June 29, 2017

Original Operating Manual

CalfRail

Versions: IFS 6.10 / Feeder S 2.00

CRS2-IF1-WH

Table of contents

1. Introduction . . . 5
1.1 Overview of the CalfRail . . . 6
1.1.1 CalfRail viewed from the right . . . 6
1.1.2 Interior view . . . 7
1.1.3 Front view . . . 8
1.1.4 Name plate . . . 9
1.1.5 Heating system . . . 10
1.2 Technical data . . . 11
1.2.1 Electrical connection . . . 11
1.2.2 Dimensions . . . 12
1.2.3 Weight . . . 12
1.2.4 Number of feeding stations and animals . . . 12
1.2.5 Installation requirements . . . 12
1.3 Manufacturer's contact details . . . 14

2. Important safety instructions . . . 15
2.1 Intended use . . . 15
2.2 Your requirements . . . 15
2.3 Residual risks . . . 15
2.4 Your duties . . . 16
2.5 How am I warned of hazards? . . . 17
2.5.1 What are the components of a hazard description? . . . 17
2.5.2 Potentially fatal hazards or health hazards . . . 17
2.5.3 Material damage . . . 18
2.6 Safety signs . . . 18
2.6.1 Warning signs on the machine . . . 19
2.7 Safety devices . . . 21

3. Hygiene . . . 22

4. Transmitter and animal management . . . 23
4.1 Manual registration of animals . . . 23
4.2 Canceling animals or animal groups . . . 25
4.2.1 Canceling individual animals . . . 25
4.2.2 Canceling a group . . . 26
4.2.3 Canceling weaned animals . . . 26
4.3 Changing the registration of animals . . . 27
4.4 Changing the box for the CalfRail . . . 27
4.4.1 Box/transmitter present . . . 27
4.4.2 Resetting a transmitter . . . 27

5. Feeding . . . 29
5.1 Feeding plans . . . 29
5.2 Feeding times . . . 30

5.3 Feeding of additives . . . 30
5.4 Plan for maximum speed . . . 31
5.5 Waiting times . . . 32

6. Operation . . . 33
6.1 Starting the CalfRail manually . . . 33
6.1.1 Start feeding . . . 33
6.1.2 Move feeding forward . . . 33
6.1.3 Stop feeding . . . 34

7. Cleaning . . . 35
7.1 Cleaning agents . . . 36
7.2 Preparing for cleaning . . . 36
7.3 Cleaning procedure . . . 37
7.3.1 Basic settings . . . 37
7.3.2 Flushing the suction hose . . . 37
7.3.3 Automatic cleaning . . . 38
7.3.4 Flushing circuit . . . 38
7.3.5 Teat cleaner basic cleaning (optional) . . . 40
7.3.6 Cleaning of the teat and teat holder . . . 41

8. Care and maintenance . . . 42
8.1 Daily care and maintenance intervals . . . 43
8.2 Weekly care and maintenance intervals . . . 44
8.3 Four-month care and maintenance intervals . . . 44
8.3.1 Calibration of the hose pump . . . 44
8.3.2 Automatic calibration . . . 45
8.4 Annual care and maintenance intervals . . . 45

9. Faults and warnings . . . 46
9.1 Faults . . . 46
9.2 Warnings . . . 46
9.2.1 CalfRail . . . 47
9.2.2 CalfRail pivot arm . . . 47
9.2.3 CalfRail travel to parking . . . 47
9.2.4 CalfRail travel to box . . . 47
9.2.5 CR feeding/flushing . . . 48
9.2.6 Automatic calibration . . . 48
9.2.7 Feed deviation . . . 48
9.2.8 Heating system water shortage . . . 48
9.2.9 Heating system temperature . . . 49
9.2.10 Heating sensor . . . 49
9.2.11 Heating system pump . . . 49
9.2.12 CR water heating system . . . 49
9.3 Diagnosis . . . 49

10. Disposal . . . 52

10.1 Disposing of cleaning agent residues. 52
10.2 Disposing of hoses 52
10.3 Disposing of cables. 52
10.4 Disposing of the circuit board 52
10.5 Disposal of the CalfRail. 52

11. Appendix **54**
11.1 Materials list 54
11.2 Care and Maintenance schedule / routine work 54
11.2.1 Important safety instructions. 54
11.2.2 Maintenance intervals and activities. 55

Index. **57**

1. Introduction

In this chapter you will learn how your CalfRail is constructed and how to operate it safely as intended.

Carefully read the operating manual before commissioning and ask your service technician to explain anything that you do not understand before you commission it.

Do not start up the CalfRail until you have read and understood the safety chapter (see 2. "Important safety instructions" - 15). Clarify any questions with your service technician before commissioning.

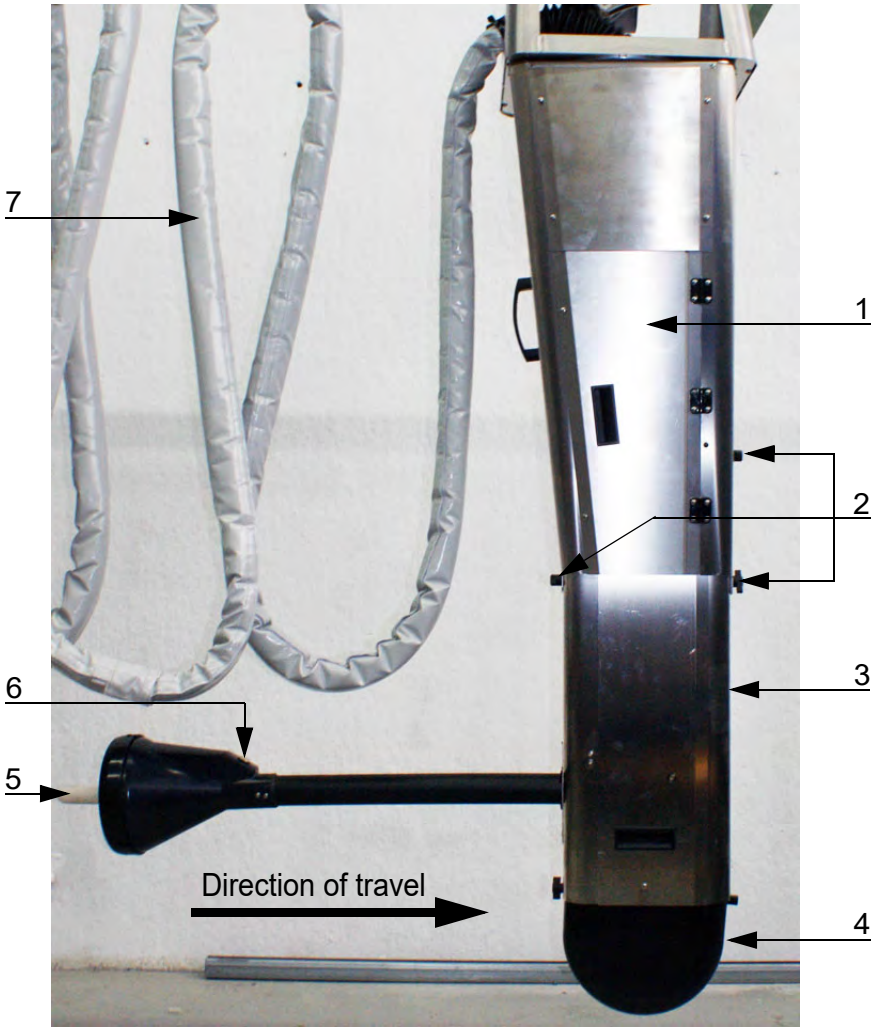
Keep the CalfRail operating manual, the operating manuals for the automatic feeders and the safety data sheets for the cleaning agents readily available at all times and pass them on to the next user.

Observe all of the warnings and safety instructions in this operating manual.

The CalfRail is connected to an automatic feeder. You must also comply with the separate operating manuals, safety instructions and warnings for the automatic feeder.

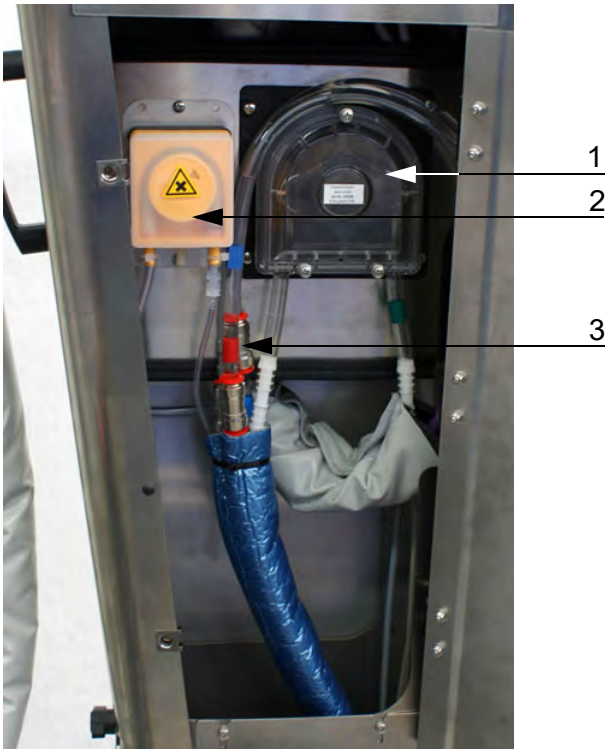
1.1 Overview of the CalfRail

1.1.1 CalfRail viewed from the right



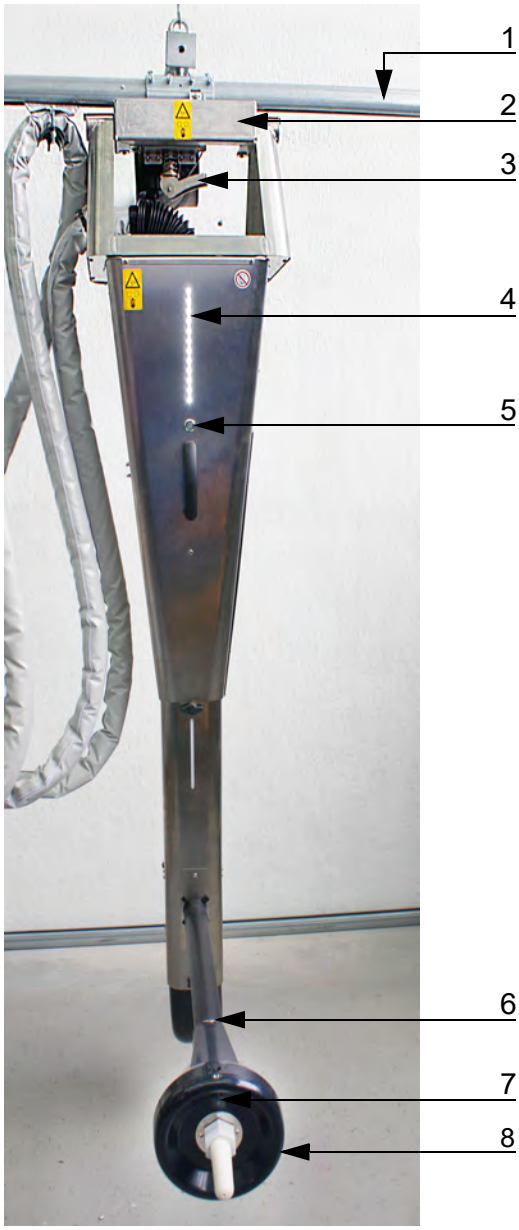
1 Service door
2 Screws to adjust teat height
3 CalfRail unit
4 Service opening for suction sensor
5 Teat
6 AFeed button with entitlement LED
7 Supply line

1.1.2 Interior view



1 Servopump
2 Pump for teat cleaning (optional)
3 Connectors for hose group

1.1.3 Front view



1 Rail
2 Drive carriage
3 Quick release
4 LED light strip
5 Continue button
6 Feed button with entitlement LED
7 Teat cleaner (optional)
8 Return valve (internal)

Continue button

If during feeding the CalfRail is in front of a box and this button is pressed, the CalfRail moves on to the next box.

