Automatic milking system

MIᴏɴᴇ (Revision R-A/ R-B/ R-C)

International Sample unit

**Operation Manual / Installation Instructions / Parts List
(Original operating instructions)**

**7801-9001-045
01 July 2017**

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Contents

1 Preface

1.1 About this manual

The manufacturer reserves the right to make changes due to technical developments in the data and images given in this manual.

Reproductions, translations and copies of any kind, including extracts, require written authorisation from the manufacturer.

The abbreviations, units, technical terms, special names or industry-specific terminology used in this manual are explained in greater detail in the Appendix.

These instructions are part of the supply.

- They should be kept close at hand and remain with the equipment even if the equipment is sold.

- This manual is not subject to an amendment service. The most recent version at any time can be obtained through the technical dealer or directly from the manufacturer.

- This manual has a modular structure and is intended exclusively for the mentioned product.
  For more information on the product and its components, please refer to the corresponding documents and manuals.
  This applies, in particular, to the safety instructions!

Necessary documents

● Instructions on components connected with the product:
(not a complete list):

Part no.	Description
7801-90 . . -041	Operation ”MI*one*”
7160-90 . . -531	DairyManagementSystem ”DairyPlan C21”

Pictograms used

Note
The signalling word indicates information that is important for the product and environment.

This pictogram indicates a special tool required for installation.

A correction bar in the margin indicates changes to the previous edition. The character string ”!!” in the search field of the PDF document locates the correction bar.

RDM This pictogram indicates a menu point in the system program.
See manual 7801-90 . . -001, section: Robot Data Manager

This pictogram refers to another document or section.

If a manual number is given, the middle 4 digits indicate the language, as follows:

	Language		Language		Language
-9000-	German	-9013-	Dutch	-9032-	Serbian
-9001-	English (United Kingdom)	-9015-	English (North American)	-9034-	Slovak
-9002-	French (France)	-9016-	Polish	-9035-	Chinese
-9003-	Italian	-9018-	Japanese	-9036-	Lithuanian
-9004-	Romanian	-9021-	Danish	-9038-	Portuguese (Brazil)
-9005-	Spanish (Spain)	-9022-	Hungarian	-9039-	French (Canada)
-9007-	Swedish	-9023-	Czech	-9040-	Latvian
-9008-	Norwegian	-9024-	Finnish	-9041-	Estonian
-9009-	Russian	-9025-	Croatian	-9043-	Spanish (Central America)
-9010-	Greek	-9027-	Bulgarian		
-9012-	Turkish	-9029-	Slovene		
All of the above languages may not be available.					

1.2   Manufacturer's address

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D-59199 Bönen

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🖶 +49 (0) 2383 / 93-80
✉ contact@gea.com
@ www.gea.com

1.3   Customer services

Authorised Technical Dealer

If necessary, please contact your nearest authorized technical dealer.

There is a comprehensive dealer Internet search function on our website at the following address:

www.gea.com

European Contact Information:

GEA Farm Technologies GmbH
Siemensstraße 25-27
D-59199 Bönen

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1.4 Declaration of incorporation for incomplete machinery in accordance with EC Machinery Directive 2006/42/EC, Annex II 1. B

Manufacturer:	**GEA Farm Technologies GmbH** **Siemensstraße 25-27** **D-59199 Bönen**

We, as manufacturer, declare in sole responsibility that the incomplete machinery

Name:	Automatic milking system
Model:	MIone
Type:	Probennahmeeinrichtung

complies with the following provisions of the above-mentioned Directive:
According to Annex I, the following points are fulfilled. .
1.1.5, 1.3.1, 1.3.7, 1.3.8, 1.4.1, 1.4.2, 1.5.13, 1.6.1, 1.6.2, 1.7.1

Relevant EC Regulations:	2006/42/EC 2014/30/EU	EC Machinery Directive EMC Directive
Applied harmonized standards, in particular:	DIN EN ISO 12100:2011-03	Safety of machinery - General principles for design - Risk assessment and risk reduction
	DIN EN 61000-6-2:2011-06	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
	DIN EN 61000-6-3:2011-09	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments

Remarks:	We also declare that the special technical documentation for this machine has been created in accordance with Annex VII, Part A and we obligate to provide these upon reasoned request from the individual national authorities by data transfer.

Authorized person for compiling and handing over technical documentation:	Josef Schröer GEA Farm Technologies GmbH Siemensstraße 25-27 D-59199 Bönen ☎ +49 (0) 2383 / 93-70

Bönen,
20. June 2017

Jörg Krämer
(Managing Director)

Holger Siegwarth
(Head of Product Development - Dairy Farming)

2 Safety

2.1 The owner of this product must ensure compliance with the following requirements

The product has been designed and constructed taking account of a potential risk analysis and after careful selection of the compliant harmonized standards and other technical specifications. It therefore ensures a maximum level of safety.

This safety can only be achieved in practice on the farm however when all of the necessary measures have been taken. It is part of the farmer's obligation of care to plan these measures and check that they are carried out.

The owner must ensure the following:

- Anyone performing work or activities relating to this product must carefully reads the instructions (especially the safety instructions and warnings) and signs to confirm that they have understood them and will act in accordingly!

- The manual must always be available, in a legible and complete condition, at the place where the product is used.

- All persons who carry out work on the product must be able to consult the manual at any time.

- The instructions given in the section on "Basic Safety Instructions" must be followed.

- The legal requirements are observed.

- Operating instructions must be developed for and specially adapted to the conditions of the farm to take account of all aspects of safety.

- The product may only be used for its intended purpose.

- The product may only be used if it is in perfect working condition. The safety devices especially must be checked regularly to ensure they are working.

- The computer and the software installed on it must be installed and operated in accordance with the specifications.

- A working data backup system must be available.
  Only use computers which are in perfect working condition.

- Work should only be carried out by suitably qualified persons.

- The personnel is regularly instructed in all relevant matters of safety at work and protection of the environment and is familiar with the manual, particularly the safety instructions it contains.

- To start with, operating personnel who require training may only operate the equipment under the supervision of an experienced person. Their successful completion of training is to be confirmed in writing.

- Safety signs, plates and decals, which are attached to the product, must be replaced immediately if they become illegible or lost!

- Unauthorized persons (e.g. children) are not allowed in hazardous areas and should not have access to cleaning agents or disinfectants.

2.2 Explanation of safety symbols

The safety symbols draw attention to the importance of the adjacent text.

The design of the warnings is based on ISO 3864-2 and ANSI535.6.

Safety symbols and signalling words

> ⚠️ **Warning!**
> The signalling word indicates an immediate danger that could lead to loss of life or serious physical injury.

> **Attention!**
> The signalling word indicates hazardous situations that could lead to damage to property.

2.3 Basic safety instructions

> ℹ️ **Note**
> There are warnings about specific residual dangers in the corresponding chapters.

- There are risks involved in the operation and maintenance of equipment for dairy farms. For your own safety, read and follow the operating manual carefully (especially the section entitled "Safety information")!

- The chapter on "Technical data" gives the permissible working conditions (pressure ranges, temperature ranges, airflow quantities etc.) and these must be observed!

- Do not open or dismantle devices (risk of injury)!

- Do not remove any protective devices (risk of injury)!

- When working with cleaning and disinfecting agents observe the notes on dangers and protective measures (risk of caustic burns)!

- Also observe the safety and warning instructions given in the operating manuals for the milking system.

- Always keep the control cabinet / all electricity supply units / electrical control units closed. Access is only permitted to authorized personnel with a key or special tool.

- Protect live and high-voltage components against moisture. Do not use water or high-pressure cleaners on these electrical products!

2.4 Personnel qualification

Everyone who performs work or activities in connection with the product must carefully read and understand the manual and then act accordingly.

- Only use trained or briefed personnel!

In addition, special qualifications are required for the following activities:
- Installation
- Commissioning
- Operation
- Troubleshooting
- repairs

> **ℹ Note**
> Work that requires special qualifications is described in the relevant chapters!

2.5 Safety guard and devices

- Cover plate, protective cover

- Safety symbols, warnings, warning signs and labels

3   Description

3.1   Intended Use

The product described has been designed for use in agricultural (mainly milk producing) environments.

The international sampling device is to be used exclusively for automatic milk sampling in MIone and Monobox automatic milking systems with Metatron milk meters.

Applications which are not listed here are not part of the intended use and are therefore considered as improper use!

The manufacturer/supplier is not liable for any resulting damage. The user alone bears the risk.

Correct use also includes reading the instructions and observing the inspection and maintenance conditions.

- We would specifically like to point out that parts or accessories not supplied by ourselves and setting instructions not provided by the manufacturer/supplier are not checked or released by us either.

- The installation or use of products from other manufacturers may affect the specified properties of the original parts and lead to injury to people and animals.

- The manufacturer does not accept any liability for injury to people or animals, or damage to the product, caused by the use of products from other manufacturers.

