July 1, 2014
(DE: 14.04.2014)

Original Service Instructions

Automatic calf feeder
Vario type Combi
Program version 8.06 and higher

TAK5-VH2-50 / VDW5-VH2-50

Table of contents

1 Introduction

This operating manual enables you to operate this automatic feeder machine safely as intended.

> Have the end user provide you with the operating manual for the automatic feeder, the operating manuals of all additional equipment to be connected and the safety data sheets for cleaning agents.

> Carefully read all operating manuals and safety data sheets before starting up the automatic feeder for the first time or restarting it.

> Observe all of the warnings and safety instructions in these operating manuals and safety data sheets at all times.

1.1 Automatic feeder versions

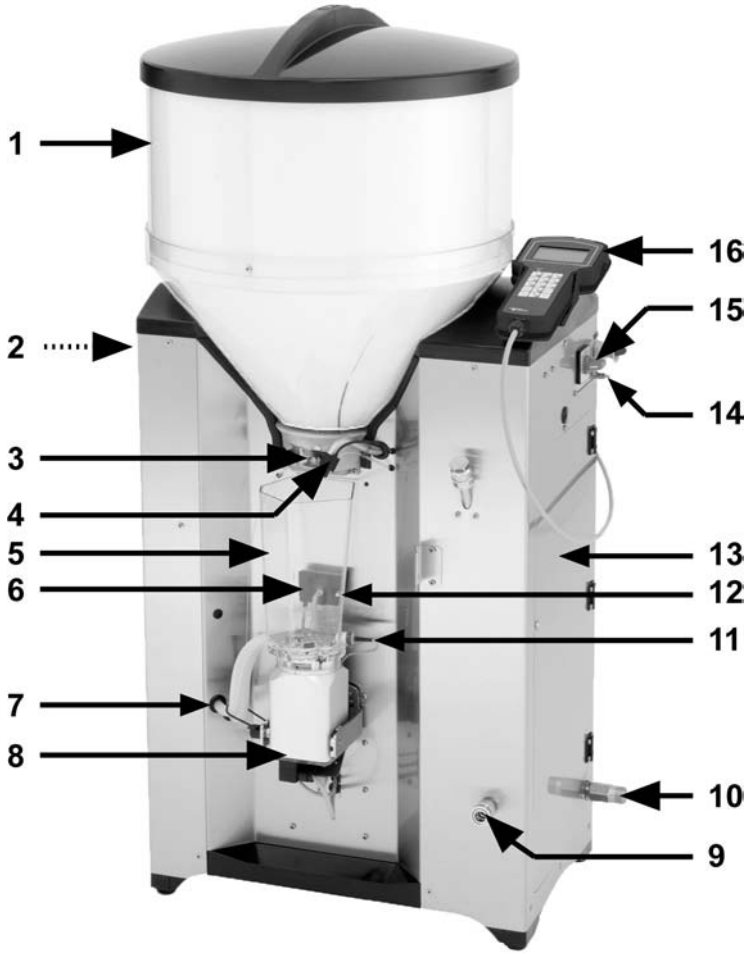
The following automatic feeder versions are available:

- **Powder** - for the use of milk substitute (MP).
- **Combi** - for the use of milk substitute and fresh milk.
- **Fresh milk** - for the use of fresh milk.

All automatic feeder versions can be equipped with a variety of pieces of peripheral equipment and options.

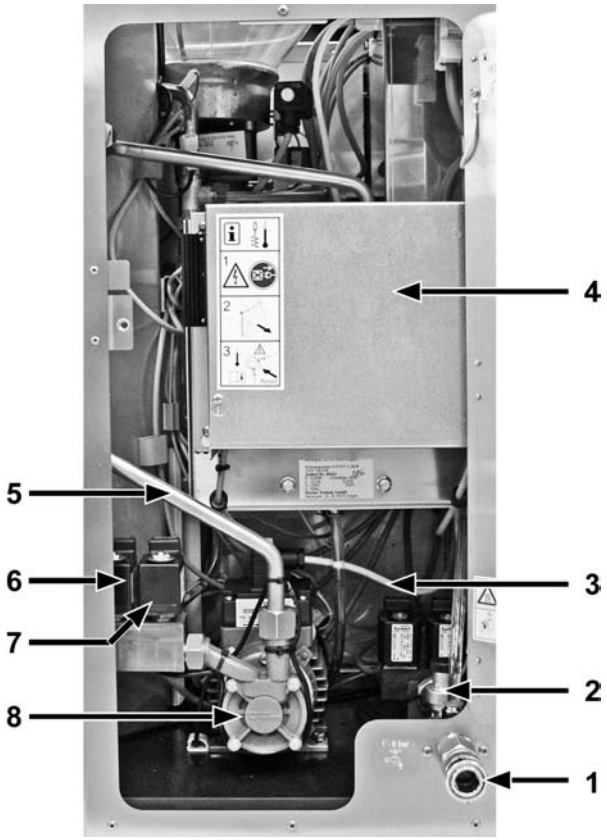
1.2 Overview of the automatic feeder

1.2.1 Front and right side view of automatic feeder



1 Milk powder container
2 Outlet valve (not shown here)
3 Milk powder discharge
4 Water supply
5 Mixer jar
6 Rod electrode
7 Hose connection from mixer to station valve
8 Mixer motor
9 Milk connector
10 Water connector
11 Temperature sensor
12 Point electrode for 500 ml portion
13 Right door
14 Ground connection screw
15 Main switch
16 Hand terminal

Behind right side door



1 Water supply
2 Pressure-reducing valve
3 Water supply line to boiler container
4 Boiler container with heat exchanger
5 Milk supply line
6 Milk valve
7 Circulation valve
8 Milk pump

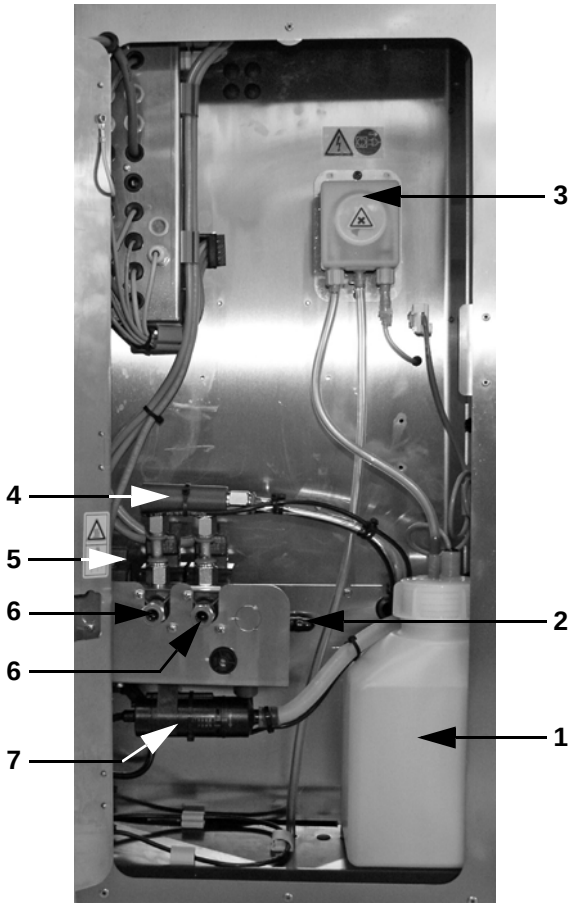
1.2.2 Left side view of the automatic feeder

The name plate is located above the left side door on the outside of the automatic feeder. It contains information about the manufacturer, type and number of the automatic feeder, information about connecting the feeder to the mains as well as its certification. An example of a name plate is shown below.

Name plate

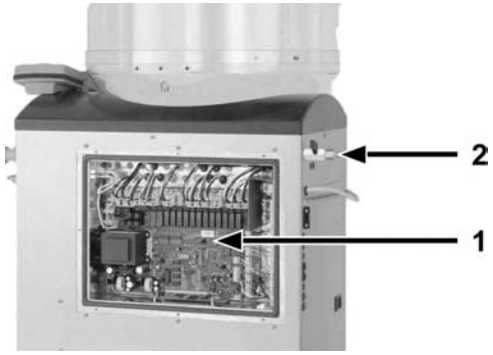
1 Name and address of the manufacturer
2 Type and number of the automatic feeder
3 Information for connection to the mains
4 The automatic feeder's certification

Behind the left side door



1 Storage container for detergent
2 Adapter for the cleaning cycle
3 Detergent dosing pump
4 Connector for valve cleaning
5 Mixer drain valve
6 Feeding box valve(s)
7 Feeding pump

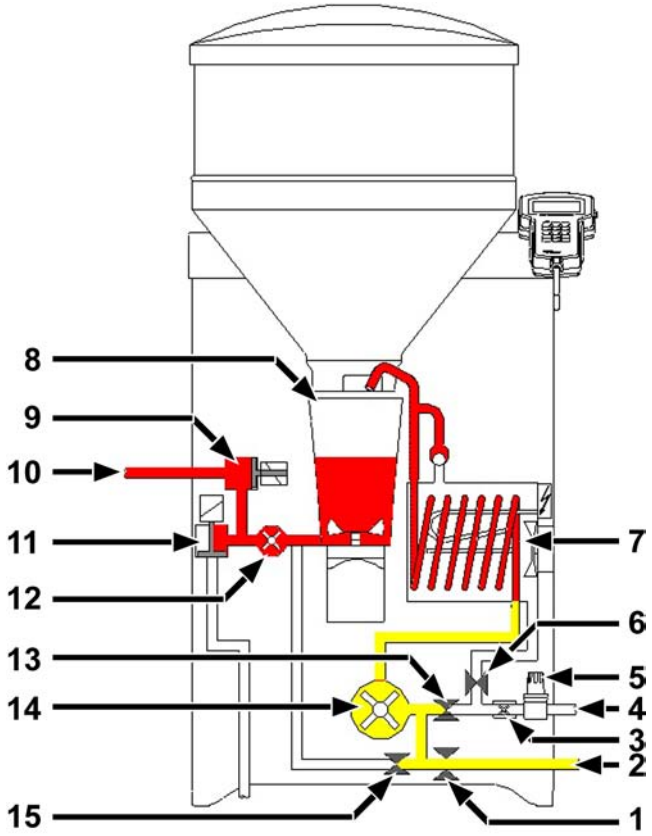
1.2.3 Rear view of automatic feeder



1 Processor and power circuit board

2 Outlet valve for hose cleaning

1.2.4 Heat exchanger with separate heating circuits for milk and water



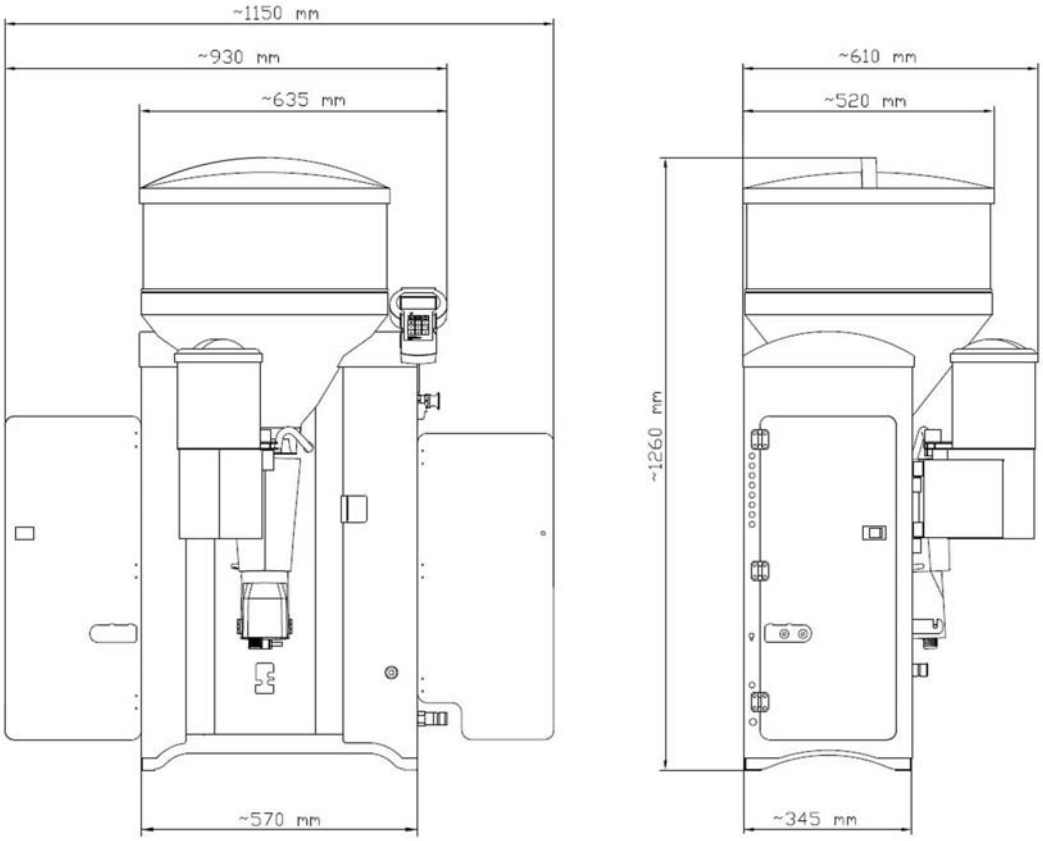
1 Milk valve
2 Hose connection for milk tank
3 Water meter
4 Hose connection for water pipe
5 Pressure-reducing valve
6 Boiler water valve
7 Heat exchanger with stainless steel coil
8 Mixer
9 Feeding box valve
10 Hose connection between feeding box valve and teat
11 Mixer drain valve
12 Feeding pump
13 Water valve for heat exchanger
14 Milk pump
15 Circulation valve

1.3 Technical data

1.3.1 Electrical connection

Note: The electrical connection specifications can be found on the name plate on the left-hand side of the automatic feeder (see **1.2.2** Left side view of the automatic feeder on page **10**).

1.3.2 Dimensions of the automatic feeder



Depth when the fly screen door is opened ~ 690 mm

1.3.3 Weight

Approximately 80 kg.

1.3.4 Water connection

Water is connected via a 1/2 inch hose with a 3/4 inch screwed connection.

The water pressure on site must be between 1 and 6 bar.

1.3.5 Heat exchanger

The stainless steel coil holds 0.5 l of water or milk.

1.3.6 Milk powder container

The milk power container with attachment holds approximately 35 kg of milk substitute.

1.3.7 Number of feeding stations and animals

Feeding stations	Calves per feeding station	Calves per device
max. 4	max. 30	max. 120

1.4 Disposal

All components, liquids and solids must be disposed of in compliance with the official local regulations for waste prevention and appropriate waste recycling or disposal which apply in the your country. Also observe the corresponding safety data sheets.

1.5 Symbols and abbreviations

1.5.1 Symbols

You will find a list of the symbols and abbreviations as used in this operating manual in the following.

- The places in the text marked with this symbol only apply to the automatic feeder Vario.
- The places in the text marked with this symbol only apply to the automatic feeder Vario+.
- The places in the text marked with this symbol only apply if at least one of the automatic feeder's stations is operated in parallel mode.
- Option: A white plus sign on a black background indicates that optional functions or equipment are being described.

1.5.2 Abbreviations

Abbreviation	Meaning
abs.	Absolute
comp. factor	Compensation factor
sw.off del.	Switch-off delay
dr. time	Drain time
bo	Boiler
dos.	Dosage
El	Electrolyte
elec.	Electrode
sw. on del.	Switch-on delay
F / f	40FIT feeding principle
gradient	Gradient control
gr. A (B)	Group A (B)
IFS-TR / -TR4 / -KF	Intelligent feeding station feed / quadruple compact unit / concentrate
IV	Interval feeding program
Ball valve	Ball valve
KF	Concentrate
conc./concentr.	Concentration
Drain via teat	Drain via teat
l. service	last service
w. add.	With additive
MAP	Manual feeding pump
MP	Milk substitute
max	Maximum
Min. temp.	Minimum temperature
mix. full	Mixer full
mixer cl.	Cleaning the mixer
No.	Number
T. slider	Teat slider
n. service	next service
w/o add.	Without additive
P 1-5	Periods 1 - 5
R	rationed feeding principle
R1-4	Recipe 1 to 4
Drnk spd.	Drinking speed
servo	Servo control
Temp.	Temperature
TR	Feeding box
water bo.	Boiler water
HE	Heat exchanger
inc./dec.	Increase/reduction
add. disp.	Additive dispenser

2 Important safety information

This chapter outlines:

- The hazards caused by your automatic feeder and how to avoid them.
- The safety labels attached to the automatic feeder and what they mean.
- How to safely install the automatic feeder.

The automatic feeder is state of the art and is produced in compliance with recognized safety regulations. However, hazards and adverse effects may arise when using it. Both warning signs directly on the automatic feeder and warning notices in this manual provide warning of these hazards.

2.1 Intended use

The automatic feeder may only be used to prepare, heat, and dispense liquid feeds, for example milk, for calves.

2.2 Necessary qualifications

Only trained service technicians are authorized to install the automatic feeder, put it into service and perform maintenance and repairs on it.

Service technicians are specialists with the appropriate qualifications. They are able to assess the work assigned to them and detect potential risks on the basis of their technical training as well as their knowledge of the relevant standards. They are familiar with the relevant accident prevention regulations, generally accepted safety regulations and country-specific standards and provisions.

2.3 Residual risk which can arise from the automatic feeder

2.3.1 Hazards to health caused by the automatic feeder:

⚠ WARNING The automatic feeder is powered by electricity. You must observe the general precautions for handling electrical equipment:

- Read the operating manual before using the automatic feeder.
- Keep children away from the automatic feeder.
- Do not touch any moving parts of the automatic feeder, for example the mixer blades.

- Only use genuine spare parts from the manufacturer.
- Turn off the automatic feeder and disconnect the mains plug before carrying out any maintenance or cleaning work on the automatic feeder.
- If the end user intends to operate the automatic feeder outside of closed spaces, inform the user that he/she must protect the automatic feeder from rain and moisture, for example with a roof.
- The following specific hazards are associated with the automatic feeder's electrical system:
    - **Electrical breakdown**. If there is an electrical or voltage breakdown, electric current flows through parts of the automatic feeder that are normally insulated. Touching the unit can cause a fatal electric shock. The automatic feeder must be checked regularly for electrical safety in compliance with national regulations (repeated inspection). Make sure that a 30 mA residual current device (RCD) is installed.
    - **Short circuit, Indirect contact**. If there is a short circuit, current at many times the level of the operating current can flow. Touching the unit can cause a fatal electric shock. In the electrical supply to the automatic feeder, you must install a circuit breaker or fuse corresponding to the rating on the name plate and a 30 mA residual current device (RCD) in compliance with local regulations.
- The solenoid valves and the pipes to the valves can reach temperatures of up to 70°C. Touching them can cause burns. Do not touch the solenoid valves and pipes during operation.
- Liquid at temperatures of up to 70°C can spray out of the pipes to the valves. This can cause scalding. Do not touch the pipes during operation. Carry out the recommended maintenance on the hoses.
- The mixer and powder supply may start up unexpectedly if a calf which is entitled to feed approaches the unit. This can crush or chop off fingers or hands. Never reach into the area of the mixer or powder supply while the automatic feeder is in operation. Only use the scraper supplied to clean the powder discharge opening.
- **Poisoning**. Additives that are fed to the calves may contain substances that are hazardous to human health. Avoid direct contact and always wear protective gloves and goggles when handling these substances.

- **Chemical burns**. The cleaning agent used to clean the automatic feeder contains caustic substances. These can cause severe injuries to your hands or eyes. Avoid direct contact and always wear chemical-proof protective gloves and goggles when handling the cleaning agent.
- **Excessive strain**. The automatic feeder weighs 80 kg. Never attempt to carry it by yourself as this can cause excessive physical strain.

2.3.2 Material damage caused by the automatic feeder

The automatic feeder can cause the following types of material damage:

- **Infection**. Improper cleaning or incorrect operation can result in calves becoming infected by pathogens from the automatic feeder. This can lead to medical costs or to the death of the calves.
- **Corrosion**. Improper cleaning or maintenance can result in the automatic feeder ceasing to function correctly.
- **Loss of stability**. The automatic feeder must be set up on a level surface. Otherwise, the automatic feeder can tip over and suffer damage.

2.4 What hazard warnings are provided?

Hazards are indicated directly on the automatic feeder by safety labels (warning signs, instruction and prohibition notices), and in the operating manual by specially marked hazard descriptions.

The warnings for hazards that can cause death or injury to people are emphasized more than those for material damage, for example through the colors, hazard words or symbols used.

Safety labels are an important element of the overall automatic feeder safety concept. They provide warnings about hazards and explain how to avoid them.

Make sure that all the specified safety labels are fitted to your automatic feeder and that they are in a legible condition. If the safety labels are difficult to read, replace them immediately. New safety labels are available from Förster-Technik GmbH.

2.4.1 Components of a hazard description

A hazard description is always made up of the following elements:

- The hazard word (Danger, Warning, Caution, Attention).
- The nature of the hazard (what could happen?).
- The location of the hazard (where can it occur?).
- The actions to take to prevent the hazard (what do I need to do?).

2.4.2 Hazards causing death or injury

Depending on their severity and the probability of them occurring, hazards that can cause death or injury to people are indicated by a hazard symbol ⚠ (warning triangle with exclamation mark) and the following hazard words:

- The word **DANGER** indicates an imminent hazard that will lead to death or serious injury.
  - Warning signs on automatic feeder: **DANGER** (white text on red background).
  - Operating manual: **⚠ DANGER** (white text on black background).
- The word **WARNING** indicates a potentially hazardous situation that could lead to death or serious injury.
  - Warning signs on automatic feeder: **WARNING** (black text on orange background).
  - Operating manual: **⚠ WARNING** (white text on black background).
- The word **CAUTION** indicates a potentially hazardous situation that could lead to minor injury.
  - Warning signs on automatic feeder: **CAUTION** (black text on yellow background).
  - Operating manual: **⚠ CAUTION** (white text on black background).

2.4.3 Material damage

The word **Attention** indicates possible material damage. The automatic feeder or an object in its vicinity may be damaged, for example a calf.

- Prohibition notice on the automatic feeder: a pictogram crossed out in red in a white circle with a red border indicates something you are not allowed to do.
- Operating manual: **ATTENTION** (white text on black background).

2.5 Safety labels on the automatic feeder

Different safety labels are attached at the hazardous points on the automatic feeder. Warning signs, prohibition and instruction notices.

What are warning signs?

Warning signs consist of:

- A pictogram in a yellow triangle illustrating the potential hazard.

What are prohibition notices?

