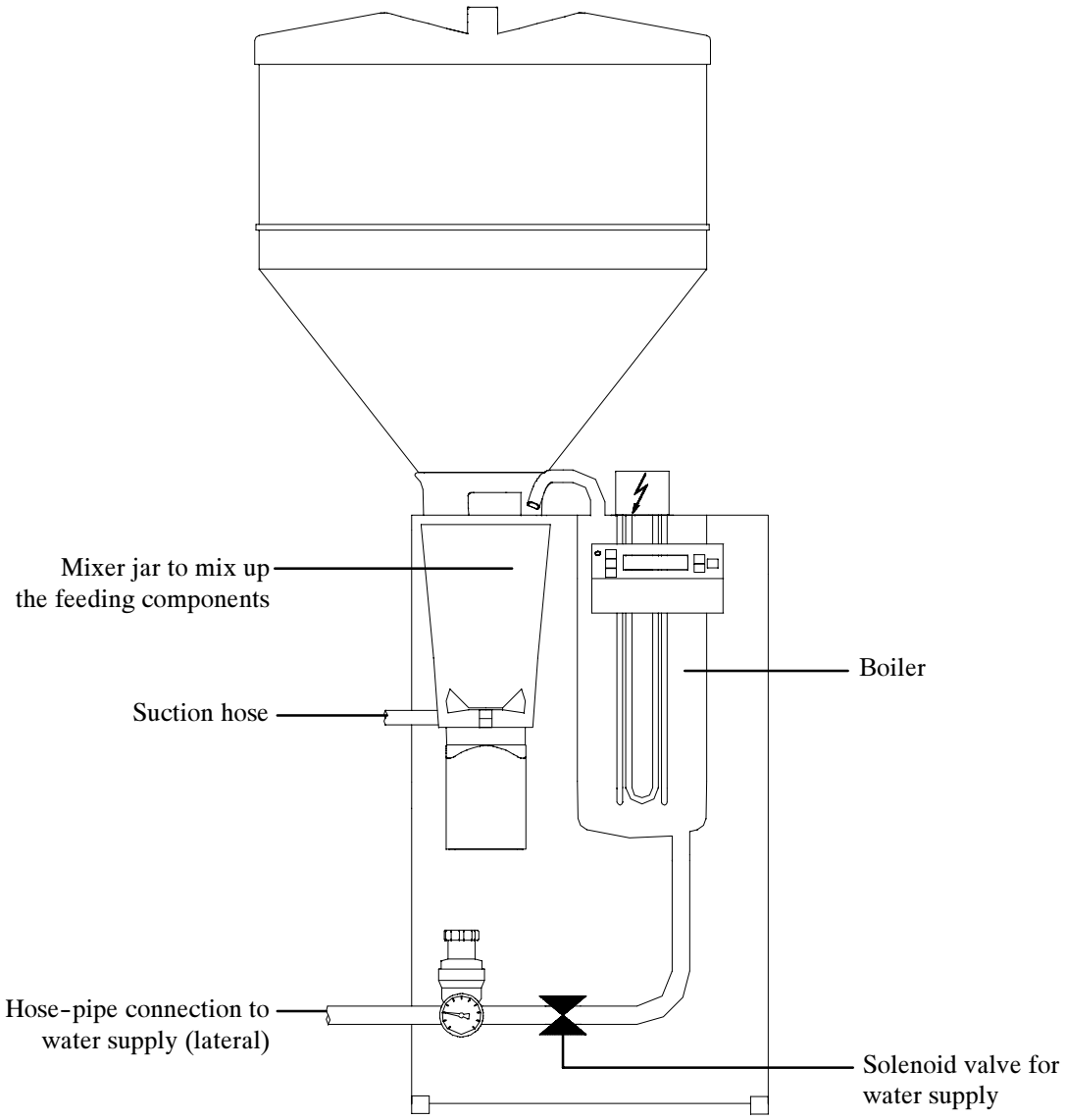
On the circuit card you can find the transformer for current supply of the control unit, the relays, as well as the sockets for external devices, the fuses and pilot lamps.

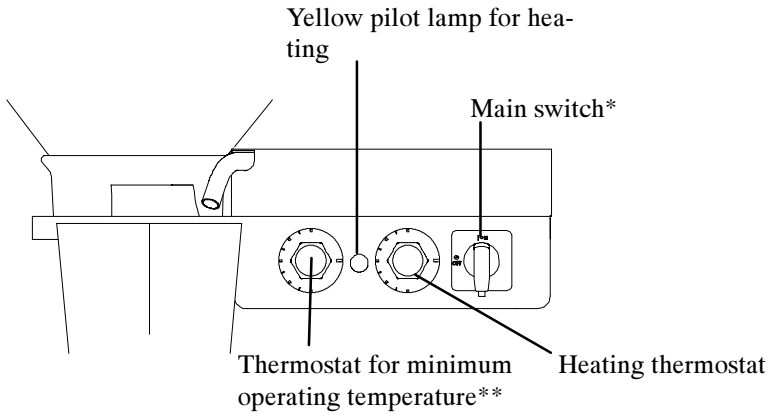
In case the System-Machine is connected to a transceiver, relay Interface is used.

On the relay Interface you can find a jumper on position „OE“, indicating when the automatic calf feeder is empty. The jumper has already been factory-set. Control the position of the jumper (see chapter 5.1, page 24, „Starting of the automatic calf feeder“).



1.3.2 Water warm-up in the boiler and pilot lamp for heating



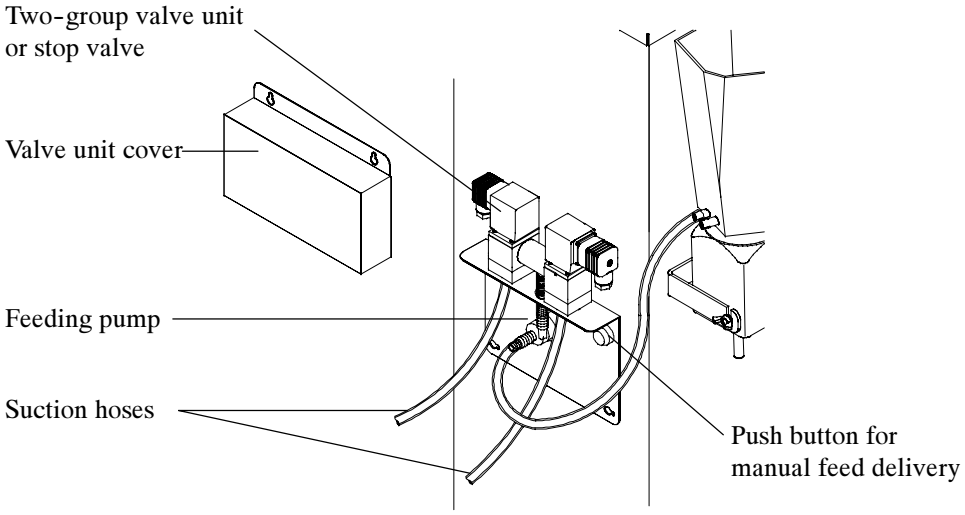


* not available on model „TAP1-SM1-27-F“ (see chapter 5.2, page 24)
** available as an option on model „TAP1-SM1-27-F“

1.3.3 Hand-actuated feeding pump

The hand-actuated feeding pump supports the calf's training in using the feeding station. You can find it between mixer exit and sucking station. The feeding pump can be activated by pushing a button at the lower side of the housing or at the sucking station. The feed is then directly transported from the mixer to the teat and into the mouth of the calf respectively.

You may also use the feeding pump to discharge manually rinse water located in the mixer jar.



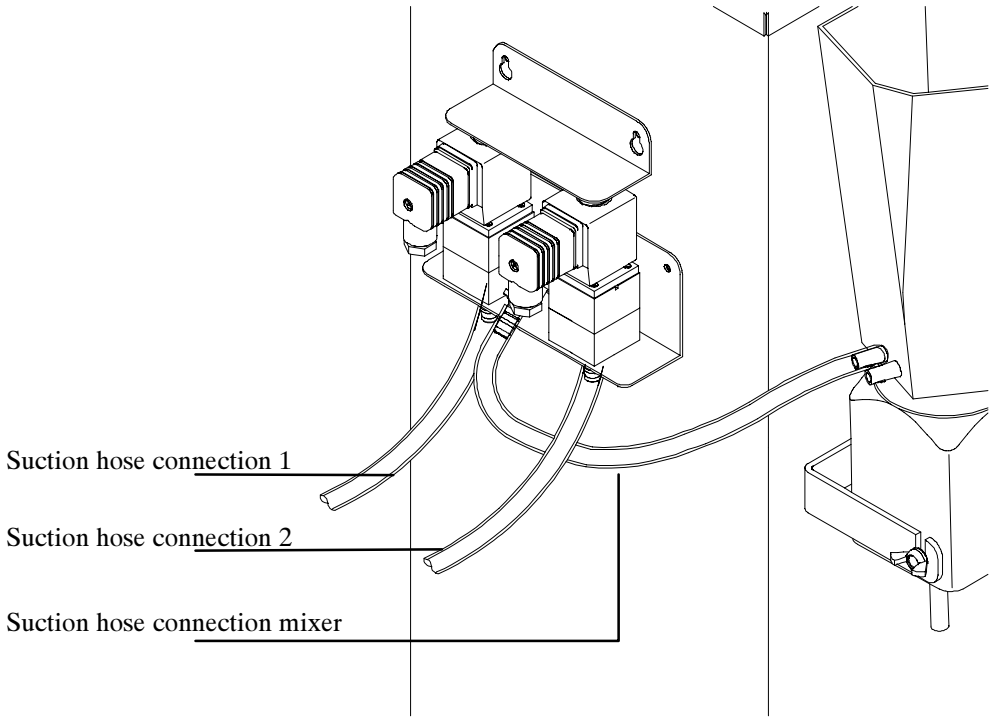
Do not clean the feeding pump with the rinse sponge. It may get clogged!

1.3.4 Accessories: Two-Group-Valve-Unit

System-Machines can provide two drinking stations one after the other, by means of a priority control with the two-group-valve-unit. Priority control is defined as follows: a calf with drinking right, entering the drinking station, gets its portion without interruption, while the other station is closed during this time. The commutation occurs by means of the two-group-valve-unit.