3.2   Product Changes

Unauthorised product changes may have a negative impact on the service life or function of the product.
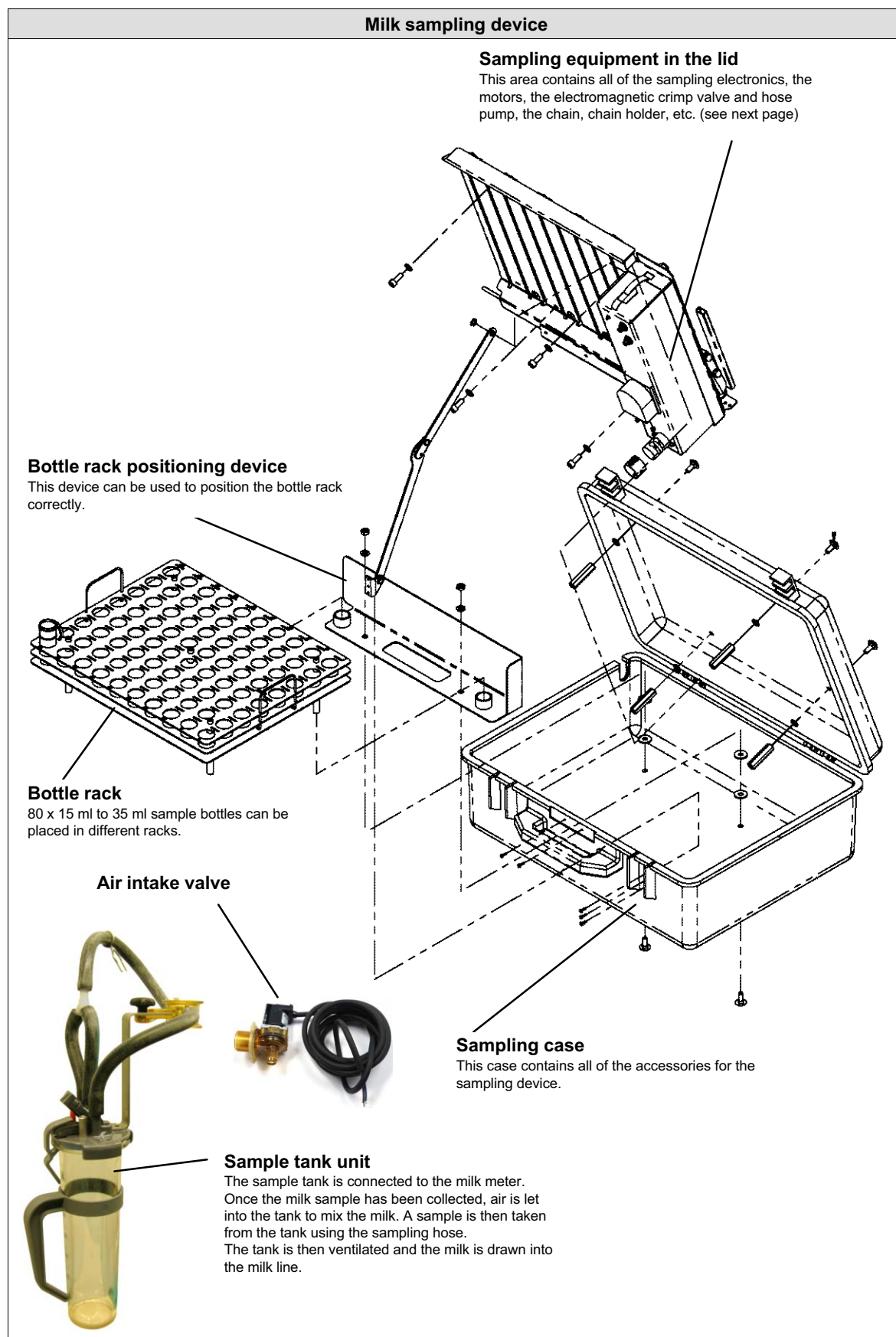
Any modifications not described in the product documentation are deemed to be prohibited.

For safety reasons, do not carry out any unauthorized changes!

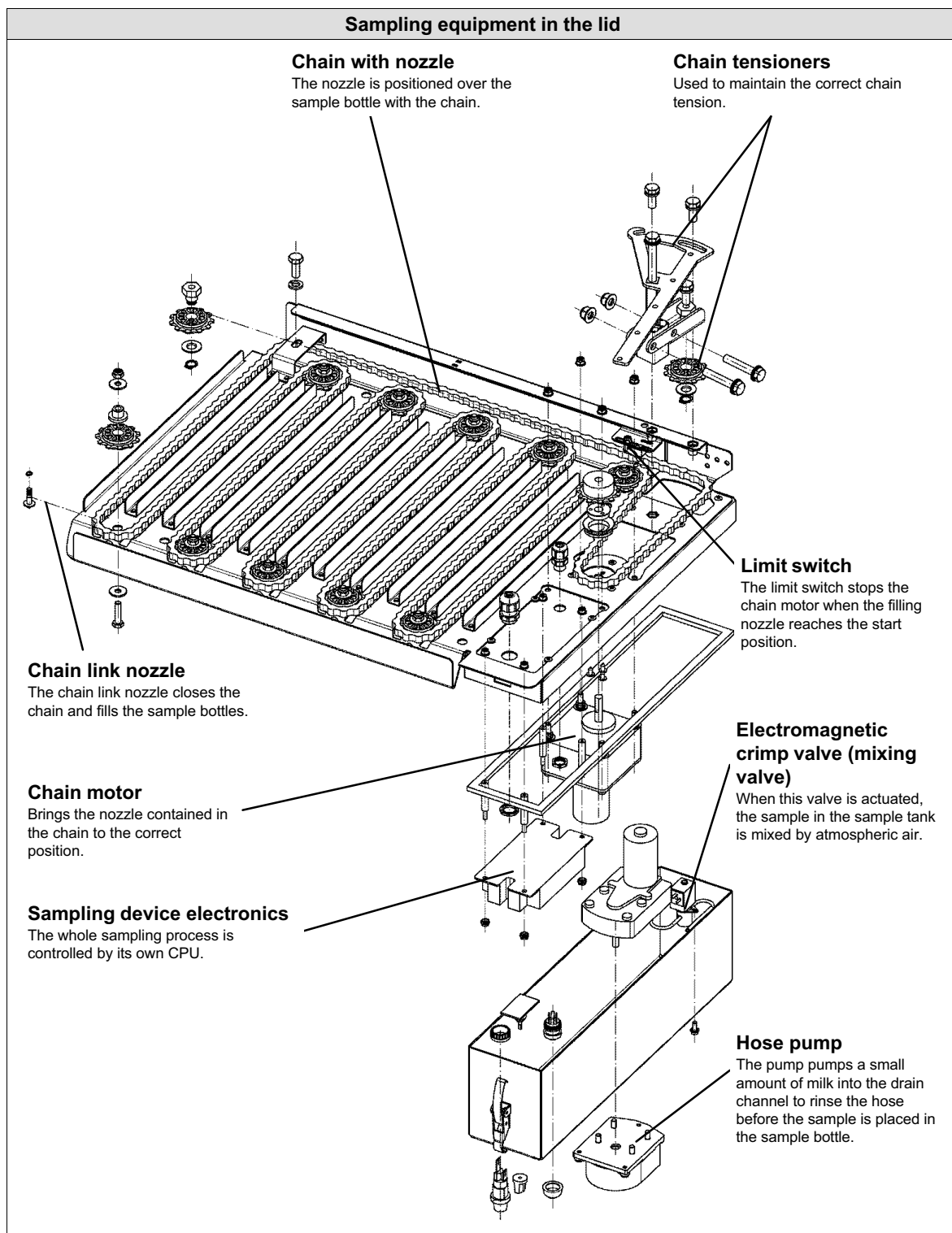Scheduled modifications must be approved in writing by the manufacturer.

Unauthorised modifications of the product will void the warranty and may invalidate the Manufacturer's Declaration or Declaration of Incorporation.

3.3   Design of the equipment

Milk sampling device

Sampling equipment in the lid
This area contains all of the sampling electronics, the motors, the electromagnetic crimp valve and hose pump, the chain, chain holder, etc. (see next page)

Bottle rack positioning device
This device can be used to position the bottle rack correctly.

Bottle rack
80 x 15 ml to 35 ml sample bottles can be placed in different racks.

Air intake valve

Sampling case
This case contains all of the accessories for the sampling device.

Sample tank unit
The sample tank is connected to the milk meter. Once the milk sample has been collected, air is let into the tank to mix the milk. A sample is then taken from the tank using the sampling hose.
The tank is then ventilated and the milk is drawn into the milk line.

Sampling equipment in the lid

Chain with nozzle
The nozzle is positioned over the sample bottle with the chain.

Chain tensioners
Used to maintain the correct chain tension.

Limit switch
The limit switch stops the chain motor when the filling nozzle reaches the start position.

Chain link nozzle
The chain link nozzle closes the chain and fills the sample bottles.

Chain motor
Brings the nozzle contained in the chain to the correct position.

Sampling device electronics
The whole sampling process is controlled by its own CPU.

Electromagnetic crimp valve (mixing valve)
When this valve is actuated, the sample in the sample tank is mixed by atmospheric air.

Hose pump
The pump pumps a small amount of milk into the drain channel to rinse the hose before the sample is placed in the sample bottle.

3.4 How the System Works

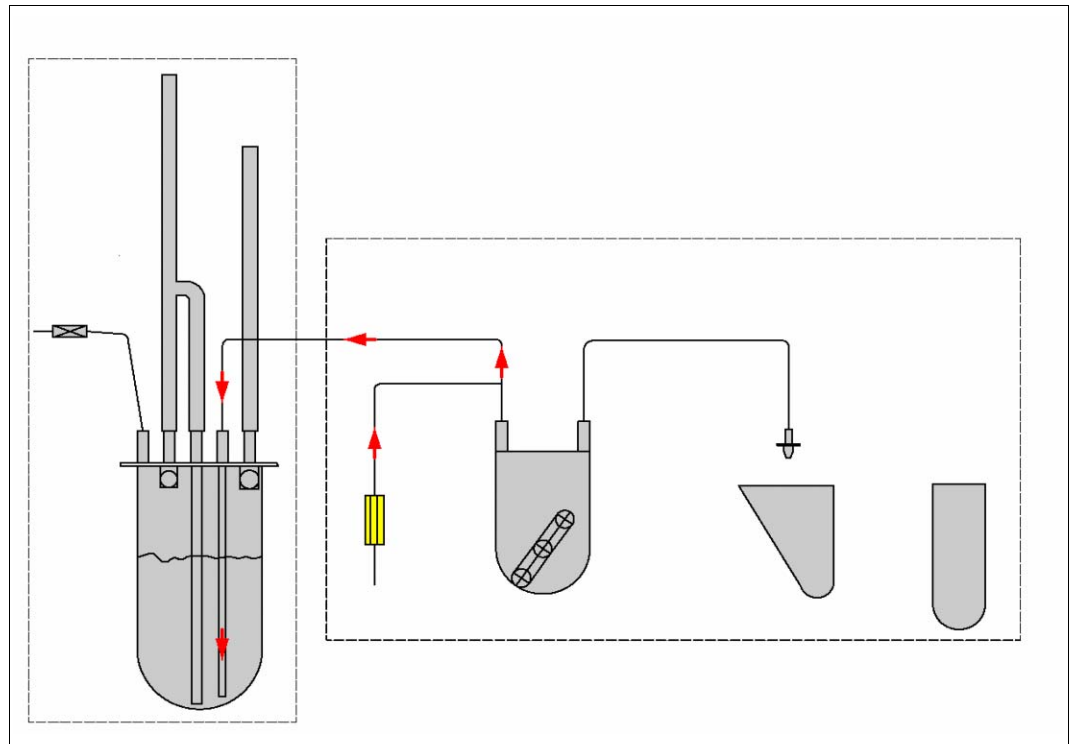| Legend:			
1	sample jar	5	Hose pump
2	Stop balls	6	Filling nozzle
3	Air intake valve	7	Drain channel
4	Mixing valve	8	Sample bottle