Feed button

The feed button activates the servopump. The servopump makes it easier for the animals to become accustomed to automatic feed consumption and encourages weak calves to consume feed. The feed button has an integrated **Entitlement LED**:

- LED lights up: The calf has a feed entitlement.
- LED flashes slowly: The calf has a feed entitlement ≤ 0.5 liters.
- LED flashes rapidly: The calf has no feed entitlement.

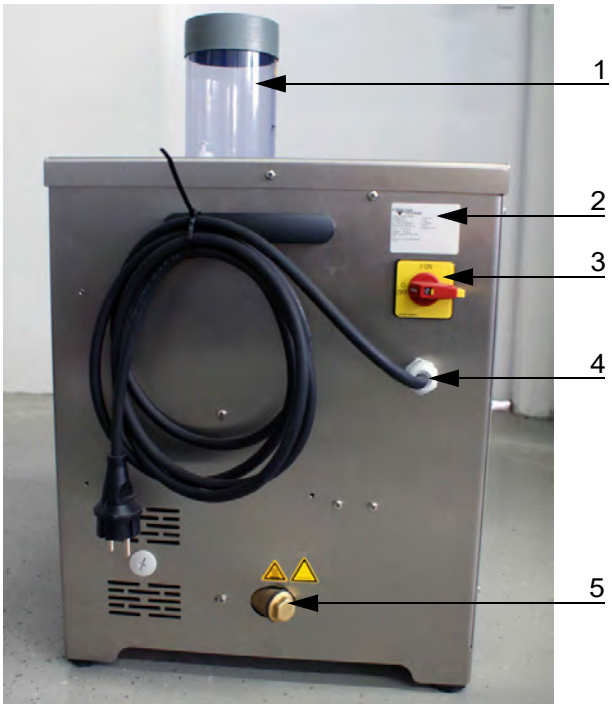
1.1.4 Name plate

There is a name plate on the left-hand exterior side of the CalfRail and on the rear of the control box and there is a component name plate on the rear of the heating system. They provide information about the manufacturer, type and number of the CalfRail, information for connecting the feeder to the mains as well as the certifications of the CalfRail. An example of a name plate is shown below.

1 Name and address of the manufacturer
2 Type and number of the CalfRail
3 Information for connection to the mains
4 Certifications of the CalfRail

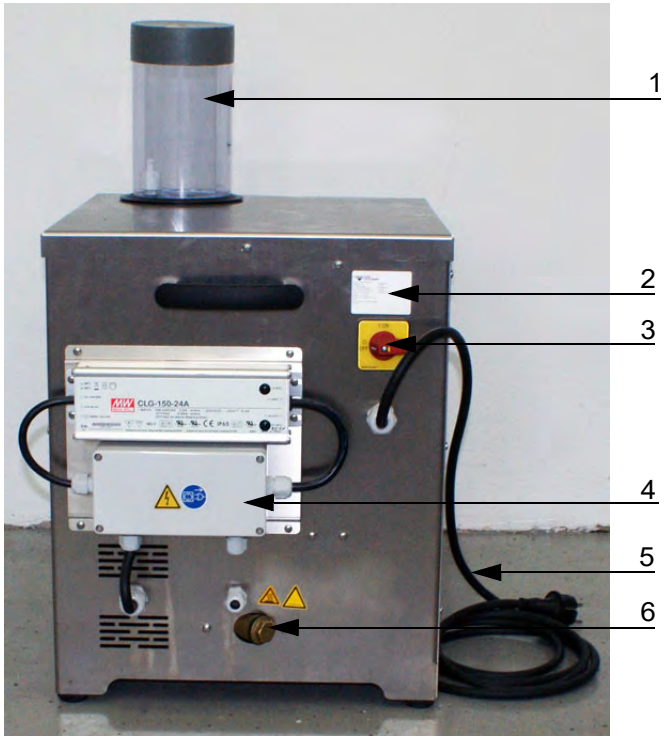
1.1.5 Heating system

Single unit rear view



1 Expansion vessel
2 Component name plate
3 Main switch
4 Mains connection
5 Filter

Double unit rear view



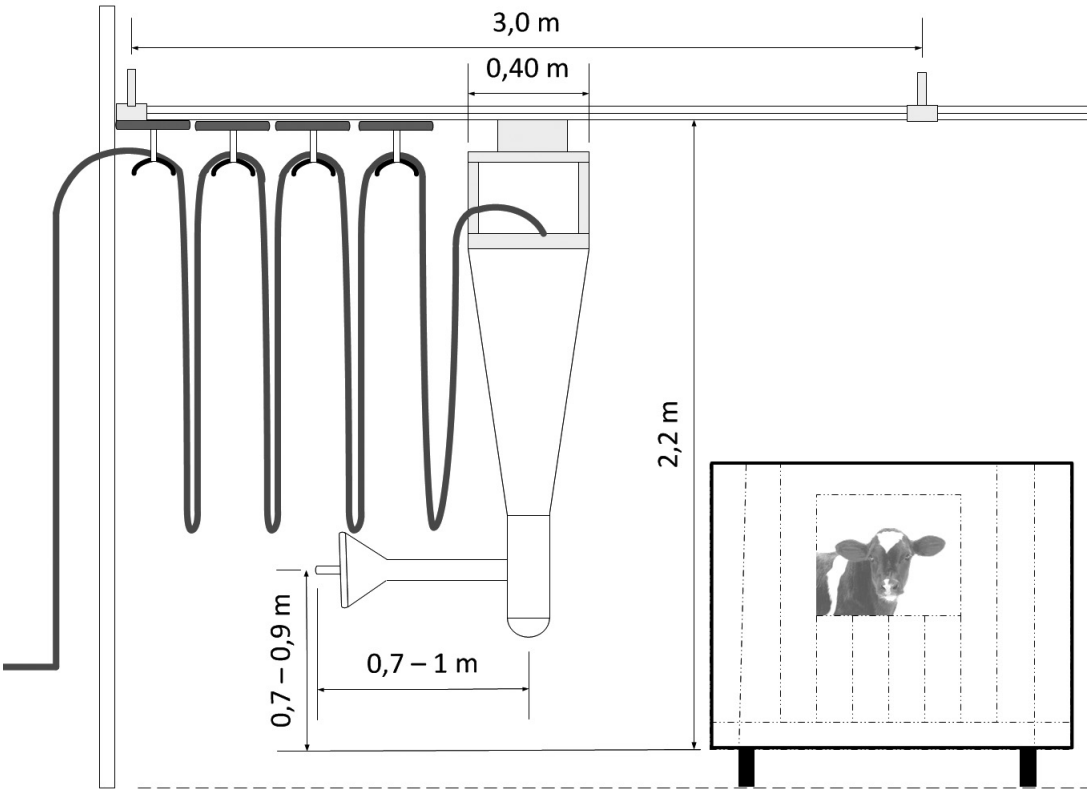
1 Expansion vessel
2 Component name plate
3 Main switch
4 Mains adapter for second CalfRail
5 Mains connection
6 Filter

1.2 Technical data

1.2.1 Electrical connection

Note: The electrical connection specifications of the CalfRail can be found on the name plate on the left-hand side of the CalfRail unit and on the component name plate of the heating system.

1.2.2 Dimensions



1.2.3 Weight

CalfRail unit: approx. 40 kg.

Water heating system: approx. 35 kg.

1.2.4 Number of feeding stations and animals

CalfRail/automatic feeder	Calves/CalfRail	Calves/side
Max. 2	Max. 32	Max. 16

1.2.5 Installation requirements

1.2.5.1 Structural integrity of the carrier system

The hanger elements for the rails on the carrier system must be designed so as to accommodate both the vertical and horizontal loads in the rail direction and perpendicular to the rail direction.

In planning the carrier system, the following hanging loads deriving from the CalfRail system must be taken into account for the carriers exposed to the greatest load:

- Vg,k = 1.0 kN (vertical hanging load resulting from the dead load)
- Vp,k = 0.10 kN (vertical hanging load resulting from the payload)
- HL,k = 0.05 kN (horizontal load in rail direction resulting from the inertial forces)
- HQ,k = 0.06 kN (horizontal load perpendicular to rail direction resulting from the transverse pull)

Note: All hanging loads include the dynamic increase factors!

The specified values apply subject to the following conditions:

- Spacing of rail fasteners $\leq$ 3.0 m
- Spacing of carriers of the carrier system on which the rail is hung $\leq$ 6.0 m

1.2.5.2 Running rail

- The running rail should be suspended at a height of 2.2 meters (measured from the calf floor level to the running rail).
- The distance between the suspension points for the running rail may not be more than 3 meters.
- The running rail must be able to carry the weight of the CalfRail unit (40 kg).
- The rail system must be installed without any inclination or tilt.
- A roof over the running rail is recommended.
- The maximum length of the hose group from the automatic feeder to the CalfRail is 30 meters for each CalfRail.
- The running rails may not be welded to the carrier system.

Note: The carrier system must be configured to suit.

1.2.5.3 Igloo/Calf box

- The calf boxes should have only a single central opening.
  - This enables easy installation as opposite-facing boxes can be set up as mirror images of one another
  - Off-center openings result in offset boxes with an individual orientation, since the teat must always come to rest in the middle of the opening. This can mean longer rail and hose lengths
- The distance from the rail to the calf box should be 0.7 - 1 meter. Therefore the feeding alley should be set up as follows:
  - At least 1 meter distance from the building wall to the calf box;
  - Minimum of 1.4 meters from calf box to calf box, up to a maximum of 2.0 meters.