The milk hose leads from the mixer to the hose connection between the two solenoid valves. You may find the connections of the solenoid valve to the teat underneath the corresponding solenoid valves.

The two illuminated plugs of the solenoid valves indicate which suction line is open (1 or 2).

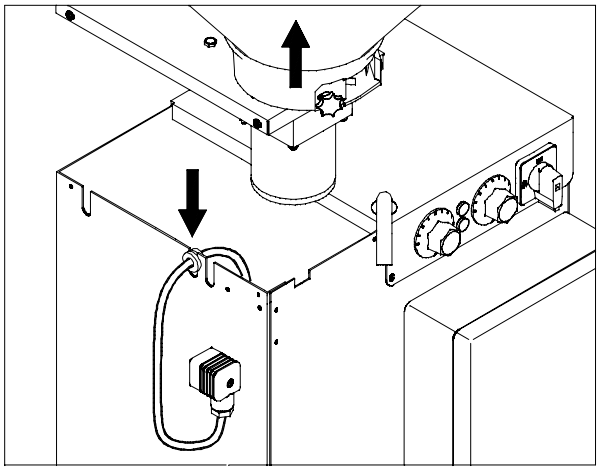


Make sure that the suction hose connection 1 leads to the sucking station 1 (antenna) and the suction hose connection 2 to the sucking station 2 (antenna 2). In case you should not observe this order, a calf, requesting a portion at drinking station 1, will get no drinking. Instead of this, the portion will be dispensed at drinking station 2.

1.3.5 Accessories: additive dispenser

You can connect an additive dispenser to a System-machine (either for powder or for liquid additives). The automatic feeder is equipped with a cable for additive dispenser with plug, as a standard.

Connection: When connecting the additive dispenser, remove the powder hopper unit and pass the cable through one of the openings on the left-hand side of the body shell to the outside.



Assembly and installation of the additive dispenser: see user manual *„Precision dispenser for powdery additives or dosing pump for liquid additives“*.

1.4 Technical data for Automatic Feeder

Please observe the data on the rating plate on the right-hand side of the shell!

Electrical connection
TAP2-SM1-50-P, TAP1-SM1-38-P, TAP1-SM1-27-F (400V)

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

TAP1-SM1-32-P, TAP1-SM1-27-F (230V)

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

TAP1-SM1-28-P, TAP1-SM1-27-F (240V)

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

TAP1-SM1-30-P

200V, 50 Hz / 60 Hz, 20 A

Water supply

1/2“ hose with 3/4“ hose screw-connection.
Water pressure supplied by customer: 2,5 to 6 bar.

Boiler

Boiler capacity, approx. 5 l

Milk powder hopper - Storage capacity (with hopper top section)

TAP1: approx. 35 kg
TAP2: approx. 55 - 120 kg (depending on hopper top section)

Number of sucking stations and calves

Each calf feeder can supply about 20 - 30 rearing calves or 15 - 20 veal calves from one single sucking station. From 2 sucking stations it can supply about 50 - 60 rearing calves, 20 - 30 veal calves or 20 rearing calves and 15 veal calves.

2 Functioning of the Automatic Calf Feeder

2.1 Drinking preparation

The preparation of the drinking begins with the water supply. When the water jet hits the sensor (short sensor) in the mixer jar, a pre-selected milk-powder portion (MP) falls out of the hopper into the mixer jar where it is mixed up with water (0,5 l). The mixer is connected to the sucking station by means of a suction hose. The calves can now drink their feeding portion running through the suction hose to the teat.

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

2.2 Drinking dispense

2.2.1 Restricted mode

Sensor free:

When a calf with drinking right enters the box and is identified, the automatic calf feeder begins to prepare a drinking portion, in case the mixer is empty. The liquid grounds the long sensor. After the calf has drunk the milk portion, the sensor gets free again and, on demand, the automatic feeder prepares another portion.

Sensor covered:

When a calf with drinking right enters the box and is identified, it gets the residual portion in the mixer jar. When the mixer is empty and the sensor is not covered any more, the automatic feeder prepares the next portion.

Two sucking stations:

When a calf with drinking right is identified, the corresponding suction line is opened. In case the sensor is free and the calf has no drinking right, the suction line is closed after feeding time. When the sensor is covered, the suction line is closed after approx. 2 minutes.

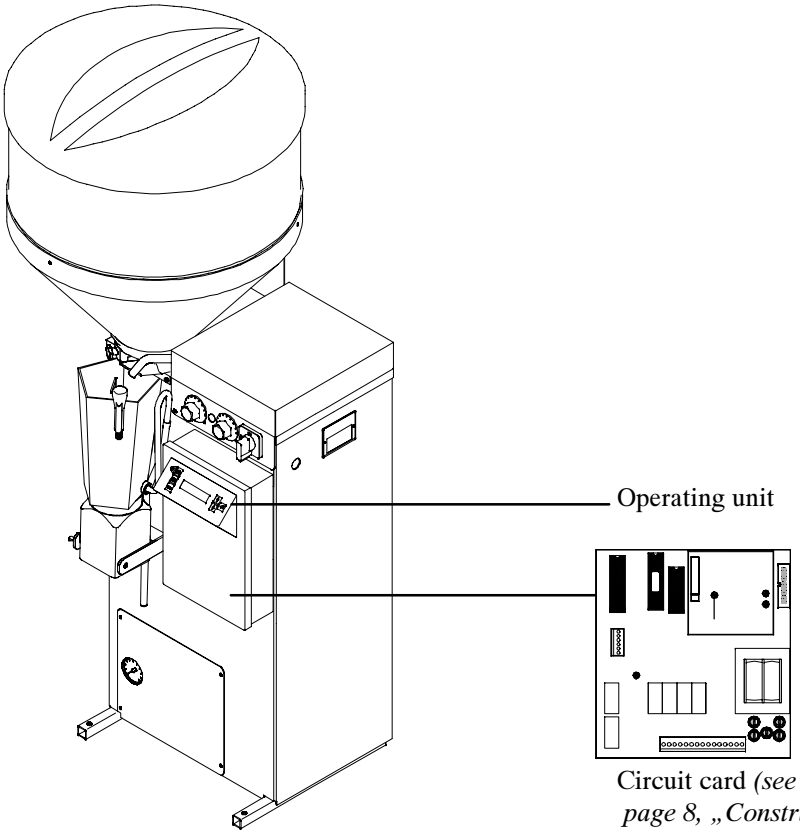
2.2.2 Ad libitum mode

In the adlib (ad libitum) mode the machine operates without identification. Whenever the sensor is free, the next portion is prepared.
In case of two sucking stations, both suction lines are open.

When the machine operates for a long time in the adlib mode, the valves of the two-group valve unit get very hot. Therefore fix the suction hoses directly on the mixer and remove the plug of the two-group valve unit.

3 Operating and Control unit

3.1 Operating unit and circuit card



Operating unit

On the operating unit you can find a text display and a keyboard. The keyboard consists of the function keys „Automatic“, „Cleaning“ and „Menu“, as well as the arrow-up, arrow-down and the Enter keys.

Next to the „Automatic“ key there is a green pilot lamp which always lights up when the automatic feeder operates in the automatic mode without errors.

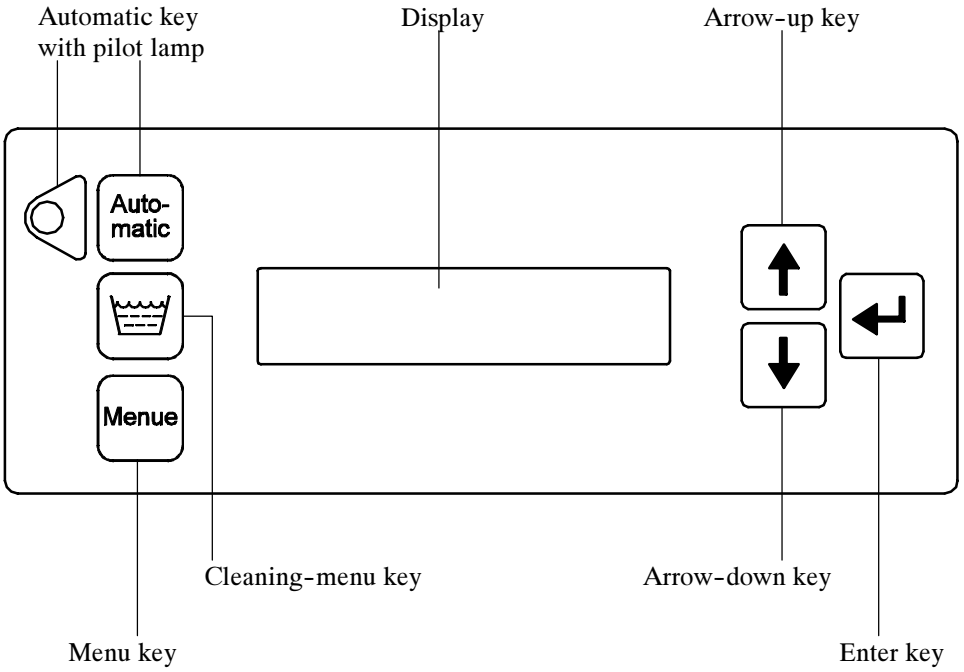
Circuit card

On the circuit card you can find the transformer for current supply of the control unit, the relays, as well as the sockets for the external devices, the fuses and pilot lamps.

3.2 Operational control

3.2.1 Keyboard

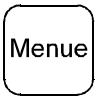
All major settings and actions such as operating mode, portion values, calibration, cleaning, diagnosis etc. are controlled via the keyboard. The text display features all current actions or settings.



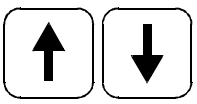
3.2.2 Function keys

„Automatic“ key: the automatic feeder runs in the automatic mode.

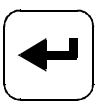
„Cleaning“ key for the cleaning menu.



„Menu“ key: you may choose between several functions and menus.



Arrow keys to access the menus and modify the entries.