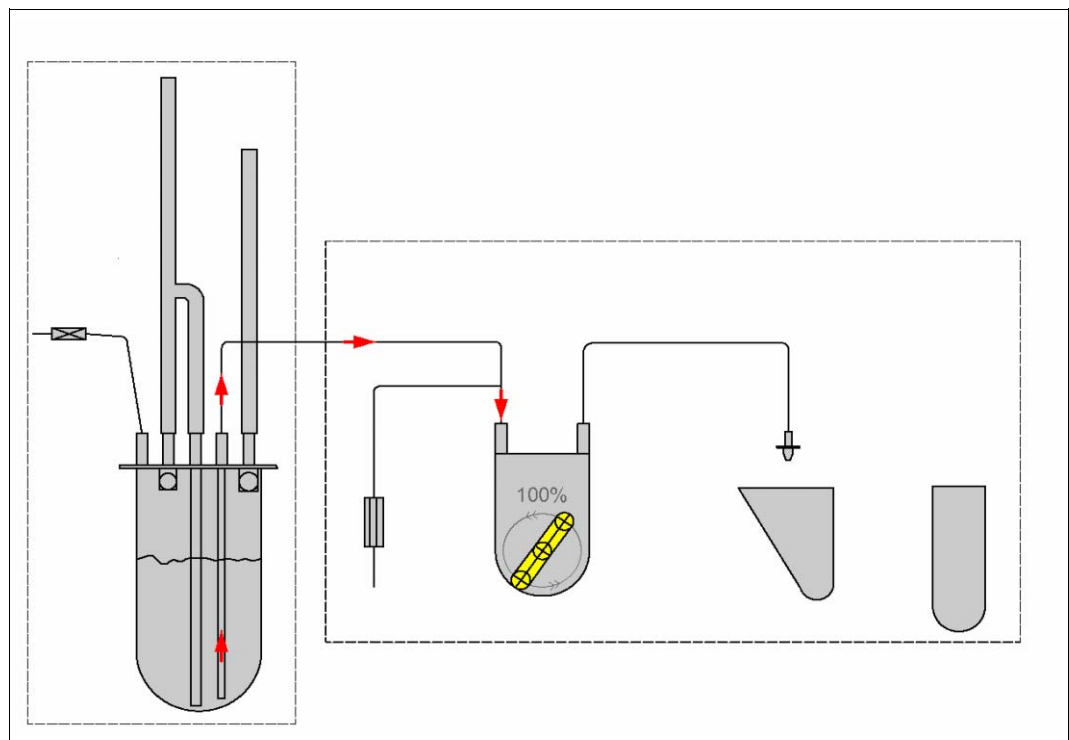The following diagrams show how the sampling device works:

3.4.1 Mix sample

- During the milking process the sample tank is filled with about 2.5% of the actual milk produced.
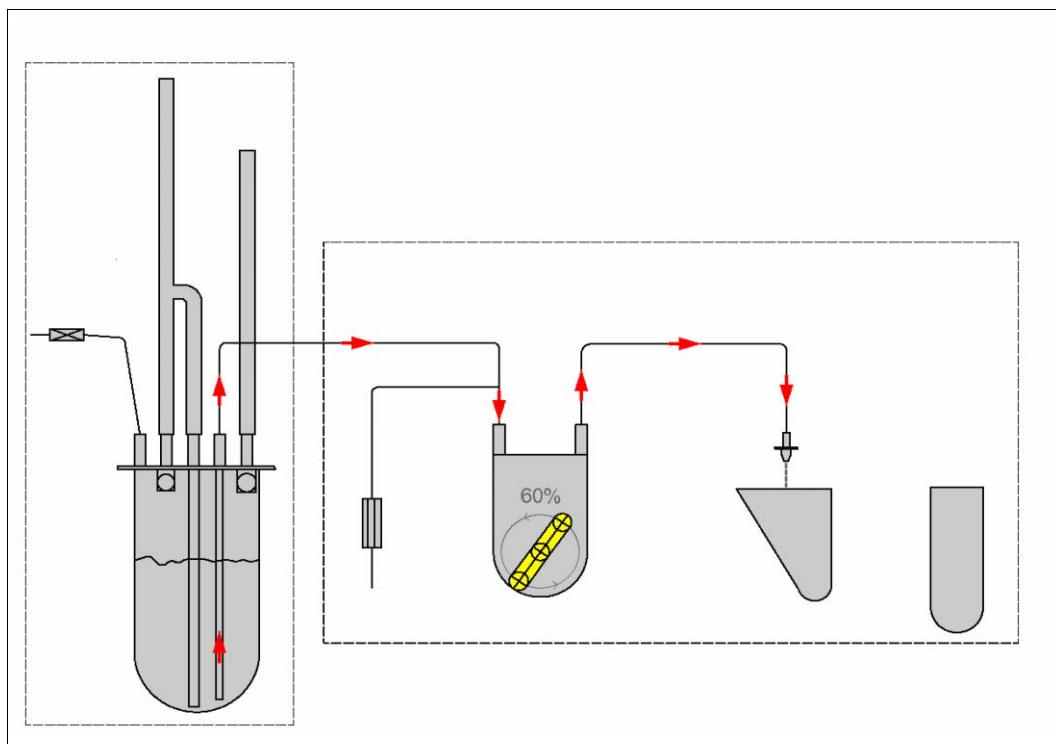

- After milking, atmospheric air flows through the open mixing valve and mixes the sample in the sample tank.
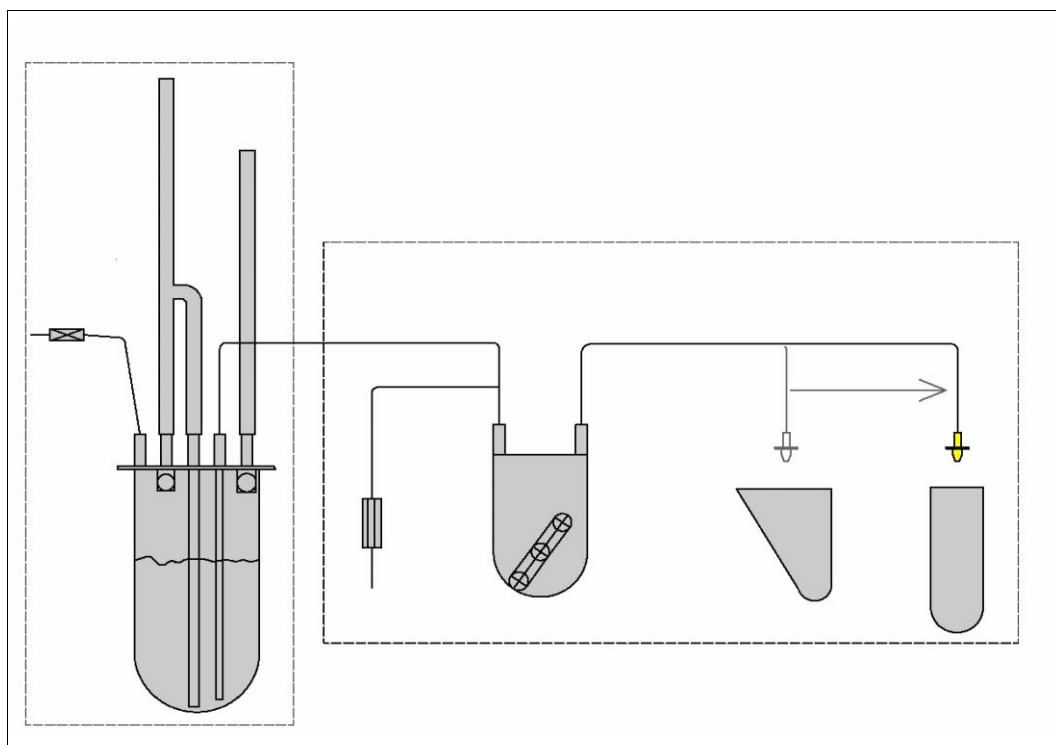
3.4.2 Draw sample

- The hose pump (turning 100%) draws the sample out of the sample tank.
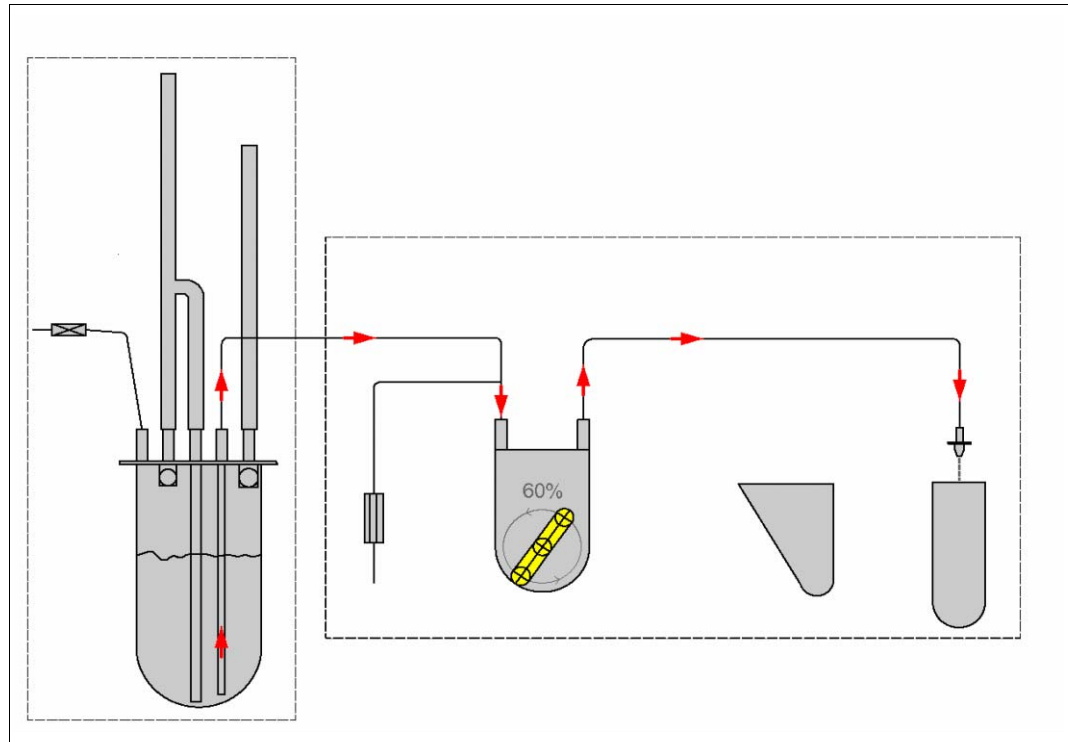
3.4.3 Rinse lines with milk