Prohibition notices show a pictogram of the prohibited action in a red crossed out circle. See adjacent example. They illustrate what you are not allowed to do. In the example, the crossed out hose means that you are not allowed to use high pressure cleaners.

What are instruction notices?

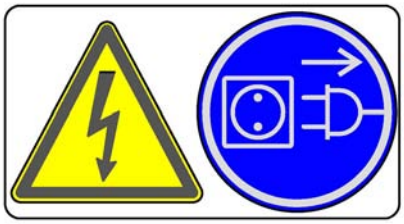
Instruction notices show a pictogram of what you are being instructed to do in a blue circle. They illustrate what you have to do. In the example, the pictogram means that you must always disconnect the plug first.

Other labels

Grounding label You will see this label at the points where you have to ground the equipment.

2.5.1 Warning signs on the machine

Danger of death by electric shock



Burns / scalding

Health hazards due to additives

Chemical burns caused by cleaning agents

Automatic startup

Do not spray the equipment down

Grounding label

2.6 Safety equipment on the automatic feeder

The automatic feeder may only be operated if the safety equipment is complete and intact. The automatic feeder has the following safety equipment:

- Safety labels (warning signs, instruction and prohibition notices).
- The heater's safety temperature limiter. This shuts down the heater in the event of overheating (temperature rises above 70°C). The heater may only be reactivated by a service engineer.
- Safety grid for the powder hopper attachment. The safety grid prevents people from being injured by the rotating tools in the hopper, for example when adding milk powder. It must always be installed when the unit is operating.
- The scraper next to milk powder discharge. The powder discharge opening may only be cleaned with the scraper. This prevents finger and hand injuries caused by the mixer starting up automatically.

The safety devices at the machine are an important part of the safety concept and help prevent accidents.

- Do not remove or change the safety devices without observing the corresponding safety instructions.
- Put the machine into service only after all safety devices have been attached and are in protection position.

Safety temperature limiter

The automatic feeder's heater is equipped with a safety temperature limiter which will be triggered in the event of overheating (70°C) and which will then shut down the heater.

The safety temperature limiter is triggered if the water gets too hot or if the heater is running dry. It can be found behind the cover illustrated below.

1 Cover of the safety temperature limiter

Safety grid for powder hopper attachment

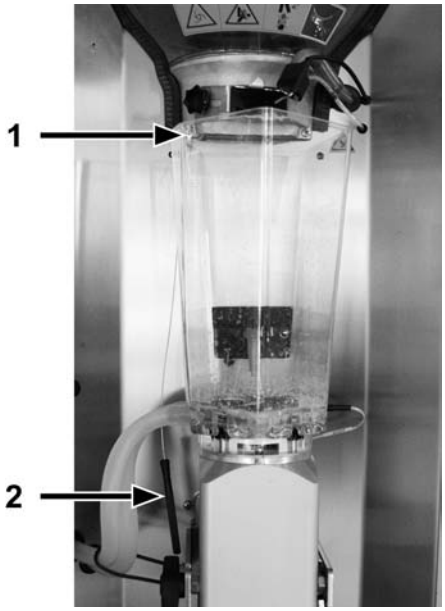
The protective grid for the powder hopper attachment prevents you from being injured by the rotating tools in the powder hopper, for example, when filling in milk powder.

1 Protective grid

⚠ WARNING There is a risk of injury due to rotating tools. The safety grid must always be installed when the unit is operating.

Scraper next to milk powder discharge

The powder discharge opening may only be cleaned with the scraper. This prevents finger and hand injuries caused by the mixer starting up automatically.



1 Mount for scraper
2 Scraper

⚠ WARNING There is a risk of injury due to automatic start-up. Do not reach into the hazardous area of the mixer. The mixer can start up automatically at any time, crushing or cutting off your fingers. Always turn off the automatic feeder with the main switch and disconnect the mains plug. Only use the scraper supplied to clean the powder discharge opening.

3 Initial startup and restart

Have the end user provide you with the operating manual of the automatic feeder, the separate operating manuals of additional equipment to be connected as well as the safety data sheets for the cleaning agents.

The appendix contains a check list of all instructions that you must observe during the initial startup or restart process. (see **8.1** Checklist for initial startup and restart on page **127**).

3.1 Initial startup

3.1.1 Setting up the automatic feeder

> When setting up the automatic feeder, observe the occupational safety measures.

⚠ CAUTION Beware of the health hazards caused by lifting heavy loads Never carry the automatic feeder by yourself.

> Always set up the automatic feeder on an even surface.

Note: Using its adjustable feet, if necessary, you can level the automatic feeder.

> Set up the automatic feeder in a frost-free location. If this is not possible, inform the end user that he/she must protect the automatic feeder from frost using additional equipment such as the additional frost protection equipment or suction hose heating made by Förster-Technik.

> If the end user intends to operate the automatic feeder outside of closed spaces, inform the user that he/she must protect the automatic feeder from rain and moisture, for example with a roof.

> Make sure that there is a drain where the automatic feeder is set up, for the cleaning water.

> Inform the user that the automatic feeder and its cables must be protected from exposure to sunlight.

3.1.2 Electrical connection provided by the customer

The automatic feeder needs its own power supply.

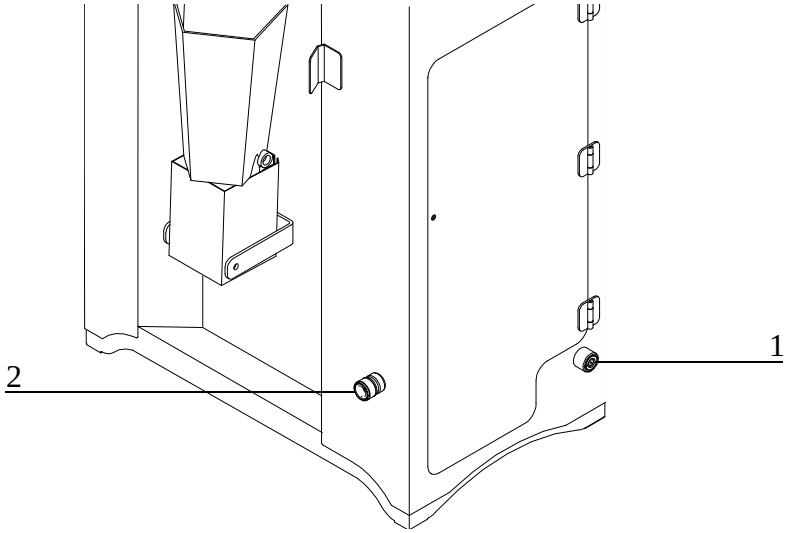
- The power supply must meet the voltage and frequency specifications. The mains supply must correspond to the supply voltage stated on the left side of the automatic feeder.

- A residual current device (30 mA) in the power supply provided by the customer is compulsory for the operation of the automatic feeder.
- Since it is not technically possible to protect the automatic feeder separately against lightning, you must inform the end user that he/she must provide the appropriate lightning protection (e.g. lightning protection system for the entire building).
- Comply with the local regulations and safety measures.

Grounding

To protect the animals and prevent electrical faults, all metallic objects, such as water pipes, feeding station, stand partition and automatic feeder must be grounded. These locations are indicated by the grounding label (see **2.5** Safety labels on the automatic feeder on page **21**). The connecting screw to ground the automatic feeder is on the right-hand side of the machine housing, directly next to the electrical connection cable. Connect this screw to the local ground via a short, flexible copper cable (minimum cross-section of 4 mm²).

3.1.3 Water and milk connector



1 Water connector
2 Milk connector

> When connecting the automatic feeders, observe the national regulations about protection of drinking water.

> Tell the end user that it is best to place the milk tank next to the automatic feeder.

> The hose from the milk tank to the automatic feeder may not be longer than 3 m. Make sure that the hose connection is as short as possible. If a long hose connection is unavoidable, use a hose with a large cross-section.

> Connect the milk hose to the base of the milk tank. Do not hang it into the milk tank from above. In this way, you will prevent air bubbles from impairing the dispensing of the milk.

> If the milk line consists of several sections, may sure the connectors don't leak. The same applies to the connectors on the milk tank and automatic feeder.

> For reasons of hygiene, avoid differences in cross-section.

> Only use connectors which can be cleaned reliably.

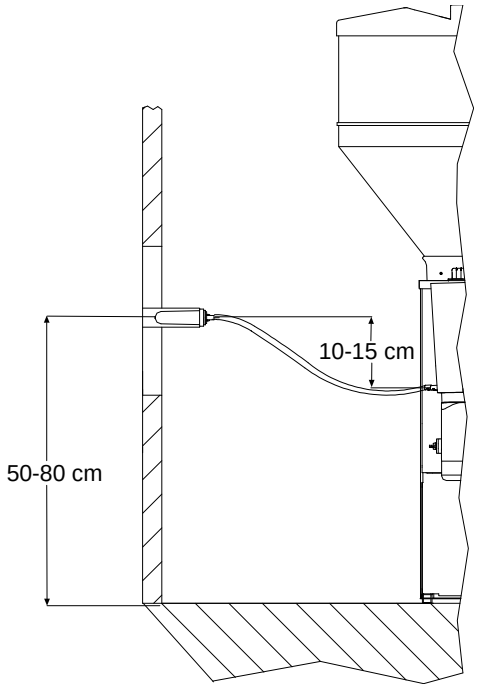
> Close off the milk connection at the automatic feeder with the supplied dummy plug if the automatic feeder is to work entirely in water mode.

ATTENTION Air in the lines can interrupt feeding operation. The automatic feeder might interrupt the feeder operation or undesirably switch over to MP mode if there are very long lines with a small cross-section and thin-walled lines which may contract. An interruption in feeding operation means that your calves will not receive any feed. This can lead to malnutrition. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves. Tell the end user that he/she must provide the calves with feed using an alternative method if feed operation is interrupted.

3.1.4 Installing feeding stations

3.1.4.1 Installing feeding station

Install the teat at its intended location on the front plate, 10 to 15 cm above the suction hose connection of the mixer and the resulting 50 to 80 cm above the calf's floor level. The corresponding suction bracket with splash guard must point downwards.



ATTENTION The suction hose may not be longer than two meters Otherwise, the calves will have problems sucking in the feed. This can lead to malnutrition. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves.

ATTENTION There is a risk of infection due to feed building up in the hose. The hose between the teat and the mixer jar valve (rationed mode) or mixer jar (ad lib mode) must not sag and must be installed at a gradient to the automatic feeder (see the illustration).

3.1.4.2 Installing stand partition

Install the stand partition in accordance with the manufacturer's instructions.

3.1.5 Connecting antennas

3.1.5.1 Installation of antennas

ATTENTION There is a risk of the antenna cables being damaged. Install the antenna cables so that they cannot be damaged by the animals. Observe the separate operating manual for the antennas.

Install the antennas as follows:

> Keep the distance between the antenna and transmitter as small as possible, no more than 15 - 25 cm. The range of the antenna is, depending on the version, 15 - 25 cm.

  > If necessary, block the area next to the feeding box. This is the only way to prevent a situation in which feed for a calf outside of the feeding box is prepared but that calf does not receive it.

  ATTENTION There is a risk of malnutrition if calves do not receive any feed. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves.

> Check the range of the aerials using the aerial test (see **7.2.3** Identification on page **108**).
  Note: If two calves are identified simultaneously by one aerial, animal identification is interrupted for both calves.

  > The distance between 2 antennas should be approx. 100 cm to avoid any range overlapping.

  > In case double or misidentification occurs, shield the antennas using grounded metal plates.

Note: It is a precondition for the use of the winter feed plans that a MultiReader detector with a temperature sensor is installed at feeding box 1. From January 1, 2013 every MultiReader detector is equipped with that by default. You can check whether your MultiReader detector is equipped with a temperature sensor under **Feeding > Plans > Winter feeding plans** (see the chapter "Feeding > Winter feeding plans" in the automatic feeder's operating instructions).

3.1.5.2 Squelch values and identification ranges

The approximate range of the antennas is 15 - 25 cm.

The version of the antenna is crucial for the identification range. With Nedap micro-identification, you can set the range via the squelch value.

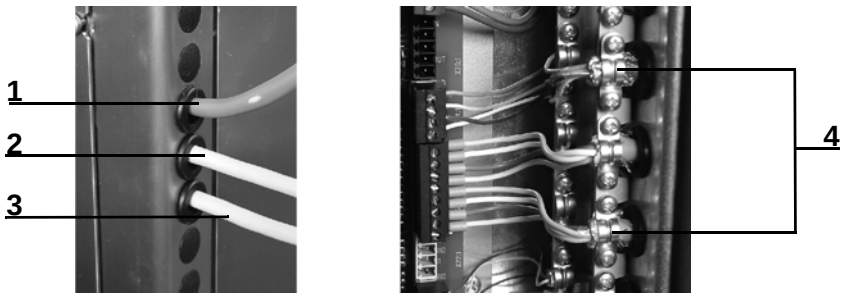
The squelch values and the identification ranges for the various identification systems are listed in the following table. These squelch values are based on experience and are set at the factory.

If the actual values differ, the settings can be changed in the setup (see **5** Setup on page **71**).

System	**Squelch** (default values)	**Identification range**
Collar (X-responder)	0	15 - 20 cm
Collar (PM-responder)	180	15 - 20 cm
Earmark (also in the collar) (Nedap system)	0	15 - 20 cm
Earmark (also in the collar) (Tiris system)	-	15 - 20 cm

3.1.5.3 Connecting the antenna cables to the main board

⚠ DANGER There is a danger of death by electric shock. The electrical components of the automatic feeder are live. Turning the unit off using the main switch does not disconnect the voltage to the unit. Always turn off the automatic feeder using the main switch and disconnect the mains plug before you connect the antenna cables.



1 Cable of the hand-held terminal
2 Antenna cable of feeding station 1
3 Antenna cable of feeding station 2
4 Cable clamps

Connect the antenna cable as follows:

1. Turn off the automatic feeder with the main switch and disconnect the mains plug.

2. Remove the housing cover from the control box.
3. There are two more grommets under the grommet for the hand terminal cable. Push the antenna cables through them into the control box.
4. Connect the cables of the multi-identification unit or the antenna to the main board in accordance with the wiring diagram. The wiring diagram can be found in the appendix.
5. Fasten the wiring looms to the cable clamps.

   ATTENTION To ensure proper grounding, you must also ensure that approx. 1 cm of shield is also under the clamp. Make sure that the shield is in contact with the clamp and not separated by the cable insulation.
6. Connect the control box.
7. Insert the mains plug and turn on the automatic feeder again using the main switch.

3.1.6 Installing the safety grid for the powder hopper attachment

Install the safety grid as follows:

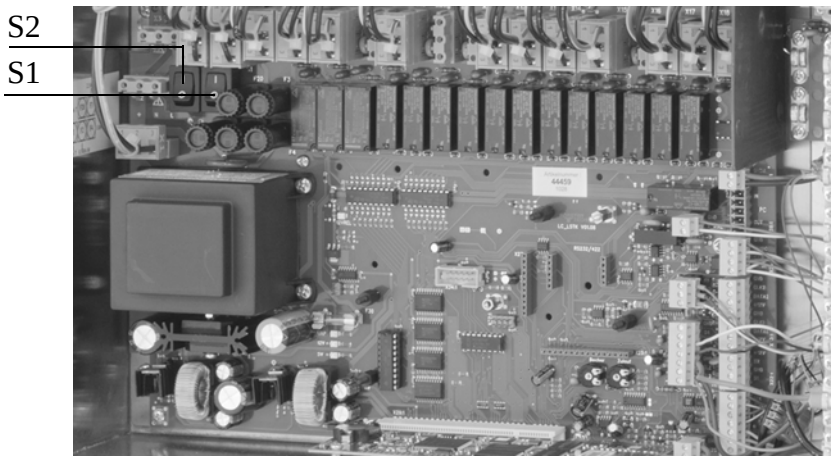
1. Turn off the automatic feeder with the main switch and disconnect the mains plug.
2. Remove the bag with the small parts and hoses as well as the operating manual from the powder hopper.
3. Insert the safety grid for the powder hopper attachment.
4. Screw in the three self-tapping screws into the holes provided.
5. Insert the mains plug and turn on the automatic feeder again using the main switch.

3.1.7 Switching on the condensation prevention heating for powder discharge and frost protection equipment

⚠ DANGER There is a danger of death by electric shock. The electrical components of the automatic feeder are live. Turning off using the main switch does not disconnect the voltage to the unit. Always turn off the automatic feeder using the main switchbefore you turn on the condensation prevention heating.

If the automatic feeder is equipped with condensation prevention heating for the powder discharge and/or frost protection equipment, you must check whether the respective switches on

the processor board are switched on. If not, you must turn on the switches. Set the switches to 0 during summer.



S2 = switch for frost protection equipment
S1 = switch for condensation prevention heating for the powder discharge

Fill the powder container with milk powder (MP) and fill the milk tank with milk. When the milk tank is empty, the automatic feeder switches to MP mode.

ATTENTION There is a risk of malnutrition if calves receive only water when the milk tank and and power container are empty. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves. Tell the user that he/she must immediately refill an empty powder container or milk tank or he/she must provide the calves with feed using an alternative method.

Insert the mains plug and turn on the automatic feeder. Use the hand terminal to control the automatic feeder.

Note: After the hand terminal has been switched on, the version of the hand terminal's program first briefly appears in the display, before the automatic feeder carries out a test routine. Do not press any buttons on the control panel during these initial routines.

3.1.8 Filling the heat exchanger

1. In the display, you can see the fault message **HE not filled**. Press Enter.
2. Confirm **Fill HE?** by choosing Enter.
3. The heat exchanger will be filled with water.

3.1.9 Reconfiguring everything

During the initial startup and restart process for the automatic feeder, the program (software) must be completely reconfigured (reset). This will remove superfluous data as well as outdated or incorrect settings from the memory.

Note: Choosing **New installation** deletes the **animal data** (group membership, barn transfer date, feeding days, consumption sums), the **transmitter numbers** are set to zero and the **device data** and the **feeding plans** are overwritten with default values.

Reconfigure all menus as follows:

1. Choose  **> Device data** to go to the **New installation** submenu.
2. Confirm **Everything** by choosing Enter.
3. Confirm **Reinstall everything?** by choosing Enter.
4. Confirm the security prompt **Do you really want to restore the data to factory settings?** by choosing Enter.

   The message **New installation completed!** will appear.
5. Confirm **New installation completed!** by choosing Enter.

   All data has been reset to factory settings.

Note: The settings in the feeder setup are not changed by **new installation** .

3.1.10 Setting the portion

ATTENTION Feed temperatures that are too low can cause digestion problems in calves and feed temperatures that are too high can cause gastritis in the abomasum. The temperature of the feed in the mixer jar must correspond to the mixing temperature specified by the MP manufacturer. Keep to the feed temperatures recommended in this operating manual.

In the device data menu (see **4.5** Device data on page **56**) you can make the following settings for the feed portion:

- Adjust the set temperature of the feed in the mixer jar (see **4.5.3.1** Setting the set and minimum temperature on page **61** and following pages).
- Set the minimum temperature of the water in the boiler (see **4.5.3.1** Setting the set and minimum temperature on page **61** and following pages).

- Set a pause between the dispensing of two portions (see **4.5.3.2** Dispensing pause on page **61**).
- Set the parameters for the mixer's draining, emptying and for its OFF delay (see **4.5.3.3** Mixer draining on page **62** and following pages)

3.1.11 Setting operating modes

You set the **operating modes** for the automatic feeder in the **Device data** menu (see **4.5.1** Operating modes on page **57** following).

The automatic feeder operates in rationed mode by default, but can also be switched to ad lib mode.

3.1.11.1 MP mode or milk mode

In the **Feed** line you set the type of feed to be dispensed (see **4.5.1.2** MP mode or milk mode on page **58**):

- The automatic feeder dispenses MP feed only. **[MP only]**.
- The automatic feeder dispenses milk and MP feed. **[MP/milk]**.

If you want the combined automatic feeder to dispense MP feed only, always configure this via **Operating modes**.

ATTENTION The automatic feeder will malfunction if you set the feeder type to **Powder** during setup. For example, the circulation pump and the valves will no longer be actuated. This can lead to malnutrition. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves. Configure MP only via **Operating modes**.

3.1.12 Checking and setting the time/date

During the initial startup process, you must check and, if necessary, correct the time and the date. Time and date are shown in automatic mode (see **4.5.2** Checking and setting the time/ date on page **60**).

Note: In order to force an immediate daily offset after changing the date, you have to switch the feeder off and then on again.

3.1.13 Drain time station parameters

In the **Feed** menu, you can define the drain time for each feeding box. The drain time starts when the rod electrode becomes free for the last portion and ends when the feeding box valve concerned closes (see **4.5.4** Drain time station parameters on page **63**).

If calves do not finish drinking the contents of the mixer jar within the standard setting for drain time, the drain time can be extended.

3.1.14 Function keys

The hand terminal has two freely programmable function keys  and  . You define which functionality or which menu will be called up when the respective function key is pressed (see **4.5.5** Function keys on page **64**).

3.1.15 Animal list

The animal list is assigned to the  key by default (see **4.5.6** Animal list on page **64**).

Here is how you define which parameters are displayed in the two columns of the animal list:

1. Choose  **> Device data** to go to the **Animal list** submenu.
2. In **Column 1** or **Column 2**, select the parameter by choosing  or  . You can choose between **Feed consumption (in %)**, **Drinking speed** (in %), **Animal visits**, **Break-offs** and **Consumption**.

3.1.16 Calibrating feed components

You must calibrate the feed components first so that they are mixed in the right proportion.

3.1.16.1 Manually calibrating liquid and powder components

If your automatic feeder does not have an **automatic calibration scale**, you must provide the following items for the calibration:

- 1 graduated cylinder with gradations in ml (approximately 1 liter capacity).
- 1 scale (weighing accuracy of 1 g).
- 1 container to collect milk substitute.

3.1.16.1.1Calibrating without a calibration scale

You determine the actual value using a scale and a graduated cylinder and the program will prompt you to enter this value using the number keys.

Proceed as follows to calibrate powder components without a calibration scale:

1. Choose  **> Calibration** to go to the **Components** submenu.
2. In **MP**, you calibrate the milk substitute.
   - Confirm **MP** by choosing Enter.
   - **Set quantity** shows the amount of milk substitute (MP) to be dispensed by the automatic feeder.
   - **Runtime** shows the time in which the automatic feeder should dispense the milk powder.
   - **Date** shows when MP was last calibrated.
   - Tilt the empty mixer forward.
   - Hold the container for the milk substitute under the powder discharge.
   - Confirm **Start?** by choosing Enter.
   - Confirm **Exit automatic mode?** by choosing Enter. This message will only be displayed if your automatic feeder is still in automatic mode.
   - Powder will be dispensed.
   - Place the container with the collected milk substitute on the scale.
   - In **Actual**, enter the weight displayed on the scale.
   - Confirm **Confirm value....** by choosing Enter.
   - **Date** now shows the current date.
   - Repeat the calibration to check your results.
   - Calibrate other **powder components** using the same method.