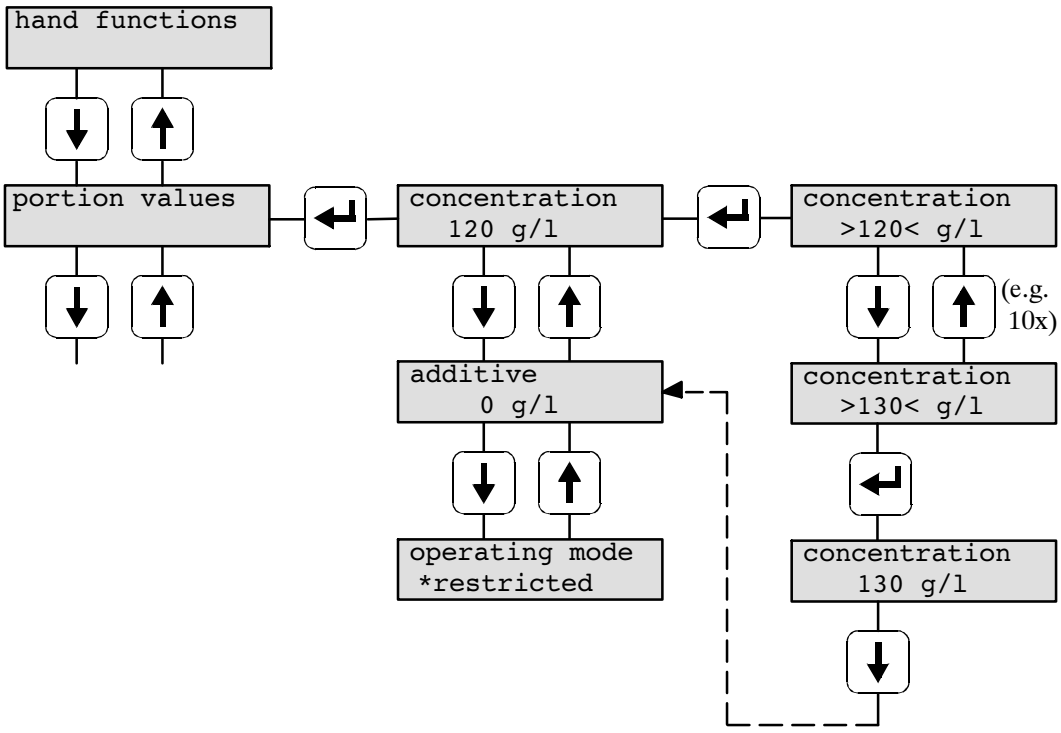


Enter key to open the menus and store the entries.

3.2.3 Entering the values

You can enter and change different values, concerning e.g. calibration, concentration, additive amount etc. by pressing the arrow and Enter keys. Press „Menu“ in order to reach those main menus. Press Enter to change a value. The value in the display immediately begins to flash (e.g. >120<). The arrow-up key is used to increase the value, and the arrow-down key is used to decrease the value. If the respective arrow key is held down for a longer period, the value moves up or down faster. Once the correct value has been set, it is stored by pressing the Enter key (the value stops flashing). If you do not wish to change the value, press the „Menu“ key and you will return to the main menu.

Example for the input of values within the functions of the „Menu“ key

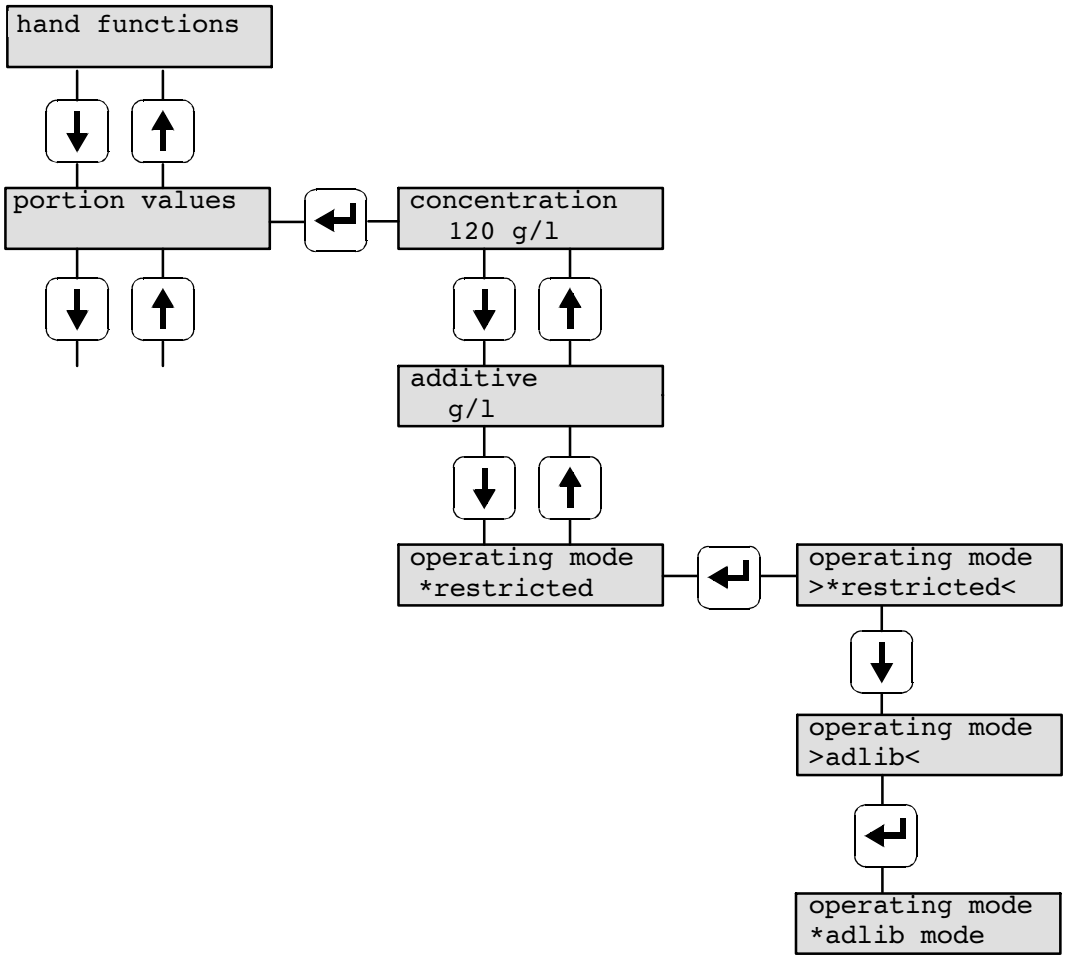


3.2.4 Selection of options

You may only select one of several options. An automatic feeder may run in „adlib“ or „restricted“ mode, but not in both simultaneously. The option selected is marked by an asterisk in the second line of the display.

Press Enter to change the option. The current option in the display is now flashing. Press the arrow keys to access the different options. Press Enter when the display features the required option. The option is then marked by an asterisk and stored. If you do not wish to change the option, return to the main menu by pressing the „Menu“ key.

Example for the input of values within the functions of the „Menu“ key



4 Location of the automatic calf feeder

4.1 Local electrical connection

- Local electrical connection must be installed by a qualified electrician.
- Local regulations and safety precautions have to be observed. An earth leak switch (30 mA) in customer's power supply is prescribed, in order to operate the automatic calf feeder.
- The automatic feeder requires its own power supply: *see Technical data.*
- Nominal voltage and nominal frequency have to be observed. The supply voltage indicated on the rating plate must correspond to the one of the electric network.
- In case of overvoltage risk, install a surge voltage protector in the main distribution unit.

Equipotential bonding

For animals' safety and to prevent electrical faults, carry out an equipotential bonding of all metal parts such as automatic calf feeder, water conduit, sucking station and race-way. On the rear of the calf feeder you will find the connecting screw of the equipotential bonding.

Lightning protection

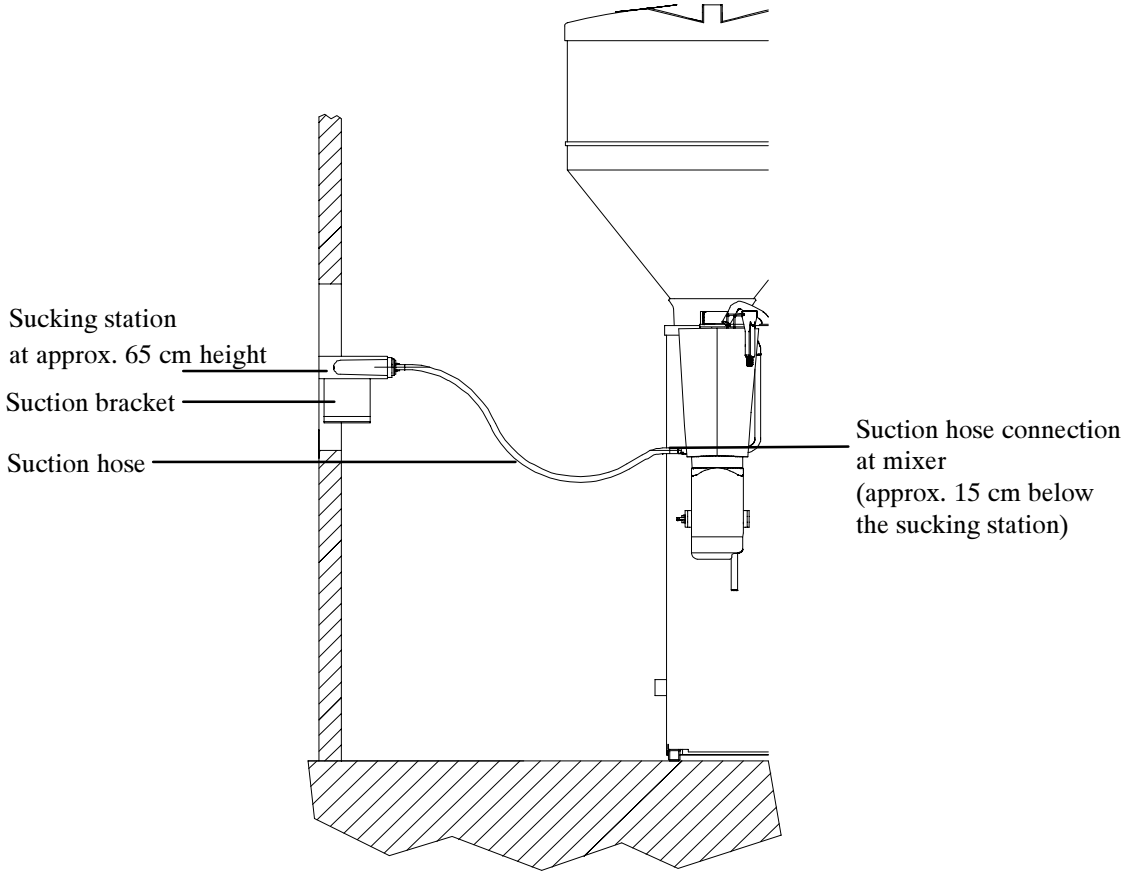
As it is impossible to protect the installation separately against lightning stroke, it is to the owner to install an adequate lightning protection (e.g. lightning protection system for the whole building). We recommend to take out an insurance policy against lightning stroke.