● The hose pump (turning 60%) pumps the first part of the sample into the drain channel.
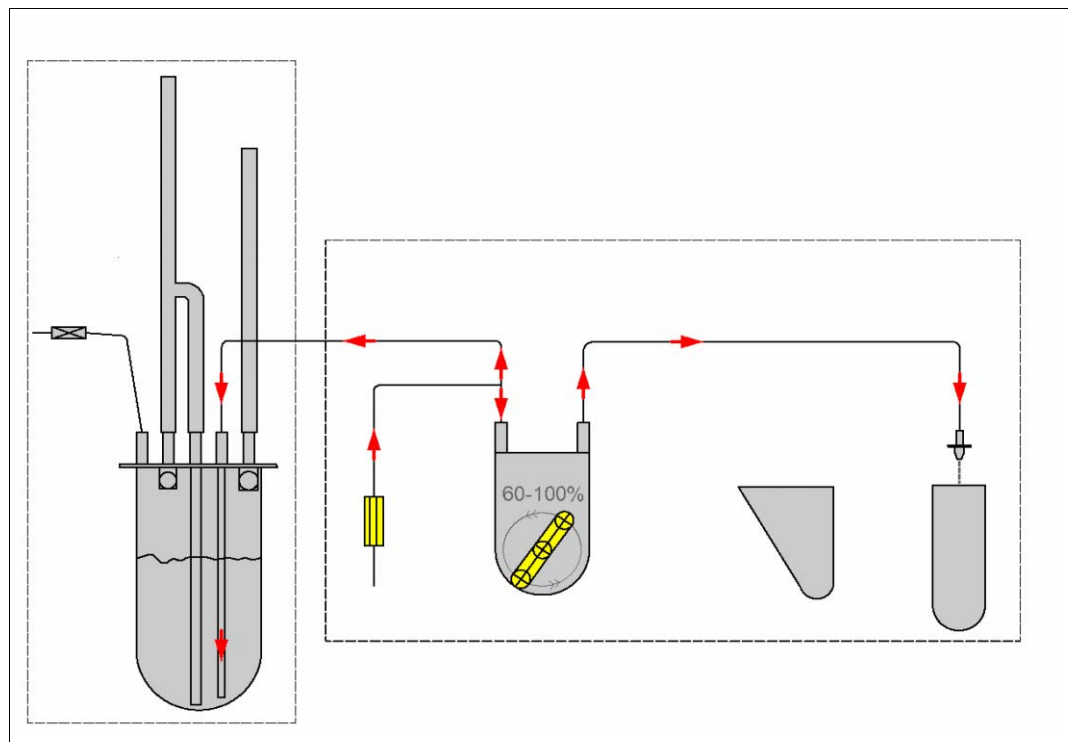
3.4.4 Position filling nozzle

● The filling nozzle is positioned over the next sample bottle.
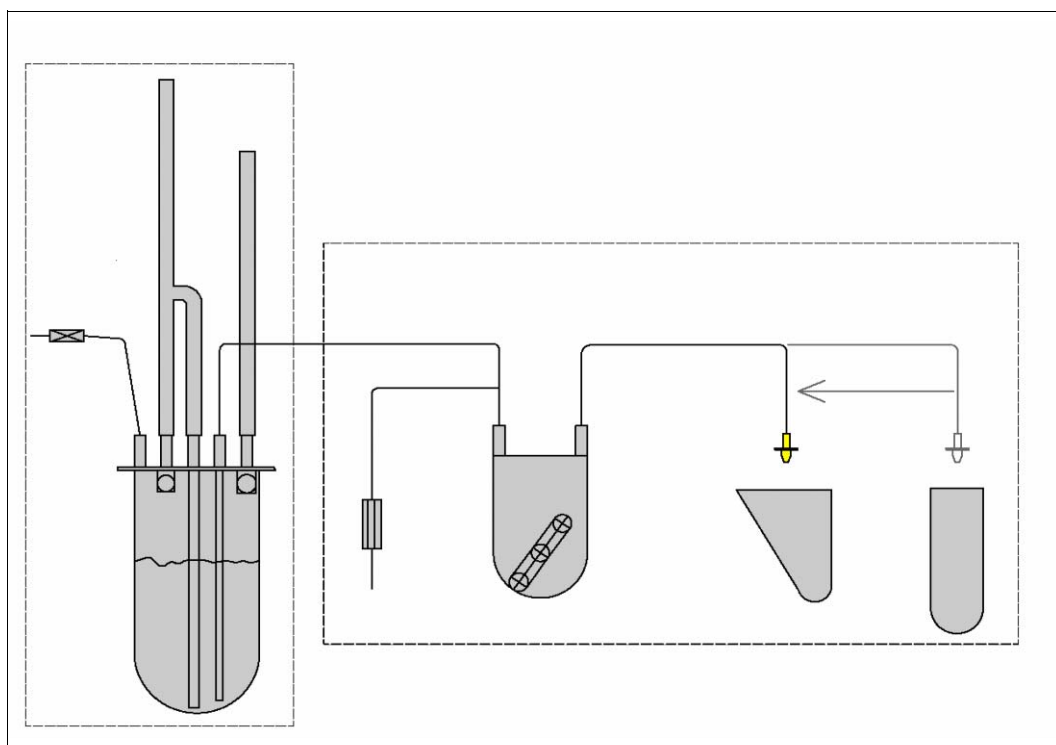
3.4.5   Fill sample bottle

● The hose pump (turning 60%) fills the sample bottle with the sample.
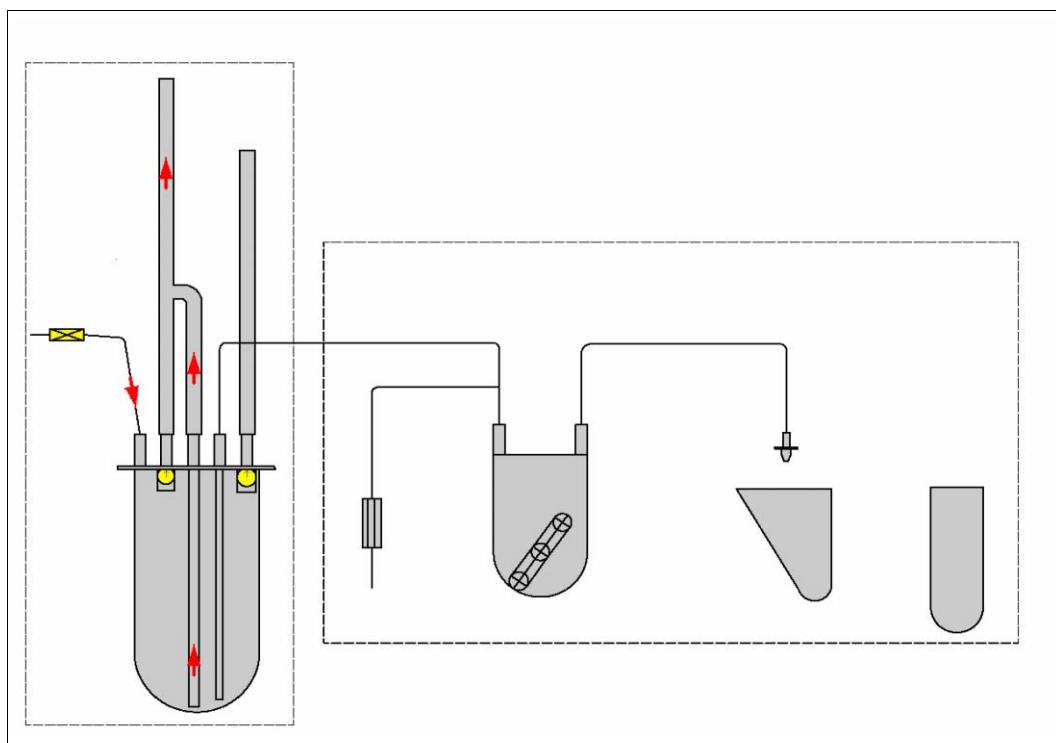
3.4.6   Drain lines

● atmospheric air flows in through the open mixing valve and drains the intake line.

● The hose pump (turning 60-100%) also drains the pressure line.

3.4.7 Return

● The filling nozzle is moved to the next drain position through one of the two drain channels.

3.4.8 Drain sample tank

● Air flows into the sample tank through the open air inlet valve releases the stop balls and drains the sample tank.
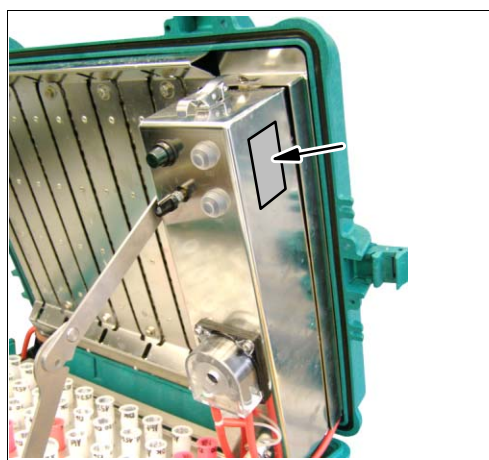
3.5   Technical Data

Geometric data

Dimensions (width x height x depth)	650 x 530 x 240
Weight of the case (without bottle rack)	24,5 kg

Electrical data

Electrical Connection	24 V DC

Manufacturer's plate

The rating plate is placed on the side of the sampling device.