Proceed as follows to calibrate liquid components without a calibration scale:

1. Choose  **> Calibration** to go to the **Components** submenu.

2. In **Water**, you calibrate water.
   - Confirm **Water** by choosing Enter.
   - With < > choose **Boiler water** or **HE water** (heat exchanger).
   - **Set quantity** shows the amount of water that the automatic feeder should dispense.
   - **Runtime** shows the time in which the automatic feeder should dispense the water.
   - **Date** shows when the water was last calibrated.
   - Confirm **Start?** by choosing Enter.
   - Confirm **Exit automatic mode?** by choosing Enter. This message will only be displayed if your automatic feeder is still in automatic mode.

     Water will be dispensed into the mixer.
   - Tilt the mixer so that the water flows into the graduated cylinder. Measure the collected water in milliliters.
   - In **Actual**, enter this measured quantity using the number keys.
   - Confirm **Confirm value....** by choosing Enter.
   - **Date** now shows the current date.
   - Repeat the calibration to check your results.
   - Calibrate other **liquid components** using the same method.

3.1.16.1.2Calibrating using the calibration scale:

The automatic feeder determines the actual value using the built-in automatic calibration scale (additional equipment). To calibrate the components with the scale, the automatic feeder must first be calibrated itself in the setup menu (see **5.8** Calibration scale on page **80**).

Proceed as follows to calibrate liquid components using the calibration scale:

1. Via go to **> Calibration > Components > Water**
2. With < or > choose the calibration menu for the **Boiler water**.
3. Confirm **Start?** by choosing Enter. The calibration procedure will start. The set value of 500 ml will be shown first in the display.

4. The device now carries out two check weighings without the user having to do anything and shows the result.
5. Then the average value of these two control weighings is shown flashing in the **displayed** line. Confirm this determined value with Enter. You then return to the calibration menu.
6. Calibrate other **liquid components** using the same method.

Proceed as follows to calibrate powder components using the calibration scale:

1. Choose **> Calibration** to go to the **Components** submenu.
2. In **MP**, you calibrate the milk substitute.
   - Confirm **MP** by choosing Enter.
   - **Set quantity** shows the amount of MP that the automatic feeder should dispense.
   - **Runtime** shows the time in which the automatic feeder should dispense the MP.
   - **Date** shows when MP was last calibrated.
   - Confirm **Start?** by choosing Enter.
   - Confirm **Exit automatic mode?** by choosing Enter This message is only displayed if your automatic feeder is still operating in automatic mode.
   - Place the calibration box into the mixer jar and confirm the prompt **Calibration box used?** by choosing Enter.

     MP will be dispensed into the calibration beaker.
   - Confirm the **Confirm value....** promptby choosing Enter.
   - **Date** now shows the current date.
   - Remove the calibration beaker from the mixer jar.
   - Repeat the calibration to check your results.
3. Calibrate other **powder components** using the same method.

Proceed as follows to calibrate the detergent using the calibration scale:

1. Choose **> Calibration** to go to the **Components** submenu.
2. In **Detergent**, you calibrate the cleaning agent.

- Confirm **Detergent** by choosing Enter.
- **Set quantity** shows the amount of cleaning agent that the automatic feeder should dispense.
- **Runtime** shows the time in which the automatic feeder should dispense the cleaning agent.
- **Date** shows when the cleaning agent was last calibrated.
- Confirm **Start?** by choosing Enter.
- Confirm **Exit automatic mode?** by choosing Enter This message is only displayed if your automatic feeder is still operating in automatic mode.
- Place the calibration box into the mixer jar and confirm the prompt **Calibration box used?** by choosing Enter.

  Detergent will be dispensed into the calibration beaker.
- Confirm the **Confirm value....** promptby choosing Enter.
- **Date** now shows the current date.
- Remove the calibration beaker from the mixer jar.
- Repeat the calibration to check your results.

3.1.16.2 Automatic calibration

If the automatic feeder has a calibration scale, then they should be used to carry out a daily automatic calibration during normal operation of the feed components to be dispensed. If the calibration value determined during the automatic calibration deviates from the entered tolerance value, then the calibration value already determined remains valid. A **Calibrating warning** will then be issued.

You set the start of calibration as follows:

1. Via  **> Calibration > Settings** go to the **MP or water** submenu.
2. In **Calibr./day** enter the required number of calibrations per day (milk, MP) or, in **Autocalib.** select **yes** (water).

   Note: If the value **0** is set in **Calibr./day**, then the automatic calibration is deactivated.

3. Under **Calibration times**, define the time points at which the calibration procedures are to take place.

   Note: The calibration will take place **from** the set time. First however, a calf must have fed from the set calibration time, for the calibration to be started.

4. Enter the required percentage in the **Tolerance** menu option.

Calibration procedures/day	**Water**	**Milk powder**	**Milk**
Default value:	Yes	1	1
Amount changeable:	no	yes	yes
Range of values:	yes/no	0 to 4	0 to 4

Note: When water is automatically calibrated, first the boiler water and then the HE water will be calibrated successively in one procedure.

Note: The automatic feeder has a water meter which compensates for water pressure fluctuations. For this reason, the automatic calibration procedure for water is only used as a check and not as automatic adjustment. If the deviation of the newly determined value exceeds the tolerance value, then the **Calibration** warning will be issued.

3.1.17 Checking or setting cleaning settings

Check the settings for temperature of the cleaning water, detergent amount and teat cleaning and, if necessary, set them. (see the **Cleaning > Settings** chapter in the operator's manual for the automatic feeder).

3.1.18 Cleaning the automatic feeder

For hygienic reasons, you must completely remove any coolant and lubricant remnants from the system before beginning the initial startup process. To do this, execute the cleaning cycle. (see the **Cleaning > Cleaning cycle** chapter in the operator's manual for the automatic feeder).

⚠ WARNING Beware of chemical burns from cleaning agents. The cleaning agent can cause chemical burns to your eyes or hands. Always wear goggles and chemical-proof protective gloves when using cleaning agents. Follow the safety instructions listed in the safety data sheet for the cleaning agent and wear the specified safety equipment.

3.1.19 Reading in and creating transmitters

During the initial startup process for the automatic feeder, the transmitters have to be read and created once in the system. When you do this, each transmitter number is assigned one animal number of no more than six digits. These animal numbers are then available and can be used to register the animals (see **6** Transmitter and animal management on page **85** and the following pages).

3.1.20 Registering animals

Animals will only be fed at the feeder if they are also registered for that feeder (see **6.2** Registering animals on page **90** and the following pages).

3.1.21 Entering correction days

During the initial startup process, the total feeding duration of an animal can be reduced by “shifting” the animal to the desired plan day. (see the **Operation > Feeding** chapter in the operator's manual for the automatic feeder).

3.2 Restart

The control units of newly delivered automatic feeders are put into service by the manufacturer in the factory. After a shutdown, for example after replacing the processor board, you must set up the device data again.

Proceed as follows:

1. Switch on the automatic feeder using the main switch.
2. Confirm the message **first startup press enter to start installation** by choosing Enter.
   The message **restore last backup?** will appear if there is a valid backup of the animal and device data in the automatic feeder.
3. Confirm **restore last backup?** by choosing Enter.
   The animal data and device data from the last backup will be restored.
4. In **Basic settings**, enter the desired language, the current date and the current time of day.
   This concludes the restart process.

4 Programming and control

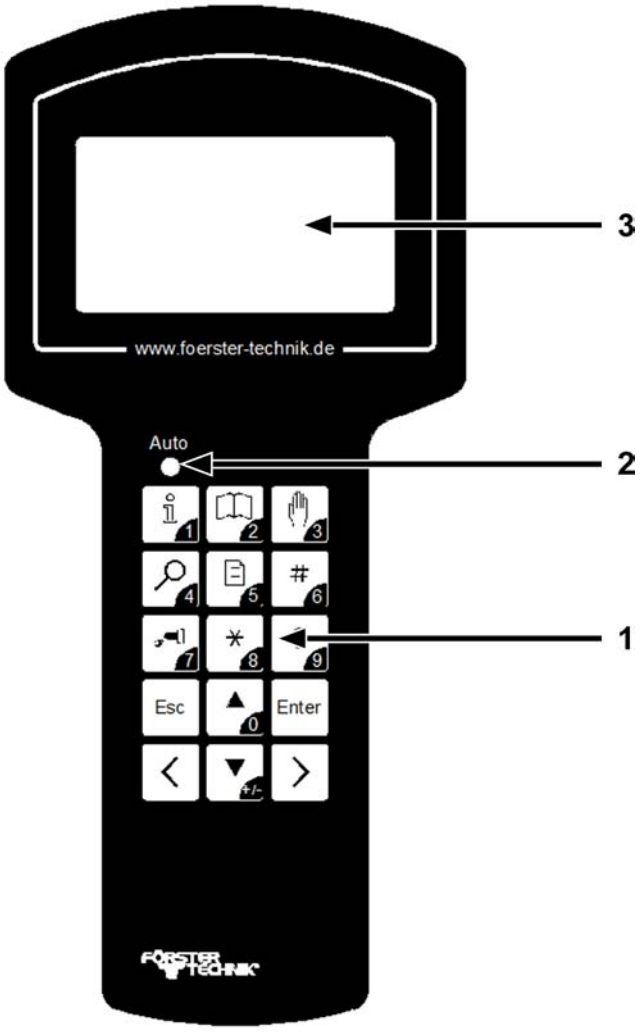
You control the automatic feeder using the hand terminal. The hand terminal is directly connected to the automatic feeder by a cable. You switch it on and off together with the automatic feeder. It remains in operation as long as the automatic feeder is switched on.

Note: After the hand terminal has been switched on, the version of the hand terminal's program first briefly appears in the display, before the automatic feeder carries out a test routine. Do not press any buttons on the control panel during these initial routines.

- You monitor and control the automatic feeder (the **feeding pump**, for example) directly via the keys of the hand terminal.
- You monitor and change the settings of the automatic feeder and the values of calves via menus. The menus and sub-menus are arranged so that you can find the necessary settings quickly and easily. With a click of a button, you can access the most important menus, such as **Animal control**, **Main menu** and **Manual functions,** as well as the **Animal list** with the 15-key hand terminal.

4.1 Hand terminal

4.1.1 The 15-key hand terminal



1 Keypad
2 Auto LED
3 Display

Keypad

With this key, you open the **Animal control** menu or enter the number 1.

With this key, you open the **Main menu** or enter the number 2.

With this key, you open the **manual functions** menu and enter the number 3.

With this key, you open the **search functions** or enter the number 4.

With this key, you open the **animal list** and enter the number 5.

This key is a freely selectable **function key**. With this key, you can also enter the number 6.

With this key, you activate the **feeding pump** or enter the number 7.

This key is assigned 2 functions:

- You press this key to select a calf in submenus in which an animal number is displayed. An asterisk (*) is displayed in front of the animal number of a selected calf.
- In the overview menu in automatic mode, you use this key to toggle between the four-line (large font) and the eight-line (small font) display.

With this key, you can also enter the number 8.

This key is assigned 2 functions depending on the menu you are currently in:

- In the alarm submenu, you use this key to delete warnings and alarms.
- In the overview menu of automatic mode, you use this key to bring warnings to the foreground.

With this key, you can also enter the number 9.

You use this key to go backward within the menu structure. You return to the starting menu by pressing this key multiple times.

You use this key to move the cursor upward and choose items from a list, for example [yes] or [no]. With this key, you can also enter the number 0.

With this key you move the cursor downward and select items form a list. You use this key to change the sign of a number, for example from +1 to -1. This is how you enter negative numbers.

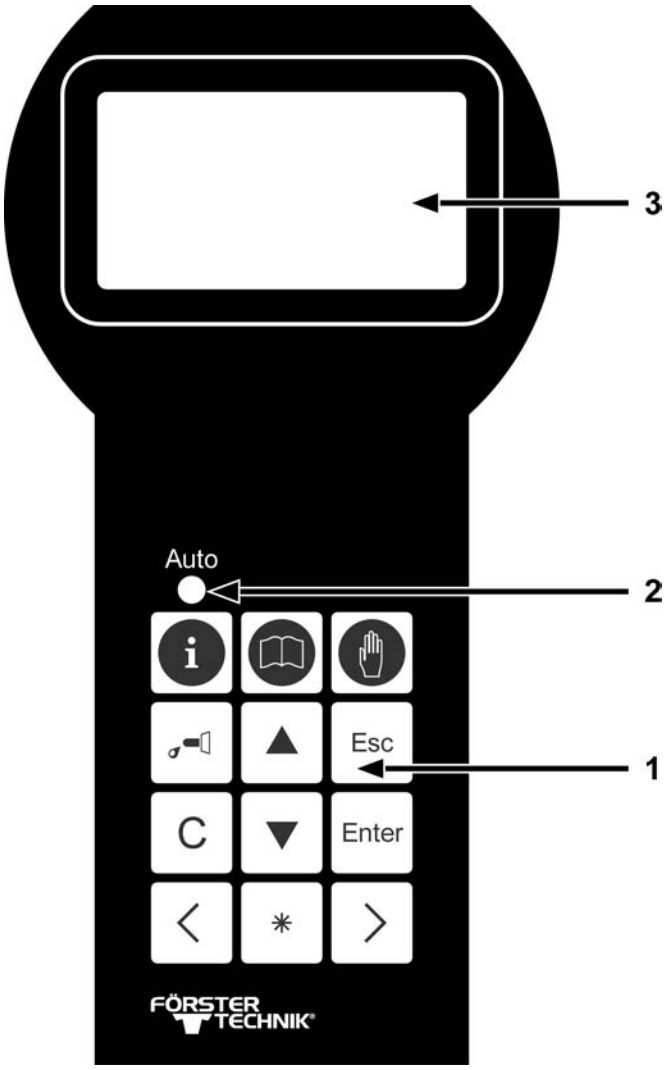
You use this key to confirm your selection and open a menu or an input field. An [input field] is indicated by square brackets.

You use this key to scroll between pages on the screen or list items to the left and jump to the end of a list.

You use this key to scroll between pages on the screen or list items to the right and jump to the end of a list.

4.1.2 The 12-key hand terminal

Older versions of the automatic feeder still have the hand terminal with 12 keys.



1 Keypad
2 The Auto LED
3 Display

The operation of this hand terminal differs from the operation of the 15-key hand terminal in the following ways:

- You cannot enter numbers directly via the keypad. In the menus in which you would like to enter numbers, use ▲ 0 ▼ +/- to select a number and confirm your selection using Enter.

- There are no freely assignable function keys. You access the animal list via the **Animal control** menu.
- You cannot save the data of the automatic feeder to an SD card.

4.1.3 Auto LED

The Auto LED (light-emitting diode) of the hand terminal displays important information about the status of the automatic feeder.

- In automatic mode, the LED lights up green.
- In offline mode, the LED is not lit up.
- If a malfunction occurs, the LED flashes.

You can run the automatic feeder in offline mode or in automatic mode.

4.2 Offline mode

In offline mode, you do things that you can't do while the unit is in operation, such as the recalibration of feed components. When the automatic feeder switches from automatic to offline mode, the Auto LED goes out.

You switch to offline mode when you open a menu that requires offline mode, such as the calibration menu.

You switch from automatic mode to offline mode as follows:

1. In the corresponding menu, press Enter.
2. Confirm the message **Exit automatic mode?** message by choosing Enter.
   The Auto LED on your hand terminal goes out.
3. Perform the desired action.

4.3 Automatic mode

You perform most routine tasks, such as feeding, in automatic mode. In automatic mode, the Auto LED lights up green.

After a prolonged period of inactivity, the automatic feeder automatically returns to automatic mode. This period is defined in offline mode.

You switch from offline mode to automatic mode as follows:

1. Press Esc until the message **Start automatic mode?** appears in your display.
2. Press Enter.

   You are now in automatic mode again. The Auto LED lights up green.

4.4 Menu structure

The automatic feeder is controlled using menus, submenus and lists. You control the automatic feeder by switching to lists via menus and submenus. In these lists, you can view and change values. The menu structure makes it easier to find a list quickly.

The menus that you require most frequently, such as **Animal control**  , **Main menu**  and **Manual functions**  can be directly accessed with the press of button. The **animal list** is the list that end users require most often. The animal list can be directly accessed by pressing the  key on the 15-key hand terminal. You can change this default setting during the initial startup process according to the end user's needs. The user will then access the animal list via the animal control menu.

During initial startup of the automatic feeder, you can assign the  key in accordance with the needs of the end user (see **4.5.5** Function keys on page **64**).

If you do not see all the menus or submenus presented here, this is either because the automatic feeder is not equipped with the component in question, or the component was not activated during setup.

Note: If you know that the automatic feeder has a component that is not being displayed, check the setup (see **5** Setup on page **71**).

4.4.1 Symbols

Symbols are displayed in front of and in several menus, submenus and lists.

4.4.1.1 Arrows

In automatic mode, arrow heads are shown in front of menus:

- ▶ A solid arrow head indicates that the menu contains submenus.
- ▷ An empty arrow head means that you can change settings here or start actions.

4.4.1.2 Angle brackets

< > If angle brackets are displayed around a menu or list, it means that you can scroll left to right in order to select menu options or list items. For example, you can select the appropriate calf from a list of animal numbers using the calf's animal number.

4.4.1.3 Square brackets

[ ] Values or terms are in square brackets. When you press Enter the value / list item begins to flash in the input field. You can now use the number keys to enter values or use ▲0 ▼AZ to select values from a list, such as [yes] or [no].

Note: If you enter a value in an input field and the value is too high or too low, this value will automatically be set to the highest (too high) or lowest (too low) possible value after you press Enter.

4.4.1.4 Rod electrode free/covered

In automatic mode, these symbols are displayed at the top right of the display.

 This symbol indicates that the mixer jar is full. The tip of the rod electrode is in the liquid.

 This symbol indicates that the mixer jar is empty. The rod electrode is free of the liquid.

4.4.1.5 Animal identification and feed consumption

 The antenna symbol after a station number, such as TR 1 for feeding box 1, indicates that a calf has been identified at this station.

✓ A check mark after the antenna symbol means that calf identified at this station may consume feed here.

 A lock symbol after the antenna symbol means that calf identified at this station may not consume feed here. For example, this could be because the milk ratio or the concentration of feed in the mixer jar does not match the feed settings for the identified calf.

- A hyphen after the station number indicates that no calf was identified at this station.

4.4.1.6 Plan tendency

The arrow to the right next to the animal number indicates the feeding phase the selected calf is now in.

↗ The feed quantity increases continuously, for example at the beginning of the feeding plan.

→The feed quantity remains constant, for example in the middle of the feeding plan.

↘ The feed quantity is continuously reduced, for example at the end of the feeding plan.

f The calf is in the 40FIT period.

4.4.1.7 Marking

***** Marked calves are indicated by an asterisk to the left of the animal number.

4.4.1.8 Alarms

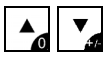
! An exclamation mark to the left of the animal number indicates that a calf has triggered an alarm.

4.4.1.9 Sleep mode

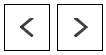
The Förster-Technik logo shows you that no key has been pressed on the hand terminal for a longer period of time. The hand terminal is in sleep mode,

4.4.2 Navigation

You use the hand terminal's keys to navigate through menus, submenus and lists.

With  you can:

- Move between the different submenus of a menu.
- Navigate between the items of a list, for example between [yes] and [no].

With  you can:

- Scroll screen by screen through a menu, for example to the submenus on the next page or directly to the last menu option.
- Scroll through a list, for example through animal numbers. At the end of the list, the message "end of the list" will appear in the display.

With  you can:

- Confirm an entry.
- Acknowledge a prompt or message shown on the display.

- Confirm a selection.
- Open menus and submenus.
- To open input fields, which are indicated by square brackets.
- Switch from the number before the decimal place to the number after the decimal place in input fields.

With Esc you can:

- Go back one menu, each time you press the key. You return to the starting menu by pressing this key multiple times.
- Exit the input field or return to the number before the decimal place in an input field.

4.4.3 The menus

4.4.3.1 Animal control

You can choose  to open the **Animal control** menu. This menu contains all submenus that the end user requires for daily calf monitoring. The numbers next to the submenus indicate the number of calves recorded in the submenu concerned.

- **Animal list**. You will see a table that shows the calves, sorted by different parameters, such as visits to the feeding box.
- **Entitled**. A list of calves is displayed, sorted by feed entitlement.
- **Alarm**. You will see a list of the calves that have triggered an alarm.
- **Plan over date**. You will see a list of the calves that have a "plan over" date.
- **Additive** You will see a list of the calves which receive an additive.
- **40FIT**. You will see a list of the calves which are currently in the 40FIT period.
- **CalfRail**. A list of calves that are fed on the CalfRail is displayed.
- **Marked**. You will see a list of calves that have been marked.
- **New**. Here you can view animals that were newly registered in the last 2 days.
- **Double**. Here you assign a new animal number to calves that have been assigned a double animal number.

- **Unknown**. Here you check whether and when the automatic feeder recorded unknown animal numbers. Here you can correctly register calves that have been recorded in this way.
- **All**. You will see a list of all calves.
- **Total consumption**. Several lists are displayed with the consumption amounts of all calves, individual calves and individual groups.
- **Print**. Here you can print out the alarm list and the feed list.

4.4.3.2 Main menu

You can choose  to open the main menu. This menu contains all submenus that the end user requires for daily operation of the automatic feeder.

- **Animal management**
- **Feeding**
- **Calibration**
- **Device data**
- **Cleaning**
- **Diagnosis**

4.4.3.3 Manual functions

You can choose  to open manual functions. Here you can start certain functions of the automatic feeder manually. For example, you can manually empty the mixer or dispense extra portions.

If you press  , the automatic feeder switches from automatic to manual mode. The LED extinguishes and the automatic feeder is in offline mode.

The automatic feeder automatically returns to automatic mode after a prolonged period of inactivity. You set this period in the **Autostart** menu option on the offline screen. The default setting is 20 minutes. The Auto LED lights up green.

You can also actively switch the automatic feeder back to automatic mode. Press Esc until the message **Start automatic mode?** appears in the display. Confirm the message by choosing Enter. The automatic feeder will return to automatic mode. The Auto LED lights up green.