4.2 Installation of the automatic calf feeder

- Install the calf feeder at a frost-free and dry place.
- If possible separated from the animal area, e.g. in the fodder storage or similar detached place.
- A fence of planks or plates also protects the automatic feeder from dirt and flies.
- The suction hoses can be easily conducted through the wall.
- If possible place the milk storage tank next to the automatic feeder.

4.3 Mounting the sucking station

- Install the sucking station max. 65 cm above the ground of the stable.
  The sucking station must be approx. 15 cm above the connection of the suction hose on the mixer.
- The suction hose must be dimensioned such, that the mixer jar can be tipped unhampered in forward direction. If possible the suction hoses must not exceed 2 m.
- Mount the suction bracket with splash board towards the bottom.



4.4 Mounting the race-way and connecting the transceiver

The sucking station must be preceded by an appropriate race-way, in order to protect a calf from being pushed aside by other calves.

- Install the race-way according to the installation manual.
- Install the cable of the transceiver according to the installation manual.

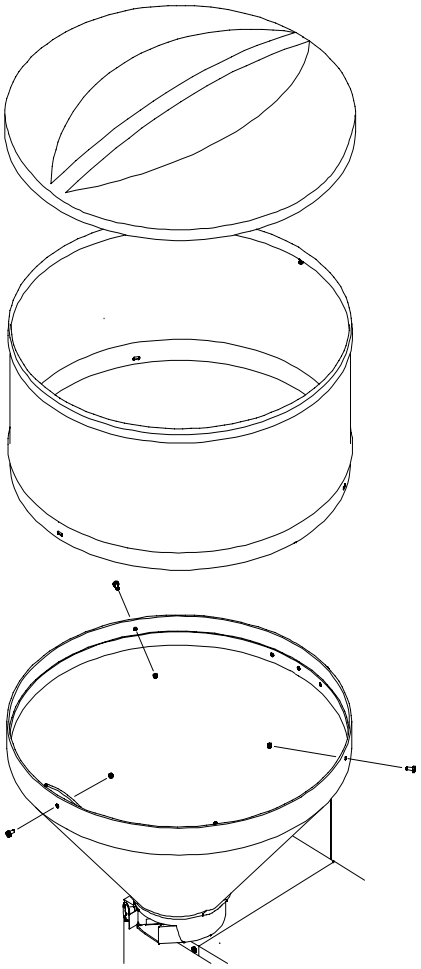
Install the cable of the transceiver in such a way, that the calves cannot touch it.

- In case of transceiver: carefully check the wiring, the codification and the program chip. See I-plan.

4.5 Mounting the top section of the milk powder hopper

- Place the top section of the milk powder hopper (part of the delivery) on the powder funnel of the automatic calf feeder and secure it with the appropriate screws and nuts (part of the delivery).

Only use the top section delivered. Do not raise the top section!



4.6 Water connection

- Connect the 1/2“ water hose with 3/4“ hose screw-connection on the side of the automatic feeder.

Local water pressure 2,5 - 6 bar.

Install additional water stop valve.

The pressure reducer is already factory-set on 2 bar.

Do not alter the setting of the pressure reducer!

5 Installation of the automatic feeder

5.1 Checking the jumper in case of relay-Interface

When starting a System-Machine, connected to a transceiver with relay-Interface, make sure that the jumper for signal empty is on position „OE“. The jumper has already been factory-set. Only control the position of the jumper when a calf with drinking right is in the feeding station and the automatic feeder does not prepare a drinking portion, even if the mixer jar is empty.

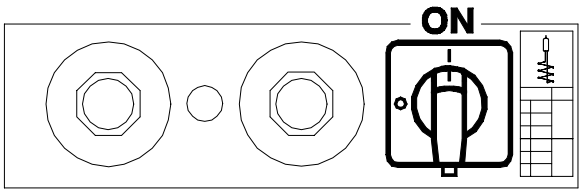
- Once the System-Machine is currentless, open the operating unit and control the position of the jumper („OE“).

A jumper for signal empty is only available when the machine is connected to a transceiver and relay-Interface is used.

5.2 Connecting the automatic feeder to the mains supply

Warning: Before activating the heater, fill up the boiler, in order to avoid damages and to guarantee a reliable functioning of the automatic feeder.

- Turn back both thermostats to position „O“ and switch off the main switch (pos. „OFF“). For model „TAP1-SM1-27-F“ turn back the heating thermostat to pos. „O“.
- Connect the mains plug and switch on the automatic feeder by turning the main switch (pos. „ON“). Model „TAP1-SM1-27-F“: activate the flip-switch, situated on the righthand side on the bottom of the control and operating unit.



Once you switched on the automatic feeder, the display briefly features the new program version.

5.3 Filling the boiler with water

Press „Menu“ key, in order to fill the boiler with water. The display features:

```
hand functions
```

Press Enter. Move to the submenu „Boiler fill“ by means of the arrow-keys.

```
boiler
fill ?
```

Press Enter, in order to open the water valve to the boiler. The water valve is open, until the water jet hits the long sensor.

```
boiler
being filled up !
```

5.4 Filling the milk powder into the powder hopper

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

There is no warning signal when the milk powder hopper is empty! The automatic feeder carries on the feeding mode without milk powder.

5.5 Calibration of the feeding components

Calibrate all feeding components.This guarantees an exact feed mix in the feeding mode.

Calibration means entering in the computer the quantity of water and milk powder which should be dispensed during a certain period of time.

How to carry out calibration, see chapter 7.3, page 36, „Functions of the Menu key, Calibration“.

5.6 Setting the heating

Only switch on the heating, when the boiler is filled with water and the water has been calibrated!

How to carry out calibration, see chapter 7.3, page 36, „Functions of the Menu key, Calibration“!

Minimum operating temperature (available as an option on model „TAP1-SM1-27-F“) and heating:

The minimum operating temperature prevents too cold water from being dispensed. If the temperature in the boiler falls below the minimum operating temperature of the water, the preparation of the feeding is interrupted until the minimum temperature has been reached.

If the minimum operating temperature is not reached, the display features:

```
fault
temperature
```

Factory settings:

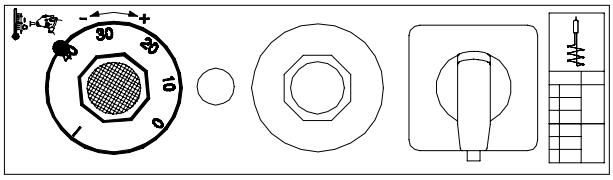
The minimum operating temperature has been factory-set between 38°C and 39°C . It should always lie 3°C below the heating temperature, in order to avoid overlaps in the control range.

The heating temperature has already been factory-set between 42°C and 43°C .

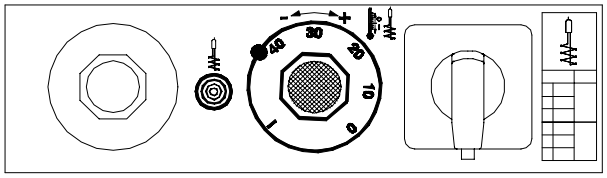
5.6.1 Setting the thermostats

The thermostat for minimum operating temperature is available as an option on model „TAP1-SM1-27-F“.

- Release locking screws of both thermostat turning knobs.
- 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 the setting of temperature.
However, a regular personal check is indispensable.

5.6.2 Recommandations for temperature settings

Cheaper milk powders with a higher fat melting point, require an outlet temperature between 42°C and 43°C . For cold-soluble milk powders a temperature of approx. 38°C will be sufficient.

The temperature must be set very carefully. When the heating temperature is reduced, the minimum operating temperature has to be lowered accordingly.
Too low temperatures may lead to indigestions.
Too high temperatures may lead, over a long period, to inflammations of the mucosa in the abomasum. Flatulence might indicate that the drinking temperature is too high.

5.6.3 Measuring the temperature

The heating regulation suits to the portion size and the drinking speed of the calves. To measure the temperature do not extract more than 0,5 l. For further measurements, wait until the boiler has restored the temperature. The heat transmission time depends on the intake and discharge temperature of the liquid and may vary between 10 and 25 seconds.

- Press the „Menu“ key.
- Press the arrow-down key and change to the main menu „Calibration“.
- Press Enter, in order to move to the submenu „Water“.
- Wait, until the yellow pilot lamp of the heating (boiler water) has extinguished.
- Hold the graduated vessel under the outlet.
- Press Enter to start the water flow.
- Measure the temperature, immediately afterwards, with an accurate thermometer.

Before activating the dispense of a new portion, wait (approx. 30 seconds) until heat transmission is completed. After careful measurement, correct the temperature, if necessary, until the desired value is reached. Fasten the locking screws, after you have set the temperature correctly. In case other measurements should follow, wait until the yellow pilot lamp for boiler heating has extinguished.

6 Adjustments in the Setup

Adjust the basic functions of the automatic feeder in Setup. Warning: Only qualified personnel may activate these functions! The manufacturer has already provided the machines with the correct settings. He does not undertake any liability for incorrect settings on the part of the user.