4   Transport

Attention!

Women who are pregnant may not lift the sample case!
The sample case weighs 24.5 kg. In accordance with Article 4.2.1 of the Maternity Protection Act (Mutterschutzgesetz) pregnant women are not permitted to carry out work that involves lifting, moving or transporting loads that exceed 10 kg without mechanical aids.

► When possible, the case should be carried or moved by two persons. There are handles on both of the short sides. Maintain a healthy posture when lifting and carrying. Keep your spine straight (study the illustration)
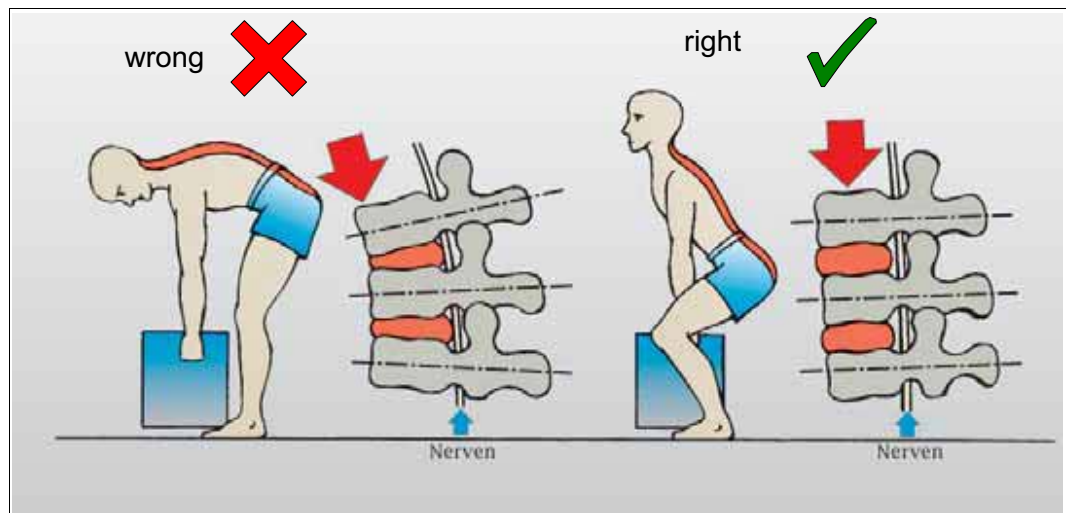
Attention!

The case contains sensitive items. Do not throw it!
► Always place the case on the floor gently!

4.1   Safety instructions for transport

Read the "Safety" section as well.

Special transport hazards:

● Projecting sharp edges may cause injury.

● If parts are stacked too high, the stack can become unstable and collapse.

● The highly inflammable packaging material represents a fire hazard - naked flames and smoking prohibited!

4.2   Transport

The cable and hose must be stowed in the space provided in the bottle rack to ensure they are not damaged during storage or transport.

Transport requirements:

- The two drain channels must go into the positions provided.
  - The rear drain channel in the positioning device
  - The front drain channel in the wall of the box
- The sampling hose and connecting cable must be placed behind the positioning device in the box.
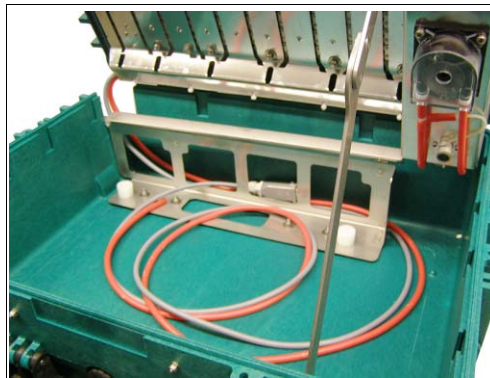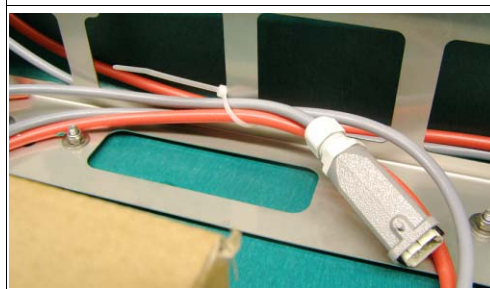

Attention!

Trapped lines
The lines must not get trapped when the sampler is closed.

- The plug on the connecting cable must be fed through the positioning device to the back.

- Alternatively, the plug may be fastened to the positioning device with a cable tie.

- A bottle rack can also be transported in the sampler.

ℹ **Note**
Not recommended! The total weight will then be more than 25 kg.

Transport problems

Observe the following points to avoid damaging the sampler:

⚠️ **Attention!**
Never lay the connecting cable or hose on top of the bottle rack.
The cable or hose might get damaged when the sampling device is closed.

⚠️ **Attention!**
Never leave the drain channels loose in the box.
Never leave the connecting cable plug loose in front of the positioning device.
This may cause damage to components (hose pump, hose, etc.) when the sampler is closed, or during transport.

4.3   Delivery

Check the goods supplied against the packing list enclosed for completeness and damage.
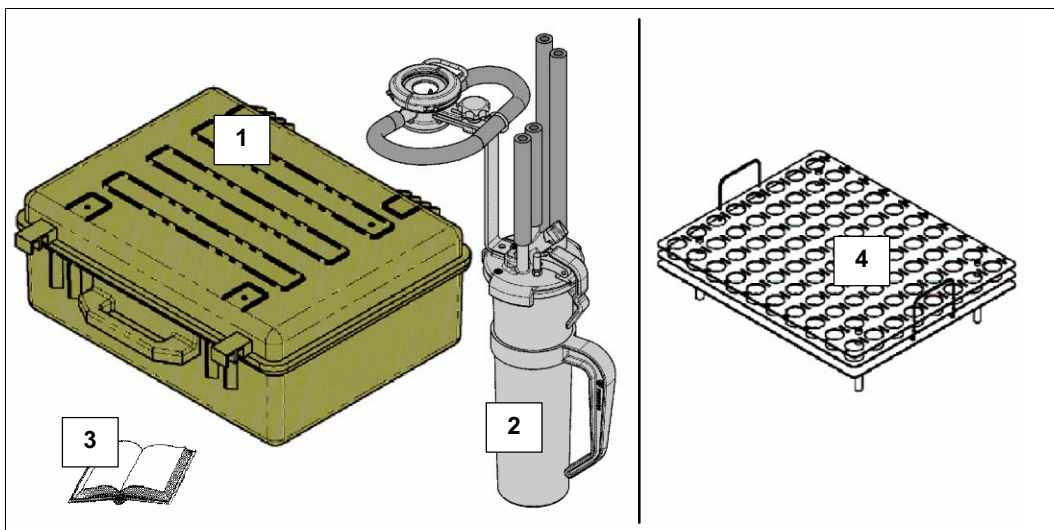
Legend:	
1	Milk sampling device
2	Sample tank unit
3	Operating manual with installation instructions
4	Bottle rack to hold up to 80 sample bottles (Option)

4.4   Storage conditions

It is recommended that the device is stored in a dry, dust-free and frost-free environment.

☞ **Please note!**
The sampling device should be kept clean to extend its service life.

4.5   Information on disposing of packing material

After unpacking, the packing material must be handled properly and disposed of carefully in accordance with the valid local regulations on waste disposal and utilization.

5 Sampling device

5.1 Special personnel qualification required for sampling

Sampling may only be carried out by specially qualified personnel in accordance with the safety instructions.

Good knowledge of working with the automatic milking system and the system program (RDM) is needed to perform sampling.

See also the section on "Personnel qualification".

5.2 Safety instructions for sampling

To prevent damage to property and/or life-threatening injury to personnel, the following must always be observed:

- Use the product for its intended purpose only.
- Taking the wrong action when there is a fault may cause damage - so familiarize yourself with the instructions on what to do if there is a fault.

Read the "Safety" section as well.

Special risks involved in sampling:

- Incorrect use may lead to serious damage to property and/or life-threatening injury to people.

Before taking samples, ensure you are familiar with:

- the operating and control elements,
- The equipment included
- The method of operation
- The immediate surroundings

Carry out the following checks before every start:

- Check and make sure that all media are suitable, connected and present.
- Check the product for any visible damage; immediately repair the fault found (noting the personnel qualification required) or contact the specialist dealer - the product may only be used if it is in perfect condition.
- Check and make sure that there are no objects or materials in the working area if they are not necessary for operation.

During sampling:

- No safety equipment may be removed or taken out of operation during sampling.
- Operating personnel should make sure that no unauthorized personnel are in the working area.

5.3   Description of the operating elements

Operation is via the controls on the sampling device and via the system computer belonging to the automatic milking system.

Milk sampling device
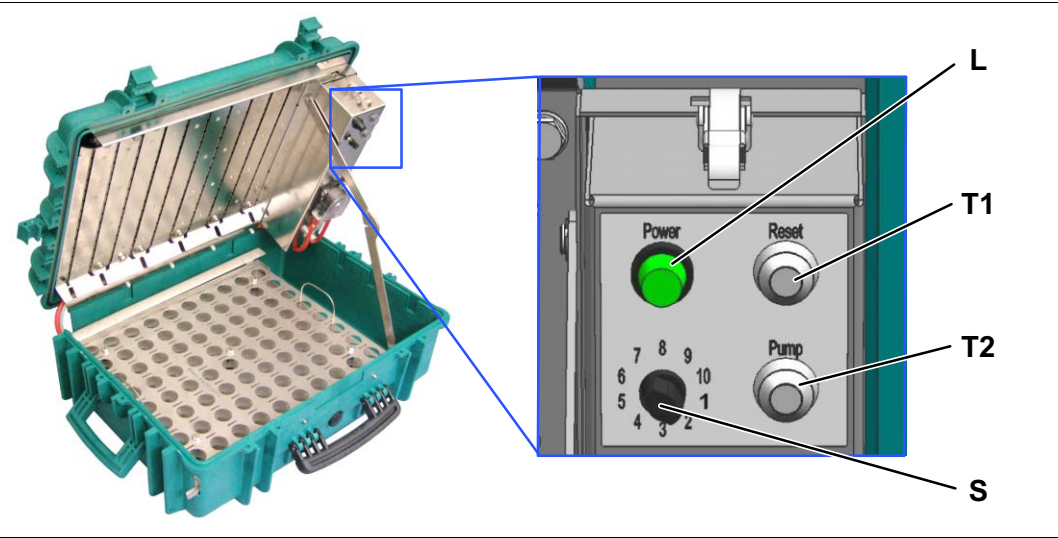
Legend:		
L	Indicator lights	On indicator (green)
T1	RESET button	Move filling nozzle to the start position
T2	PUMP button	Operate the hose pump manually
S	Selector switch	Set sample quantity

System computer

System computer control panel/user interface
Operated by touching the screen.