1.2.5.4 Automatic feeder

As a prerequisite for operating the CalfRail, the following must be present for the installation:

- Automatic feeder VARIO smart (TA*-VS*) (with current software version)
  - Power outlet

  - Water connection
  - Drain for flushing water
- 1 x power outlet for the CalfRail
- 2 x power outlets as backup near the automatic feeder
- Ideally, a drain for flushing water at the parking position
- Space for parking position, at least 0.6 meters wide and 1.5 to 3.0 meters long

1.3 Manufacturer's contact details

Please contact us if you have any questions about our products or require technical support! When you contact us, always specify the serial number of your CalfRail. The serial number is located on the name plate on the left side of your CalfRail unit.

Also specify the device type and the program version of your automatic feeder and your CalfRail so that you can obtain service tailored to your automatic feeder. The device number and model are located on the name plate on the left of the housing of the automatic feeder and the CalfRail unit.

You can call up the program version via your hand-held terminal. The relevant menu item can be found under  **> Diagnosis > Version > Peripherals > CalfRail** or **CR water heating system**.

You can note the device type, serial number and program version in the fields provided.

Device type:

Serial number:

CalfRail program version:

Water heating system program version:

Our contact details:

Förster-Technik GmbH

Gerwigstrasse 25

78234 Engen, Germany

Phone: +49/ (0)7733/ 9406- 0

Fax: +49/ (0)7733/ 9406- 99

info@foerster-technik.de

www.foerster-technik.de

2. Important safety instructions

You will learn about the following in this section:

- The hazards presented by the CalfRail and how to avoid those hazards.
- The safety signs on the CalfRail and what they mean.
- How to operate the CalfRail safely.

The CalfRail has been designed in accordance with accepted rules of engineering and approved safety standards. Hazards and adverse effects may nevertheless arise during operation. These hazards are indicated by the warning signs directly on the CalfRail as well as the warning messages in this operating manual.

2.1 Intended use

The CalfRail is only intended for the distribution, provision, delivery and dispensing of animal feed in liquid form for the Vario automatic calf feeder.

2.2 Your requirements

You must have experience with raising calves, have extensive professional farming experience and have mastered best agricultural practices.

You must have knowledge of the accident protection regulations and be familiar with the generally recognized safety rules.

2.3 Residual risks

Hazards to life and health caused by the CalfRail:

⚠ WARNING!

Hazards due to electrical power

The CalfRail is operated with electrical power.

► You must observe the general precautions for handling electrical devices.

- Read the operating manual before commissioning the CalfRail.
- Keep children away from the CalfRail.
- Do not touch any moving parts of the CalfRail, such as the drive motor.
- Use only original replacement parts made by the manufacturer.
- Always disconnect the mains plug before performing any maintenance or cleaning on the CalfRail.
- If you are operating the CalfRail outside of enclosed spaces, you must protect it against rain and moisture, for example with a roof.
- The following specific hazards are associated with the CalfRail's electrical system:

  - **Electric shock**. If there is an electrical or voltage breakdown, electric current will flow through parts of the CalfRail that are normally isolated. Touching the unit can cause a fatal electric shock. The CalfRail must be checked regularly for electrical safety in compliance with national regulations (repeated inspection) and you must install a 30mA residual current device (RCD).
  - **Short circuit, indirect contact.** A short circuit can result in currents that are many times greater than the operating current. Touching the unit can cause a fatal electric shock. Install fuse protection (provided by the customer) with the rating specified on the name plate and a residual current device (RCD) of 30 mA in compliance with local regulations.
- **Harsh environmental conditions**. In agricultural operations, water hoses or pressure washers are often used to clean areas. This can damage the CalfRail. Never spray-wash the CalfRail.
- **Risk of becoming pulled in or trapped.** The CalfRail unit is attached to the carriage by means of a slewing ring. In order to prevent injuries to fingers, do not touch the CalfRail while it is slewing.
- **Chemical burns**. The cleaning agent used to clean the CalfRail contains caustic substances. These substances can cause serious injuries to the hands or eyes. Avoid direct contact with the cleaning agent and always wear chemical-resistant protective gloves and safety glasses when using the cleaning agent.

Material damage caused by the CalfRail

The CalfRail can cause the following types of material damage:

- **Infection**. Improper cleaning or incorrect operation can result in calves becoming infected by pathogens from the CalfRail. This can result in medical costs or death of calves.
- **Corrosion**. Improper cleaning or maintenance can result in the CalfRail ceasing to function correctly.

2.4 Your duties

- Prevent misuse by children.
- Carefully read the operating manual before commissioning your CalfRail and ask your service technician to explain anything that you do not understand before you commission it.
- Follow the health and safety and accident prevention regulations.
- To avoid injury, never stand in the line of travel or behind the CalfRail.
- Always keep the feeding area of the CalfRail clean and clean the floor regularly to prevent the risk of falling or slipping.
- When cleaning the area, take care not to damage the CalfRail.
- Only clean the CalfRail with the cleaning agents recommended in this manual (see 7.1 "Cleaning agents" - 36).
- When cleaning the CalfRail, observe the safety instructions stipulated in the safety data sheet for the cleaning agent.
- Wear the safety equipment specified in the safety data sheet for the cleaning agent, such as safety glasses and chemical-proof protective gloves, when cleaning the CalfRail.

- Operate the CalfRail only if it is in faultless condition and is fully functional.
- Operate the CalfRail if only the safety equipment is fitted and intact.
- Regularly check the fitted safety equipment to ensure that it is working properly. You will find a care and maintenance schedule in the appendix (see 11.2.2 "Maintenance intervals and activities" - 55), which provides recommendations of how often to check the various safety devices.
- Visually inspect the CalfRail for possible damage. You will find a care and maintenance schedule in the appendix (see 11.2.2 "Maintenance intervals and activities" - 55), which provides recommendations of how often you should check different parts of the CalfRail.
- Repair any damage to the CalfRail, or if you are not authorized or capable of doing this yourself, have it repaired by a service technician.
- Never carry out any unauthorized modifications to the CalfRail.
- Keep all safety signs on the CalfRail in legible condition. Replace damaged or illegible safety signs immediately. You can order new safety signs from Förster-Technik GmbH.
- Use only genuine accessories, spare parts, and wearing parts. These are available from your dealer.

2.5 How am I warned of hazards?

Hazards are indicated directly on the CalfRail by safety signs (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 given greater prominence that those for material damage, for example through the colors, hazard words or symbols used.

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

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

2.5.1 What are the components of a hazard description?

A hazard description always consists of the following elements:

- Hazard word (danger, warning, caution, attention)
- Type of hazard (what can happen?)
- Location of hazard (where can it happen?)
- Actions necessary for preventing the hazard (what should I do?).

2.5.2 Potentially fatal hazards or health hazards

A hazard symbol indicates the risk of fatal injury or detrimental effects on health. The words and symbols differ according to the severity and the likelihood of occurrence: ⚠ (Warning triangle with exclamation mark) and the following hazard words:

DANGER!

The word DANGER indicates an immediate danger that can cause loss of life or injury.

Warning signs on the CalfRail and in the operating manual: **DANGER** (white font on red background).

WARNING!

The word WARNING indicates a potentially dangerous situation that can result in loss of life or severe injury.

Warning signs on the CalfRail and in the operating manual: **WARNING** (white font on orange background).

CAUTION!

The word CAUTION indicates a potentially dangerous situation that can result in minor injuries.

Warning signs on the CalfRail and in the operating manual: **CAUTION** (white font on yellow background).

2.5.3 Material damage

The word **Attention** warns you about the risk of material damage. The CalfRail or an object in its vicinity, such as a calf, can be damaged.

NOTICE!

The word ATTENTION warns you about the risk of material damage. The CalfRail or an object in its vicinity, such as a calf, can be damaged.

Prohibitory signs on the CalfRail: A pictogram with a red line through it in a white circle with a red border indicates what you may not do.

Operating manual: white font on a blue background.

2.6 Safety signs

Different safety labels are attached at the hazardous points on the CalfRail. 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 prohibitory signs?

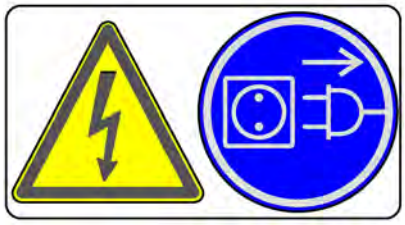
Prohibitory signs have a pictogram of the prohibited action in a red circle with a line through it. See the adjacent example. They graphically depict the prohibited action. In this example, the hose with a line through it means that you may not use high-pressure cleaners.

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.

2.6.1Warning signs on the machine

Danger of death by electric shock



Beware of hot fluids!

Danger due to hot surfaces!

Burning/scalding

Automatic startup

Never reach into the hazardous area

No spraying

Grounding symbol

2.7 Safety devices

The CalfRail may be operated only if the safety devices are complete and intact. The CalfRail has the following safety equipment:

- The safety signs (warning signs, mandatory signs and prohibitory signs).
- The safety temperature limiter of the heating system. The limiter switches off the heating system if it overheats (temperature exceeds 70°C). The heating system may be reactivated only by a service technician.

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 once all safety devices have been applied and are in the protection position!

3. Hygiene

Since you have agricultural experience with raising calves, you know the consequences of poor hygiene for the health of your calves. Common infectious sicknesses that calves suffer from include diarrhea and respiratory infections.

Every sick calf means both additional costs, such as veterinary and medication bills, together with additional time for care.

The younger the calf, the weaker its immune system – and the easier it is for infection to take hold.

Infections can never be completely excluded, however suitable hygienic measures can reduce them to a minimum.

Cleanliness is an extremely important and easily applied hygienic measure that serves to prevent infectious diseases.

Every calf raising operation can reduce its calves' risk of infection through proper and regular cleaning – and attain significant cost savings as well.

Hygienic measures save costs and time.

What are infections? Aninfection means the colonization and reproduction of germs in a host.

Germs are present everywhere. Germs become dangerous only when they reproduce and attain large numbers. The higher the number of germs, the higher the risk of infection.

Germs present in your feed, such as milk or liquid feed, can spoil it and make it unpalatable.

Germs that infect your calves, such as via infected liquid feed or other infected calves, can lead to sickness and death of those calves.

In both cases, you incur costs – which can be reduced through hygienic measures.

As an agricultural professional, it's your responsibility to identify and control sources of infection.

How do you prevent infections? Through good husbandry conditions, high quality drinking water and feed, and above all by cleanliness.

Proper cleaning is an important hygienic measure as it prevents infections.

Lack of cleaning or improper cleaning of the CalfRail can enable the germs that are present everywhere in nature to get into the nutritious liquid feed and reproduce there. As they feed, your calves can then become infected with those germs, contract a sickness and even die.

Proper cleaning of the CalfRail reduces the number of germs and therefore the infection risk.

The Cleaning chapter (see 7. "Cleaning" - 35) provides instructions on proper cleaning of the CalfRail. The appendix contains a table of recommendations regarding how to clean the individual parts of the CalfRail (see 8. "Care and maintenance" - 42).