You can control the following functions manually:

- **Extra portion**. Here you can dispense extra portions with or without additives.
- **Mixer: empty?**. Depending on the equipment, the mixer is drained via the mixer drain valve or via the teat of the feeding pump.
- **Milk: suck in?**. Here you can remove air from milk lines.
- **Milk: start?**. You open the milk valve and start the milk pump here.
- **HE water: start?**. Here you add water from the heat exchanger to the mixer.
- **Boiler water: start?**. Here you add water from the boiler to the mixer.
- **Powder: start?** You start dispensing powder here.
- **Additive 1: start?** This is where you the start dispensing additive 1.
- **Additive 2: start?** This is where you start the dispensing for additive 2.
- **Mixer: start?**. You start the mixer here.
- **Feeding box**. You open the feeding box valve(s) here.
- **HE: fill?**. You automatically fill the heat exchanger with water here.
- **Hoses: open?**. Here you can open several valves simultaneously in order to completely drain all the lines of the automatic feeder of water.

4.5 Device data

The following submenus can be found under **Device data**:

- **Operating modes**
- **Portion**
- **Date/time**
- **Stations**
- **Function keys**
- **Animal list**
- **Data backup**

- **New installation**

4.5.1 Operating modes

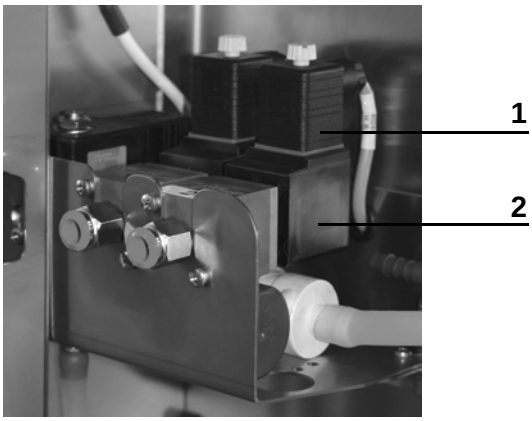
In **Operating modes**, you set the operating modes of the feeder.

4.5.1.1 Rationed mode / ad lib mode

The automatic feeder operates in rationed mode by default, but can also be switched to ad lib mode.

- In **rationed mode**, the feeder uses animal identification, i.e., the animals are individually fed rationed amounts. Rationed mode is the default setting.
- The feeder does not use animal identification in **ad lib mode**. The **automatic reading in** of transmitter numbers is therefore **not** possible in this operating mode. During feeder operation, a portion is always prepared as soon as the rod electrode in the mixer jar is free (mixer empty). The feeding box valves are constantly open.

  ⚠ WARNING Beware of the risk of burns on feeding box valves. During prolonged ad lib mode, feeding box valves become hot. You, or the end user, can burn your fingers or hand when touching these valves. For this reason, push the suction hose directly onto the mixer jar spout and disconnect the connector from the feeding box valve.



1 Female power connector
2 Box valve

ATTENTION Cleaning agent that enters the feed can be hazardous to the health of calves. Therefore, always disable all time-controlled cleaning menus during ad lib mode.

You set the operating mode as follows:

1. Choose  **> Device data > Operating modes** to go to the **Ad lib** submenu.
2. Select the option **yes** in the selection box to activate the ad lib mode. Choose **no** to select rationed mode.
3. In the subsequent lines, if necessary, adjust the values for the **feed concentration**, the **milk ratio** and the **additive dosage**.

Note: These settings are used during the preparation of all feed portions.

4.5.1.2 MP mode or milk mode

In the **Feed** menu you set the type of feed to be dispensed:

- The automatic feeder dispenses MP feed only. **[MP only]**.
- The automatic feeder dispenses milk and MP feed. **[MP/milk]**.

If you want the combined automatic feeder to dispense MP feed only, always configure this via **Operating modes.**

ATTENTION The automatic feeder will malfunction if you set the feeder type to **Powder** during setup. For example, the circulation pump and the valves will no longer be actuated. This can lead to malnutrition. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves. Configure MP only via **Operating modes**.

You set the feeding mode as follows:

1. Press  **> Device data > Operating modes**.
2. In **Feed** select the option **MP/milk** or **MP**.
   If you choose **MP/milk**, further menus will be displayed:
   - In **Milk empty:** select
   - **Stop**. When the milk tank is empty, the automatic feeder automatically switches completely off.

     ATTENTION Tell the end user that an interruption or fault in feeder operation means that the calves will not receive any feed. This can lead to malnutrition. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves. The end user must immediately refill an empty milk tank or he/she must provide the calves with feed using an alternative method.

- **MP**. When the milk tank is empty, the automatic feeder switches to MP mode.

  ATTENTION Tell the end user that an interruption or fault in feeder operation means that the calves will not receive any feed. This can lead to malnutrition. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves. The end user must ensure that the storage container for milk substitute is always filled with milk substitute.

3. In **Dry matter**, you enter the desired value for the milk substitute. You can enter values between 5 and 255 g. The default value is 150 g.

   The degree of milk dry matter is compared to the concentration plan every day. If the desired feed concentration is greater than the DS content of the milk (compensation), then MP will be added to the mixer jar until the set concentration is reached. If the desired concentration is lower than the DS content of the milk (compensation), then the milk or milk/MP feed mixture will be thinned with water.

4. In **Draining**, you specify how long a warm portion of milk should remain ready for consumption in the stainless steel coil of the heat exchanger before it is replaced with a water portion. You can enter values between 0 and 3 hours. The default value is 1 hour. The pause time starts after the last milk portion has been dispensed. If the value 0 is selected, then **Draining** is deactivated.

   ATTENTION Warm milk that remains too long in the stainless steel coil of the heat exchanger is a breeding ground for germs. Do not change the default value, if possible.

   ATTENTION Warm milk that remains too long in the stainless steel coil of the heat exchanger can thicken and block the heat exchanger. This can lead to malnutrition. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves. Do not change the default value, if possible.

5. In **1-circle**, you enter the milk ratio of the feed at which the automatic feeder switches to **simple heating circuit**. In this way, you prevent milk from remaining in the heat exchanger for too long. You can enter values between 30% and 70 % as well as 100%. The default value is 30%.

   ATTENTION Warm milk that remains too long in the stainless steel coil of the heat exchanger is a breeding ground for germs. Do not change the default value, if possible.

   ATTENTION Warm milk that remains too long in the stainless steel coil of the heat exchanger can thicken and block the heat exchanger. This can lead to malnutrition. Malnutrition can

cause impaired growth and development, increased susceptibility to illness or even the death of your calves. Do not change the default value, if possible.

4.5.2 Checking and setting the time/date

During the initial startup process, you have to check and, if necessary, correct the time and the date. Time and date are shown in automatic mode.

Set the time of day, date and date format as follows:

1. Choose  **> Device data** to go to the **Time/date** submenu.
2. In **Time**, you enter the current time of day.
3. In **Date**, you enter the current date.
4. In **Format**, you choose the desired date format.

Note: In order to force an immediate daily offset after changing the date, you have to switch the feeder off and then on again.

4.5.3 Setting the portion

The automatic feeder and preparation of the feed are designed so that even a milk substitute with a higher fat melting point can be easily processed.

If animals are fed only whole milk or cold-soluble milk substitute, a lower temperature in the mixer jar (e.g., 38ºC) can be sufficient.

ATTENTION Feed temperatures that are too low can cause digestion problems in calves and feed temperatures that are too high can cause gastritis in the abomasum. The temperature of the feed in the mixer jar must correspond to the mixing temperature specified by the MP manufacturer. Keep to the feed temperatures recommended in this operating manual.

In this menu, you make the following settings for the feed portion:

- Set the set temperature of the feed in the mixer jar.
- Set the minimum temperature of the water in the boiler.
- Set a pause between the dispensing of two portions.
- Set the parameters for the mixer’s draining, emptying and for its OFF delay.

4.5.3.1 Setting the set and minimum temperature

Note: The first portion of feed, depending on the ambient temperature, is always mixed somewhat warmer.

Set the set temperature and the minimum temperature as follows:

1. Choose  **> Device data > Portion** to go to the **Set temp.** or **Min. temp.** submenu.
2. Enter the desired set temperature in **Set temp.** of the feed in the mixer jar (= mixing temperature).
3. Enter the desired minimum temperature in **Min. temp.** for the water in the boiler.
   Enter 0ºC in **Min. temp.** in order to disable the minimum temperature parameter.
4. After entering the temperature, check whether the portion is being prepared with the set temperature.

	Set temperature	**Minimum temperature**
Default value:	42 ºC	39 ºC
Permitted range of values:	10 ºC to 44 ºC	0 ºC to set temperature minus 0.5 ºC

Note: The values that you have entered for set and minimum temperature will be converted to the set and minimum temperature of the boiler water. If the temperature of the boiler water falls below the minimum temperature, the feed preparation will be interrupted until the minimum temperature has been reached again.

4.5.3.2 Dispensing pause

To lengthen the time to prepare the feed, a dispensing pause can be set. As the preparation of a portion starts, the feed station valves will close and stay closed until the dispensing pause is over.

We recommend entering a dispensing pause for:

- milk substitutes with poor solubility,
- very high concentrations (> 200 g/l),
- extreme calf drinking speeds (> 2 l/min).

You set the dispensing pause as follows:

1. Via  **> Device data > Portion** go to the **Dispensing pause** submenu.

2. In **Dispensing pause** enter the required value in seconds, from 1-16. The default value is 0.

4.5.3.3 Mixer draining

Leftover feed in the mixer must be evacuated. This is done either via the mixer drain valve or the teat. Alternatively, you can choose not to evacuate residual amounts at all.

ATTENTION Leftover feed in the mixer can lead to an increased risk of infection when outdoor temperatures are high (summer). When outdoor temperatures are low (winter), leftover feed in the mixer becomes so cold that calves will no longer drink it. This can lead to malnutrition. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves.

Leftover milk in the mixer jar provides a perfect breeding ground for germs. You specify the amount of time after which this leftover milk is discarded in order to ensure optimal feed hygiene. Mixer draining may also be followed by a drainage procedure (see the **Cleaning** chapter in the operator's manual for the automatic feeder).

4.5.3.3.1 Mixer draining via mixer drain valve

The best and simplest solution is to evacuate the contents of the mixer via the mixer drain valve. You specify whether a mixer drain valve is present during setup (see **5.5.1** Mixer drain on page **76**).

This function will only be available if there is a mixer drain valve and if you have specified [yes] for the mixer drain.

Proceed as follows to specify the amount of time after which a remaining portion in the mixer will be evacuated

1. Choose  **> Device data > Portion** to go to the **Draining** submenu.

2. In **Draining**, enter the desired period in minutes.

Default value:	15 min
Permitted range of values:	0 min (= draining deactivated), 5 to 120 min

4.5.3.3.2 Mixer draining via teat

If the automatic feeder does not have a mixer drain valve, the leftover feed can be evacuated using the **feeding pump** via the **teat**. Alternatively, you can choose not to evacuate residual amounts at all.

You set mixer drainage via the teat as follows:

1. Choose  **> Device data > Portion** to go to the **Drain via teat** submenu.
2. In the **Drain via teat** menu option, specify whether the mixer is to be drained.

4.5.3.3.3 Mixer OFF delay

You can change the runtime of the mixer in the **OFF delay** menu option. Whether and how long the mixer should have an OFF delay depends on the solubility of the milk substitute.

1. Choose  **> Device data > Portion** to go to the **Mixer OFF delay** submenu.
2. In **Mixer OFF delay**, enter the desired value.

Default value:	3 sec
Permitted range of values:	0 to 12 sec

Note: If you specify 0 seconds for the mixer OFF delay, mixing will no longer occur when animals are fed 100% fresh milk.

4.5.4 Drain time station parameters

In the **Feed** menu, you can define the drain time for each feed station. The drain time starts when the rod electrode becomes free for the last portion and ends when the feed station valve concerned closes.

If calves do not finish drinking the contents the mixer jar within the standard setting for drain time, the drain time can be extended.

You can extend the drain time as follows:

1. Choose  **> Device data > Boxes > Feed** to go to the **Drink-out time** submenu.
2. In **Drink-out time**, you enter the desired time. You can enter values between 10 and 60 seconds. The default value is 16 seconds.

4.5.5 Function keys

The hand terminal has two freely programmable function keys [6] and [#6]. You define which functionality or which menu will be called up when the respective function key is pressed.

Note: This option is not available for automatic feeders with a 12-key hand terminal.

You define the function keys as follows:

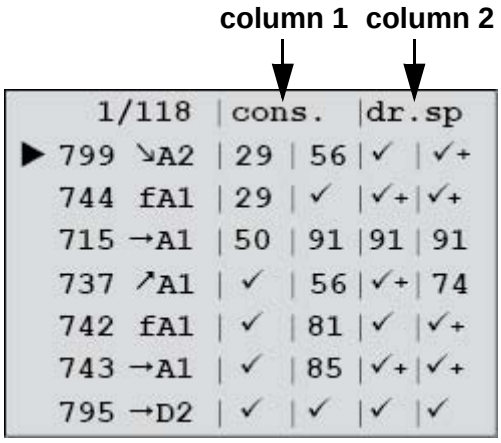
1. Choose [2] **> Device** data to go to the **Animal list** submenu.
2. Choose [0] or [+/-] to go to the desired function, for example **Start mixer**.
3. Choose [Enter] to confirm.
4. Choose [0] or [+/-] to select the symbol of the function key to which the assignment is to be made.
   - The list symbol stands for the [5] key.

     Note: This key is assigned the animal list by default.
   - The hash symbol stands for the [#6] key.
   - The hyphen [**-**] in the selection box is used to remove an assignment.

4.5.6 Animal list

In the animal list menu, you can list your calves in a table sorted by parameters. The table is sorted in ascending order by the first column of the first parameter. Parameters sorted in ascending order. This means that the calf with the greatest need for monitoring is at the very top of the table. The following parameters can be displayed:

- Feed consumption (as a percentage)
- Drinking speed (as a percentage)
- Animal visits
- Breaks



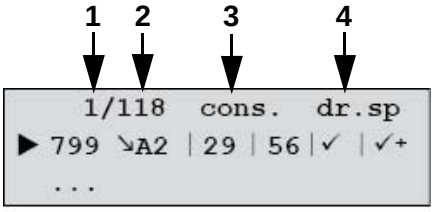
Note: You can directly access the **animal list** by pressing the key on the 15-key hand terminal.

Here is how you define which parameters are displayed in the two columns of the animal list:

1. Choose **> Device data** to go to the **Animal list** submenu.
2. In **Column 1** or **Column 2**, choose to select the parameter to be displayed in the respective column.

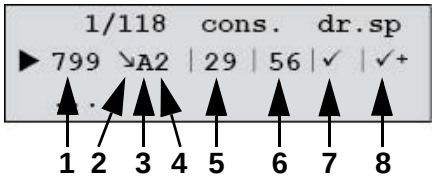
You call up an animal list as follows:

- Choose to go to the **Animal list** submenu.
- In the top line, from left to right, you can check the following:



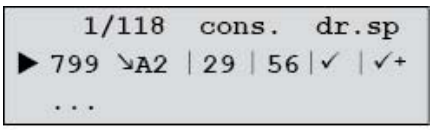
  - The number of the calf you have selected in the list, counting from the top (1).
  - How many calves are registered (2).
  - The two parameters you have chosen (3 & 4).

- You can view the following in the subsequent lines, from left to right:



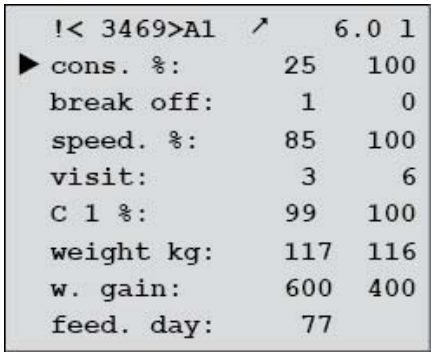
  - The animal number (1).
  - The plan tendency (2).
  - The group to which the calf concerned has been assigned (3).
  - The last feeding box visited (4).
  - Parameter 1. The current value (today) is in the column on the left. Yesterday's value is in the column on the right (5 & 6).
  - Parameter 2. The current value (today) is in the column on the left. Yesterday's value is in the column on the right (7 & 8).

  Note: If there is a check mark instead of a number, then the value is 100%. A check mark followed by a plus indicates a value greater than 100% (only for drinking speed and visits).



  For example: The calf shown with the number 799 is in the weaning phase (reduced plan tendency), has been assigned to group A and has visited feeding box 2. At present, the calf has only called up 29 % of its feed entitlement, yesterday it was only 56 %. The current value for drinking speed is 100% (✓); yesterday it was more than 100% (✓+).

- By pressing Enter, you can go to the detailed view for the currently marked animal. Via < > you can scroll to the other animals.



Note: In each line, by pressing Enter, detailed information can be called up.

4.5.7 Backing up and restoring data

Every day at midnight, a backup of **animal data** and **device data** is performed automatically so that a current backup of data is available in case of data loss.

ATTENTION Data may be lost when the version of the automatic feeder program is updated or when the battery of the computer card is changed. You must also save the data of the automatic feeder manually, for example to an SD card. Otherwise, calves may suffer from malnutrition if incorrect feed portions are dispensed. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves.

4.5.7.1 Internal data backup (automatic feeder)

4.5.7.1.1 Saving data

You save data as follows:

1. Choose > **Device data > Data backup** to go to the **Internal (feeder)** submenu.
2. Confirm **Save?** by choosing Enter.

   A progress bar informs you about the current status of the data backup being carried out.

4.5.7.1.2 Restoring data

You restore data as follows:

1. Choose > **Device data > Data backup** to go to the **Internal (feeder)** submenu.
2. Confirm **restore?** Enter.
3. Confirm the security prompt **restore last backup?** by choosing Enter.

   A progress bar informs you about the current status of the data backup being carried out.

4.5.7.1.3 Checking the current data backup

Check the data backup as follows:

1. Choose > **Device data > Data backup** to go to the **Internal (feeder)** submenu.
2. In **last backup**, you can view the version, time and date of the last backup performed.

4.5.7.2 External data backup using an SD card

During each backup, a folder with the date of the backup is created on the SD card. In the case of a **recovery**, a date stored on the SD card can be entered and selected using the number field. The date of the last backup is always shown on the display.

Note: This option is not available for automatic feeders with a 12-key hand terminal.

SD card and hand terminal

Proceed as follows to perform a data backup using an SD card:

1. Open the rubber cover on the right side of your hand terminal.
2. Insert the SD card into its slot.
3. Choose 2 **> Device data > Data backup** to go to the **SD card** menu.
4. Confirm **save?** with Enter.
   A progress bar informs you about the current status of the data backup being carried out.

This is how to perform a backup:

1. Choose 2 **> Device data > Data backup** to go to the **SD card** menu.
2. If required, in **Date** enter a date, from which you would like to restore the data, and confirm this with Enter.
3. Confirm **restore?** by choosing Enter in order to perform a backup.
4. In **Date**, you can see when the last data backup was performed.
5. Remove the SD card.

6. Close the rubber cover.

4.5.8 New installation

The program (software) must be completely reinstalled (reset) during the initial startup and restart process for the automatic feeder. This will remove superfluous data as well as outdated or incorrect settings from the memory.

Note:New installation will result in the deletion of the **animal data**. The **transmitter numbers** will be set to zero and the **Device data** will be overwritten with default values.

Animal data is, for example, group membership, barn transfer date, feeding days, consumption totals.

Device data includes portion settings, for example.

4.5.8.1 Only reinstall device data, plans, animal data or transmitter numbers

Proceed as follows to reinstall device data, plans, animal data and transmitter numbers:

1. Choose  **> Device** data to go to the **New installation** submenu.
2. Confirm **Device data** by choosing Enter.
3. Confirm **Reinstall device data?** by choosing Enter.
4. Confirm the security prompt **Do you really want to restore the data to factory settings?** by choosing Enter.

   The message **New installation completed!** will appear.
5. Confirm **New installation completed!** by choosing Enter.

   You are back in the **New installation** menu.
6. Perform steps 2 to 5 in the same manner for **plans, animal data** or **transmitters**.

4.5.8.2 Reconfiguring everything

You can also reconfigure all menus instead of individual menus.

Reconfigure all menus as follows:

1. Choose  **> Device** data to go to the **New installation** submenu.
2. Confirm **Everything** by choosing Enter.

3. Confirm **Reinstall everything?** by choosing Enter.
4. Confirm the security prompt **Do you really want to restore the data to factory settings?** by choosing Enter.

   The message **New installation completed!** will appear.
5. Confirm **New installation completed!** by choosing Enter.

   All data has been reset to factory settings.

Note: The settings in the feeder setup are not changed by **new installation** .

4.6 Software update

To update the application program, depending on the equipment, you have a choice between an SD card, "FlashManager Plus" or "UpdateManager".

The options available for your equipment can be seen in the dealer area of Förster-Technik's web site **www.foerster-technik.de**.

5 Setup

The program menus in the setup menu contain basic settings, e.g. for the equipment of the automatic feeder. Check to ensure that the settings are correct.

You open the setup menu as follows:

1. Press  and keep this key pressed when you switch on the feeder.
   After a short time, the setup menu will appear in the display.
2. If you want to change settings, go to the relevant menu option and make the changes.
3. Confirm your changes by choosing Enter.
4. To exit the setup, press Esc until the message **Exit setup?** appears. Choose Enter to confirm.

5.1 Overview of the Setup menus

Language		German
Time/date		Time / date
Machine	Type	Powder Milk or combi
	Number	1-99 (= machine number, decimal)
	Address	2-FC (= CAN address, hexadecimal)
	System	Interval (IV)
	Operating mode	SA / SM
	HE size	500 ml
	Heating	electronic / none
	Boiler valve	Brass
	HE valve	Brass
Equipment	Mixer drain	present yes
	Feeding pump	present yes / no?
	⊕Additive dispenser 1	present yes / no?
	⊕Additive dispenser 2	present yes / no?
	⊕Detergent pump	present yes / no?
	⊕Detergent sensor	no / rod
	⊕Circulation valve	HE VFValve/ no
	⊕Air valve	present yes / no?
	Circulation pump	present yes / no?
	Ball valve	present yes / no?
	Mix. sensor T.	present yes / no?
	Water meter	yes
	Supply electrode	yes / no
	Point electrode	yes
Identification	Type	Multi / Tiris / Ned
	Squelch	0 to 255
ID chip	activated	yes
	read?	
⊕Calibration scale	activated (yes / no) adjust? Cal. factor Cal. date	

Stations	Feed	<internal 1>, <internal 2>
		<IFS feed 1 .. 8>
		<IFS feed quadruple 1, 2>
		CalfRail
	⊕ Concentrate	<IFS-C 1 .. 8>
		Allocation: [C-station 1 .. 8]
		Address: 51-60
		Type: Standard
	⊕ Animal scales	Activate
		Adjust
Terminal	Address	1-FC (= CAN address, hexadecimal)
	Contrast	70 %
	Sleep mode	0-999 min.
Communication	Institute	yes / no
	⊕ Printer	no / serial / CAN
	⊕ Gateway	MAC: IP: 0-255 . 0-255 . 0-255 . 0-255 SN: 0-255 . 0-255 . 0-255 . 0-255 IP assignment: manual / autom. Factory settings?
	MultiReader	No Version update Multireader? Temperature Read transponder -type/-country/-no/ Squelch Resets Restarts
	CAN analyzer	CAN devices
		CAN errors
		CAN load
SD card	Feeding plans	Feeding plans read in / active / changed
	Licenses	Request license/ Read data/ Active licenses
Service	Initial operation: Date last: Date Type: RS1/RS2/RS3 next: Date Type: RS1/RS2/RS3 Service done?	