See instructions for further information on the subject
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5.4 Overview of the steps involved in the sampling process

> ⚠️ **Warning!**
>
> **Risk of crushing**
> There is a danger of being trapped between moving and stationary parts.
> ► Standing in the danger area is strictly forbidden.

The following steps must be performed to ensure successful sampling. Detailed information on the individual steps is given below:

Prepare for sampling
- Stop automatic operation
- Set up and connect the sampling device
- Settings on the user interface of the automatic milking system

Take samples
- Start automatic operation
- Note the box data

Interrupt sampling
- Stop automatic operation
- Stop sampling
- Change the bottle rack
- Resume sampling
- Resume automatic operation

End sampling
- Stop automatic operation
- Stop sampling
- Create the sample file
- Transfer the sample bottles
- Start the system clean
- Disconnect and remove the sampling device
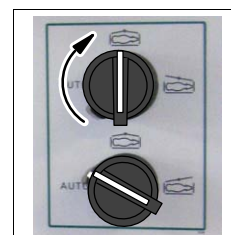- Resume automatic operation

5.5 Prepare for sampling

> ℹ️ **Note**
> Connect the sampling device to the automatic milking system before the system clean so that the milk-carrying parts of the installation can be cleaned again before sampling.
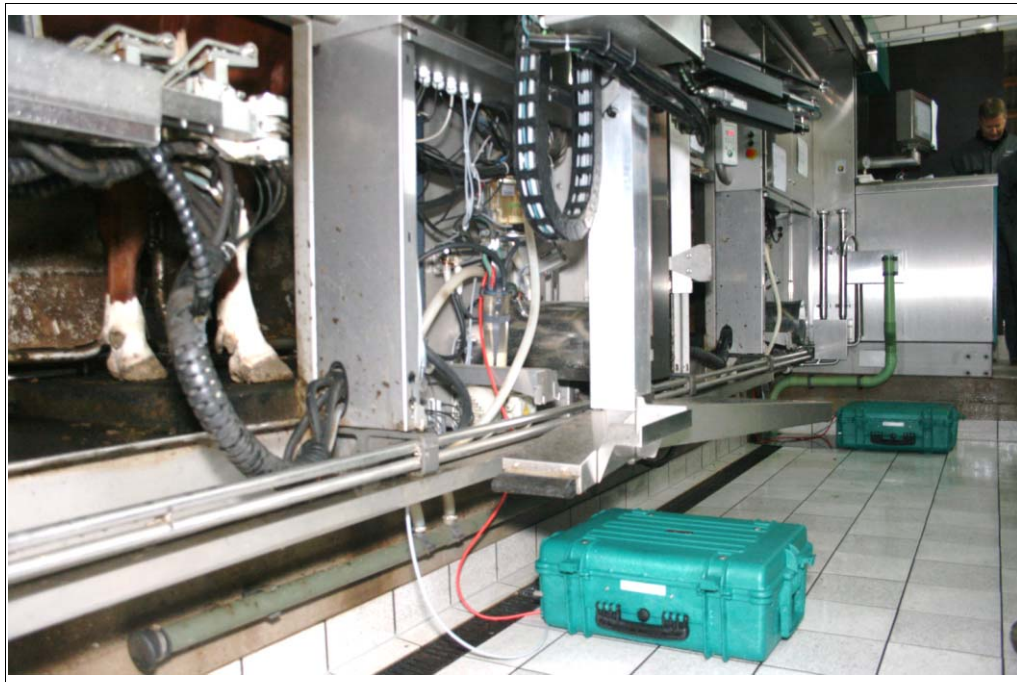
5.5.1 Stop automatic operation

- Close entry gates to all milking boxes.
  - Wait until the animals have left the milking boxes.

5.5.2 Set up and connect the sampling device

Set up the sampling device

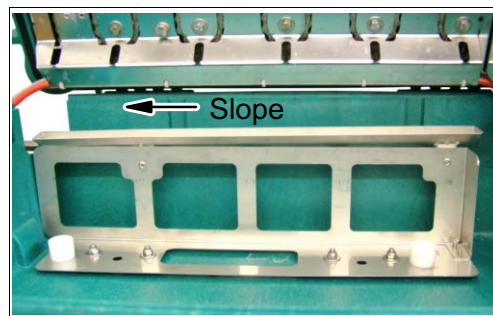The sampling device must be set up on the floor so that the robot can move freely.

> **ℹ Note**
> One sampling device is required for each milking box.

The sampling device is drained through the internal drain channels.

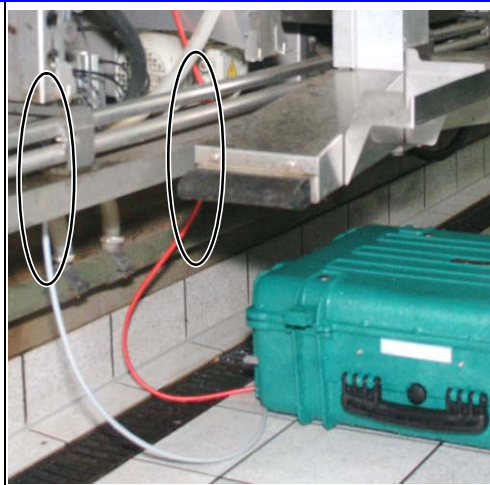- Set up the sampling device horizontally or with a slight incline.

Attention!

Risk of collision

The robot can collide with the sampling hose and connection cable.

► Run the connection cable and sampling hose under the robot rail so that the robot can move freely.

Set the sample quantity (depends on the capacity of the sample bottles)

The correct volumes for filling the 15 ml to 35 ml bottles must be set with the selector switch.

> ℹ **Note**
> The sample quantities actually filled may differ from the values given in the table. They depend upon:
> - correct hose lengths
> - vacuum level
> - amount of wear on the hose pump

Switch position									
1	2	3	4	5	6	7	8	9	10
11-13	15-17	19-21	23-25	27-29	31-33	34-36	38-40	42-44	45-47
Sample quantity [ml]									

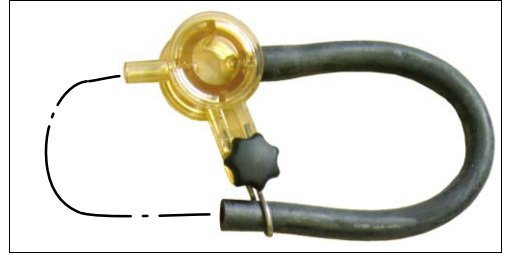- Set the switch as indicated in the table.
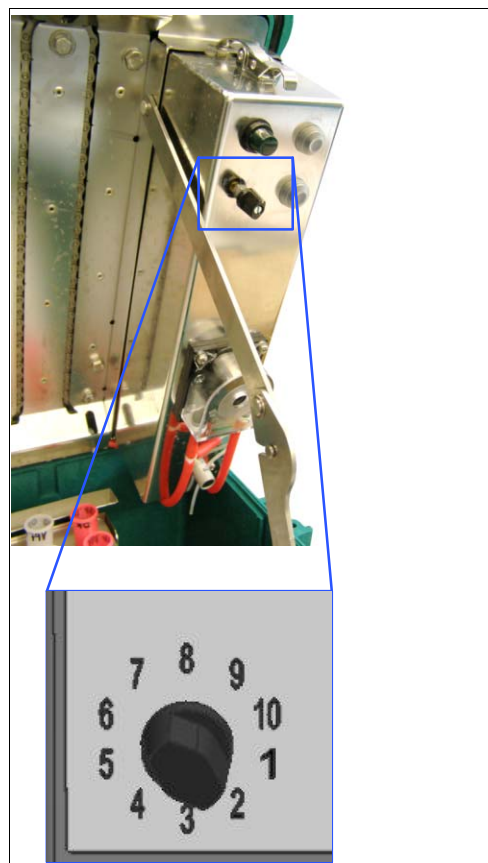
> ℹ **Note**
> The capacity of the hose pump reduces over time. This must be compensated for by increasing the switch setting.

Mount the sampler on the milk meter

When commissioning for the first time, the sampler has to be mounted beneath the milk meter tank.

● Remove the milk meter tank.
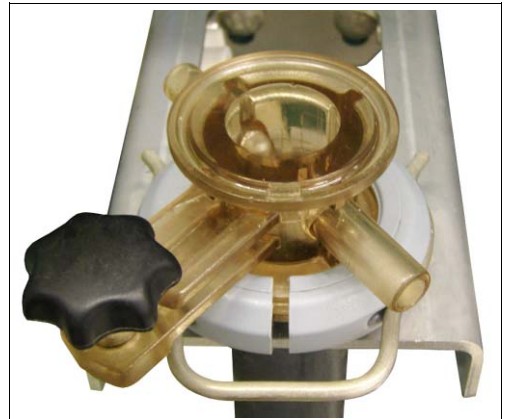
● Fit sampler, including gasket.
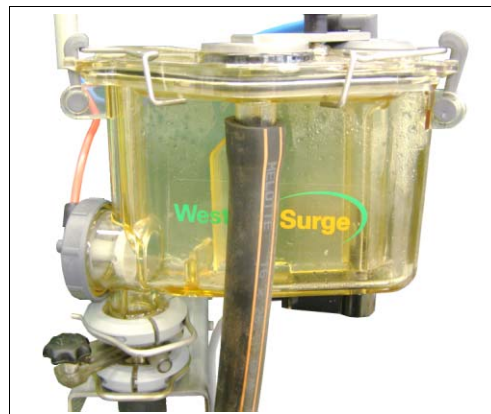

Attention!