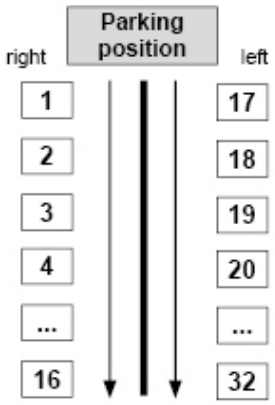
4. Transmitter and animal management

Calves are registered for the CalfRail in basically the same way as they are registered in a group with a collar. However instead of a transponder number, a box number from 999101 to 999432 is assigned. The box number is also used for the animal number.

The numbers are made up of several components:

- **999**, stands for CalfRail.
- **1 - 4**, stands for the number of the feeding box.
- **01 - 32**, stands for the box number.

If a CalfRail with two-sided feeding consists of 4 boxes, the calves are registered with the numbers 999101, 999102, 999103 and 999104. 999101 and 999102 are on the right side (direction of travel), 999103 and 999104 are on the opposite of the CalfRail.



The automatic feeder starts counting at the right-hand box closest to the parking position. The corresponding numbers must be assigned depending on how many calves are registered and to which box (see 4.1 "Manual registration of animals" - 23).

During registration, correction days, additives and weights can be entered. In doing this, comply with the operating manual for the automatic feeder.

Note: When the CalfRail is activated for the first time during setup, all box numbers are automatically created for the specified stopping positions. Delete any surplus numbers (see the transmitter and animal management chapter in the service manual for the automatic feeder).

Note: The animals must be registered before they are included in the feeding time.

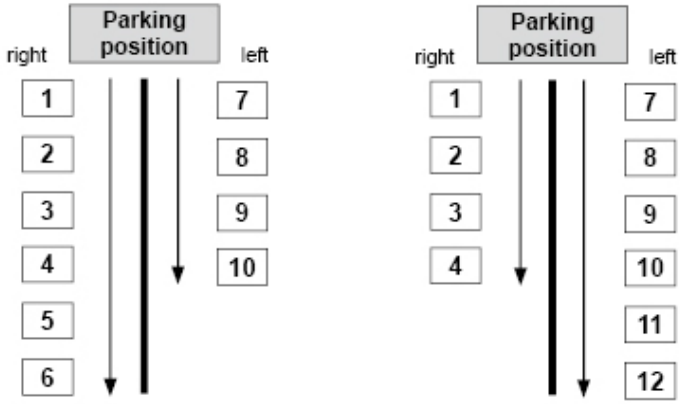
Example: Animal 999303, which is to be registered in Group B, is then included in the feeding time.

4.1 Manual registration of animals

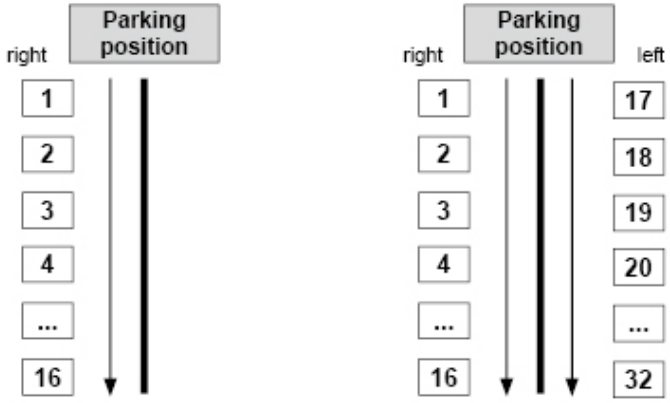
Box numbering is always on both sides, proceeding from the parking position to the rail end, and always begins on the right side (direction of travel) of the CalfRail. If the boxes are arranged on one side, a maximum of 16 animals can be entered; if the boxes are arranged in two rows, up to 32 animals (16 per side) can be entered (see illustration).

Example: If 6 boxes are arranged on the right side of the CalfRail (direction of travel), register the animals under numbers 1-6. If the boxes are arranged on the left side, register the animals under numbers 7-12.

In a two-sided arrangement (16 stopping positions), the CalfRail, starts on the right, traveling to a maximum of 16 boxes on the right side (Nos. 1 to 16), then travels back to the parking position. It then switches to the left side and serves a maximum of 16 boxes on that side (Nos. 17 to 32). After the final box, the CalfRail travels back to the parking position (see illustration).



If the number of boxes differs between the left and right sides, the number of stopping positions on the side with more positions must be entered in the setup by a service technician (see illustration).



Note: After initial installation, a magnet is attached to the corresponding box. If the boxes are subsequently moved the magnets must also be adjusted. If a box is removed, its box number must be left out during registration. Note that one magnet serves two boxes facing opposite each other.

Example: Animal 999303, which is to be registered in Group B, is then included in the feeding time.

Note: Do not remove any of the magnets, as the allocation is performed by magnet count.

Follow these steps to manually register animals for CalfRail:

1. Navigate via  **> Animal management > Registration** to the **Animal** sub-menu.
2. Select one of the available animal numbers that you wish to register.
3. In **Group**, select the group to which the calf is to be allocated.
4. If the total feeding duration for the animal is to be shortened, you can set this under **Correction day** (see the **Feeding > Total feeding duration** chapter in the operating instructions of the automatic feeder).
5. Confirm **Register?** with Enter.
6. Confirm the prompt **Register animal no. xx in group X?** with Enter.

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

NOTICE!

Once a calf has reached the end of the feeding plan, it does not receive any more feed.

This may result in malnutrition, which causes growth and development problems, increased susceptibility to disease or even the death of your calves.

► You must supply canceled calves with feed in some other way.

4.2 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 and their registration canceled. The same applies to calves whose feeding plan has expired.

4.2.1 Canceling individual animals

Follow these steps to cancel an individual animal:

1. Navigate to  **> Animal management > Cancelation** to the **Animal** sub-menu.
2. Select the desired animal number.
3. In **End of plan**, you can check how long the animal is still to be fed according to the plan.
4. In **MP**, you can check how much milk powder the calf has consumed from the time of registration to the time of cancelation.
5. In **Milk**, you can check how much milk the calf has consumed from the time of registration to the time of cancelation.
6. Confirm **Cancel?** with Enter, to cancel a calf.

NOTICE!

There is a risk of malnutrition if calves do not receive any feed.

Malnutrition in calves can cause growth and development problems, increased susceptibility to disease or even death of the calves.

► You must supply canceled calves with feed in some other way.

4.2.2 Canceling a group

Follow these steps to cancel a group:

1. Navigate via  **> Animal management > Cancelation** to the **Group** sub-menu.
2. Select the desired group.
3. In **Registered**, you can see how many animals are being fed in accordance with the respective plan.
4. In **Weaned**, you can see how many animals have finished the and therefore no longer get any feed.
5. Confirm **Cancel?** with Enter, if all animals in the group are to be canceled regardless of whether they are registered or weaned calves.
6. Confirm the security prompt **Cancel animals in Group X?** with Enter.

NOTICE!

There is a risk of malnutrition if calves do not receive any feed.

Malnutrition in calves can cause growth and development problems, increased susceptibility to disease or even death of the calves.

► You must supply canceled calves with feed in some other way.

4.2.3 Canceling weaned animals

Follow these steps to cancel weaned calves:

1. Navigate via  **> Animal management > Cancelation** to the **Weaned animals** sub-menu.
2. Confirm **Cancel?** with Enter, if weaned animals are to be canceled.
3. Confirm the security prompt **Cancel animals?** with Enter.

NOTICE!

There is a risk of malnutrition if calves do not receive any feed.

Malnutrition in calves can cause growth and development problems, increased susceptibility to disease or even death of the calves.

► You must supply canceled calves with feed in some other way.

4.3 Changing the registration of animals

You can change registered calves to another group at any time.

Follow these steps to change the group of an already registered animal:

1. Navigate via [2] **> Animal management** to the **Change registration** sub-menu.
2. Select the desired calf.
3. Select the desired feeding group in **Group**.
4. Confirm the prompt **Change registration of animal no. xx to Group X?** with Enter.

   Note: When registration is changed, the feeding day is retained; the animal is **not** reset to the start of the feeding plan (= to plan day 1).

4.4 Changing the box for the CalfRail

Registered animals can also have their registration changed to reflect being moved from one box to another box, or from a box to a group.

4.4.1 Box/transmitter present

Follow these steps to change the box of a calf registered on CalfRail:

1. Navigate via [2] **> Animal management > CalfRail box change** to the **Box/transmitter present** sub-menu.
2. Use < >, to select the desired animal and confirm **change box to...** with Enter.
3. Use < >, to select the desired, free animal number.
4. Select the desired feeding group in **Group**.
5. Confirm **Change box now?** with Enter.
6. Confirm the prompt **Register animal no. xx in group X?** with Enter.

4.4.2 Resetting a transmitter

Proceed as follows to change the box of a calf for the CalfRail and create a new transmitter number:

1. Navigate via [2] **> Animal management > CalfRail box change** to the **Reset transmitter** sub-menu.
2. Use < >, to select the desired animal.
3. In **No.**, enter the transmitter number or hold the transmitter next to the identification unit.

   Note: The transmitter numbers for the CalfRail always begin with the box number (999+) see page *23*.
4. In the Animal **No.** menu, check the suggested animal number and confirm it with Enter.

   Note: The animal number for a CalfRail calf is always the box number.
5. In **Box**, choose the feeding box at which you would like read in the transmitter.

6. In **No.**, choose **Consecutive** or **Automatic**.
7. If you have selected **Consecutive**, go to the **Next** menu and specify the animal number from which you want automatic reading of transmitters to start.
8. If you have selected **Automatic**, go to the **Range** menu and define the number range of the transmitter number that you want to use as the animal number. The animal number can have a maximum of six digits.

   Example: 5-2 means that – counting from the right – the second to the fifth numeral of the transmitter number is accepted as the animal number. **6-1** means that – counting from the right – the first to the sixth numeral of the transmitter number is accepted as the animal number.
9. Confirm **Change box now?** with Enter.
10. Confirm the prompt **Register animal no. xx in Group X?** with Enter.

5. Feeding

You may only use the CalfRail to feed liquid feed.

NOTICE!

It is recommended that you use the 40FIT Plan for calves on the CalfRail.

The 40FIT Plan ensures that the calves can actually consume feed at each set feeding time.

► If you use a rationed feeding plan, note that the calves may not have entitlement during feeding and therefore may not be fed.

The standard feeding plans A and B correspond to the 40FIT feeding principle.

The CalfRail travels automatically to the registered calves with feed entitlement at specific set feeding times:

In a two-sided arrangement (16 stopping positions), the CalfRail, starts on the right, traveling to a maximum of 16 boxes on the right side (Nos. 1 to 16), then travels back to the parking position. It then switches to the left side and serves a maximum of 16 boxes on that side (Nos. 17 to 32). After the final box, the CalfRail travels back to the parking position.

⚠ **CAUTION!**

Injuries due to impact

The CalfRail unit runs along a rail system during feeding and can strike a calf.