6.1 Different selections in the Setup

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

Language You may choose between the following languages: German, English, French, Netherlands, Italian, Norwegian, Swedish, Danish, Finnish, Polish and Japanese. These languages are splitted up into 3 different program chips.

Program Chip 1	Program Chip 2	Program Chip 3
German	German	German
English	English	English
French	Norwegian	Polish
Netherlands	Swedish	Japanese
Italian	Danish	
	Finnish	

In Setup you may only select the languages contained in the corresponding program chip!

Machine type Select the corresponding operating mode, depending on the model of the automatic feeder:
Powder- the automatic feeder runs in the Powder/Water mode, it only works with milk powder (MP).
Combi- the automatic feeder works with fresh milk as well as MP.
Milk- the automatic feeder only works with fresh milk.
KU and **KU light-** these automatic feeders only work without feeding computer in the adlibitum (adlib) mode.

Interface You may select 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, which transmits the relay and ready signals to the automatic feeder.
Option **„Priority Group 1/2"-** this option indicates which feeding station or calf group should get the drinking as a matter of priority. The automatic feeder works in the adlib mode with a two-group valve unit and sucking sensors.
The options **„Alcom-Bus"** and **„VC3-Bus"** are reserved to the connection to other Bus-systems.

Box valve Select the box valves in the Setup, 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.

Heating system This option (only valid for automatic feeders Combi and Fresh milk) indicates if the automatic feeder works in the mode with heat exchanger with single heating circuit (HE 1-circ-

le) or with separate heating circuits (HE 2-circle). For automatic feeders which have been installed before the 1. 07. 1998, only select the heat exchanger with a single heating circuit.

Min.oper.therm. This option indicates if the automatic feeder has a minimum operating thermostat.

Circulating pump Here is indicated, if the automatic feeder has a circulating pump. (Only valid for Combi or Fresh-milk feeders).

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

Detergent dispenser In case the mixer should be cleaned with detergent and a detergent dispenser is connected, select the detergent dispenser. A detergent dispenser can only be connected on feeders having a heat exchanger with a single heating circuit.

Mixer type Here is indicated, if the automatic feeder has a mixer with/without automatic cleaning and if a mixer motor is available. Select „no mixer motor“ only on fresh-milk automatic feeders and in case no additives should be dispensed.

Portion size Choose the portion size: either 250 ml or 500 ml milk for each portion.

6.2 Function Table „Setup“

Setup	Option
Language	deutsch english francais nederlands italiano norsk svenska dansk suomi polski japanese
Machine type	powder combi fresh milk KU KU light
Interface	no Interface relay signal priority 1 gr. priority 2 gr. Alcom-Bus VC3-Bus
Box valve	no 1 2
Heating system	HE 1-circle HE 2-circle
Thermostat for minimum operating temperature	yes no
Circulation pump	yes no
Additive dispenser	yes no
Detergent dispenser	yes no
Mixer type	no mixer motor with autom. cleaning without autom. cleaning
Portion size	500 ml 250 ml

6.3 How to make entries in the Setup

When starting the automatic feeder, **only** press the „Menu“ key on the operating unit, until the display features:

```
language
*deutsch
```

Press Enter, choose the language by means of the arrow-up, arrow-down keys and confirm with Enter.

Now call up the other menus available by pressing the arrow-up, arrow-down keys. For modifications, press Enter, in order to open the memory. Choose the option desired by means of the arrow-keys. Confirm with Enter.

All options selected are marked by an asterisk*.

Leave the „Setup“ by pressing the „Automatic“, „Cleaning“ or „Menu“ keys.

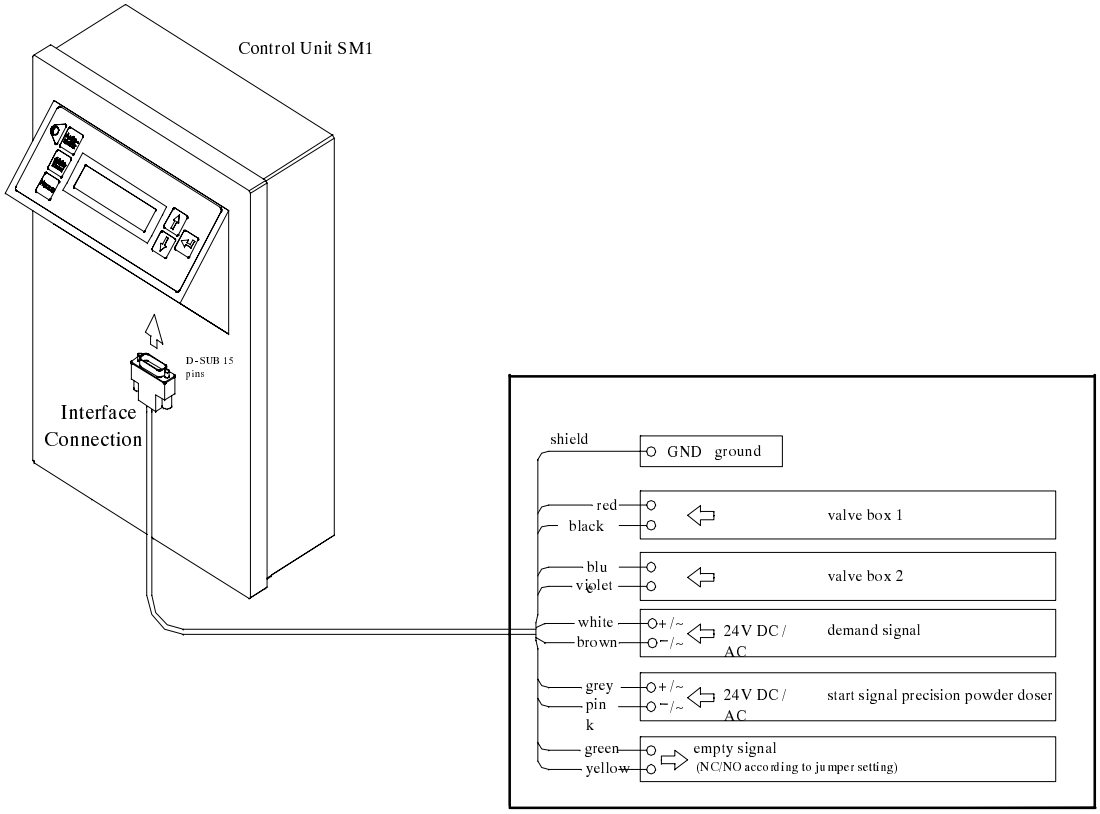
6.4 Connection of the System-Machine to the feeding computer

You may connect the automatic feeder to a transceiver, by means of the relay Interface.

Carry out the following adjustments in the Setup:

Press „Menu“ key. Move to the „Interface“ Menu by pressing the arrow-down key. Press Enter, to open the memory. Select the option „relay Interface“ and confirm with Enter.

```
interface
*relay
```



7 Functions of the „Menu“ key

Menue

The functions of the „Menu“ key are summed up in the main menus
- Hand functions,
- Portion values,
- Calibration,
- Time intervals,
- Diagnosis.

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

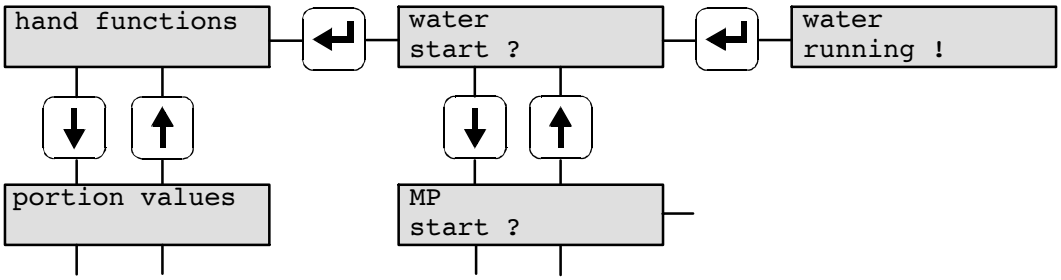
Move to the different submenus within a main menu by pressing the arrow-keys. If you are in a submenu, return to the main menu level by pressing the „Menu“ key.

Depending on the basic adjustments carried out in the Setup, particular menus do not appear on the display.

7.1 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 the functions of the automatic feeder can be activated individually and manually.

You may choose between the following functions:
- Water start
- Powder motor start
- Additive dispenser start
- Mixer start
- Valve box 1/2 open
- Boiler fill



Release the Enter key, in order to complete the operation which has been carried out.

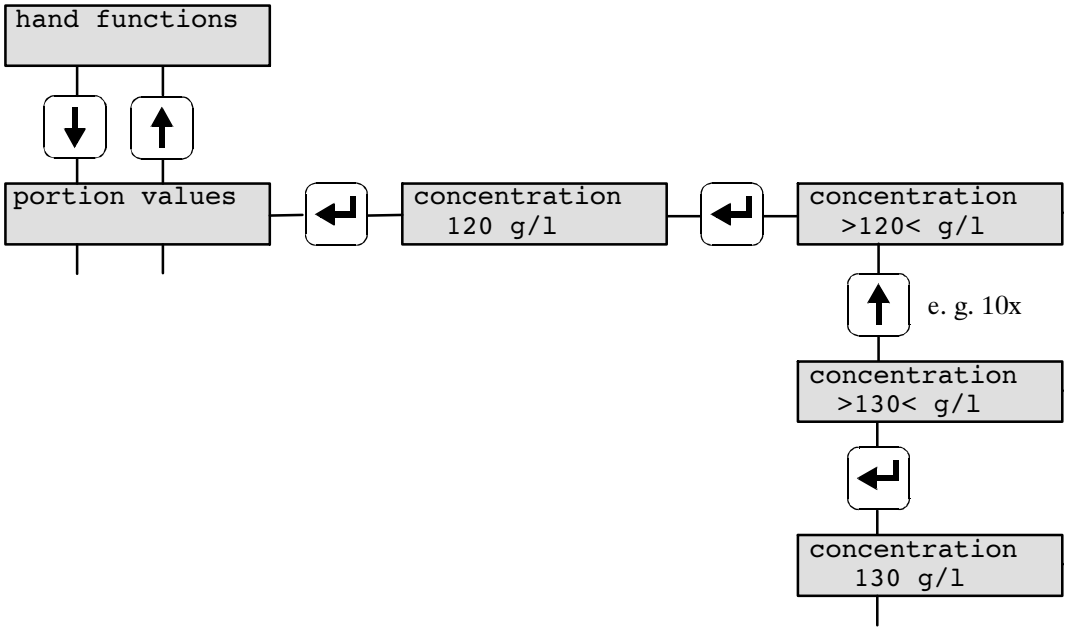
7.2 Portion values

In the main menu „Portion values“ you may enter the operating mode and the values of each portion which should be prepared.