5.2 Language

You select the language for the user interface of the feeder as follows:

1. In the setup menu, choose the **Language** option.

2. Select the desired language for the user interface.
3. Confirm your entry by choosing Enter.

5.3 Time/date

You set the time / date as follows:

1. In the setup menu, choose the **Time / date** option.
2. Enter the current time of day and the current date.
3. Confirm your entries by choosing Enter.

5.4 Machine

5.4.1 Feeder type

There are three different automatic feeder types:

- **Powder:** feeds MP water mixtures.
- **Combi:** feeds fresh milk as well as MP water mixtures.
- **Milk:** feeds fresh milk only.

You select the feeder type as follows:

1. Leave the factory default value as it is.
2. **ATTENTION** Even if you want a combined feeder to dispense MP feed only, you must select Combi for the feeder type. If you choose **Powder**, the feeder will malfunction. The only place you set what liquid animal feed or which combination of liquid animal feeds you want to feed is in **> device data > Operating modes > Feed**.

5.4.2 Feeder number

For the KalbManagerWIN program (optional additional equipment) to access the automatic feeder's software, the automatic feeder needs a number. Number 1 is set by default.

Note: When connecting more than one automatic feeder, be sure that each number is only assigned once.

You select the feeder number as follows:

1. In the setup menu, choose the **Machine** option.

2. In **Number**, you select a number.

3. Confirm your entry by choosing Enter.

5.4.3 Feeder address

For clear identification, every participant of the CAN bus system needs an address.

Address ranges for members of CAN networks	
1-10	=> hand terminal
11-20	=> automatic feeder
41-50	=> IFS feed single
51-60	=> IFS-C
61-70	=> IFS feed quadruple
71-80	=> CalfRail

You select the feeder address as follows:

1. In the setup menu, choose the **Machine** option.

2. In **Address**, you select an address.

3. Confirm your entry by choosing Enter.

Note: If you select an address that has already been assigned, the message **Address already assigned!** will appear in the display.

5.4.4 Feeder operating mode

The automatic feeder can be operated in **Stand Alone (SA)** mode or **System machine (SM)** mode. Please leave the factory set value **SA** (= Stand Alone) as it is.

5.4.5 Animal number

An automatic feeder can manage a maximum of 250 calves.

You select the number of animals as follows:

1. In the setup menu, choose the **Machine** option.

2. In **Animal number**, select 250.
3. Confirm your entry by choosing Enter.

5.4.6 HE size

The set value determines:

- The set quantity for calibrating **water HE and milk**.
- The amount of water with which the milk is pressed out of the stainless steel coil.

You define the size as follows:

1. In the setup menu, choose the **Machine** option.
2. In **HE size** enter 500.
3. Confirm your entry by choosing Enter.

5.4.7 Heater

Here you specify whether the feeder has a heater and, if so, what type of **heating relay** it has.

You set the heating type as follows:

1. In the setup menu, choose the **Machine** option.
2. In **Heating**, select **electronic**.
3. Confirm your entry by choosing Enter.

5.4.8 Boiler water valve and heat exchanger

Please do not change the factory settings.

5.5 Equipment

Here you specify whether the automatic feeder is equipped with certain components or options.

5.5.1 Mixer drain

The contents of the mixer can be drained completely automatically via the mixer drain valve.

You set the mixer drain valve as follows:

1. In the setup menu, open the **Equipment** option.
2. In **Mixer drain**, choose **yes** if a mixer drain valve is present, otherwise choose **no**.
3. Confirm your entry by choosing Enter.

5.5.2 Feeding pump

The feeding pump is included by default. It helps the animals become used to the automatic feeder. The feeding pump can also be used to drain the mixer jar.

You set the feeding pump as follows:

- In the setup menu, open the **Equipment** option.
- In **Feeding pump**, choose **yes** if a feeding pump is present, otherwise choose **no**.
- Confirm your entry by choosing Enter.

5.5.3 Additive dispenser

Up to two additive dispensers can be connected to the automatic feeder.

You activate the additive dispenser as follows:

1. In the setup menu, open the **Equipment** option.
2. In **Add. disp. 1** select **yes** if there is an additive dispenser, otherwise choose **no**.
3. Confirm your entry by choosing Enter.
4. In **Add. disp. 2** select **yes** if there is a second additive dispenser, otherwise choose **no**.

5.5.4 Detergent pump

If the automatic feeder is equipped with a detergent pump, detergent can be automatically dispensed during a cleaning cycle.

You set the detergent pump as follows:

1. In the setup menu, open the **Equipment** option.
2. In **Detergent pump**, choose **yes** if there is a detergent pump, otherwise choose **no**.
3. Confirm your entry by choosing Enter.

5.5.5 Detergent sensor

If the level in the detergent tank is detected by a float switch mounted on a bearing bar, set **bar**. If, however, the detergent sensor is integrated in the detergent's system of pipes, set **no**.

5.5.6 Circulation valve

Valve: This valve enables fully automated cleaning of the heat exchanger. **no** will be shown if there is no automatic heat exchanger cleaning.

HE (= heat exchanger) is displayed if the automatic feeder is equipped with automatic heat exchanger cleaning.

You set the circulation valve as follows:

1. In the setup menu, open the **Equipment** option.
2. In **Circ. valve**, choose **no/HE**.
3. Confirm your entry by choosing Enter.

5.5.7 Air valve

The air valve is part of the compressed air cleaning system.

5.5.8 Circulation pump

The circulation pump ensures that the heat of the boiler water is transferred quickly and evenly to the contents of the stainless steel coil.

You set the circulation pump as follows:

- In the setup menu, open the **Equipment** option.
- In **Circulation pump**, choose **yes** if there is a circulation pump, otherwise choose **no**.
- Confirm your entry by choosing Enter.

5.5.9 Mixer temperature sensor

The temperature sensor in the mixer continually records the temperature of the feed in the mixer jar. If the temperature deviates from the set value, the boiler heater will be adjusted to compensate. The feed always has the desired temperature, regardless of the season.

You set the mixer temperature sensor as follows:

1. In the setup menu, open the **Equipment** option.
2. In **Mix. sensor T**, choose **yes** if there is a temperature sensor, otherwise choose **no**.
3. Confirm your entry by choosing Enter.

5.5.10 Water meter

Please do not change the factory settings [**yes**].

5.5.11 Supply and point electrode

Specify [**yes**] for supply electrode for point electrode.

Set the supply and point electrode as follows:

1. In the setup menu, open the **Equipment** option.
2. In **Supply electrode** and in **Point electrode** select [**yes**].
3. Confirm your entry by choosing Enter.

5.6 Identification

Type and squelch

Here you set the identification system, depending on the identification system of the distribution partner. The input or reading sensitivity of the identification system is set via the squelch value. The larger the entered value, the lower the range of the identification system (see **3.1.5.2** Squelch values and identification ranges on page **31**).

You set the identification system as follows:

1. In the setup menu, open the **Identification** option.
2. In **Type**, select the identification system.
3. In **Squelch**, select the squelch value.
4. Confirm your entry by choosing Enter.

5.7 ID chip

Before delivery, all setup settings are saved as read-only settings on the ID chip. This means you can restore the original settings of the setup at any time. For example, this may be necessary if you have accidentally changed a setting or the processor board has to be replaced.

You set the ID chip as follows:

1. In the setup menu, choose the **ID chip** option.
2. In **activated**, you must specify **yes** because the automatic feeder is equipped with an ID chip.
3. Confirm **read?** by choosing Enter if you want to transfer the data from the ID chip to the processor board.
4. Confirm your entry by choosing Enter.

5.8 Calibration scale

You activate the calibration scale as follows:

1. In the setup menu, open the **Calibration scale** option.
2. In **activated** choose **yes** if a calibration scale has been installed.
3. Confirm your entry by choosing Enter.
4. Press **adjust?** Enter to adjust the calibration scale.
5. The adjustment process begins with the taring of the calibration scale. You will be informed of this in the **calibration scale will be tared** message.
6. A menu appears where you need to enter the reference weight in grams that you require for the adjustment. If need be, adapt the respective value in this menu (default value: 500 g).

   Note: A 500 g reference weight is included in the delivery.
7. Place the reference weight with the hole on the screw in the feeding box such that it is fixed in place, and then press Enter in order to start the adjustment process.
8. After completing the adjustment process, a corresponding message about the success or lack of success of the adjustment will be issued. At the same time, the currently determined

weight value will be shown. After removing the calibration weight, 0 grams should be shown here.

9. Press Enter. **Date** now shows the current date.

5.9 Stations

Activate the feed or concentrate station and define the additional equipment for these stations or any additional equipment in the **Stations** menu. Automatic feeders are normally equipped with one station valve for one feeding box.

5.9.1 Feed

You set the feeding box as follows:

1. In the setup menu, choose the **Stations > Feed > Internal** option.
2. In **Allocation** select the feeding box to be allocated to the internal control system.
3. Confirm your entry by choosing Enter.

5.10 Terminal

5.10.1 Address

The hand terminal is integrated into the CAN bus system of the automatic feeder. That is why is needs its own address. **Address 1** is set by default.

Note: In a CAN bus system, each address may only be assigned once.

You set the address as follows:

1. In the setup menu, choose the **Terminal** option.
2. In **Address**, select **[1]**.
3. Confirm your entry by choosing Enter.

5.10.2 Contrast

You set the contrast as follows:

1. In the setup menu, choose the **Terminal** option.
2. In **Contrast**, enter the desired value. The default value is 60%.

3. Confirm your entry by choosing Enter.

5.10.3 Sleep mode

If no key has been pressed on the hand terminal for a longer period of time, it will switch to sleep mode. If the hand terminal is in sleep mode, the Förster-Technik logo will appear in the display.

You set sleep mode as follows:

1. In the setup menu, choose the **Terminal** option.
2. In **Sleep mode**, enter the required value. The default value is 10 minutes. To deactivate sleep mode, set [0] minutes.
3. Confirm your entry by choosing Enter.

5.11 Communication

5.11.1 ⊕Printer

Current animal lists can be generated via the automatic feeder's printer function.

- **Serial:** Select this option if you have connected a commercially available printer via the serial interface to the automatic feeder.
- **CAN:** Select this option if the printing data is to be sent via the CAN bus. In this case, a PC program will play the counterpart.

5.11.2 ⊕Gateway

You can configure all relevant parameters of the ⊕Förster gateway here.

- **MAC address**: You can see the MAC address of your gateway here. Your gateway is uniquely identified via its MAC address. This address cannot be changed.
- **IP address**: You can see the IP address of your gateway here and, if need be, change it. You will need this value to register your feeder at the CalfManagerWIN or in connection with the communication module.
- **Subnet mask**: You can see the subnet mask of your gateway here and, if need be, change it.

- **IP assignment**: If the value here is **automatically** set, then your gateway will try to get its IP address from a DHCP server in your network. If you select **manual** here, then you will have to set the IP address of your gateway yourself.
- **DHCP status** (only in connection with the automatic assignment of IP addresses): This line gives you information about the internal status when getting the automatically assigned IP address. There are five statuses that can occur: **OK**, **waiting**, **off**, **on** and **unknown (=n/a)**.
- **Factory settings:** If you call up this item and confirm the security query which then appears, the values of your gateway for the IP address, the subnet mask and the manual or automatic procurement of the IP address will be reset back to the factory settings.

5.11.3 MultiReader

Here, you can call up information about the connected MultiReader calf identification system.

- **Version** shows the current version of the MultiReader identification system.
- In **Update**, if you press Enter, then you can update the MultiReader identification system.
  Note: To update the MultiReader identification system, you may have to first update the automatic feeder.

5.11.4 CAN analyzer

Here, you can call up information about the CAN bus. This information can be helpful if a fault occurs in the CAN bus system.

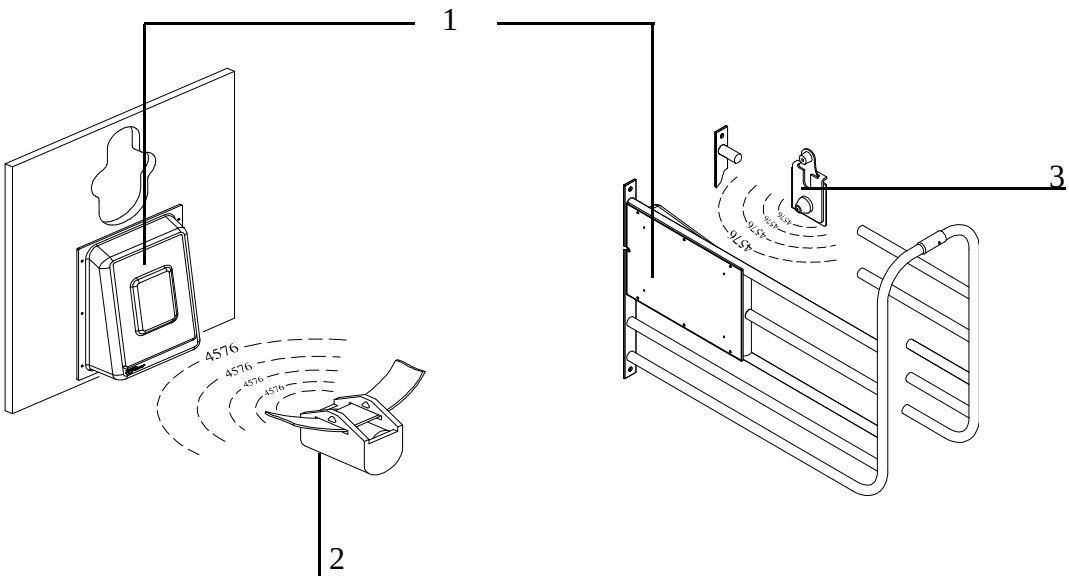
6 Transmitter and animal management

All menus for management of the list of all transmitters and the calves registered at the feeder can be found via > **Animal management**.

6.1 Managing transmitters

6.1.1 Basics

6.1.1.1 Identification process at the station



1 Antenna
2 Collar transmitter
3 Earmark transmitter

For identification purposes, each calf wears a collar with a transmitter or an earmark with a transmitter. The transmitter has a multi-digit number, which is also usually stamped into the transmitter housing. This **transmitter number** is sent from the transmitter to the antenna, which is part of the feeding box.

6.1.1.2 Connection of transmitters and animal numbers

The multi-digit transmitter number is not well suited for the rapid location of individual calves. For this reason, a calf is issued an animal number along with the transmitter number. The animal wears this animal number on an easily readable collar, or the animal number is put on the

earmark where it can be easily read. Up to 250 different animal numbers of up to six digits can be assigned to the calves.

6.1.2 Creating transmitter numbers

During the initial startup process for the feeder, existing transmitters have to be created once in the system. When you do this, each transmitter number is assigned one animal number of no more than six digits. These animal numbers are then available and can be used to register the calves.

6.1.2.1 Reading transmitter numbers

When creating new transmitter numbers, it is a good idea to have these read by the feeder. This saves you from typing in the numbers and eliminates the possibility of typing errors.

To set up the reading of transmitter numbers by the feeder, proceed as follows:

1. Choose  **> Animal management > Transmitters** to go to the **New** submenu.
2. Hold a transmitter next to the identification unit of a feeding box.

   The number of the transmitter will be read in and displayed in the line after **No. ł**. At the same time, the animal number to be newly assigned will be suggested in the **Animal no.** line.

   Note: You can affect the suggested animal number by selecting an assignment scheme for the animal numbers in the **No.** line.
3. Check whether the suggested **animal number** is correct and, in the line **accept?, press** Enter.

   Note: Make sure that the correct feeding box is selected in **Stations**.
4. In order to allocate the newly read transmitter number to the displayed animal number, confirm the security prompt **Create new no. xxx for animal xx?** by choosing Enter.

6.1.2.2 Manually entering transmitter numbers

Instead of reading the transmitters, you can also manually type in the transmitter numbers, if necessary

You manually enter transmitter numbers as follows:

1. Choose  **> Animal management > Transmitters** to go to the **New** submenu.

2. Enter the transmitter number in **No. ł**.
3. In **Animal No.**, check the suggested animal number and confirm it by choosing Enter.
4. Confirm **accept?** by choosing Enter.
5. In order to allocate the newly read transmitter number to the displayed animal number, confirm the security prompt **Create new no. xxx for animal xx?** by choosing Enter.

6.1.3 Assigning animal numbers

If the transmitter numbers are automatically read when new numbers are created, an animal number will be automatically suggested. When doing this, there are two schemes to choose from for the assignment of numbers.

6.1.3.1 Consecutive assignment of animal numbers

There is a counter which counts up for each new transmitter number as it is read. In this way, all of the transmitter numbers that are registered by the identification function are linked to consecutive animal numbers; e.g., from 1 to 50.

You set up consecutive assignment of animal numbers as follows:

1. Choose  **> Animal management > Transmitters** to go to the **New** submenu.
2. Select the **consecutive** option in **No.**
3. If necessary, in **next**, specify the animal number at which you want automatic reading of transmitters to start.

   Note: If you use collars, it makes sense to start with 1 and read in the transmitters in order.

6.1.3.2 Assignment of animal numbers based on transmitter numbers

More and more often, calves are already equipped with an electronic earmark transmitter when they are born and keep this earmark their whole lives. The automatic feeder program has been adapted for this type of transmitter so that the registration process of the transmitters and calves can take place completely automatically.

You set up automatic assignment of animal numbers as follows:

1. Choose  **> Animal management > Transmitters** to go to the **New** submenu.
2. Select the **automatic** option in **No.**

3. In **Range** , define the part of the transmitter number that you would like to use as the animal number. The animal number can have a maximum of six digits.

   For example:5-2 means that, counting from the right, the second to the fifth digits of the transmitter number will be used as the animal number. **6-1** means that, counting from the right, the first to the sixth digits of the transmitter number will be used as the animal number.

6.1.4 Editing transmitter or animal numbers

In necessary, (e.g., if a transmitter is lost), a transmitter number can be subsequently changed or deleted.

6.1.4.1 Changing the transmitter number

Manually changing the transmitter number

You manually change a transmitter number as follows:

1. Choose  **> Animal management > Transmitters** to go to the **Edit** submenu.
2. Select the transmitter number to be changed.
3. Change the transmitter number in **No.** and confirm by choosing Enter.

Reading the new transmitter number for the change

You read a new transmitter number as follows:

1. Choose  **> Animal management > Transmitters** to go to the **Edit** submenu.
2. Select the transmitter number to be changed.
3. Confirm **read?** by choosing Enter.

   A new menu is displayed, and the transmitter number flashes in the first line.
4. Hold the transmitter that you want to read next to the identification unit.

   The number is automatically accepted in the first line.
5. Confirm **accept?** by choosing Enter.

6.1.4.2 Changing the animal number

Like the transmitter number, the animal number can also be changed.

1. Choose  **> Animal management > Transmitters** to go to the **Edit** submenu.

2. Select the animal number you would like to change.
3. In **Animal No.**, change the animal number that is currently allocated to the transmitter and confirm by choosing Enter.

6.1.4.3 Deleting transmitter numbers

You delete transmitter numbers as follows:

1. Choose **> Animal management > Transmitters** to go to the **Edit** submenu.
2. Select the transmitter number to be deleted and confirm **Delete** by choosing Enter.

   Note: You can only delete transmitter numbers of calves that are not registered (= status: available).

6.1.5 Deleting the transmitter number when canceling an animal's registration

Generally, the collars (or earmarks) with the respective transmitters remain at the organization and are reused after the calf is taken out of the pen and its registration is canceled. For this reason, the default setting when canceling the registration of a calf is to not delete its transmitter number. If the calf's transmitter is, however, **not** reused but rather stays with the calf, (lifelong earmark), make the following setting in the feeder:

1. Choose **> Animal management > Cancel** to go to the **Settings** submenu.
2. Select the **yes** option in **Delete no.** When a calf's registration is canceled, the transmitter number is also deleted along with the animal number. This prevents an accumulation of unused transmitter numbers, which would use up the available storage space.

6.1.6 Calling up transmitter statistics

You call up a transmitter statistic as follows:

1. Choose **> Animal management > Transmitters** to go to the **Information** submenu.
2. An overview of the transmitters created in the system is displayed. The following is shown in the displayed list:
   - In **Registered**, you check the number of registered transmitters or calves.
   - In **Available** you check the number of available transmitters.
   - In **Free**, you check how many transmitters you can still create.

6.2 Registering animals

Calves are only fed at the feeder if they are also registered there. You can either manually register each calf or instruct the feeder to automatically register the calves. In the latter case, the calf is registered as soon as it enters the feeding station for the first time. This means that the manual registering of the calves is not needed.

During registration, the calf is allocated to one of four groups, A to D. The calf will then be fed in accordance with the feed, concentration and milk ratio plans of this group.

The group to which you allocate the calves depends solely on the feed quantity, concentration and milk ratio that the end user wants to feed the calves. In this case, it does not matter which station the calves consume their feed in or which bay the calves have been housed in.

If the end user houses two groups of animals, and one group will receive milk only and the other will receive MP only, allocate these calves to different feeding groups.

6.2.1 Registering animals manually

You register animals manually as follows:

1. Choose  **> Animal management > Register** to go to the **Animal** submenu.
2. Select one of the available (not yet registered) animal numbers.
3. In **Group**, select the group to which the calf is to be allocated.
4. If you want to reduce the total feeding duration for the calf, you can set this up under**Correction days** (see **Feeding > Total feeding duration** in the operator's manual).
5. Confirm **Register?** by choosing Enter.
6. Confirm the prompt **Animal xx in group X register?** by choosing Enter.

Note: On its registration day, the animal receives the exact amount of feed, spread over the course of the day, at is intended for it by the feeding plan for the first day. If you have entered correction days, then the animal will receive the feed that is intended for the corresponding day.

Note: For the next manual registration, the values last set will again be shown and can be used or changed for the current animal.