► To avoid injury, never stand in the line of travel or behind the CalfRail.

5.1 Feeding plans

For the preparation of the feed, the following plans will be taken into consideration.

- Quantity plan
- Concentration plan
- Quantity limitation plan
- Milk ratio plan

Please consult the operating instructions of the automatic feeder for how to set and change the individual feeding plans.

NOTICE!

If you deviate form a standard quantity plan, a calf may receive too little feed.

This may result in malnutrition, which causes growth and development problems, increased susceptibility to disease or even the death of your calves.

► You must supply canceled calves with feed in some other way.

5.2 Feeding times

In this menu, you define the number of occasions of feeding and cleaning as well as the individual feed amounts.

One feeding run to a maximum of eight feeding runs can be set. When feeding times (number of feedings) are defined, the feeding runs are displayed along with proposed times of day. These times can be changed and adjusted individually and retrospectively. We recommend times that are coordinated with operating hours and overlap with milking time, for example.

You can define feeding times as follows:

1. Navigate via  **> Feeding > Plans > Feeds** to the **Feeding times** sub-menu.
2. In the **Feeding times** line, enter the number of feedings per day.
3. In the **Number of flushings** line, enter the frequency with which the suction hose will be flushed with water before and after feeding.

   Note: The setting should be 2 flushing runs. This ensures that the CalfRail is sufficiently heated before feeding and sufficiently cleaned after feeding.
4. Define the **Times of day** at which the CalfRail is to dispense feed.

NOTICE!

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 death of the calves.

► When defining feeding times, note the defined feeding plan. Blocked periods (feed restriction) should be in the time between feedings because the CalfRail does not move to the calves if they are not entitled to feed.

Note: The duration of the feeding run is determined based on the defined waiting times (see 5.5 "Waiting times" - 32). When specifying the intervals between feeding times, take into account the duration of a feeding run.

5.3 Feeding of additives

Additives can be fed to calves at the CalfRail.

WARNING!

Hazardous or irritating substances.

Additives that are fed to the calves may contain substances that are hazardous to human health.

► Observe the manufacturer's instructions and national regulations for the use and disposal of the additive being used.

NOTICE!

If only the calves at the CalfRail receive medicine, the calves in the group box cannot consume feed during CalfRail feeding.

NOTICE!

Medicine must always be dispensed to all CalfRail calves, otherwise the feed distribution will be disrupted.

You define the medicine prescription as follows:

1. Navigate via  **> Feeding > Additive** to the **Medicine prescr.** sub-menu.
2. In the **Dispensing** line, select **[g/l]**.

NOTICE!

If calves are fed at the CalfRail, always select g/l, otherwise the feed distribution will be disrupted.

3. For more detailed procedures, consult the **operating manual of the additive dispenser**.

Note: Calves cannot be fed electrolytes at the CalfRail.

5.4 Plan for maximum speed

This plan regulates the percent of maximum speed at which the servopumps rotate. By default, at the beginning of the feeding period the pumps run at 70% of maximum speed. This value increases continuously to 90% at the end of the feeding period. If need be, you can divide the plan for the maximum speed into up to 5 periods. You can define values between 30 and 100% for the percentage of maximum speed.

Note: The speed of the pumps can be defined for each group. By adjusting the pump speed, you can ensure that calves are fed appropriately for their age.

Note: During cleaning and calibration, the pump always operates at 100%.

Set the speed as follows:

1. Navigate via  **> Feeding > Plans > Feeds** to the **Max. speed** sub-menu.
2. Use < > to select the desired group (A, B, C or D).

   The corresponding plan for maximum speed is displayed.
3. Enter the length (number of days) of the first feeding period in **P 1** and confirm your entry with Enter.
4. In the **from** column, enter the starting value for the maximum speed and confirm your entry with Enter.
5. In the **to** column, enter the final value for the maximum speed and confirm your entry with Enter.

6. Repeat these steps as necessary for P2 to P5.
7. In **Duration**, you can check the total duration of the pump speed plan.

   Note: The total duration of the pump speed plan does not have to match the length of the feeding plan period. The speed for the last defined day is maintained until the end of the feeding plan.

5.5 Waiting times

You define waiting times as follows:

1. Navigate via  **> Device data > Stations** to the **Feeds** sub-menu.
2. Use < >, to select the desired **feed station**.

   Note: Do not make any changes in the **Delay On, Delay Off** or **Start and stop ramp** lines.
3. In the **Min. waiting time** line, specify the desired time.

   The **minimum waiting time** specifies how long the CalfRail waits at a box if the calf has not consumed any feed. If the calf does not drink within the defined time, the CalfRail moves on.

   Note: The minimum waiting time increases to the maximum waiting time if the feed button is pressed or the calf starts to drink.
4. In the **Max. waiting time** line, specify the desired time.

   The **maximum waiting time** is the time that is most critical for young calves in the training feeding phase. If the feed button is pressed or the calf has already consumed some feed, the CalfRail will remain at the calf for this period.

   Note: During commissioning, we recommend the default value of **8 min** should not be changed. The maximum waiting time can be customized later.
5. **Residual sucking** is the time available to the calf after it has consumed its maximum amount of feed.

Note: The duration of a feeding run can be calculated from the minimum waiting time and the maximum waiting time per calf.

6. Operation

6.1 Starting the CalfRail manually

If a calf has never drunk at the CalfRail before, we recommended that you use the manual start for **Feed start**.

You can choose between the following methods:

- Start feeding.
- Move feeding forward.
- Stop feeding.

To start feeding the calves, use the Feed start button (see 1.1.3 "Front view" - 8).

6.1.1 Start feeding

Feeding starts and the CalfRail moves to all selected calves. If multiple CalfRail units are connected, you can select between all units (CR1+CR2).

Start the CalfRail manually as follows:

1. In the automatic mode menu, go to **Start CR manually > Start feeding**.
2. In CR, select preheating [**yes**] if you want to pre-heat the CalfRail.
3. In **CR box**, choose **[Yes]** to select the box to which the manual start should apply.

   Note: If multiple CalfRail units are connected to the automatic feeder, you must set all other feeding boxes to [**No**] to prevent the CalfRail from stopping there.
4. Navigate to the menu item **Select boxes**. Use [<] [>], to select the desired CalfRail station.
   - 4.1. In **deactivate all**, set all registered boxes to zero.
   - 4.2. In **all with entitlement**, the CalfRail stops at all calves with entitlement. These calves can be identified in the animal list on the display. The quantity consumed is recorded.
   - 4.3. In **activate all 2L**, the Calf Rail stops at all calves and supplies them with two liters of feed. The quantity consumed is recorded.
   - 4.4. In **Box xx**, there is also the facility to supply each box with feed individually and at your discretion. A feed quantity of **1-4 liters**, existing **entitlement** or **-** (do not feed) can be selected. The quantity consumed is recorded.
5. Press [Esc], to go back to the **Start CR manually** menu item.
6. Confirm **Start now?** with [Enter], to start the CalfRail run.

   Note: The most recently set values remain saved for the next start.

6.1.2 Move feeding forward.

The scheduled feeding is moved forward in time and not performed at the defined time of day. The CalfRail only stops at calves that are entitled to feed at this time of day.

You move feeding forward as follows:

1. In the automatic mode menu, go to **Start CR manually > Move feeding forward**.
2. Confirm the prompt **Start xx feeding now?** with Enter.

   Note: After feeding, ✓ is displayed in front of the defined time of day in the **CR start** line of the automatic mode menu. Feeding has already taken place.

6.1.3 Stop feeding

With this menu option, you can stop the feeding run at any time. The CalfRail unit moves to the parking position and cleaning is performed.

You can stop feeding as follows:

1. In the automatic mode menu, go to **Start CR manually > Stop feeding**.
2. In **CR box**, choose **[Yes]** to select the box for which you want to stop the run.

   Note: If multiple CalfRail units are connected to the automatic feeder, you must set all other feeding boxes to [**No**] so that they are not stopped as well.
3. In **Stop CR run**, press Enter.

   The CalfRail unit returns to the parking position and cleaning is performed.

Note: You can start another feeding after 15 minutes without preheating.

7. Cleaning

You must clean all parts of the CalfRail that come into contact with liquid or powder animal feed.

The type of feed you are using also plays a role here. For example, raw milk contains more bacteria than pasteurized milk. Therefore if you are feeding your animals raw milk you must clean more frequently than if you are feeding your animals pasteurized milk.

NOTICE!

► See the cleaning instructions in the original operating manual for your automatic feeder.

Note: This section describes the following steps using a flushing agent pump (optional). If you have not installed a flushing agent pump in your automatic feeder, you must follow the instructions for cleaning without a flushing agent pump in the operating manual of your automatic feeder.

Cleaning methods

You can use a variety of cleaning methods:

- You can clean using programs that run automatically.
- You can clean using programs that are started manually.
- You can clean manually.

Remember:

- You must follow all safety instructions in the safety data sheet for the cleaning agent you are using.
- You must always wear the protective gear, such as safety glasses and protective gloves specified in the safety data sheet for the cleaning agent you are using.
- Undiluted cleaning agent may not be drained into the ground water or sewage system. Follow the recommendations in the safety data sheet for your cleaning agent and contact your water utility company and your sewage disposal company to find out which regulations apply to you.
- Observe the cleaning intervals recommended by the manufacturer of the cleaning agent as well as those recommended in this operating manual. (see 11.2 "Care and Maintenance schedule / routine work" - 54).
- Use only the cleaning agents recommended in this operating manual.
- Follow the manufacturer's instructions regarding the quantity, temperature and concentration of the cleaning agent you are using.
- Perform all cleaning steps recommended in this operating manual.

NOTICE!

Never use cleaning agents containing chlorine, as they can attack the materials of the CalfRail and impair its function.

If this happens, your calves may not receive enough feed. This may result in malnutrition, which can cause growth and development problems, increased susceptibility to disease or even death of your calves.

7.1 Cleaning agents

⚠ WARNING!

Beware of chemical burns from cleaning agents.

The cleaning agent can burn your eyes or hands.

► Always wear safety glasses and protective gloves when using cleaning agents for cleaning. Follow the safety instructions in the safety data sheet of the cleaning agent and wear the safety equipment required by the instructions.

7.2 Preparing for cleaning

⚠ WARNING!

Beware of chemical burns from cleaning agents.

The cleaning agent can burn your eyes or hands.

► Always wear safety glasses and protective gloves when using cleaning agents for cleaning. Follow the safety instructions in the safety data sheet of the cleaning agent and wear the safety equipment required by the instructions.

Prepare for cleaning as follows:

1. Make sure the cleaning agent container is sufficiently filled.
2. Set the cleaning agent quantity and temperature in the menu. Consult the data sheet for the cleaning agent to determine the quantity recommended by the cleaning agent manufacturer.

NOTICE!

► See the cleaning instructions in the original operating manual for your automatic feeder.