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

7.2.1 Selecting the concentration

The drinking concentration is defined as the amount of milk powder per liter milk, given to each calf.



According to particular feeding computer programs, you may enter a variable concentration according to the needs of each single calf. The display of the System-Machine does not feature the submenu „Concentration“ any more. You have to enter the concentration value in the feeding computer.

7.2.2 Entering the additive

The calves can be treated with powdery or liquid additives. In the submenu „Additive“ enter the amount of additive in grams per liter which should be added to each drinking portion. The feeding computer indicates which drinking portion should be prepared and dispensed with or without additive.

According to particular feeding computer programs, you may enter a variable additive share according to the needs of each single calf. The display of the System-Machine does not feature the submenu „Additive“ any more. You have to enter the additive value in the feeding computer.

7.2.3 Selecting the restricted/adlib - mode

The restricted mode is standard. However, the automatic feeder can also run in the adlib mode.

Restricted

In the restricted mode the automatic feeder works with calf-identification, meaning that the calves are provided for individually and in a restricted way.

In case the automatic feeder with relay Interface is connected to a feeding computer, you may choose between the operating mode „restr. fix con.“ (restricted fix concentration) and „restr. var. con.“ (restricted variable concentration). If you select „restr. var. con.“ on the System-Machine, you have to carry out the same operation on the feeding computer. *(See user manual of the feeding computer).*

Ad libitum

In the adlib-mode the automatic feeder works without calf-identification and without connection to the feeding computer. In the feeding mode a portion is prepared when the sensor in the mixer jar is free. In case of two sucking stations, both feeding stations are open. All calves get the concentration set in the menu „Portion values, Concentration“.

Press the „Menu“ key, in order to enter the operating mode. Change to the menu „Portion values“ by pressing the arrow-down key. Press Enter once again to move to the submenus. Go to the submenu „Operating mode“ by pressing the arrow-down key. Press Enter. Select the desired operating mode by pressing the arrow-keys and confirm with Enter. The operating mode selected is marked by an asterisk.

7.3 Calibration

7.3.1 Calibration of water and MP

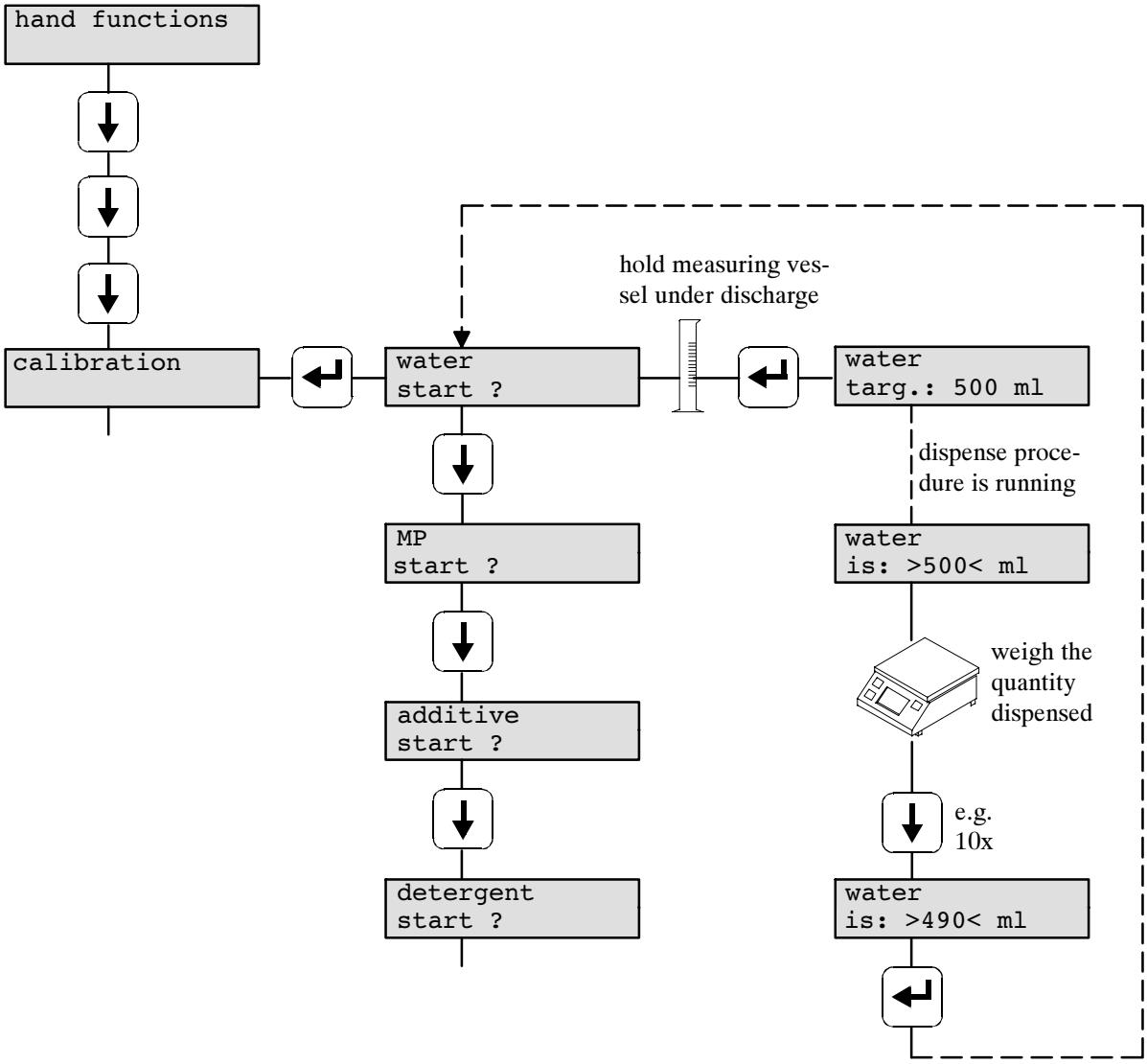
Calibration is defined as the input in the computer of the amount of water and MP dispensed in a certain time. You may only enter the value which is actually dispensed. The number of submenus shown in the display depends on the type of machine.

In case the feed components have not been calibrated at all or inaccurately, the automatic feeder cannot prepare the exact feed mix in the feeding mode. We do not undertake any liability for errors due to inadequate calibration.

The procedure for calibrating the feeding components is always the same:
First press the „Menu“ key and move to „Calibration“ by means of the arrow-down key. Then press Enter to access the submenus. Hold an empty measuring vessel under the discharge. Press Enter. The automatic feeder dispenses e.g. the quantity of water calibrated. The display shows the quantity to be reached. Once the water is dispensed, the display changes. Now enter the amount dispensed and measured by pressing the arrow-keys and confirm with Enter. „Water start“ appears once again in the display.

Repeat the calibration procedure, in order to be sure.

Example for the calibration of water



Calibrate all components which can be selected in the submenus!

7.3.2 Calibration of additives and detergent

In case an additive dispenser is connected or the mixer should be cleaned with a detergent, calibrate the additives and the detergent, too.

Weigh out the powder additives with precision scales (e.g. electronic scales). The weighing accuracy must 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.

If precision scales are not at your disposal, repeat calibration a number of times, in order to get a bigger quantity of additive. Then divide the measured quantity by the number of calibration procedures and enter the value.

Measure liquid additives and detergent with a cylinder.

Repeat the calibration procedure, in order to be sure.

If the warning „Amount too small“ appears, the dispensed amount was too small and the target amount has not been reached. Repeat the calibration procedure once again.

```
additive
amount too small
```

```
detergent
amount too small
```

7.4 Time intervals

In the main menu „Time intervals“ you may enter the duration of the intervals for the mixing of a new drinking portion in the mixer jar.

7.4.1 Intermediate mix

Press the „Menu“ key. Move to the main menu „Time intervals“ by means of the arrow-down key.

```
time intervals
```

Press Enter. The display shows:

```
intermediate mix
 0 min
```

Here you may enter whether and after how many minutes an intermediate mix of the drinking should be carried out. Only enter values from 5 minutes on.

You can only carry out an intermediate mix, when the sensor is covered.

7.4.2 Entering the preparation interval

In the submenu „Prep. interval“ you can enter a pause for the dispense of the drinking. After preparation of the first portion, the stop valve or the two-group valve unit closes during the entered distribution pause. It is advisable to set a distribution pause only in case of not readily soluble milk-powders, very high concentrations (> 200 g/l) and extreme drinking speeds (> 2 l/min).

Change to the submenu „Distribution pause“ by pressing the arrow-down key. Press Enter.

```
prep. interval
   0 sec
```

Select the distribution pause by pressing the arrow-keys. Only enter values between 0 and 16 seconds. (Standard value: 0 s).

```
prep. interval
   0 sec
```

7.5 Diagnosis

The main menu „Diagnosis“ facilitates an eventual search for errors. Motors, valves and pumps can also be controlled separately.

Press the „Menu“ key. Move to the main menu „Diagnosis“ by pressing the arrow-down key:

```
diagnosis
```

7.5.1 Controlling the outputs

In the following submenus each output can be controlled separately. The function of each single output appears in the display. So it is possible to verify the functioning of output and control.

Go to the submenus by pressing the arrow-down key.
The display shows:

```
water valve
open ?
```

Press Enter, in order to open the water valve. The water valve is open as long as you press the Enter key.

```
water valve
opened !
```

The same applies to:
- Mixer
- Powder motor
- Additive dispenser
- Detergent dispenser
- Valve box 1/2
- Signal ready (this means whether the automatic feeder transmits a signal ready to the feeding computer).