Observe the position of the assembly marking (nose)!
The nose of the flange must be pointing upwards and forward.

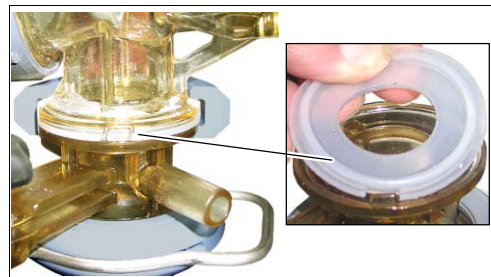● Fasten sampler with 2 half-clips and a clamp.

● Place milk meter tank on the sampler and fasten.

● Connect Hose.

ℹ **Please note!**
The nose of the sampler must fit into the groove in the gasket and the milk meter tank.

Attention!

Incorrect measuring results
A missing sampling device nose can lead to incorrect measuring results.
► Under no circumstances is the nose of the sampling device to be removed!


ℹ **Please note!**
The sampler remains on the milk meter tank even after sampling.

● Connect the two connecting pieces together with the milk tube.

● Push the hose holder into the sampler holder and tighten the knob.

● Position the hose in the holder so that the two bends in the hose run evenly and no kinks are produced.

Assemble the sample tank

The sample tank must be assembled before it is installed.
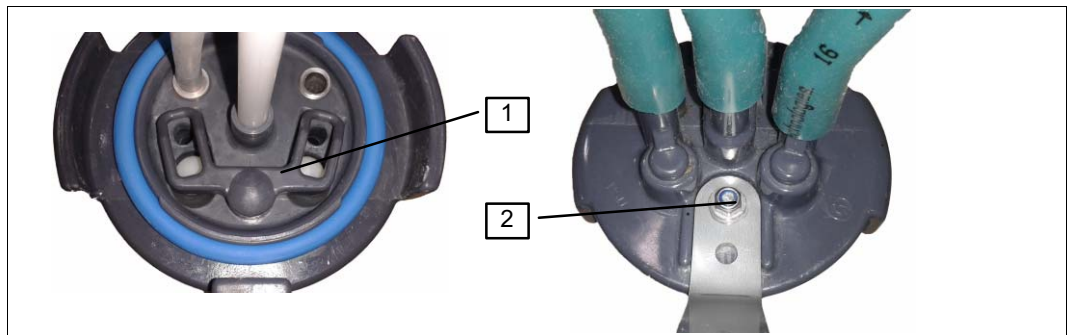
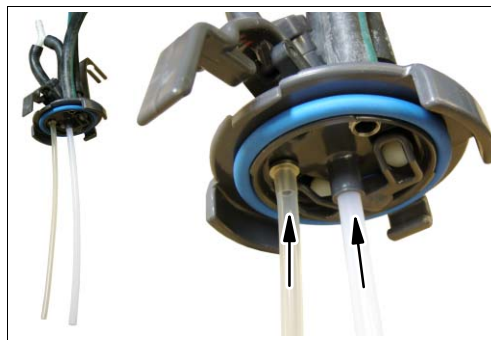| **Attention!** |
| :--- |

Sample suction error
If the ball catch (1) is not seated properly under the lid, the balls do not block the holes in the lid properly when the sample is being sucked from the tank.
► Check that the ball catch is seated properly(1).
● Loosen the nuts, if necessary (2)
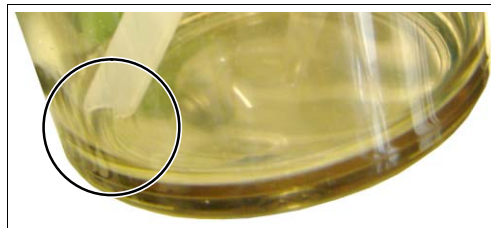● Align the ball catch and retighten the nuts(1, 2)

● Fit Y-hose connectors.
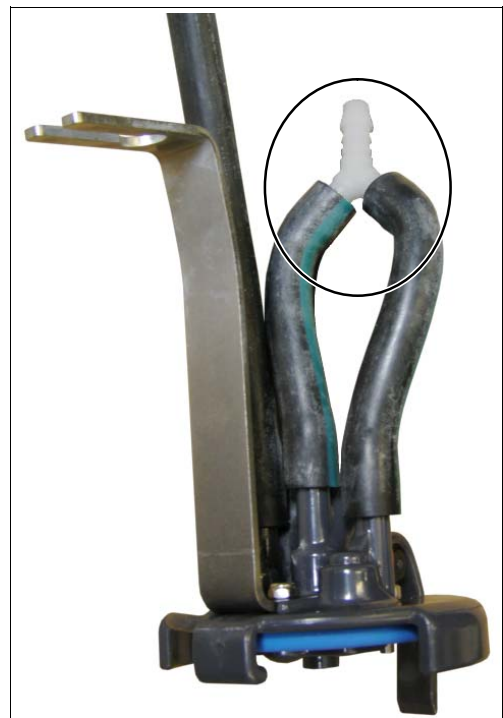
● Fit hose and intake tube.

● Taper the intake tube at the bottom so that it cannot attach itself to the bottom of the tank.

● Place tank on the cover and fasten.
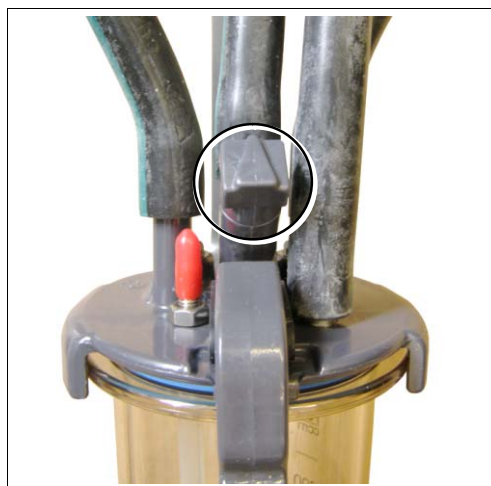
Note
The arrow on the plug must be pointing up for sampling.

Fit the sample tank in the milking system (Metatron)

The sample tank must be connected to the milk meter, air inlet valve and sampling device.
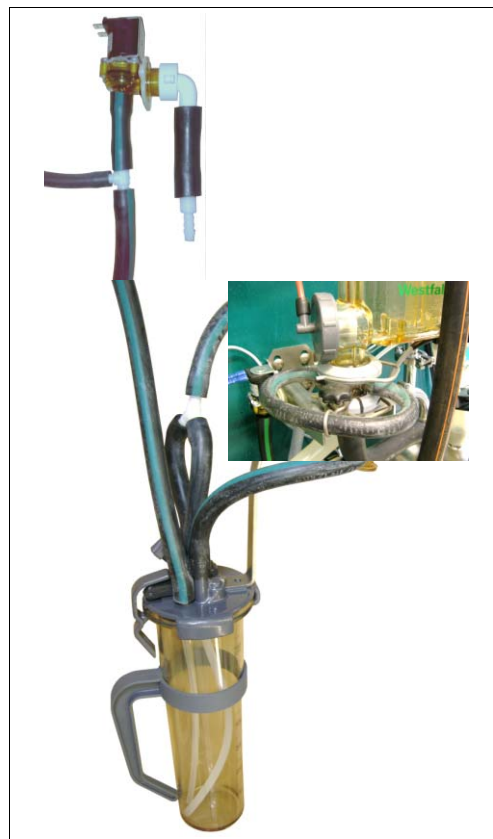
● Remove hose from the right-hand connector on the sampler

● Fasten sample tank to the sampler with holder and knob.
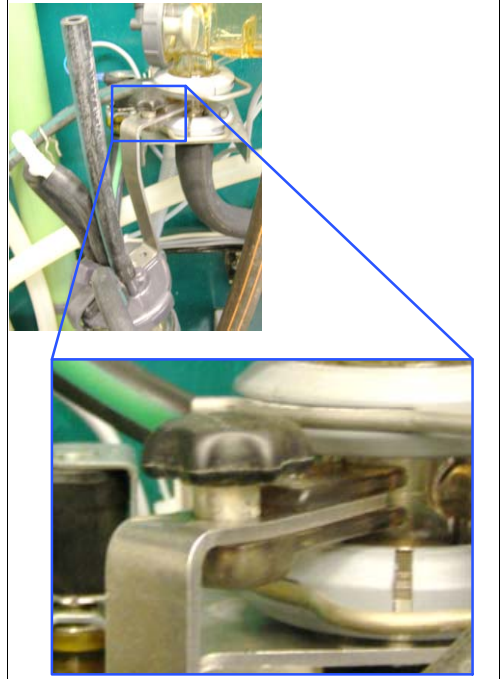
Attention!

The hose and intake tube from the cover must end at the lowest point in the sample tank.

● Connect the hose from the sample tank to the right-hand connector on the sampler.