3. Calibrate the cleaning agent as described in the Calibration chapter in the operating manual for the automatic feeder.
4. Have the supplied flushing adapter ready.
5. Have a damp cloth ready to clean the outside of the CalfRail unit.

NOTICE!

Damage to the housing of the CalfRail causes corrosion and impairs its function.

► Never use a pressure washer to clean the CalfRail.

7.3 Cleaning procedure

You perform the following cleaning steps:

- Flush the suction hose.
- Automatic cleaning.
- Flushing circuit.
- Teat cleaner basic cleaning.
- Cleaning of the teat and teat holder.

7.3.1 Basic settings

In the **Settings** menu, define values for the flushing temperature and the flushing agent quantity.

You define basic settings as follows:

1. Navigate to  **> Cleaning > Temperature**.
2. In **Temperature**, you can enter the desired temperature. You can enter values between 10°C and 58°C. The default setting is 45°C.

   Note: Consult the data sheet for the cleaning agent to determine the temperature recommended by its manufacturer and enter this value.
3. In **Flushing agent**, you can enter the desired amount of flushing agent. You can enter values between 0 ml/l and 25 ml/l. The default setting is 0 ml/l.

   Note: Consult the data sheet for the cleaning agent to determine the amount recommended by its manufacturer and enter this value.

7.3.2 Flushing the suction hose

You can flush the suction hose that runs from the automatic feeder to the teat with water before and after each feeding. This hygienic measure prevents clogging of the suction hose.

1. Navigate via  **> Feeding > Plans > Feed** to the **Feeding times** sub-menu.
2. In the **Number of flushing runs** line, enter the frequency with which the suction hose is flushed with water before and after feeding.

   Note: You should define at least 1 flushing run in order to prevent unhygienic conditions.

7.3.3 Automatic cleaning

The suction hose can be cleaned automatically via the **mixer flushing run** or the **heat exchanger flushing run** (for combined feeders). After the main flushing run, water containing flushing agent is automatically pumped into the CalfRail suction hose and drained into the gully through the return line.

Two automatic mixer flushing runs at 07:00 hours and 22:00 hours are preset.

NOTICE!

You do not have to set automatic mixer flushing if you have set **daily flushing for the heat exchanger**. The mixer is always flushed when the heat exchanger is flushed.

► **For more information, see the original operating manual for your automatic feeder.**

1. Navigate via  **> Cleaning** to the **Mixer** sub-menu.
2. In **Flushing runs/day**, you can enter the required number of flushing runs. You can set a maximum of four flushing runs.

   Note: In order to prevent unhygienic conditions you should define at least 1 flushing run per day.
3. For **Flushing time 1**, enter the desired time of day.
4. Repeat step 3 for additional **Flushing times** if desired.

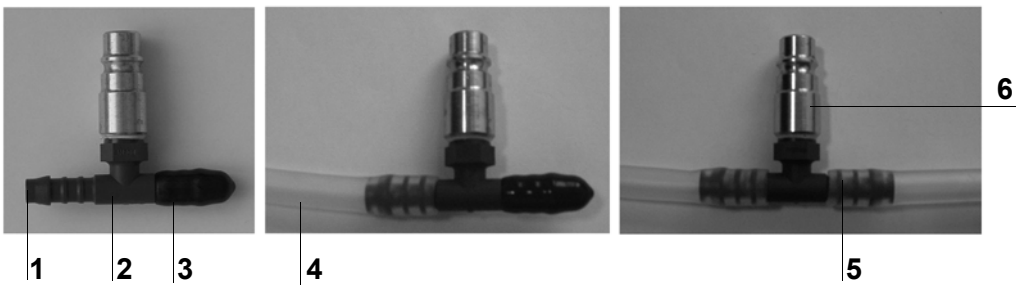
   Note: Do not schedule flushing times to coincide with feeding times.

Note: Heat exchanger flushing is set up using the same procedure.

7.3.4 Flushing circuit

In a flushing run you flush the suction hoses. Perform the flushing run at least **once a week**.

For combined automatic feeders, you will require the flushing adapter and hose nozzles shown below. For powder automatic feeders, you require the flushing adapter to attach to the mixer. These items are supplied with the automatic feeder.



1 Hose nozzle
2 Flushing adapter
3 Rubber closure cap
4 Suction hose (1st station)
5 Suction hose (2nd station)
6 Coupling for milk connection

You set the flushing run as follows:

1. Navigate via  **> Cleaning** to the flushing run sub-menu.
2. In **Water/box**, you can enter the desired amount of water. You can enter values from 0.5 l to 1.5 l. The preset default value is 1 l.

   Note: The longer the hoses, the higher the value you must select.
3. Confirm **Start?** with Enter.

   The message **Exit automatic mode?** appears on the display.
4. Confirm **Exit automatic mode?** with Enter.
5. In **Flushing agent**, you can enter the desired amount of flushing agent. Use the amount recommended in the data sheet for your cleaning agent.

   The automatic feeder will start the **pre-flushing**. After the mixer has been automatically pumped out, clear instructions are shown on the display. Follow these instructions:

   5.1. Remove the end of the CalfRail return hose from the gully and push it onto the plastic hose connectors of the flushing adapter or mounting holder.

   Note: If multiple CalfRails or additional boxes are connected, all the stations must be included in the flushing process.

   5.2. Position the flushing adapter and-or mounting holder so that the flushing water can drain directly into the gully.
6. To confirm that the instructions have been followed, press Enter.

   The automatic feeder continues the **pre-flushing**. When pre-flushing is completed, further instructions appear on the display. Follow these instructions:

   6.1. Suspend the CalfRail return hose in the mixer using the mounting holder (for automated powder feeders).

   6.2. Disconnect the milk hose from the milk connection of the automatic feeder and connect the flushing adapter to the milk connection of the automatic feeder (for combined feeders).
7. To confirm that the instructions have been followed, press Enter.

   The automatic feeder will start the **main flushing run**. The remaining time appears on the display. When the main flushing run is completed, further instructions appear on the display. Follow these instructions:

   7.1. Remove the mounting holder from the mixer and position the flushing adapter with the connected hose so that the flushing water can drain directly into the gully (for automatic powder feeders).

   7.2. Disconnect the flushing adapter with the connected hoses from the milk connection and position the flushing adapter with the connected hoses so that the flushing water can flow directly into the gully (for combined feeders).
8. To confirm that the instructions have been followed, press Enter.

   The automatic feeder starts the **rinsing** cycle.

Wait until the cleaning has been completed.

8.1. For combined automatic feeders, reconnect the milk hose to the automatic feeder, if necessary.

8.2. Remove the flushing adapter from the CalfRail return hose and place the end of the hose back in the gully.

8.3. If additional boxes are connected, bring the hoses back to the starting position.

9. Press Esc until the message **Start automatic mode?** appears on the display.
10. Confirm **Start automatic mode?** with Enter.

    The automatic feeder is now operating in automatic mode again.

7.3.5 Teat cleaner basic cleaning (optional)

The dosing device for the teat cleaner must be cleaned every time there is a change of additive or if there is a long break out of use.

⚠ WARNING!

Beware of chemical burns from cleaning agents.

The cleaning agent can burn your eyes or hands.

► Always wear safety glasses and protective gloves when using cleaning agents for cleaning. Follow the safety instructions in the safety data sheet of the cleaning agent and wear the safety equipment required by the instructions.

1. Place the bucket under the teat.
2. Exit automatic mode of the automatic feeder.
3. Disconnect the hose from the liquid reservoir and empty the reservoir.
4. Flush out the liquid reservoir with clean water.
5. Fill the liquid reservoir with clean water and reconnect the suction hose to it.
6. Navigate via 📖 **> Diagnosis > Stations** to the **Feeds** sub-menu.
7. Use < >, to select the desired CalfRail.
8. Confirm **Teat cleaning?** with Enter and hold down the key until approximately half of the available liquid has been dispensed. The dosing pump is activated and the line system is flushed.
9. If **decommissioning:** Fully drain the liquid reservoir and fully empty the flushing water from the liquid reservoir. Start the dosing pump to empty the hose.
10. If **changing fluid:** Fully drain the liquid reservoir and fill it with a liquid. Start the dosing pump to fill the hose.
11. Clean the nozzle on the teat holder.
12. Switch the automatic feeder back to automatic mode.
13. Remove the bucket and dispose of the cleaning agent.

7.3.6 Cleaning of the teat and teat holder.

The teat and holder should be cleaned as needed or if feeding is to be interrupted for a longer period.

⚠ WARNING!

Beware of chemical burns from cleaning agents.

The cleaning agent can burn your eyes or hands.

► Always wear safety glasses and protective gloves when using cleaning agents for cleaning. Follow the safety instructions in the safety data sheet of the cleaning agent and wear the safety equipment required by the instructions.

1. Exit automatic mode of the automatic feeder.
2. Remove the teat and clean it inside and out.

   Replace the teat if necessary. New teats are available from your dealer.
3. Only clean the teat holder by hand using a damp cloth.
4. Reattach the teat to the holder.
5. Switch the automatic feeder back to automatic mode.

8. Care and maintenance

This chapter covers regular maintenance and functional inspections of the CalfRail. These activities ensure that the required hygienic standards are maintained. Maintenance includes additional measures to preserve hygiene that are not described in the cleaning chapter, as well as scheduled replacement of wearing parts. Visual and functional testing of components as well as replacement of the teat can be carried out by the owner/operator.

Note: Repair work and the replacement of wearing parts on or in the CalfRail, with the exception of the teats, may be carried out only by a service technician.

On a regular basis, you must visually inspect and test the functions of the CalfRail and its components, clean it to maintain hygiene, calibrate it and replace simple wearing parts such as the teat. Depending on the CalfRail component in question, and depending how you run your CalfRail, you must perform inspections and maintenance once a week, once every four months and once a year.

Note: For a quicker overview, see the care and maintenance schedule in the appendix (see 11.2 "Care and Maintenance schedule / routine work" - 54).

DANGER!

Fatal electric shock

The electrical components of the CalfRail are live.

► Always disconnect the mains plug of the heating system before starting work on its components.

DANGER!

Beware of injuries due to automatic starting up.

The servopump may start up automatically at any time, crushing your hand or fingers.

► Do not reach into the hazard area of the servopump. Always disconnect the mains plug of the heating system before starting work on its components.

WARNING!

Injuries due to being pulled in or trapped.

The CalfRail unit is attached to the carriage by means of a slewing ring.

► In order to prevent injuries to fingers, do not touch the CalfRail while it is slewing.

⚠ WARNING!

Beware of chemical burns from cleaning agents.

The cleaning agent can burn your eyes or hands.

► Always wear safety glasses and protective gloves when using cleaning agents for cleaning. Follow the safety instructions in the safety data sheet of the cleaning agent and wear the safety equipment required by the instructions.

⚠ WARNING!

Risk of burns due to hot surfaces

The expansion vessel of the heating system contains hot water.

► Allow the water to cool down before opening the cover of the expansion vessel.