6.2.2 Registering animals automatically

If an animal that is not yet registered enters the feeding station for the first time, it can then be automatically registered. For automatic registration, three different modes can be set which are described in detail in the following three sub-sections. The following table presents an overview of this.

Overview of the three modes for automatic registration

Automatic registration mode	**Transmitter number being identified**	
	available	**unknown**
deactivated	Warning **Unknown transmitters**	Warning **Unknown transmitters**
available transmitters	Animal will be registered	Warning **Unknown transmitters**
all transmitters	Animal will be registered	Transmitter is created, new animal number is assigned, animal is registered

6.2.2.1 Deactivating automatic registration

Automatic registration is deactivated by default. You can restore this setting at any time:

You deactivate automatic registration as follows:

1. Choose **> Animal management > Register** to go to the **Automatic** submenu.
2. Select **Mode no** and confirm by choosing Enter. Automatic registration is then deactivated.

   Note: When the registration function is deactivated, the **unknown transmitters warning** will be triggered if an unregistered calf enters a station.

6.2.2.2 Only automatically register available transmitters

Automatic registration shortens the registration process for the calves. When doing this, you can specify that only calves can be registered whose transmitter numbers are already in the system. If an available transmitter number is registered in the identification unit, the corresponding calf will be automatically registered. Calves or transmitter numbers that have not yet been created in the system will trigger the **Unknown transmitter number** warning.

Proceed as follows to set up automatic registration of available transmitters:

1. Choose **> Animal management > Register** to go to the **Automatic** submenu.

2. In **Mode** select the **available** option.

3. In **Group**, choose the group in which you want to automatically register the calves.

Note: The registration of calves that are to be removed should only be canceled after they have left the bay, as they will otherwise automatically be reregistered when they enter the station and will then be returned to the start of the feeding plan.

6.2.2.3 Creating transmitter numbers and automatically registering calves

To shorten the registration process even more, you can specify that calves can also be registered if their transmitter numbers are not known in the system. This eliminates the need for reading or manual entry of transmitter numbers. In this case, if an unknown transmitter number is registered in the identification unit, this transmitter number is automatically created in the system and a new animal number is issued and registered at the same time.

Note: When newly creating transmitters and animal numbers, the animal number will either be produced consecutively or as a part of the transmitter number (see **6.1.3** Assigning animal numbers on page **87**). Clarify whether this kind of number assignment is actually what the end users wants.

Proceed as follows to create transmitter numbers and automatically register calves:

1. Choose  **> Animal management > Register** to go to the **Automatic** submenu.

2. In **Mode** select the **All** option.

3. In **Group**, choose the group in which you want to automatically register the calves.

Note: Calves **without collars** should never be in the bay. They could push other animals out of the way and steal remaining amounts of feed.

6.3 Canceling animals or animal groups

Individual calves or a group of calves that are no longer being fed according to the plan must be removed from the pen compartment and their registration canceled. The same applies to calves whose feeding plan has expired.

6.3.1 Canceling an individual animal's registration

You cancel an individual animal's registration as follows:

1. Choose  **> Animal management > Cancel** to go to the **Animal** submenu.

2. Select the desired animal number.
3. In **Plan end**, you check how much longer the calf is to be fed according to the plan.
4. In **MP**, you can check how much milk powder the calf has consumed from the start of registration to its cancellation.
5. In **Milk**, you can check how much milk the calf has consumed from the start of registration to its cancellation.
6. Confirm **cancel?** by choosing Enter in order cancel a calf.

   ATTENTION There is a risk of malnutrition if calves do not receive any feed. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves. Tell the end user that he/she must provide the canceled calves with feed using an alternative method.

   Note: If you have chosen the value **All**or **Available** for the **automatic registration mode**, you should remove unregistered calves from the bay, as otherwise they will be automatically registered again.

6.3.2 Canceling a group registration

You cancel a group registration as follows:

1. Choose  **> Animal management > Cancel** to go to the **Group** submenu.
2. Select the required group.
3. In **Registered** , you can see how many calves are being fed according to the corresponding plan.
4. In **Weaned** you can see how many calves have finished the feeding plan and are therefore no longer receiving any feed.
5. Confirm **Cancel** by choosing Enter if all calves in the group are to be cancelled regardless of whether they are registered or weaned calves.
6. Confirm the security prompt **Cancel animals in group?** by choosing Enter.

6.3.3 Canceling the registration of weaned animals

You cancel the registration of weaned calves as follows:

1. Choose  **> Animal management > Cancel** to go to the **Weaned animals** submenu.

2. Confirm **cancel?** by choosing Enter if weaned calves are to be canceled.
3. Confirm the security prompt **Cancel animals?** by choosing Enter.

6.4 Transferring animals' registrations

You can transfer calves registered at an automatic feeder to another group at any time.

To change a registered calf to another group, proceed as follows:

1. Choose  **> Animal management** to go to the **Change registration** submenu.
2. Select the desired calf.
3. Select the desired feeding group in **Group**.
4. Confirm the prompt **Animal xx in group X register?** by choosing Enter.

   Note: When registration is transferred, the feeding day is retained; the calf will **not** be reset to the start of the feeding plan (= to plan day 1).

7 Faults and warnings

The automatic feeder shows fault messages or warning messages in the display to indicate faults during feeder operation.

In the event of a **fault**, automatic mode will be interrupted and no feed prepared.

ATTENTION An interruption in feeding operation means that your calves will not receive any feed. This can lead to malnutrition. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves. Tell the end user that he/she must provide the calves with feed using an alternative method if feed operation is interrupted.

In the case of a **warning**, automatic mode will not be interrupted, and feeder operation will continue.

Once you have eliminated the fault, delete the fault and warning messages.

- Some fault and warning messages are deleted automatically.
- Some fault and warning messages can be deleted by pressing C.
- Some fault and warning messages are deleted by confirming **Delete fault?** or **Delete warning?** by choosing Enter.

7.1 Faults

7.1.1 CRC error

"CRC error" will be shown in the display if data records in the memory of the control unit have been destroyed. The following variants can be displayed:

- Check animal.
- Check device data.
- Check plans.
- Check prescriptions.

Feeder operation will be interrupted. Make sure that the end user provides the calves with feed using an alternative method as long as feed operation is interrupted.

Reinstall the program as follows:

- To reinstall the program, choose  **> Device data > New installation** to to go to the **Everything** submenu.
- Confirm **new installation?** by choosing Enter.

  Note: The end user's personal settings will be deleted and replaced by predefined default values.

7.1.2 Calibration scale

If the calibration scale was not adjusted during setup, you will see **Fault, calibration scale** in the display.

You correct the fault as follows:

1. Confirm **Calibration scale** with Enter.
2. Press **adjust?** Enter to adjust the calibration scale.
3. The adjustment process begins with the taring of the calibration scale. You will be informed of this in the **calibration scale will be tared** message.
4. A menu appears where you need to enter the reference weight in grams that you require for the adjustment. If need be, adapt the respective value in this menu (default value: 500 g).

   Note: A 500 g reference weight is included in the delivery.
5. Place the reference weight with the hole on the screw in the feeding box such that it is fixed in place, and then press Enter in order to start the adjustment process.
6. After completing the adjustment process, a corresponding message about the success or lack of success of the adjustment will be issued. At the same time, the currently determined weight value will be shown. After removing the calibration weight, 0 grams should be shown here.
7. Press Enter. **Date** now shows the current date.

7.1.3 Heating

failure heating xx.x °C will be shown in the display if the temperature of the boiler water is too low. Feeder operation will be interrupted until the set minimum temperature has been reached. Make sure that the end user provides the calves with feed using an alternative method as long as feed operation is interrupted.

You correct the fault as follows:

If heating up the boiler water does not solve the problem:

1. Choose  **> Device data > Portion** to go to the **Set temp.** or **Min. temp.** submenu and check the temperature settings.
2. Check that the heater is working properly.

7.1.4 Temperature too high

Failure, temperature too high will appear in the display when the water temperature in the boiler is too high. Feeder operation will be interrupted until the water in the boiler has cooled to the set maximum temperature. Make sure that the end user provides the calves with feed using an alternative method as long as feed operation is interrupted.

You correct the fault as follows:

- Confirm **Failure, temperature too high** by choosing Enter.
- In **HE water start?** , press & hold Enter .
- Release water from the heat exchanger's boiler into the mixer jar until the fault message in the display disappears.
- Confirm **Mixer: empty?** by choosing Enter.

Check the temperature of the water supply if the heat exchanger is supplied with preheated water.

7.1.5 Heat exchanger not filled

When the automatic feeder turns on, the control unit checks whether the **Heat exchanger** is filled with Milk . If it is not filled, feeder operation will be interrupted and **Failure, HE not filled** will appear in the display.

Feeder operation will be interrupted. Make sure that the end user provides the calves with feed using an alternative method as long as feed operation is interrupted.

You correct the fault as follows:

1. Check the water supply
2. In **Fill HE?** press Enter.

3. Check whether the water jet hits the supply electrode.

If the fault persists, proceed as specified in “Water shortage” on page 98.

7.1.6 Water shortage

If the rod electrode or the supply electrode is not grounded in the mixer jar when water is being added and the water meter sends no pulse, a water test will be started. If the water test is not successful, then feed preparation and animal identification will be switched off. **Failure, water shortage** appears in the display.

Feeder operation will be interrupted. Make sure that the end user provides the calves with feed using an alternative method as long as feed operation is interrupted.

You correct the fault as follows:

1. Confirm **HE water start?** by choosing Enter.
2. Check whether the water jet hits the rod electrode or the point and supply electrode .
3. Check the water supply to the automatic feeder.
4. Check whether deposits such as calcium have formed on the electrodes.
5. Confirm **Delete failure?** with Enter if you have fixed the fault.

⚠ DANGER Beware of lethal electric shock. The electrical components of the automatic feeder are live. Always turn off the automatic feeder using the main switch and disconnect the mains plug before you change the response sensitivity of the electrode.

Check and change the response sensitivity of the electrode.

1. Choose  **> Diagnosis > Sensors** to go to the **supply electrode, point** electrode or **El. rod** submenu.
2. In the right-hand column, check the status (**free** or **covered**).
3. Confirm **supply electrode, point** electrode or **El. rod submenu.** by choosing Enter.
   - 3.1 In **Status**, check the status (**free** or **covered**).
   - 3.2 Confirm **HE water, start?** or **Milk: start?** by choosing Enter.

     The electrode will be triggered if **water** or **milk** is dispensed into the mixer jar.

3.3 Confirm **Mixer: empty?** with Enter to pump out the liquid again.

4. Visually inspect the electrode.

   4.1 If the electrode reports that it is **covered** although it is actually free, the sensitivity of the electrode is too high.

   4.2 Reduce the sensitivity of the electrode by rotating the potentiometer (see machine circuit diagram in the appendix) counterclockwise on the main board.

   4.3 If the electrode reports that it is **free** although it is actually covered, the sensitivity of the electrode is too low.

   4.4 Increase the sensitivity of the electrode by rotating the potentiometer (see machine circuit diagram in the appendix) clockwise on the main board.

7.1.7 Water meter

Failure, water meter will appears in the display if the supply electrode is grounded when water is dispensed, but the water meter issues no pulse.

Feeder operation can be continued in emergency mode.

You start emergency mode as follows:

1. Confirm **HE water start?** by choosing Enter.
2. Check whether pulses are shown in the display.
3. Confirm **Mixer emptying?** by choosing Enter.
4. Confirm **Delete failure?** by choosing Enter.
5. Confirm **emergency mode start?** by choosing Enter.
   Warning, water meter will appear in the display. The calibration values for heat exchanger water become invalid.
6. Calibrate water heat exchanger and water boiler.
   The automatic feeder will operate in emergency mode, the error message **Calibr. HE water** will disappear.

You correct the fault as follows:

Repair or replace the water meter if necessary.

1. Delete the **water meter warning**.

   You will see the fault message **Calibr. HE water** in the display.

2. Calibrate water and milk.

3. Return to automatic mode.

7.1.8 Mixer emptying

Failure, mixer emptying will appear if the mixer cannot be drained.

Feeder operation will be interrupted. Make sure that the end user provides the calves with feed using an alternative method as long as feed operation is interrupted.

You correct the fault as follows:

⚠ DANGER Beware of lethal electric shock. The electrical components of the automatic feeder are live. Always turn off the automatic feeder using the main switch and disconnect the mains plug before you perform work on the feeder's components.

1. Turn off the automatic feeder using the main switch and disconnect the mains plug.
2. Check all components carrying feed from the mixer to the mixer drain valve or from the mixer up to the teat for blockages and remove them.
3. Check the feeding pump:

   3.1 Confirm **Start feeding pump?** by choosing Enter.

4. Check the mixer drain valve:

   4.1 Confirm **Open mixer drain?** by choosing Enter.

5. Check the rod electrode:

   5.1 Confirm **HE water start?** by choosing Enter to fill the mixer with water.

6. In **Mixer emptying?**, confirm by choosing Enter.
7. Confirm **delete fault?** with Enter if you have fixed the fault.
8. Insert the mains plug and turn on the automatic feeder again using the main switch.
9. Remove detergent remnants from components carrying feed by rinsing them with water.

ATTENTION Detergent remnants that enter the feed can be hazardous to the health of calves. Remove detergent remnants before restarting the automatic feeder.

10.Return to automatic mode.

7.1.9 Heating

Failure, heating will be shown in the display if the heater is faulty.

Feeder operation will be interrupted. Make sure that the end user provides the calves with feed using an alternative method as long as feed operation is interrupted.

You correct the fault as follows:

⚠ DANGER Beware of lethal electric shock. The electrical components of the automatic feeder are live. Before working on components, always turn off the automatic feeder with the main switch and disconnect the mains plug.

- Check the heating rod for continuity.
  If the heating rod is defective, replace it.
- Check the temperature sensor.
  If the temperature sensor is defective, replace it.
- Check whether voltage is applied to the heater. Check the customer's fuses.
- Check whether safety temperature limiter has been triggered.
  ⚠ DANGER Beware of lethal electric shock. The electrical components of the automatic feeder are live. Always turn off the automatic feeder using the main switch and disconnect the mains plug before you reactivate the safety temperature limiter.
  You reactivate the safety temperature limiter as follows:

1. Confirm **Delete failure?** with Enter if you have fixed the fault.
2. Turn off the automatic feeder with the main switch and disconnect the mains plug.
3. Open the right side door of the automatic feeder.
4. Remove the metal cover under which the safety temperature limiter is located.
5. Press the reset button in order to reset the safety temperature limiter.
6. Reattach the metal cover.

7. Close the side door.
8. Insert the mains plug again and turn on the automatic feeder again using the main switch.

7.1.10 Boiler temperature sensor

Fault, Temp. sensor, boiler is shown in the display if the temperature sensor of the boiler is defective.

Feeder operation will be interrupted. Make sure that the end user provides the calves with feed using an alternative method as long as feed operation is interrupted.

You correct the fault as follows:

⚠ DANGER Beware of lethal electric shock. The electrical components of the automatic feeder are live. Always turn off the automatic feeder using the main switch and disconnect the mains plug before you work on the main board.

1. Turn off the automatic feeder with the main switch and disconnect the mains plug.
2. Remove the metal cover on the back of the automatic feeder.
3. Measure the resistance of the temperature sensor on the main board.
4. Compare the measured value with the value in the table. The table can be found in the machine circuit diagram in the appendix.
5. If the measured value differs from the value in the table, you must replace the sensor. (see machine circuit diagram in the appendix).
6. Reattach the metal cover.
7. Insert the mains plug again and turn on the automatic feeder again using the main switch.

7.1.11 Milk/circ. valve

If the **Milk/circ. valve** fault message is shown, then you can presume that there is a leak in the milk valve or in the circulation valve.

1. Visually inspect and check the function of both valves.
2. In **Start milk pump?** press Enter. If liquid comes out of the milk or water outlets after the pump starts, then one of the valves is leaking.
3. Check and, If need be, replace the valves.

4. If the cause of the fault has been remedied, in **Delete failure?** press Enter.

7.1.12 Calibration

Failure, calibration will be shown in the display if the liquid or powder feed components and the detergent have not been calibrated.

Feeder operation will be interrupted. Make sure that the end user provides the calves with feed using an alternative method as long as feed operation is interrupted.

You correct the fault as follows:

1. Calibrate all components shown in the display (see **3.1.16** Calibrating feed components on page **37**).

7.1.13 Supply electrode

Failure, supply electrode will be shown in the display if the supply electrode is permanently grounded.

Feeder operation will be interrupted. Make sure that the end user provides the calves with feed using an alternative method as long as feed operation is interrupted.

You correct the fault as follows:

- Visually check the electrode for deposits and remove them.
- If the fault persists, you must replace the electrode.

7.1.14 ID chip

The automatic feeder is equipped with an electronic name plate (ID chip) upon which the device number and other important information for the operation of the automatic feeder is stored.

Failure, ID chip missing is shown in the display if the ID chip is defective. For the first 30 days after the fault appears, feeder operation will continue normally. After this, the automatic feeder will not be fully functional.

Make sure that the end user provides the calves with feed using an alternative method as long as feed operation is interrupted.

You replace the ID chip as follows:

1. Order the new ID chip, specifying the device number.

   ⚠ DANGER Beware of lethal electric shock. The electrical components of the automatic feeder are live. Always turn off the automatic feeder using the main switch and disconnect the mains plug before you work on the main board.

2. Turn off the automatic feeder using the main switch and disconnect the mains plug.
3. Open the flap on the back of the automatic feeder.
4. Disconnect the old ID chip from the main board (see circuit diagram provided).
5. Insert the ID chip on the main board.
6. Close the flap on the back of the automatic feeder.
7. Insert the mains plug and turn on the automatic feeder again using the main switch.
8. Choose **Setup > ID chip** to go to the **Read** submenu.
9. Activate the ID chip by choosing Enter.

7.1.15 Station/drain valve

Fault, Box/drain valveis shown in the display if a feeding box valve or the mixer drain valve is leaking. The automatic feeder loses water during cleaning.

Feeder operation will be interrupted. Make sure that the end user provides the calves with feed using an alternative method as long as feed operation is interrupted.

You correct the fault as follows:

1. Check all feeding box valves and the mixer drain valve for leaks.
   - Clean leaky valves in order to remove any foreign objects that might have entered the system.
   - Repair leaky valves or replace them.
2. Check the rod electrode.
   - Choose  **> Diagnosis > Sensors** to go to the **El. rod** submenu.
   - In the right-hand column, check the status (**free** or **covered**).
   - Confirm **El. rod** by choosing Enter.

- In **Status**, check the status (**free** or **covered**).
- Confirm **HE water start?** by choosing Enter.

The electrode must report that it is **covered** if **water** is dispensed into the mixer jar up to the electrode.

If the rod electrode reports that it is **free**, you must readjust it (see **7.1.7** Water meter on page **99**).

If the fault persists, you must replace the rod electrode.

3. Confirm **Delete failure** by choosing Enter once you have eliminated the fault.

7.1.16 Uncontrolled output

The automatic feeder monitors all outputs during current operation which are responsible for the dispensing of water, milk, milk powder, additives and detergent as well as the mixer drain valve. If the corresponding relays are actuated for more than 60 seconds, the fault **Uncontroll. output** will appear in the display. Depending on the type of defect, one of the following fault codes will be displayed:

- **Milk**, if the milk valve is defective.
- **Circ. valve**, if the circulation valve is faulty.
- **HE water**, if the heat exchanger water valve is faulty.
- **Mixer drain**, if the mixer drain valve is faulty.
- **Powder**, if the motor of the milk powder conveyor is defective.
- **Additive dispenser**, if the additive dispenser is defective.

Feeder operation will be interrupted. Make sure that the end user provides the calves with feed using an alternative method as long as feed operation is interrupted.

You correct the fault as follows:

- Check the milk valve.
  - Choose  **> Diagnosis** to go to the **Valves** submenu.
  - Confirm **Milk open?** by choosing Enter to open the milk valve. The valve remains open as long as you hold down Enter.

- Check whether the valve opens. The valve opens when the milk is dispensed.
- Repair the valve or replace it.

- Check the water valve of the heat exchanger.
  - Choose  **> Diagnosis** to go to the **Valves** submenu.
  - Confirm **Open HE water?** with Enter to open the water valve. The valve remains open as long as you hold down Enter.
  - Check whether the valve opens. The valve opens when the water is dispensed.
  - Repair the valve or replace it.
- Check the water valve of the boiler.
  - Choose  **> Diagnosis** to go to the **Valves** submenu.
  - Confirm **Bo. water open?** by choosing Enter to open the water valve. The valve remains open as long as you hold down Enter.
  - Check whether the valve opens. The valve opens when the water is dispensed.
  - Repair the valve or replace it.
- Check the circulation valve.
  - Choose  **> Diagnosis** to go to the **Valves** submenu.
  - Confirm **Circulation valve open?** by choosing Enter to open the circulation valve.
  - Listen to check whether the valve opens.
  - If a valve is defective, repair or replace it.
- Check the mixer drain valve.
  - Choose  **> Diagnosis** to go to the **Valves** submenu.
  - Confirm **Mixer drain open?** by choosing Enter to open the mixer drain valve. The valve remains open as long as you hold down Enter.
  - Check whether the valve opens. The valve opens when the water drains.
  - Repair the valve or replace it.

- Check the motor of the milk powder conveyor.
  - Choose **> Diagnosis** to go to the **Motors** submenu.
  - Confirm **Powder start?** by choosing Enter in order to start the motor of the powder conveyor.
  - If the motor does not start, check the plug on the powder conveyor or check the power supply.
- Check the additive dispenser.
  - Choose **> Diagnosis > Motors** to go to the **Additive** submenu.
  - Confirm **Start?** with Enter to start the additive conveyor motor.
  - If the motor does not start, check the plug or the power supply.

7.2 Warnings

7.2.1 Mixer emptying

Mixer emptying warning appears if the mixer cannot be drained. For example, this can be because the drain is clogged or the feeding pump is no longer running.

This warning message is always hidden when the rod electrode becomes free.

⚠ DANGER Beware of lethal electric shock. The electrical components of the automatic feeder are live. Before working on components, always turn off the automatic feeder with the main switch and disconnect the mains plug.

You correct the fault as follows:

1. Check all parts which carry feed from the mixer up to the mixer drain valve for blockages and remove them.

   ATTENTION The hose which goes from the mixer drain valve to the drain channel must not be lengthened.

2. Check the feeding pump.
   - Confirm **Mixer emptying warning** by choosing Enter.
   - Confirm **Feeding pump: start?** by choosing Enter.

     The mixer will be pumped empty.

3. Check the mixer drain valve.
   - Confirm the **Mixer emptying warning** by choosing Enter.
   - Confirm **Mixer drain: open?** by choosing Enter.