7.5.2 Controlling the inputs

Inputs are sensors, such as the long sensor and the minimum operating temperature. The display immediately shows alterations of the inputs, delimiting the occurence of faults.

The display features e.g.:

```
sensor long
hit !
```

The same applies to:
- Temperature
- „Signal portion“ (this means, whether the feeding computer transmits a signal for the demand of a drinking portion)
- „Signal additive“ (this means, whether the feeding computer transmits a signal for the demand of a drinking portion with additive)
- „Signal box 1/2“ (this means, whether the feeding computer transmits a signal for the selection of a drinking station).

7.5.3 Power failures/Access to backup/Cleaning fault/Water checkups

The second line of the submenus Power failures, Access to back-up, Water checkups and Milk checkups indicates the number of power failures and data back-ups on the memory chip as well as the number of water and milk checkups. Water or milk checkups are carried out in case the sensor is not or not enough hit by the water or milk jet. These values indicate possible failures.

The submenu „Power failures“ shows the number of new program starts of the automatic feeder after power failure:

```
power failures
 2
```

In case of memory data error, the computer can fall back upon an internal safeguarding copy in the submenu „Access to back-up“. Each access to back-up is counted.

```
access to back-up
 1
```

The submenu „Cleaning fault“ indicates faults which occurred during the automatic mixer cleaning.

```
cleaning fault
 2
```

The submenu „Water checkups“ indicates the number of water checkups. A water checkup is carried out in case the sensor is not or not enough hit by the water jet.

```
water checkups
 0
```

Clear fault messages as follows: Press Enter, select „0“ by means of the arrow-keys. Then press Enter once again, in order to confirm the operation.

7.6 Function Table of the „Menu“ key for connection to transceiver

In case the System-Machine is connected to a transceiver, you may choose between the following functions (as of version 00.20):

Menu	Submenu	
Hand functions	Water start ?	
	MP start ?	
	Additive start ?	
	Mixer start ?	
	Valve box 1 open ?	
	Valve box 2 open ?	
	Boiler fill ?	
Portion values	Concentration 120 g/l	
	Additive 0 g/l	
	Operating mode	restr. fix con.
		restr. var. con.
		adlib
Calibration	Water start ?	targ.: 500 ml
	MP start ?	targ.: 100 g
	Additive start ?	targ.: 10 g
	Detergent start ?	targ.: 10 ml
Time intervals	Intermediate mix 0 min	
	Prep. interval 0 sec	

Diagnosis	Water valve open ?
	Mixer start ?
	Powder motor start ?
	Additive dispen. start ?
	Detergent disp. start ?
	Valve box 1/2 open ?
	Sensor long hit/not hit !
	Temperature ok / too low !
	Signal portion active/not active !
	Signal additive active/not active !
	Signal box 1 active/not active !
	Signal box 2 active/not active !
	Signal ready activate ?
	Power failures
	Access to back-up
	Cleaning fault
	Water checkups

Depending on the basic adjustments carried out in the Setup, particular menus do not appear in the display.

8 Functions of the „Automatic“ key

Auto-
matic

After pressing the Automatic key, the feeder runs in the automatic mode. The green pilot lamp lightens up. The automatic feeder begins to prepare a drinking portion, when the feeding computer transmits the corresponding command.

In case of faults in the automatic-mode, the green pilot lamp extinguishes, see chapter 11, page 54, „Fault messages“.

8.1 Drinking distribution in the MP-mode

The first line of the display indicates that the automatic feeder runs in the MP operating mode. The second line shows the number of box valves and the amount of drinking which has been prepared. But only on the condition that the automatic feeder has a 2-group-valve-unit or a stop valve which have been selected in the Setup. The opened box valve is marked by an asterisk*.

```
MP-mode
1*  2   58,0l    □
```

When a calf is identified and a drinking portion is prepared, the values of the actual portion appear in the second line of the display: Concentration in g/l, additive in g/l.

```
 preparation
 120g/l   25g/l
```

The last sign in the second line indicates if the sensor is free or covered:

□ Sensor free, mixer jar empty

≡ Sensor covered, mixer jar at least partly filled.

8.2 Setting the amount of portions to zero

Press the Automatic key for above 2 seconds, in order to set to zero the value indicating the amount of portions.

8.3 Dispense of an extra-portion

In the automatic-mode, when the long sensor is free, you may manually activate the dispense of a complete drinking portion.

Press Enter for about 2 seconds. The concentration value shown in the display begins to flash. Enter the required concentration by pressing the arrow-keys. Immediately afterwards confirm with Enter.

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

A drinking portion is mixed up. Meanwhile the display shows the values of the actual portion.

```
preparation
120g/l     0g/l
```

After a drinking portion has been mixed up, you may choose the feeding station which should issue the portion. Choose the requested option by pressing the arrow-keys and confirm with Enter. The drinking portion will be dispensed.

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

After feeding time, the automatic feeder returns automatically to the automatic operating mode.

9 Functions of the „Cleaning“ key

After pressing the „Cleaning“ key, the automatic feeder changes from the automatic mode to the cleaning menu.

You may call up the automatic mode at any time, by pressing the automatic key once again.

In the cleaning menu you may choose between the following functions:
- Cleaning mixer,
- Water start,
- Detergent start.

In case an automatic feeder is equipped with an automatic mixer-cleaning device, in the course of the cleaning menu the display features:

```
cleaning mixer
0 times a day
```

Enter the number of the daily cleaning operations requested. Confirm by pressing Enter. You may only enter values between 0 and 9.

If the mixer runs without liquid, the seals could be damaged.

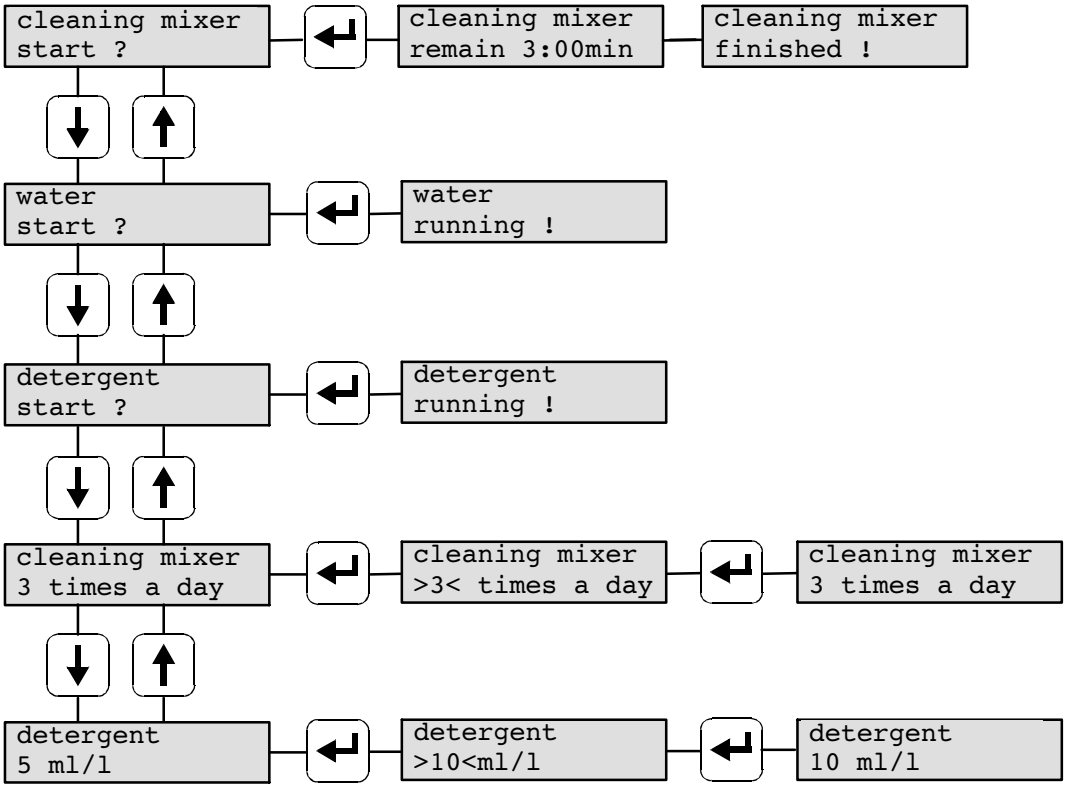
In case detergent should be added to the cleaning, you have to enter the amount of detergent. You may only enter values between 0 and 25 ml per liter water.

```
detergent
0 ml/l
```

Do not use foamy detergents!

In case you select the detergent dispenser in the Setup, the feeder carries out 1 cleaning/day with detergent.

Several possibilities to choose from in the cleaning menu:



9.1 Mixer cleaning (mixer without automatic cleaning)

Press the „Cleaning“ key and call up the Menu „Cleaning mixer“, in order to clean the mixer without automatic cleaning system.

- If no valve control is available, take off the suction hoses from the teat and hang them up. This prevents a calf from finishing off the liquid in the mixer jar.

Functioning:

After pressing Enter, in case the sensor is free, a water portion is dispensed. After 20 seconds another water portion is dispensed. Subsequently the mixer runs 3 minutes.
If the sensor is covered, the mixer runs for 3 minutes.

After mixer cleaning, the message „finished“ appears in the second line of the display.

```
cleaning mixer
finished
```

- Tip the mixer and empty it,
- or drain the water off the suction hoses.
  Open the suction lines on automatic feeders with a 2-group-valve-unit, if they are not already open: in the main menu „Hand functions“ move to the submenu „Valve box 1 / 2 open“ by pressing the arrow-keys. Press Enter, in order to open the valves. After a short time press Enter once again, in order to close the valves. Now attach the suction hoses to the teat.
- In the cleaning menu select the menu „Water start“, in order to rinse again the mixer jar again with some clear water. Now tip the mixer and empty it.

9.2 Automatic mixer cleaning (time-controlled)

Mixers with a device for automatic cleaning can be automatically rinsed, up to 9 times a day.