8.1 Daily care and maintenance intervals

Perform the following inspections on a daily basis:

- Check the safety devices of the CalfRail for visible damage. Are the warning signs still legible? Immediately replace any warning signs that are difficult to read or damaged. New warning signs are available from Förster-Technik GmbH.
- Check the hangers and the rail system for visible damage. Disconnect the mains plug in the event of damage. Contact your service technician immediately. All repairs must always be performed by a service technician.
- Check the CalfRail unit and the power and water lines for visible damage. Never operate the CalfRail with a damaged power supply line. Disconnect the mains plug in the event of damage. Contact your service technician immediately. All repairs must always be performed by a service technician.
- Check the teats and suction hoses for the following:
  - **Leaks and wear**. Replace damaged or leaky teats immediately and have a service technician replace damaged or leaky suction hoses. Leaky hoses will draw in air, which impairs the functioning of the CalfRail. As a result, your calves could receive insufficiently concentrated feed and would not be supplied with any feed or enough feed. This may result in malnutrition, which can cause growth and development problems, increased susceptibility to disease or even death of your calves. New teats are available from your dealer.
  - **Cleanliness**. Clean dirty teats and hoses as described in 7.3.4 "Flushing circuit" - 38.
- Check the teat holder and teat cleaner nozzle for soiling, damage and wear. Clean the teat holder and teat cleaner nozzle as needed and have worn-out parts replaced by your service technician.
- Inspect the servopump along with the suction sensor for damage and wear. Worn parts must be replaced by your service technician.

- Check the supply line for damage. The supply line may be repaired only by your service technician.
- Check the water level of the expansion vessel of the heating system. Add water until the water level in the expansion vessel is between the Min. and Max. marks.

  Note: Check the concentration of the antifreeze in the system if necessary.
- Check to ensure that the heating system is working properly. The heating system may be repaired only by your service technician.

8.2 Weekly care and maintenance intervals

- Check the stability of the hanger and rail system.
- Check to ensure that your flushing runs are effective.
- Check the drive motor for optimal operation and have the drive pulley tightened by your service technician, if necessary.
- Check the outside of the return valve for leakage and damage. If fluid is dripping from the teat holder this means the return valve is not leak-tight. The return valve may be repaired only by your service technician.

8.3 Four-month care and maintenance intervals

- replace all teats. This measure reduces the risk of infection. You can purchase new teats from your dealer.
- Calibration of the hose pumps. If you do not have a service contract for this service, you must perform recalibration of the hose pumps yourself.

NOTICE!

If you do not recalibrate the hose pumps regularly, your calves will not receive enough feed or feed with incorrect composition.

This will result in malnourishment, which can cause growth and development problems, increased susceptibility to disease or even death of your calves.

8.3.1 Calibration of the hose pump

The first calibration is performed by your service technician during initial commissioning.

You must manually recalibrate the hose pump since over time various factors, such as fluctuating water pressure, can cause the actual amount to differ from the target amount.

To calibrate the hose pump:

1. Navigate via  **> Calibration > Hose pumps** to the **Hose pumps** sub-menu.
2. Use < > , to select the desired feeding box.
3. Confirm **Start?** with Enter. The calibration procedure starts. The sequence of the procedure is automatic.

4. When the calibration is completed, the **Calibration completed** message appears on the display.

8.3.2 Automatic calibration

With automatic calibration, all pumps are automatically calibrated once a day. If one of the new automatically determined calibration values deviates greatly from the previous value, then the previous value will remain valid. The **Auto-calibration warning** then appears.

1. Navigate to  **> Calibration > Settings > Hose pumps**.
2. In **Auto-calib.**, select **Yes** if you want automatic calibration to be performed.
3. Select the time at which the automatic calibration should take place at **Calibration time**. The default setting is for each automatic calibration to occur at 00:00 hours.

8.3.2.1 Setting the tolerance values

A tolerance value can be separately set for every feeding box. This defines by how many percentage points the new automatically determined calibration value can deviate from the previous calibration value and still be seen as valid and therefore be accepted as the new value.

1. Navigate to  **> Calibration > Hose pumps**.
2. Use  , to select the desired feed station.
3. Enter the desired percentage for the tolerance value in **Tolerance**.

Default value:	15 %
Permitted range of values:	5 to 50 %

Note: If the value determined by the automatic calibration is discarded, then the Auto-calibration warning is displayed (see 9.2.6 "Automatic calibration" - 48).

8.4 Annual care and maintenance intervals

- Have the pump hose of the servopump and the pump of the teat cleaner unit replaced by your service technician.
- Have the suction hose, which runs from the servopump to the teat replaced by your service technician.
- Have the return valve and the suction sensor cleaned and the diaphragms replaced by your service technician.
- Visually inspect the louvers of the heating system for dirt and have your service technician clean the louvers and the filter if necessary.
- Have the suction hose in the supply line replaced by your service technician if necessary.

9. Faults and warnings

The Auto LED on the hand-held terminal flashes to alert you to faults during CalfRail operation. Each specific fault is described by fault and/or warning messages on the display of your automatic feeder.

You must remedy operating faults immediately. Unremedied faults, especially during feed preparation, can result in malnourishment of your calves.

NOTICE!

If feeder operation is interrupted, your calves will not receive any feed. This will lead to malnutrition.

Malnutrition in calves can cause growth and development problems, increased susceptibility to disease or even death of your calves.

► You must provide feed to your calves in some other way for as long as the automatic feeder is out of service.

You can remedy some of the faults yourself. You will be informed of faults that only a service technician may remedy.

Note: Also follow the instructions in the operating manual for the automatic feeder.

9.1 Faults

In the event of a **fault** automatic mode is interrupted and no feed is prepared. Respond immediately to the fault and ensure that your calves are provided with feed in some other way for as long as the automatic feeder is out of service.

NOTICE!

If feeder operation is interrupted, your calves will not receive any feed. This will lead to malnutrition.

Malnutrition in calves can cause growth and development problems, increased susceptibility to disease or even death of your calves.

► You must provide feed to your calves in some other way for as long as automatic feeding is interrupted.

9.2 Warnings

In the case of a **warning**, automatic mode of the automatic feeder is not interrupted, and feeder operation continues. In the case of warnings regarding the CalfRail, no feeding takes places until the warning has been remedied.

NOTICE!

If feeder operation is interrupted, your calves will not receive any feed. This will lead to malnutrition.

Malnutrition in calves can cause growth and development problems, increased susceptibility to disease or even death of your calves.

► You must provide feed to your calves in some other way for as long as automatic feeding is interrupted.

9.2.1 CalfRail

If the CAN connection between the automatic feeder and CalfRail unit cannot be established, **CalfRail Warning** appears on the display.

You must contact a service technician immediately.

9.2.2 CalfRail pivot arm

If the CalfRail experiences a timeout while pivoting, the **CalfRail pivot arm warning** appears on the display.

To rectify the fault, proceed as follows:

1. Confirm **CalfRail pivot arm** with Enter.
2. In **pivot arm right/left?**, press Enter and check whether the CalfRail detects the positions.

   Note: The CalfRail may not be rotated more than 180°. Instead, it must be rotated back to the starting position by confirming movement in the opposite direction.
3. Once the fault has been rectified, delete the warning.

9.2.3 CalfRail travel to parking

If the CalfRail experiences a timeout while traveling to the parking position, the **CalfRail travel to parking** warning appears on the display.

To rectify the fault, proceed as follows:

1. Confirm **CalfRail travel to parking** with Enter.
2. In **Carriage travel forward/reverse?**, press Enter and check whether the motor is still working and the magnets were detected.
3. Move the CalfRail to the parking position with **CR travel to parking**.
4. Once the fault has been rectified, delete the warning.

9.2.4 CalfRail travel to box

If the CalfRail experiences a timeout during feeding, the **CalfRail travel to box warning** appears on the display.

To rectify the fault, proceed as follows:

1. Confirm **CalfRail travel to box** with Enter.
2. In **travel forward/reverse?**, press Enter and check whether the motor is still working and the magnets were detected.
3. Move the CalfRail to the parking position with **CR travel to parking**.
4. Once the fault has been rectified, delete the warning.

9.2.5 CR feeding/flushing

During a flushing run or when heating the CalfRail, if water is not pumped through the hose within a certain amount of time (usually max. 2 minutes), the **CR feeding/flushing warning** appears on the display.

To rectify the fault, proceed as follows:

1. Confirm **CR feeding/flushing** with Enter.
2. Check whether the suction hose is clogged.
3. In **Pump forward/reverse?**, press Enter and check whether air in the system is preventing the pump from delivering.
4. Once the fault has been rectified, delete the warning.

Note: If the warning appears again, contact a service technician immediately.

9.2.6 Automatic calibration

The **Auto-calibration warning** indicates that the value determined during the last auto-calibration was not accepted since it deviated greatly from the current calibration value.

1. Calibrate (depending on the text of the message) the box for which the warning was issued (see 8.3.1 "Calibration of the hose pump" - 44).
2. Once the fault has been rectified, delete the warning.

   Note: You can change the tolerance value for the acceptance of the determined auto-calibration value in the calibration menu for the respective box.

9.2.7 Feed deviation

If the deviation between dispensed and the consumed amount is greater than 2 liters per pump, the **Feed deviation warning** appears on the display.

You must contact a service technician immediately.

9.2.8 Heating system water shortage

If there is insufficient water in the heating system, the **CR heating system water shortage** message appears on the display.

⚠ WARNING!

Scalding with hot water.

The expansion vessel and the hoses of the heating system contain hot water.

► Allow the water to cool down before starting work on the heating system.

1. Check the water level in the expansion vessel of the heating system. Add water until the water level in the expansion vessel is between the Min. and Max. marks.

   Note: Check the concentration of the antifreeze in the system if necessary.

Note: If this warning appears frequently, contact a service technician immediately.

9.2.9 Heating system temperature

If the heating system or the temperature sensor are defective, or if the safety temperature limiter of the heating system has been triggered, the **CR heat. temperature** message appears on the display.

You must contact a service technician immediately.

9.2.10 Heating sensor

If a temperature sensor or float switch short circuits, or the sensors are not connected correctly, the **CR heating sensor** message appears on the display.

You must contact a service technician immediately.

9.2.11 Heating system pump

If the pump is activated and after a certain period of time there has been no change in temperature, the **CR heating system pump** message appears on the display.

You must contact a service technician immediately.

9.2.12 CR water heating system

If the CAN connection between the automatic feeder and the water heater cannot be established, **Warning CR water heating system** appears on the display.

You must contact a service technician immediately.

9.3 Diagnosis

In the event of an error, or to test the CalfRail, you can check the settings via the **Diagnosis** menu.

Test the settings of the CalfRail as follows:

1. Navigate via  **>Diagnosis > Stations** to the **Feeds** sub-menu.
2. Use < > , to select the desired CalfRail.
3. Test the options in the **Feeding box** assigned to the CalfRail:

3.1. **Move to park:** This function moves the CalfRail unit into the parking position. Pressing Enter, moves the CalfRail unit into the parking position. The display shows how long the unit will remain in the parking position.