     The mixer will be pumped empty.
4. Check the rod electrode.
   - Visually check the rod electrode for deposits.
   - Check that the rod electrode works properly (see **7.5.3** Checking sensors on page **120**).
5. Fill and drain the mixer.
   - Confirm **Mixer emptying warning?** with Enter if you have fixed the fault.
   - Confirm **HE water, start?** by choosing Enter.

     The mixer will fill up with water.
6. Confirm **Mixer: empty?** by choosing Enter.

   The mixer will be drained.

If the fault has been fixed, confirm the message **Delete warning?** in the display with Enter.

7.2.2 Mixer temperature sensor

The **Mixer temp. sensor warning** will be shown in the display if the temperature sensor in the mixer jar is faulty or the temperature of the mixed feed in the mixer jar drops below 0 °C.

You correct the fault as follows:

Use a ohmmeter to measure the voltage at the input of the temperature sensor on the board. Compare the measured value with the value in the circuit diagram, and if it is different, replace the temperature sensor (see circuit diagram provided).

7.2.3 Identification

Warning, identification appears in the display if animal identification is not working.

You correct the fault as follows:

Check the cables leading to the antenna. Repair any damage or replace the cables or antennas.

7.2.4 Incorrect ID

All CAN nodes have a unique ID which cannot be changed. The ID is used to automatically check whether the right node reports on the CAN address. If this is not the case, it is possible for the feeder and the node to communicate, but there will be no proper data exchange. **Warning, Incorrect ID** appears in the display.

You correct the fault as follows:

Check all CAN addresses.

1. Switch on the feeder and hold down the  button until the setup menu appears in the display.
2. Via **Boxes > Feed** to go to the **CAN address** submenu and check all CAN nodes.
3. To exit the setup, press Esc until the message **Exit setup?** appears. Confirm this by choosing Enter.

If IDs have changed, e.g., for reasons of compatibility, you must update all CAN nodes. For this, use "FlashManagerPlus" or an SD card if necessary.

7.2.5 Address used twice

If two or more nodes are linked together in a bus system, it can happen that one CAN address is issued twice. **Warning, address used twice** appears in the display.

You correct the fault as follows:

- Confirm **Warning, Address used twice** by choosing Enter.
  The CAN node with the double address will be displayed.
- Choose **> Setup > Boxes > Feed > IFS simple** to go to the **CAN address** submenu.
- Assign another address which is still available to the CAN node with the double address. For more information on assigning CAN addresses, see the **Setup > Address** chapter (see **5.4.3** Feeder address on page **75**).
  Note: If possible, use an address from the standard range of numbers for the CAN node concerned.

- Confirm your changes by choosing Enter.
- To exit the setup, press Esc until the message **Exit setup?** appears. Confirm this by choosing Enter.
- Delete the warning on all feeders.

7.2.6 Unknown transmitters

The **Unknown transmitters warning** appears in your display:

- If a transmitter is detected by the identification unit for which no animal number has been assigned.
- If a transmitter number has been allocated to an animal number, but has still not been registered.

You correct the fault as follows:

1. Confirm **Unknown transmitters warning** by choosing Enter.
2. In **No.**, you check the unknown transmitter number.
3. In **Number**, you check how often the unknown transmitter number has been identified.
4. In **Time**, you check when the transmitter was last registered by the identification system.
5. Confirm **delete?** by choosing Enter if you want to delete the transmitter number.
6. Confirm **Register** by choosing Enter if you want to allocate the unknown transmitter number to an animal number.

7.2.7 Calibration

The **calibration warning** will appear in your display if the last calibration was 120 days ago. You will see which components you have to calibrate.

You correct the fault as follows:

1. Calibrate all components shown in the display (see **3.1.16** Calibrating feed components on page **37**).
2. Confirm **delete warning?** by choosing Enter.

Note: If you delete the warning without calibrating, the message will appear again the next day.

7.2.8 Calibration scale

The **calibration scale warning** will appear in your display if your calibration scale is not working.

ATTENTION There is a risk of malnutrition caused by incorrectly dispensed feed portions. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves. You must ensure that the end user provides his/her calves with feed using an alternative method as long as the calibration scale is not working.

You correct the fault as follows:

⚠ DANGER Beware of lethal electric shock. The electrical components of the automatic feeder are live. Before working on components, always turn off the automatic feeder with the main switch and disconnect the mains plug.

1. Check whether the circuit board for the mixer scale is correctly plugged onto the main board of the feeder.
2. Check the cables which go to the calibration board as well as to the load rod for visible damage (for example, animal bites).
3. Check the load rod and the calibration unit of the mixer scale.

Note: The warning is automatically deleted when the fault has been rectified.

7.2.9 Circulation pump

The feeder control unit checks whether the circulation pump is working at the start of the day. If it is not working, **Warning, circulation pump** will appear in the display.

You correct the fault as follows:

- Open the right side door of the automatic feeder.
- Choose  **> Diagnosis > Motors** to go to the **Circulation pump** submenu.
- Confirm **start?** by choosing Enter.
- Listen to check whether the circulation pump is running.
- Confirm **check?** by choosing Enter in order to perform an extensive test of the circulation pump.

- If the circulation pump is defective, replace it.
- Confirm **Delete warning?** by choosing Enter once you have eliminated the fault.

7.2.10 ID chip

The automatic feeder is equipped with an electronic name plate (ID chip) upon which the device number and other important information for the operation of the automatic feeder is stored.

The **warning ID chip still xx days** will appear in your display if the ID chip is defective. After 30 days, the functionality of the feeder will be limited.

ATTENTION An interruption in feeding operation means that your calves will not receive any feed. This can lead to malnutrition. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves. Make sure that the end user provides the calves with feed using an alternative method as long as feeder operation is interrupted.

You replace the ID chip as follows:

1. Order the new ID chip, specifying the device number.
   ⚠ DANGER Beware of lethal electric shock. The electrical components of the automatic feeder are live. Always turn off the automatic feeder using the main switch and disconnect the mains plug before you work on the main board.
2. Turn off the automatic feeder using the main switch and disconnect the mains plug.
3. Open the flap on the back of the automatic feeder.
4. Unplug the old ID chip from the main board (see circuit diagram provided).
5. Insert the new ID chip on the main board (see circuit diagram provided).
6. Close the flap on the back of the automatic feeder.
7. Insert the mains plug and turn on the automatic feeder again using the main switch.
8. Choose **Setup > ID chip** to go to the **Read** submenu.
9. Activate the ID chip by choosing Enter.

7.2.11 Double animal number

Warning, double animal no. will appear in your display if the same number was assigned twice during the fully automated registration process.

You change the double animal number as follows:

1. Confirm **Double animal no. warning** with Enter

   The **Double** menu in animal control appears (see the **Animal control > Double** chapter in the operator's manual).

2. In **No.**, the full transmitter number of the animal appears.

3. In **Animal no.**, change the automatically assigned number.

4. In **Time** and **Date**, check when the double animal number appeared.

5. Once you have changed the animal number, confirm **confirm?** by choosing Enter.

Note: Only when you have changed the animal number will your confirmation take effect and the warning be deleted.

7.2.12 Machine capacity

Warning, Machine capacity will appear when there is no more storage space available for animal numbers or transmitter numbers.

Confirm **Machine capacity** by choosing Enter in order to view detailed information.

- **only 250 animals poss.** means: No more free animal numbers are available.
- **Transmitter storage full** means: No more storage space available for further transmitter numbers.

You rectify the fault "only 250 animals poss." as follows:

1. Cancel the registration of one or more animals in the **Animal** menu.

   ATTENTION When you cancel an animal's registration it will not receive any feed. This can lead to malnutrition. Malnutrition can cause impaired growth and development, increased susceptibility to illness or even the death of your calves. The end user must use an alternative method to supply their calves with feed.

2. Confirm **delete warning?** by choosing Enter.

You rectify the fault "transmitter storage full" as follows:

1. Choose **> Animal management > Transmitters** to go to the **Edit** submenu.
2. Select the transmitter number to be deleted and confirm **Delete** by choosing Enter.
   Note: You can only delete transmitter numbers of calves that are not registered (= status: available).
3. Confirm **delete warning?** by choosing Enter.

7.2.13 Database

The **Database warning** will appear in your display if there are errors in your database.

7.2.14 Checking the SD card (15-key hand terminal)

The **Check SD card** warning appears in your display:

- If data is to be saved manually, but no SD card is present.
- If data is to be saved manually, but the SD card is currently write-protected.
- If data is to be saved automatically but the SD card is full.
- If data is to be saved automatically but the SD card is currently write-protected.

7.3 Other faults and messages

7.3.1 Automatic feeder

7.3.1.1 Starting program

The message **High Vxx.xx starting program** appears when the control program of the automatic feeder starts.

Wait until the automatic feeder is ready to operate.

7.3.1.2 Initialization of the feeder

The message **first startup, press enter to start installation** will appear in the display in the following cases:

- When the automatic feeder starts for the first time.
- If the computer card must be replaced due to a hardware defect.

- If the battery on the computer card is depleted.

Follow the instructions on the screen. The following steps can be performed in the course of the initialization:

> Restoration of the last backup (if available).

> Entry of the language for the user interface.

> Entry of the current date and time.

7.3.1.3 NXP bootloader

The message **NXP Bootloader waiting for update** appears if the control program has started the NXP bootloader while updating the feeder version.

You correct the fault as follows:

Update the internal bootloader using FlashManagerPlus or with an SD card. Always wait until the internal bootloader has been updated before performing further steps.

7.3.1.4 Bootloader version obsolete

Bootloader version obsolete will be shown, if the automatic feeder's control program has an obsolete version of the internal bootloader. In this case, the application cannot be started.

You correct the fault as follows:

Acknowledge the message with Enter and update the internal bootloader using FlashManager-Plus or an SD card.

7.3.2 Hand terminal

7.3.2.1 CAN bus off

If a short circuit or electromagnetic discharges negatively affect the CAN cable, the message **terminal Vxx.xx CAN bus off** will appear in the display.

You correct the fault as follows:

Check the CAN bus for short circuits and other faults and correct them.

7.3.2.2 CAN bus heavy

The following faults trigger the message **terminal Vxx.xx CAN bus heavy** :

- Short circuit.
- Terminating resistor not set.
- Break in the data line.
- CAN cable incorrectly attached.
- No connection for automatic feeder control unit.

You correct the fault as follows:

- Check the CAN bus for short circuits.
- Check whether the terminating resistor has been properly set.
- Check whether the data line has been interrupted.
- Check whether the CAN cables are correctly connected.
- Check whether the data line is correctly wired and that the feeder control is working.

7.3.2.3 Waiting

The following faults prevent the hand terminal from initializing:

- The CAN bus address of the terminal is not the same as the one defined in setup of the of the automatic feeder.
- The feeder control unit is not active.

The message **terminal Vxx.xx waiting** appears.

You eliminate the faults as follows:

1. Start search mode: Press < > when you switch on the feeder and keep this key pressed.
2. When the display reappears, you have to check whether the feeder control is working.

7.3.2.4 Searching

When the hand terminal is in search mode, the message **terminal Vxx.xx searching**will appear.

You correct the fault as follows:

- Check whether the feeder is working.

- If the message is not automatically hidden in about ten seconds, you must check the feeder control.

7.3.3 Bootloader

7.3.3.1 Waiting for update

The following faults trigger the message **bootloader Vxx.xx waiting for update**:

- The automatic feeder's control program is not able to run.

  Update the program using FlashManagerPlus.

  Note: With bootloader version 02.04 and higher, you can also update the program using an SD card.

- The bootloader was (accidentally) activated while switching on.

  If the bootloader was accidentally started during the start of the automatic feeder by pressing and holding ▲0 ▼+/-, you have to restart the automatic feeder.

7.3.3.2 Flash programming

The message **bootloader Vxx.xx flash programming** will appear while the program is being updated.

Wait until the update has been completed.

7.3.3.3 Starting program

The message **bootloader Vxx.xx starting program** will appear when the bootloader for the automatic feeder starts.

Wait until the program has started.

7.4 Service messages

A service message appears in the automatic feeder's display every 4 months. This message indicates the maintenance (regular service) that must be performed. Compliance with these maintenance intervals is the only way to ensure the long life and reliability of the automatic feeder.

The following regular services (RS) have been defined:

- RS1 must be performed every 4 months.

- RS2 must be performed every 12 months.
- RS3 must be performed every 36 months.

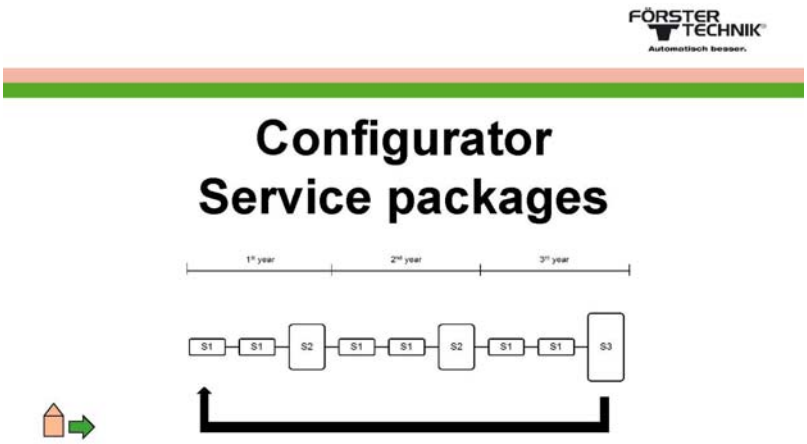
Via **Setup > Service > last**, check when the last regular service was carried out and in **Type**, check what sort of regular service it was (RS1, RS2 or RS3).

Via **Setup > Service > next**, check when the next regular service is due and in **Type**, check what sort of regular service is to be done (RS1, RS2 or RS3).

7.4.1 Service work

For each regular service, there are various service packages (sets of spare parts) with the spare parts required, which will differ, depending on the type of feeder and type of service. After replacing the parts subject to wear, you must also check that the feeder is working properly e.g. the calibration. The service work is described in the installation information for the sets of spare parts.

You can collect the corresponding service packages (sets of spare parts) via a regular service configuration tool which is available in the dealer area of Förster-Technik's web site (**www.foerster-technik.de**).



After doing the regular service, under **Setup > Service > Serv. done?** confirm the message **Use today's date as regular service date?** with Enter.

Note: This service message will be shown in the display for 3 days and will then disappear until the next regular service is due. It can be deleted earlier by pressing C; however, it will be re-created every day within these 3 days.

7.5 Diagnosis

The **Diagnosis** menu helps you to find faults in the event of technical problems. You can reach this menu via  . A diagnosis can be performed for the following parts of the automatic feeder:

- Valves
- Motors
- Heating
- Sensors
- Control system
- Version
- Setup
- Software

7.5.1 Checking valves/motors

In this menu, you check actuators (valves and motors) and their actuation.

7.5.1.1 Valves

Check the valves as follows:

1. Choose  **> Diagnosis** to go to the **Valves** submenu.
2. Confirm **Open HE water valve?** by choosing Enter in order to open the water valve. The valve remains open as long as you hold down Enter.
3. Confirm **Open milk?** with Enter to open the milk valve. The valve remains open as long as you hold down Enter.
4. Confirm **Mixer drain open?** by choosing Enter to open the mixer drain valve. The valve remains open as long as you hold down Enter.
5. Check whether the valve opens.

7.5.1.2 Motors

Check the motors as follows:

1. Choose  **> Diagnosis** to go to the **Motors** submenu.

2. Confirm **Mixer start?** by choosing Enter in order to start the mixer.
3. Confirm **Milk pump start?** by choosing Enter in order to start the milk pump.
4. Confirm **Start powder?** with Enter to start the powder conveyor.
5. Confirm **Feeding pump start?** by choosing Enter in order to start the feeding pump.
6. Confirm **Circulation pump** by choosing Enter.
7. Confirm **start?** by choosing Enter in order to start the circulation pump. (Simple functional test)
8. Confirm **check?** by choosing Enter in order to check the circulation pump. (Extensive functional test)

7.5.2 Checking the heating

In this menu, you check the boiler heater.

Check the boiler heater as follows:

- Choose  **> Diagnosis** to go to the **Heating** submenu.
- Confirm **switch on?** by choosing Enter.
- In **Boiler**, you check the temperature.
- If you hold down Enter in switch on?, the boiler is heated up. If the temperature rises, the heater is working.

7.5.3 Checking sensors

In this menu, you check the sensors of the following components:

- Supply, point and rod electrode.
- Button for the manual feeding pump (active/inactive).
- Mixer and boiler (temperatures of the liquids in the boiler and in the mixer jar).

7.5.3.1 Supply, point and rod electrode

Check the electrodes as follows:

1. Via  **> Diagnoseis > Sensors** go to the **Point electrode, point electrode** or **Rod electrode** submenu.

2. In the right-hand column, check the status (**free** or **covered**).
3. Confirm **Point electrode, point electrode** or **Rod electrode** with Enter.

   3.1 In **Status**, check the status (**free** or **covered**).

   3.2 Confirm **HE water: start?** or **Milk: start?** with Enter.

   The electrode will be triggered if **water** or **milk** is dispensed into the mixer jar and hits the electrode.
4. Confirm **Mixer: empty?** with Enter to pump out the liquid again.

7.5.3.2 Button for the manual feeding pump

Check the button as follows:

1. Choose **> Diagnosis > Sensors** to go to the **MP button** submenu.
2. In the right-hand column, check the status (**active** or **inactive**).

7.5.3.3 Temperature in the mixer and boiler

Check the temperature of the liquid in the mixer or boiler as follows:

1. Choose **> Diagnosis > Sensors** to go to the **Boiler** or **Mixer** submenu.
2. Check the temperature in the right-hand column.

7.5.3.4 Water meter

In this menu, you check the water meter.

Check the water meter as follows:

1. Choose **> Diagnosis > Sensors** to go to the **Water flow meter** submenu.
2. In **Pulses**, you check the pulses from the water meter.
3. Confirm **HE water** with Enter.

   The water meter is actuated when the number of pulses increases.
4. Confirm **Mixer: empty?** with Enter to pump out the liquid again.

7.5.4 Checking stations

In this menu, you check the feeding box(es).

> You check whether the identification system of the feeding box works.

> You can open the feeding box valve.

> In the display, you can view the control unit assigned to the feeding box.

You check the identification system of a feeding box as follows:

1. Choose  **> Diagnosis > Boxes > Feed** to go to the **Feeding box 1** or **Feeding box 2** submenu.
2. To check the identification (antenna test), hold a transmitter near the antenna.
3. In **No. ‡**, you check the transmitter number.

If the transmitter number is not recognized, proceed as follows:

> Check in the setup whether the correct identification system is configured.

> Check that the data lines between antenna and automatic feeder are undamaged.

> Check the setup for the allocation of the station that is causing identification problems.

You check the feeding box valve as follows:

1. Choose  **> Diagnosis** to go to the **Valves** submenu.
2. Confirm **open?** for the valve concernedby choosing Enter.
3. Check whether the valve opens.

7.5.5 Control

In this menu, you check the following faults:

- How often the automatic feeder was without power (**power failures**).
  Note: Switching on and off are also considered to be power failures.
- How often the feeder control unit had to be restarted after a program error (**Reset**).
- How often the connection to the **terminal** was faulty.
- How often an error occurred in connection with the **database**.
- How often the automatic feeder received no response from the **identification** system.
- How often the minimum temperature in the heat exchanger was not met (**heating**).

- How often the water test was negative (**water shortage**).
- How often the milk test was negative (**milk shortage**).
- How often the mixer could not be drained via the mixer drain valve (**mixer emptying**).
- How often the **heating** function was faulty.
- How often erroneous values were provided by the **water meter**.
- How often faults occurred during automatic cleaning of the mixer or during automatic cleaning of the heat exchanger (**cleaning**).
- How often the test of the heat exchanger was run without success (**HE not filled**).
- How often the **milk valve** or **circulation valve** was not closed properly.
- How often implausible values were reported by the **temperature sensors** in **Boiler** and **Mixer**.
- How often the **temperature** of the boiler water was **too high**. e.g., if the automatic feeder was supplied with hot water.
- How often the **supply electrode** was grounded before the mixing of a feeding portion or at the start of heat exchanger cleaning.
- How often a feeding program not permitted for the device was installed (**incorrect ID**).
- How often the automatic feeder could not switch to automatic mode because, for example, the liquid and powder feed components were not calibrated (**calibration**).
- How often the same address has been assigned in the CAN bus to devices (**double address**).
- How often a failure has occurred in connection with the **ID chip**.
- How often **Unknown transmitters** have been detected by the identification system.
- How often it has been indicated that an animal number has already been assigned (**double animal no.**).
- How often the test of the **circulation pump** was negative.
- How often the **detergent** empty indicator was displayed.

You check the faults as follows:

1. Via  **> Diagnosis** go to the **Control** submenu.
2. Select the fault that occurred.
   - In **Number**, you check how many times the failure occurred.
   - In **since**, you check when the entries were deleted the last time.
   - In **last on** or **last at** you can determine the day on which or the time at which a certain event last occurred.
3. Confirm **delete?** by choosing Enter in order to delete the fault message.

7.5.6 Version

In the **Version** menu, you can check version numbers. The following units have a version number:

- Feeder
- Processor
- ID chip
- Terminal
- Identifications at existing feeding stations.
- Peripherals

Check the version as follows:

1. Choose  **> Diagnosis** to go to the **Version** submenu.
2. Go to the desired submenu and read the version number.

7.5.7 Setup

You can only view the settings in this menu. To make changes, you must open the setup menu. (see **5** Setup on page **71** and following pages)

You check the setup settings as follows:

1. Choose  **> Diagnosis** to go to the **Setup** submenu.
2. Go to the desired submenu and check the settings.

7.5.8 Software

This menu is only intended for the manufacturer’s development department.

8 Appendix

Note: The following checklists and overviews also include additional equipment. If this equipment is not present in your specific case, skip the irrelevant items on the list.

8.1 Checklist for initial startup and restart

Note: Before each initial startup or restart of the automatic feeder, you must carefully read and observe the operating manual, particularly the safety information.