The mixer must have an automatic cleaning device and be connected to a valve control (2-group-valve-unit or stop valve). „Cleaning mixer with automatic cleaning“ must have been selected in the „Setup“.
For practical reasons the automatic feeder should have a nearby water drain. If there is no water drain, the mixer drain hose must hang in a bucket.

Empty the bucket regularly. Do not immerse the mixer drain hose into the rinsing water.

Functioning:

When the long sensor is free, the mixer jar is filled with 2 water portions. The mixer runs for 3 minutes.
Then the mixer jar is filled with a third water portion. The overflow is reached and the entire rinsing water drains off. The message „Mixer being emptied“ is displayed. After a short time the mixer jar is once again filled with 2 water portions and the cleaning cycle is repeated, but this time shorter.

If the water does not drain off after the overflow portion within one minute (the sensor is free), a fault message follows. Check if the overflow tube of the mixer rinsing device is obstructed. The valve control opens the suction hoses. The calves finish off the liquid in the mixer jar and the automatic feeder continues to run in the feeding mode.

In case the sensor is covered, the automatic cleaning is carried out as soon as the long sensor gets free. The valve control closes the corresponding suction line and the automatic cleaning is carried out.

In the adlib operating mode with automatic mixer cleaning, the preparation of the portion is interrupted when the pre-set cleaning time sets in. The mixer cleaning is then started.

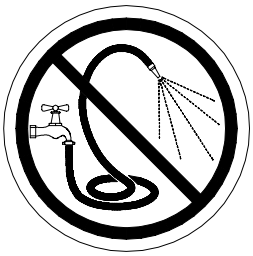
9.3 Calling up the automatic mixer cleaning manually

You may call up the automatic cleaning manually at any time in the cleaning menu.

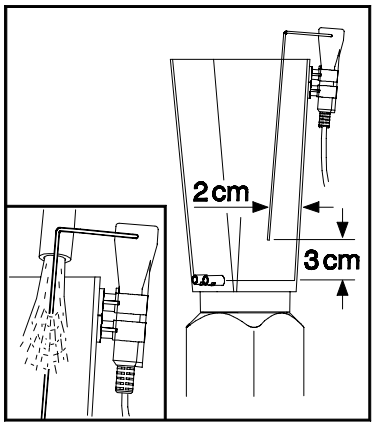
Press „Cleaning“ key. In case the sensor is free, press Enter in the menu „Cleaning mixer start“. Automatic cleaning is now carried out.

10 Service and maintenance of the automatic feeder

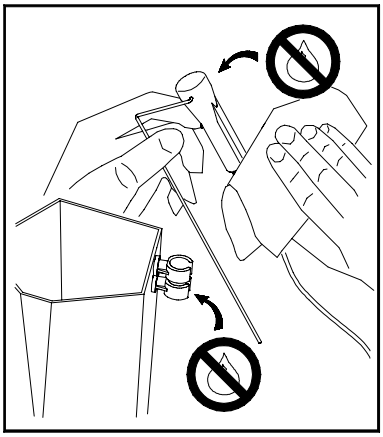
- Always keep the feeder clean and dry. Never use a water jet!



- Make sure that the sensor position is correct.

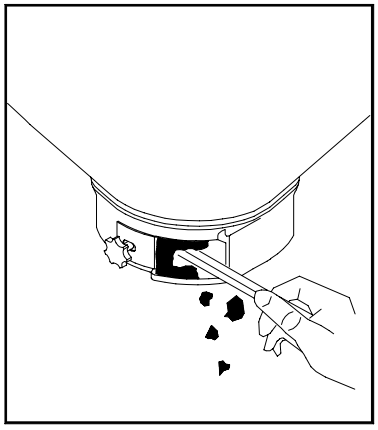


- Keep the sensor shaft and terminals clean and dry. Moisture effects grounding of the sensor and prevents the preparation of a new portion.



- Check the powder outlet every day and, if necessary, remove incrustations, as they considerably reduce the dosing accuracy.

Always remove incrustations on the powder outlet by means of a small wooden stick or similar, in order to avoid injuries. Never use the fingers!



- Clean the mixer jar every 1 to 2 days.

10.1 The day after the first starting

- Function check:
  - Check calibration values.
  - Measure feed temperature.
  - Ensure that calf identification is reliable.

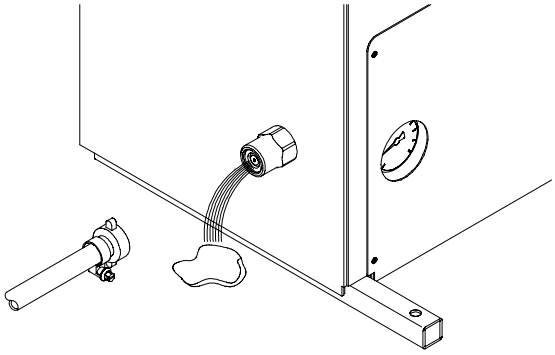
10.2 Carry out regular check routine

- Measure feed temperature with a precision thermometer.
- Check calibration of MP at least after every new delivery.
- Check calibration of the amount of water.

10.3 Shut-down

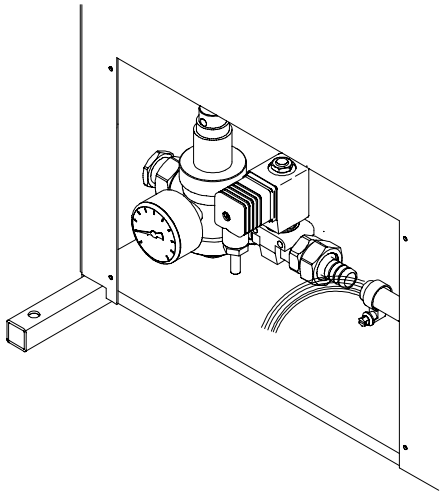
Before shut-down:

- Turn the switch of the thermostat for minimum operating temperature (available as an option on model „TAP1-SM1-27-F“) and of the heating thermostat entirely counter-clockwise.
- Disconnect the automatic feeder by turning the main switch or the flip-switch (model „TAP1-SM1-27-F“) and pull the mains plug.
- When the feeder is diconnected, in spite of the flap valve at the opening for water supply, some water can run out of the boiler.



Frost risk:

- Remove the boiler hose and drain the water out of the boiler.
- Drain the water off the solenoid valve and the pressure reducer. Remove the pressure reducer completely and drain the water. Reinstall the pressure reducer and reconnect the boiler hose.



After shut-down:

- Keep the automatic feeder in a dry place.
- Keep the connections on the control unit closed by means of closing caps.
  In case the closing caps are not closed, moisture can penetrate the control unit.

Renewed starting:

- When starting the feeder again, check that there is sufficient water in the boiler. If necessary top up the boiler with water.
- Proceed as for first starting.

11 Fault messages

In case of fault messages, in the main menu „Diagnosis“ you can control the different outputs individually. See *chapter 7.5, page 40, „Functions of the Menu key, Diagnosis“*.

In case of fault message, the green pilot lamp for the automatic operating mode extinguishes.

11.1 Fault message memory error

When starting the System-Machine, a check of all program data, being in the memory on the circuit card, is carried out.

In case these data are faulty the display shows:

```
fault
memory error
```

- Switch off the System-Machine. Press the three keys „Automatic“, „Cleaning“ and „Menu“ simultaneously while you switch on the System-Machine. Press the keys until the display features the version number of the program.

Immediately afterwards, carry out a new programmation of the Setup. Carry out calibration once again. Check portion values, milk values and time intervals. *See chapter 12, page 56, „Replacement of the program chip“*.

11.2 Interruption of the feeding mode

When the feeding mode is interrupted because the minimum operating temperature falls below the standard figure, the display shows:

```
fault
temperature
```

- Check position of the thermostats.
- Check the heating.

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

11.3 Water shortage

If the short sensor is not hit in the water mode, the automatic feeder starts a water check. The repeat handle (circuit) tries up to 5 times whether the water really does not run out. After 5 vain attempts, preparation of drinking and calf-identification are interrupted.

The display shows:

```
fault
water shortage
```

- Check if the sensor is hit by the water jet.
- Check the water supply to the automatic feeder.

- Press the „Automatic“ key, in order to delete the alarm message.

11.4 Fault: „Cleaning mixer“

A fault message appears, in case the automatic feeder is equipped with an automatic cleaning device and the mixer jar has not been emptied after dispense of the third portion (overflow portion).

The display shows:

```
fault
cleaning mixer
```

- Check, if the mixer overflow is closed up.
- Check the discharge hose and clean it, if necessary.
- Check position of the sensor.
- Check water calibration.

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

12 Replacement of the program chip

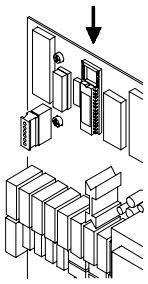
Only qualified personnel is allowed to replace the program chip.

Proceed as follows:

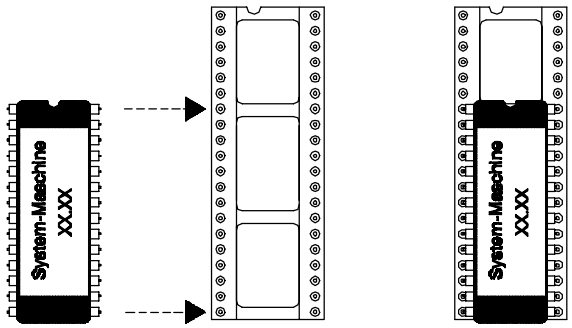
1. Before replacing the program chip, write down all machine settings. To this end, switch off the System-machine, press on the „Menu“ key while you switch on the machine once again. Keep the „Menu“ key pressed until the new program version is displayed. Note down all machine settings previously selected,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

2. Afterwards disconnect the System-machine and make it currentless.

3. Open the control-unit box and remove the old program chip (chip with adhesive label „System-Machine 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. The program chip must end at the lower level of the base.



5. Close the control-unit box.

6. Connect the System-Machine. When starting the machine, the display features 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 number of the program version is displayed. Carry out a new programming of the Setup.

8. Carry out a new calibration.

9. Check portion values, milk values and time intervals.