3.2. **Carriage travel forward:** With this function, you can check that each magnet is in its correct position. Press Enter, until the first magnet is detected and the CalfRail stops.

Press Enter, again until the CalfRail has reached the next magnet.

Note: If the CalfRail stops in a position offset from the output of the box, the magnets must be moved in order to optimize the stopping position.

3.3. **Carriage travel reverse:** Press and hold Enter, until the CalfRail has reached the parking position.

Note: When traveling in reverse, the CalfRail moves to each individual magnet and stops automatically. The CalfRail must not go past the parking position magnet. Release the Enter button once the CalfRail has reached the parking position.

3.4. **Pump forward / reverse:** Press  **> Boiler water start?**, to add approximately 1 liter of water to the mixer. Then press Enter to run the hose pump forwards until the hose has been vented and is filled with water. The hose pump is pumping forwards when fluid squirts out of the teat. Reverse pumping delivers the fluid back into the mixer.

Note: This process may take several minutes. You may have to refill the mixer with water by means of the manual function.

3.5. **Pivot arm right / left:** Pressing Enter, rotates the pivot arm in one direction until the corresponding limit switch is reached or the key is released.

Note: The CalfRail must not be turned more than 180°. Instead, press “Confirm” to turn it back in the opposite direction until it reaches its initial position.

3.6. **Teat cleaning** (option): This function allows you to fill the optional teat cleaning hose. Press and hold Enter, until water comes out of the nozzle.

3.7. **LED Entitlement:** Pressing Enter, allows you to check whether the entitlement LED on the feed button is working.

3.8. **LED Light:** Pressing Enter, allows you to check whether the LED light strip is working.

3.9. **Return valve:** Pressing Enter, allows you to check whether the return valve is working.

3.10. **Control unit:** Here you can view the CalfRail control unit to which the feeding box is assigned.

4. In **CR water heating system**, you can control the settings of the heating system.

4.1. In **Allocation**, you can see which heating system is allocated.

4.2. In **Boiler, Return** and **Outside**, the respective temperatures are displayed.

4.3. In **Heating system**, you can set the temperature to which the water should be heated. Confirm your entry with Enter. The heating cycle will now start.

4.4. In **Pump**, you can set the speed of the pump in **percent** . Confirm your entry with Enter. The pump will now start to rotate.

4.5. In **Float**, you can see whether the float in the expansion vessel is **covered** or **free**. If it is free, the expansion vessel must be topped up.

4.6. In **Heating up**, you can start the heating process, confirming **start?** by pressing Enter. During heating up, **running!** is displayed.

4.7. In **search?**, you can start the search process.

10. Disposal

All CalfRail components, liquids and solids must be disposed of in compliance with the applicable official regulations for proper waste recycling and disposal in your country. If you are not certain which regulations apply to you, ask your service technician and use the Internet or the yellow pages to find out which government agency is responsible for your jurisdiction. Contact the appropriate authorities and find out which regulations apply to you.

Always observe the safety data sheets supplied with some components, liquids and solids.

Before you dispose of the CalfRail feeder, you must have it shut down by a service technician.

10.1 Disposing of cleaning agent residues.

Dispose of the cleaning agent residue. For information about disposal of cleaning agents, see the data sheet for the cleaning agent.

⚠ WARNING!

Beware of chemical burns from cleaning agents.

The cleaning agent can burn your eyes or hands.

► Always wear safety glasses and chemical-proof gloves when disposing of cleaning agents. Follow the safety instructions in the safety data sheet of the cleaning agent and wear the safety equipment required by the instructions.

10.2 Disposing of hoses

Dispose of hoses as controlled waste or municipal waste, depending on the material. Read the disposal instructions on the packaging of the hoses, or contact your waste disposal center for instructions.

10.3 Disposing of cables

Depending on the material, dispose of the cables as hazardous waste or as household waste. Read the disposal instructions on the packaging of the cables, or request instructions from the relevant authorities.

10.4 Disposing of the circuit board

The CalfRail and the heating system have a printed circuit board. You must dispose of this component separately. Ask your waste disposal company where you can dispose of electronic waste.

10.5 Disposal of the CalfRail

For disposal instructions, contact the appropriate authorities, such as your waste disposal company or local government agency.

See the appendix for an overview of the materials in the CalfRail.

Dispose of the CalfRail.

11. Appendix

11.1 Materials list

The following materials are used in the CalfRail, among others:

- V2A, V4A
- Plastics: TPE, silicone, PVC, NBR, ABS, PUR, PA, PC, POM, PP, CR, EPDM, PE
- Rubber
- Die-cast zinc
- Bronze
- Brass
- Die-cast aluminum

11.2 Care and Maintenance schedule / routine work

Regular maintenance work and functional checks on the CalfRail ensure that the required hygiene standards are maintained. Maintenance includes calibration, additional measures to preserve hygiene that are not described in the cleaning chapter, as well as scheduled replacement of wearing parts, for example. Visual and functional testing of components as well as replacement of simple wearing parts, such as the teat, can be carried out by the owner/operator.

Note: Repair work and the replacement of wearing parts on or in the CalfRail, with the exception of the teats, may be carried out **only** by a service technician.

11.2.1 Important safety instructions

DANGER!

Fatal electric shock

The electrical components of the CalfRail are live.

► Always disconnect the mains plug of the heating system before starting work on its components.

DANGER!

Beware of injuries due to automatic starting up.

The servopump may start up automatically at any time, crushing your hand or fingers.

► Do not reach into the hazard area of the servopump. Always disconnect the mains plug of the heating system before starting work on its components.

WARNING!

Injuries due to being pulled in or trapped.

The CalfRail unit is attached to the carriage by means of a slewing ring.

► In order to prevent injuries to fingers, do not touch the CalfRail while it is slewing.

⚠ WARNING!

Beware of chemical burns from cleaning agents.

The cleaning agent can burn your eyes or hands.

► Always wear safety glasses and protective gloves when using cleaning agents for cleaning. Follow the safety instructions in the safety data sheet of the cleaning agent and wear the safety equipment required by the instructions.

⚠ WARNING!

Risk of burns due to hot surfaces

The expansion vessel of the heating system contains hot water.

► Allow the water to cool down before opening the cover of the expansion vessel.

11.2.2 Maintenance intervals and activities

Note: If you detect any faults or damage to the CalfRail between the maintenance intervals recommended below, you must make sure they are rectified immediately by a service technician as required.

	Care/maintenance interval			
	Daily	Weekly	4 months	12 months
Check the calves	✓			
Safety devices • Check for completeness and legibility of safety signs (warning signs).	✓			
Hanger and rail system • Visually inspect them for damage. • Check them for stability.	✓	✓		
CalfRail unit and power supply • Visually inspect them for damage.	✓			
Suction hose and teat • Visually inspect the suction hose and teat with holder for cleanliness, damage and wear; clean them if necessary. • Replace the teats.	✓		✓	
Servopump • Check the servopump and accompanying suction sensors for damage and wear. • Calibrate the servopump. • Have the pump hose and diaphragm replaced by a service technician.	✓		✓	✓

Heating system				
• Check the water level in the expansion vessel and add water as necessary.	✓			
• Check to ensure the heating system is working.	✓			
• Visually inspect the louvers for dirt.				✓
• Have the filter and louvers cleaned by a service technician.				✓
Teat cleaner (optional)				
• Check the pressure of the hose pump, hoses and visually inspect the intake side of the pump for damage and wear; clean it if needed	✓			
• Visually inspect the nozzle for cleanliness, damage and wear; clean it if necessary.	✓			
• Have a service technician replace the pump hose.				✓
Supply line				
• Visually inspect the supply line for damage.	✓			
• Clean the suction hose by means of a flushing run.		✓		
• Have the suction hose from the servopump to the teat replaced by a service technician.				✓
Drive motor				
• Check the drive motor for optimal operation.		✓		
Return valve				
• Visually inspect it for leakage.		✓		
• Have a service technician replace the diaphragm.				✓

Index

A

Additive feeding 30
Animal number 23
Annual
  maintenance 45
Automatic calibration 45
Automatic cleaning 38

B

Basic
  settings 37

C

Calibrating
  hose pumps 44
  tolerance values 45
Calibration 44
  Auto-calibration 45
Canceling
  groups 26
  individual animals 25
  weaned animals 26
Carriage travel forward 50
Carriage travel reverse 50
Change box 27
  box/transmitter present 27
  Reset transmitter 27
Changing the registration of animals 27
Cleaning 35
  Automatic cleaning 38
Cleaning agents 36 36
component name plate 11
Contact data 14
Continue button 8
Control unit 50

D

Daily
  maintenance 43
Disposal
  CalfRail 52
  Hoses 52
  of cables 52
  of cleaning agent residue 52
  of the circuit board 52
Duties 16

E

Electrical connection 11
Entitlement LED 9
Expansion vessel 44

F

Faults 46
Feed button 9
Feeding 29
feeding plan 26
Feeding plans 29
Feeding times 30
Flushing
  circuit 38
flushing run 38
Flushing the suction hose 37

G

Germs 22

H

Hazard description 17
Hazards
  Chemical burns 16
  Corrosion 16
  Infection 16
Hygiene 22

I

infection 22
Installation prerequisites
  Automatic feeder 13
Installation requirements 12
  Igloo/Calf box 13
  Running rail 13
  Structural integrity of carrier system 13
Instruction notices 19
Intended use 15

L

LED Entitlement 50
LED Light 50

M

Maintenance

Every four months 44
Manual starting 33
Material damage 16
Materials list 54
Maximum speed 31
maximum waiting time 32
Medicine prescr. 30
Minimum waiting time 32
Move feeding forward 33
Move to park 50

N

name plate 11
Number assignment 23
Number of feeding stations and animals 12
Number of flushings 30

P

Pivot arm right / left 50
Prohibitory signs 19
Pump forward / reverse 50
pump speed 31

R

Registration 23 23
Registration change 27
Requirements 15
Residual risks 15
Residual sucking 32
Return valve 50
Risks
Poisoning 16

S

Safety devices 21
Safety signs
Warning signs 18
Start feeding manually 33
Stop feeding 34
Suction hose
flushing 37

T

Teat cleaning 50
Times of day 30

W

Warning
Auto-calibration 48
CalfRail 47
CalfRail pivot arm 47
CalfRail travel to box 47
CalfRail travel to parking 47
CR feeding/flushing 48
CR heating system Pump 49
Feed deviation 48
Heating sensor 49
Heating system pump 49
Heating system temperature 49
Heating system water shortage 48
Weekly
maintenance 44
Weight of 12

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:	CalfRail
Type:	CRS2-IF1-WH
Function:	Distribution, provision, delivery and dispensing of animal feed in liquid form for the automatic calf feeder Vario.

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)

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, 21.11.2016

Place, date

Signature
Markus Förster
CEO