Initial startup and restart		OK?
1.	Inform the end user that the automatic feeder must be installed in a frost-proof location or must be fitted with frost protection equipment.	☐
2.	Tell end users that the automatic feeder must be protected from rain and moisture.	☐
3.	Tell the end user that the water should be of drinking water quality. Excessive calcium and/or iron and/or manganese concentrations may cause premature wear.	☐
4.	Tell end users that the hose which goes from the mixer drain valve (if fitted) to the drain shaft may not be lengthened.	☐
5.	Tell end users that the feeder and cables are to be protected against exposure to sunlight.	☐
6.	Set up the automatic feeder on an even surface.	☐
7.	Electrically ground the automatic feeder.	☐
8.	Connect milk supply.	☐
9.	Install feeding box and feeding station.	☐
10.	Connect antennas.	☐
11.	⊕ Install concentrate station (including antennas) and fill concentrate container.	☐
12.	⊕ Install animal scales: install scale control(s), install weighing platforms in the stands.	☐
13.	Install suction hoses.	☐
14.	Install safety grid for the powder hopper attachment.	☐
15.	Fill milk container.	☐
16.	Check switch setting for heating cable, condensation prevention heating and mixer jar heating (0 in summer).	☐
17.	Connect power supply.	☐
18.	Switch on automatic feeder.	☐
19.	Fill boiler with water.	☐
20.	Fill HE with milk.	☐
21.	Adjust the set and minimum temperature of the heating (in the Device data > Portion menu).	☐

22.	Check the operating mode.	☐
23.	Check time/date.	☐
24.	Define station parameters.	☐
25.	V+ Assign the function keys	☐
26.	Specify animal list.	☐
27.	⊕ Check the calibration scale.	☐
28.	Calibrate feed components and ⊕ detergent.	☐
29.	Check or set cleaning settings.	☐
30.	Perform cleaning.	☐
31.	Read and create transmitters	☐
32.	Register animals.	☐
33.	Enter correction days.	☐

Setup			**OK?**
1.	Switch off automatic feeder at the main switch and switch on again; while doing this press and hold 🕮.		☐
2.	Check the following settings:		
	2.1	Language	☐
	2.2	Check time/date, set if necessary.	☐
	2.3	Machine	
		2.3.1 Assign number and address.	☐
		2.3.2 Determine HE size.	☐
		2.3.3 Heating activated yes/no – electronic relay.	☐
	2.4	Equipment	
		2.4.1 ⊕ Mixer drain fitted yes/no.	☐
		2.4.2 Feeding pump fitted yes/no.	☐
		2.4.3 ⊕ Additive dispenser 1/2 powder or liquid present yes/no.	☐
		2.4.4 ⊕ Detergent pump fitted yes/no.	☐
		2.4.5 ⊕ Detergent sensor no/rod.	☐
		2.4.6 ⊕ Circulation valve fitted HE/no.	☐
		2.4.7 ⊕ Air valve (pulsating compressed air cleaning) fitted yes/no.	☐

	2.4.8 Circulation pump fitted yes/no.	☐
	2.4.9 Mixer temperature sensor fitted yes/no.	☐
	2.4.10 Water meter fitted yes/no.	☐
	2.4.11 Point and supply electrode fitted yes/no	☐
2.5	Identification	
	2.5.1 Set type.	☐
	2.5.2 Set squelch value.	☐
2.6	ID chip	☐
2.7	⊕Calibration scale	
	2.7.1 Activate yes/no	☐
	2.7.2 Adjust.	☐
2.8	Stations:	
	2.8.1 Activate internal feeding box(es), controlled by feeder.	☐
	2.8.2 ⊕Configure single IFS feeding box(es) / set extras, if any. For IFS feeding box(es) issue CAN bus addresses: To do that, put IFS (feeding box) into search mode and then, via search? assign address.	☐
	2.8.3 ⊕Configure quadruple IFS feeding box(es) and issue CAN bus addresses: To do that, put compact IFS unit into search mode and then, via search? Allocate address. For each of the four pumps, enter the assignment to station and its equipment.	☐
	2.8.4 ⊕Configure IFS concentrate station 1(...). Select concentrate type and automatic concentrate feeder type. Issue CAN bus addresses: To do that, put IFS (C-station) into search mode and then, via **search**? assign address.	☐
	2.8.5 ⊕Configure scale control(s) 1/x. To do this, set the CAN address on the scale control circuit board via DIP switch and enter the set address in setup. Activate any weighing units (1/2).	☐
2.9	Terminal:	
	2.9.1 Assign address	☐
2.10	Communication:	
	2.10.1 Institute yes/no	☐
	2.10.2 Printer no/serial/CAN.	☐
	2.10.3 Configure gateway, parameters.	☐
2.11	SD card	
	2.11.1 Read in feed plan	☐

Device data		OK?
1.	New installation.	☐
2.	Operating modes:	
2.1	Set rationed or ad lib mode.	☐
3.	Set milk values:	
3.1	Set MP/milk mode or MP mode.	☐
3.2	Continue with MP / machine stop.	☐
3.3	Enter milk dry matter.	☐
3.4	Activate milk draining.	☐
4.	Feeding box:	
4.1	Drain time and pause time.	☐
4.2	⊕ Check switch on and off delay for gradient or servo control.	☐
4.3	⊕ Check start and stop ramps for servo control (for IFS feeding box).	☐
4.4	⊕ Check minimum and maximum speed for servo control (for IFS feeding box).	☐
4.5	Ⓟ For parallel mode: Switch auto-calibration on or off, specify the time of auto-calibration.	☐
5.	⊕ Teat slider (close/open after xx min).	☐
6.	⊕ CalfProtect (open after xx min).	☐

Calibration		OK?
1.	MP	☐
2.	Boiler water	☐
3.	HE water	☐
4.	milk	☐
5.	⊕ Additive 1/2	☐
6.	⊕ Detergent	☐
7.	⊕ Concentrate stations	☐
8.	Ⓟ Hose pumps	☐
9.	⊕ Settings for automatic calibration of MP/water/milk.	☐
10.	⊕ Settings for automatic calibration Ⓟ of hose pump.	☐

Register		**OK?**
1.	Antenna test	☐
2.	Set the scheme for the transmitter number assignment: consecutive, automatic.	☐
3.	Read transmitter numbers.	☐
4.	Set registration mode: no, automatic, available transmitter numbers.	☐
5.	Register animals.	☐

Plans		**OK?**
Feed		
1.	Feeding plans	☐
2.	Concentrate plans	☐
3.	Milk plans	☐
4.	Quantity limitation: check minimum saved amount/maximum saved amount.	☐
5.	(P) Check the maximum speed of the hose pumps and adjust if need be.	☐
6.	(+) Weaning	☐
(+) **Concentrate**		
1.	Concentrate plan	☐
2.	Portion size	☐
3.	Quantity limitation: check minimum saved amount/maximum saved amount.	☐
4.	Activate accustoming quantity yes/no.	☐
	4.1 Check amount/threshold and adjust if necessary.	☐

Change date of individual animals		**OK?**
1.	Group	☐
2.	Feed	☐
3.	Concentration	☐
4.	Milk ratio	☐
5.	(+) Concentrate	☐
6.	(+) Additive 1 / additive 2	☐
7.	Weight	☐
8.	Plan day (correction days)	☐

Cleaning		OK?
1.	Settings:	
	1.1 Temperature, cleaning water	☐
	1.2 Detergent amount	☐
	1.3 Clean teat	☐
2.	Mixer	☐
3.	⊕ HE	☐
4.	Cleaning circuit	☐
5.	⊕ Air (pulsating compressed air cleaning)	☐
6.	Sponge	☐
7.	Suction hose	☐

8.2 Automatic feeder material list

The materials used in the automatic feeder include:

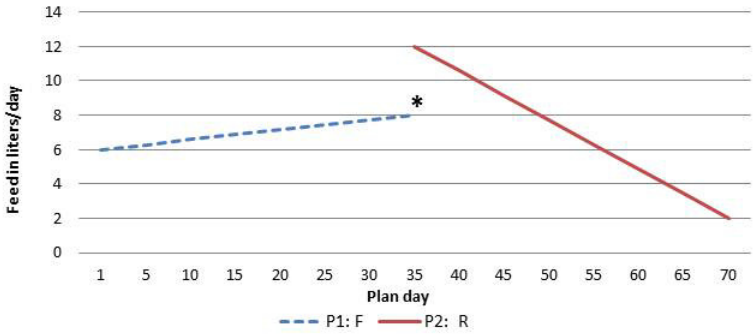
- Brass, Enzidor®
- Silicon carbide
- Carbon
- V2A, V4A
- Plastics: PET, TPE, silicone, PVC, NBR, ABS, PUR
- Viton
- Vulcanized fiber, graphitized
- Rubber
- Bronze

8.3 Automatic feeder shutdown checklist

	OK?
Empty and clean the milk powder tank	☐
Seal antenna cable glands with dummy plugs. Moisture can get in to the control boxes if the openings are not closed.	☐
Run cleaning cycle	☐
Drain water from boiler. Disconnect the water connection and turn the valve off. Remove the water hose between the water solenoid valve and the boiler and open the vent screw on the cover of the boiler to allow the water to flow out. Once the boiler is completely drained, connect the water hose and tighten the vent screw.	☐
Disconnect the milk hose and close the milk connection	☐
Drain the water from the solenoid valves and volume control valves (if there is a risk of frost!)	☐
Pull the mains plug.	☐
Basic cleaning of the powder container and dosing unit	☐
Store the equipment at a dry and, if possible, frost-free location	☐

8.4 Standard feeding plans

Standard Feeding Plan Group A



* This quantity is not intended as a maximum quantity but as a reference value to calculate an alarm level.

Standard Feeding Plan
P1: 35 days from 6 to 8 L ***F***
P2: 35 days from 12 to 2 L ***R***

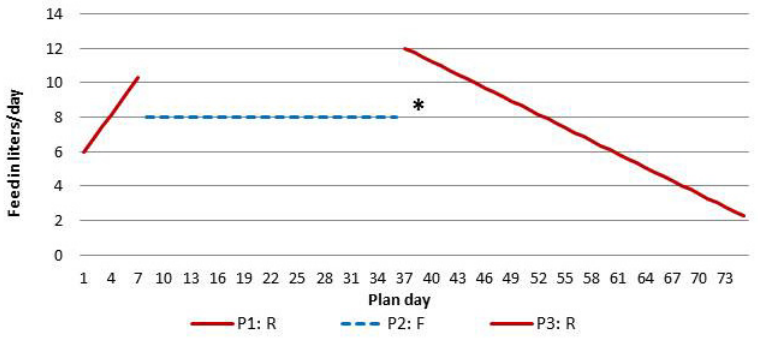
Total: 70 days

Standard Concentration Plan
P1: 70 days from 150 to 150 g/L

Standard Quantity Limitation Plan
P1: 10 days: 1.5 L (Min) 2.0 L (Max)
P2: 25 days: 2.0 L (Min) 2.5 L (Max)
P3: 35 days: 2.0 L (Min) 3.0 L (Max)

F = 40FIT feeding
R = Restricted feeding

Standard Feeding Plan Group B



* This quantity is not intended as a maximum quantity but as a reference value to calculate an alarm level.

Standard Feeding Plan
P1: 7 days from 6 to 10 L ***R***
P2: 28 days from 8 to 8 L ***F***
P3: 40 days from 12 to 2 L ***R***

Total: 75 days

Standard Concentration Plan
P1: 75 days from 150 to 150 g/L

Standard Quantity Limitation Plan
P1: 10 days: 1.5 L (Min) 2.0 L (Max)
P2: 25 days: 2.0 L (Min) 2.5 L (Max)
P3: 40 days: 2.0 L (Min) 3.0 L (Max)

F = 40FIT feeding
R = Restricted feeding

Standard Feeding Plan Group C

Standard Feeding Plan
P1: 2 days from 5.0 to 5.0 L
P2: 6 days from 5.0 to 6.0 L
P3: 21 days from 6.0 to 6.0 L
P4: 35 days from 6.0 to 2.5 L

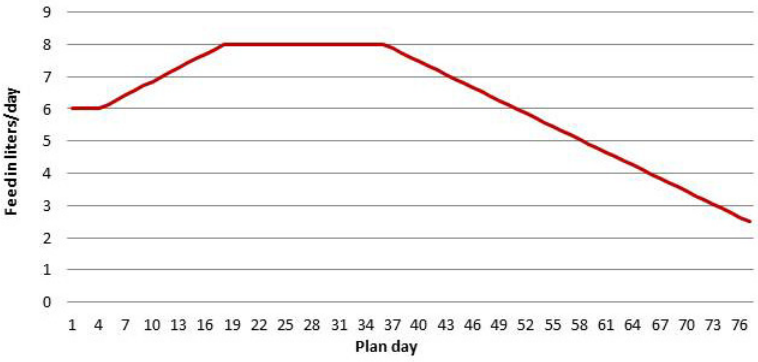
Total: 64 days = 316 L

Standard Concentration Plan
P1: 64 days from 150 to 150 g/L

Total: 64 days = 47.4 kg MP

Standard Quantity Limitation Plan
P1: 14 days: 1.5 L (Min) 2.0 L (Max)
P2: 14 days: 2.0 L (Min) 2.5 L (Max)
P3: 36 days: 2.5 L (Min) 3.0 L (Max)

Standard Feeding Plan Group D



Standard Feeding Plan
P1: 3 days from 6.0 to 6.0 L
P2: 14 days from 6.0 to 8.0 L
P3: 18 days from 8.0 to 8.0 L
P4: 42 days from 8.0 to 2.5 L

Total: 77 days = 478 L

Standard Concentration Plan
P1: 77 days from 150 to 150 g/L

Total: 77 days = 71.7 kg MP

Standard Quantity Limitation Plan
P1: 14 days: 1.5 L (Min) 2.0 L (Max)
P2: 14 days: 2.0 L (Min) 2.5 L (Max)
P3: 49 days: 2.5 L (Min) 3.0 L (Max)

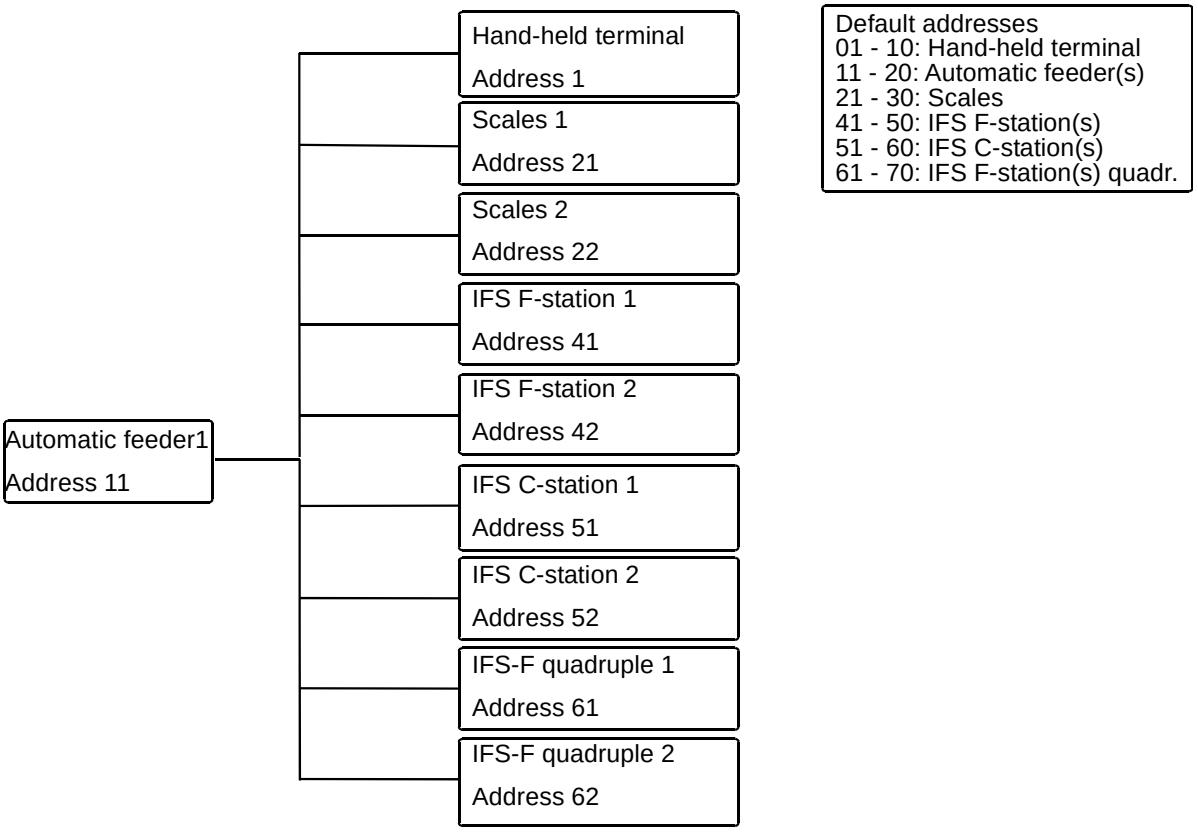
8.5 CAN bus addresses

Standard addresses

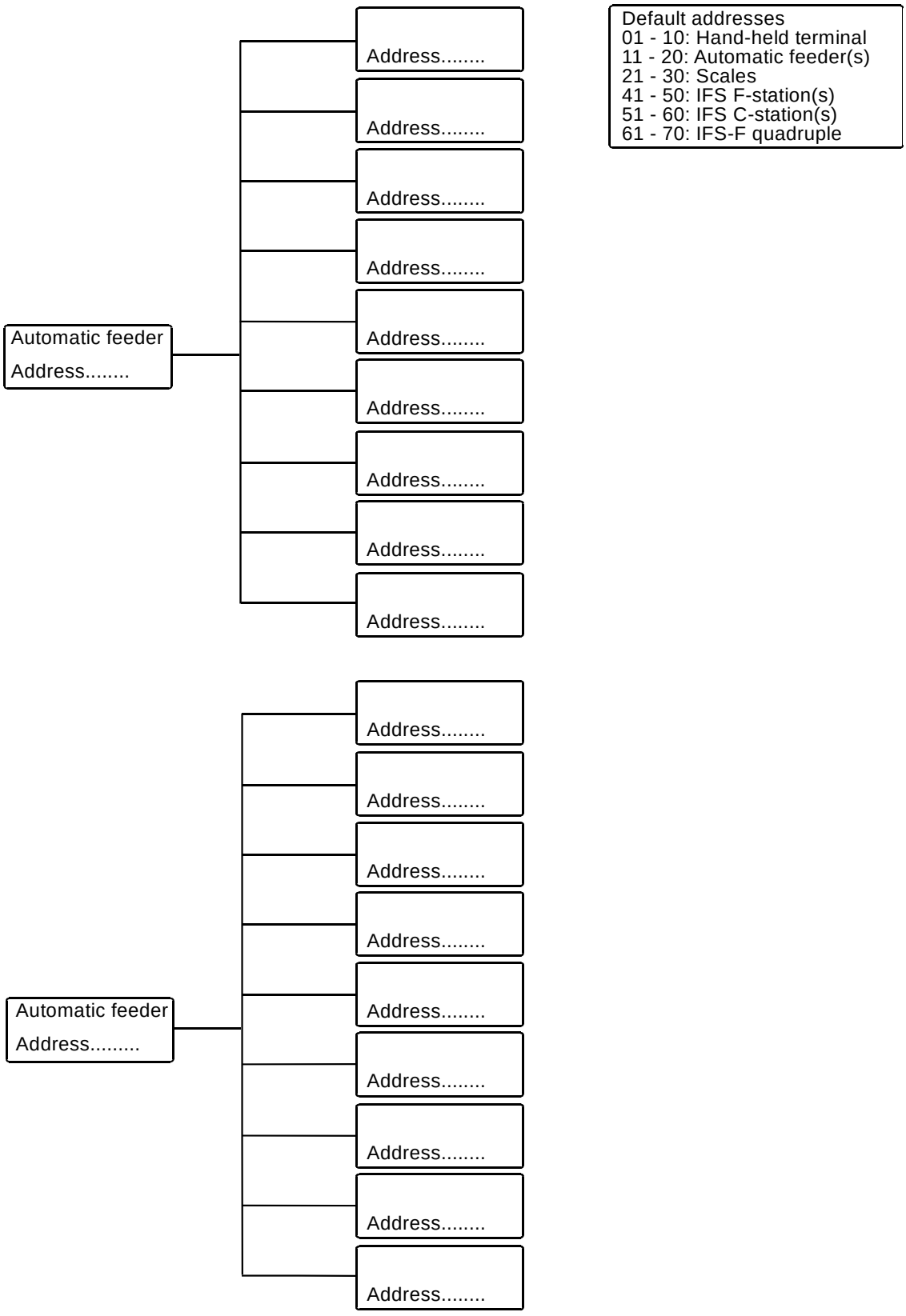
The following chart shows an example of address assignment based on default values. On the following page, you can assign completely customized addresses. Copy the template if needed.

Note: You can assign a number only once.

Note: If possible, do not change the standard addresses.



Template for custom address assignment



8.6 Components must be measured using test equipment in accordance with in national regulations

All electrical components must be checked regularly for electrical safety in accordance with the intervals and test methods defined in the national regulations.

If any faults or damage are detected during the inspection, the faulty components have to be replaced before the automatic feeder can be used again.

A

C

D

E

F

G

H

EC declaration of conformity

according to the EU Machinery Directive 2006/42/EG, Annex II, 1.A

Manufacturer:
Förster-Technik GmbH,
Gerwigstr. 25
78234 Engen

Person residing within the Community authorised to compile the relevant technical documentation:
Müller Barbara
Förster-Technik GmbH,
Gerwigstr. 25
78234 Engen

Description and identification of the machinery:

Make:	Automatic feeder
Type:	TAK5- VS1-*, TAP5-VS1-*, VDW5-VS1-*, TAK5-CS1-*, TAP5-CS1-*, VDW5-CS1-*, TAK5- VH2-*, TAP5-VH2-*, VDW5-VH2-*, TAK5-CH2-*, TAP5-CH2-*, VDW5-CH2-*, TAK1-KU2-*, TAK5-KR3-*, TAP1-ZM2-*, TAP2-ZM2-*, VDW1-WA2-*, TAP7-AH2-*
Function:	Automatic preparation, heating, and dosing of liquid feeds for young animal feeding

It is expressly declared that the machinery fulfils all relevant provisions of the following EU Directives:

2006/42/EG	Directive 2006/42/EG of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EG (recast)
2014/30/EU	Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast)
97/23/EG	(Pressure equipment) Directive 97/23/EG on the approximation of the laws of the Member States concerning pressure equipment

Reference to the harmonised standards used, as referred to in Article 7(2):

EN ISO 12100:2010-11	Safety of machinery - Electrical equipment of machines - Part 1: General requirements (ISO 12100:2010)
EN 60335-1:2012/A11:2014	Household and similar electrical appliances - Safety - Part 1: General requirements IEC 60335-1:2010 (modified)
EN 61000-6-2:2005/AC:2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-3:2007/A1:2011/ AC:2012	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments

Engen, 20.04.2016

Place, date

Signature
Markus Förster
CEO