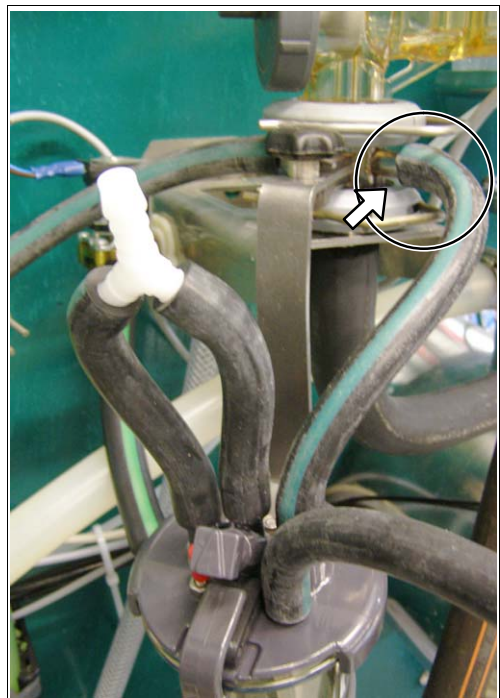● Fit the hose from the air inlet valve on the sample tank.
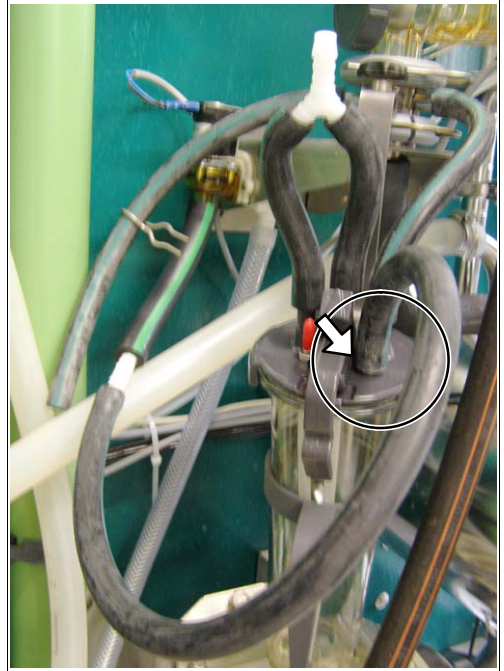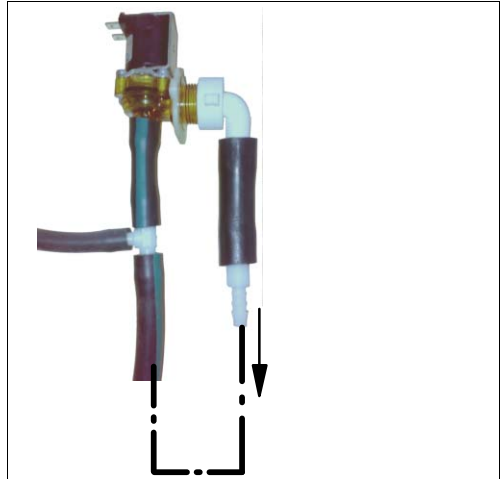
● Connect the hose from the left-hand connector on the sampler to the Y-connector on the sampler.
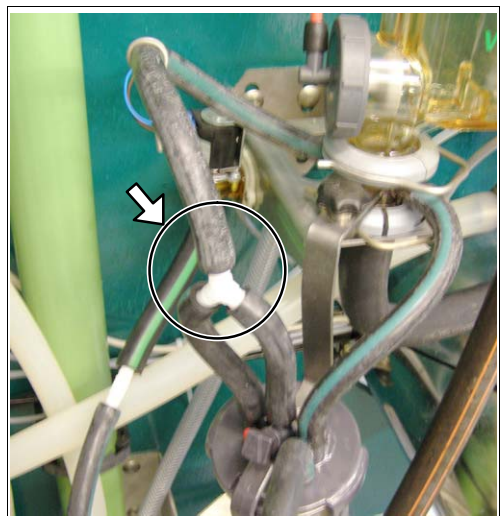
● Remove the cap from the sampler cover.
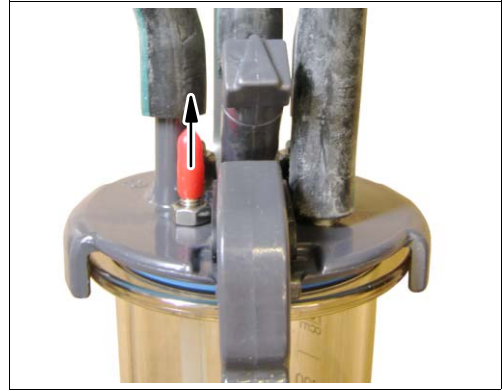
● Connect the sampling hose of the sampling device to the sample tank.
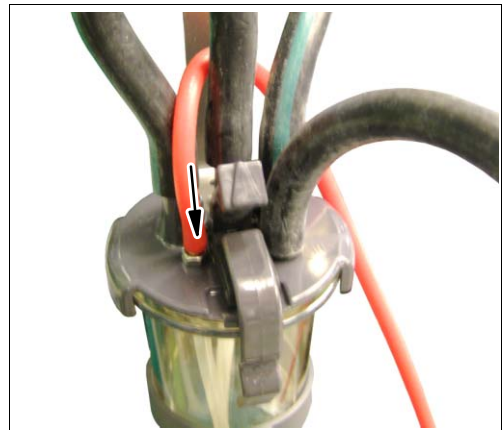
Attention!
Risk of collision
The robot can collide with the sampling hose.
► Run the sampling hose underneath the robot rail.

Note
The sampling device's operating times are adapted to the original length of the sampling hose.
Do not change the length of the hose!

Insert the bottle rack

Before sampling begins, the drain channels must be fitted and a bottle rack inserted.

● Push the front drain channel onto the side of the case.

● Place the bottle rack in the positioning device.

⚠ **Attention!**
Make sure the bottle rack is the right way round.
Note numbering!
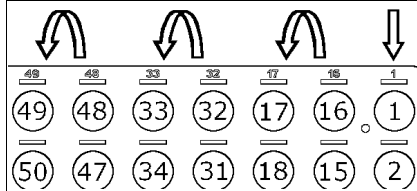
ℹ **Note**
The bottle rack can only be inserted or removed without the rear drain channel fitted.

● Push rear drain channel onto the positioning device.

> **ℹ Please note!**
> When starting a sampling session and replacing a bottle rack, the individual rack number must be assigned.
> If other bottle rack numbers are to be used, change them before sampling starts.

📖 For information on this subject see the section entitled "Stop sampling"

Attention!

Overheated samples
The samples in the sampling device must not overheat!
► Do not expose the sampling device to direct sunlight.

ℹ Note
Keep the sample bottles filled with milk in a place that is cool and protected from frost.

Connect the cable to the automatic milking system

The sampling device receives the electricity it needs from the automatic milking system.

Attention!
The connecting cable must be fed beneath the robot rail so that the robot can move freely.

● Connect the 5-pole plug on the connecting cable to the connector on the left beneath the control unit for the corresponding milking box.
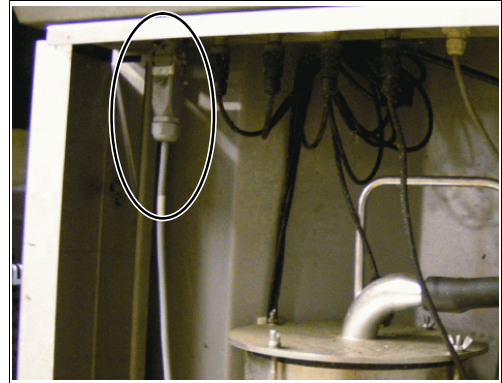
- The green indicator lamp on the sampling device will light.

● Press the "RESET" button.

- The filling nozzle will be heard moving to the start position.
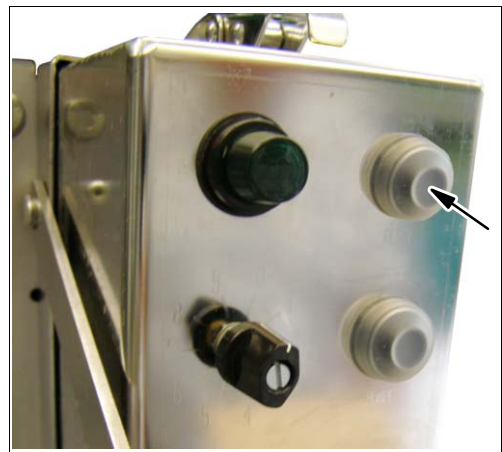
● Close the sampler cover.

5.5.3 Settings on the user interface of the automatic milking system

Entering settings:

- Open menu item

	Robot Data Manager
RDM	Herd / Sampling / Sampling specification

- Set number of milk samples per animal

- Set number of bottles in the bottle rack

Sampling then begins and the status is shown on the Box page.

See instructions for further information on the subject
7801-90 . . -001

5.6 Take samples

> **i** **Please note!**
> Carry out a system clean before starting sampling so that the milk-carrying parts of the installation can be cleaned once again.

> **For information on this subject see the section entitled "Cleaning"**

5.6.1 Start automatic operation

Start sampling

● Open menu item

RDM	**Robot Data Manager** Herd / Sampling / Operations

- Click on the button. (X)
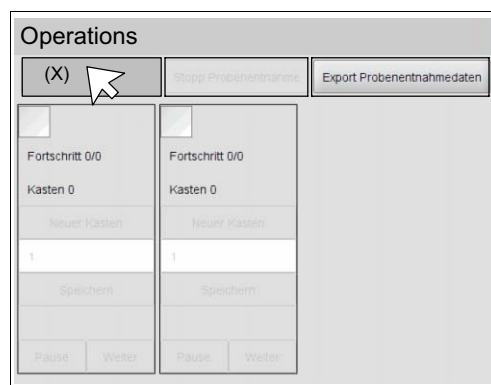
> **i** **Please note!**
> First enter the number of the bottle rack if the number suggested is not going to be used.

> **For information on this subject see the section entitled "Stop sampling"**

● Switch entry gates to all milking boxes to automatic mode.
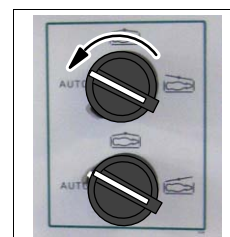
> **i** **Please note!**
>
> ● If a cow produces less than 2 kg of milk (e.g. if the cluster is inadvertently removed), the data is not recorded and a sample is not taken.
>
> ● If the teat cups are being attached manually during sampling, wait for at least one minute after the cow has left the box before attaching the cluster to the next cow.
> The sampling cycle does not start until the cluster has been removed and takes about one minute.
>
> ● A message is generated when all of the sample bottles in the sampling device have been filled.

5.6.2 Note the box data

Note the following data so that the data export can be checked:

- Sampling start time
- ID of the first cow in each box

5.7 Interrupt sampling

To change a bottle rack, sampling must be interrupted for the corresponding milking box.

5.7.1 Stop automatic operation

- Close entry gate to the milking boxes.
  - Wait until the animal has left the milking box.
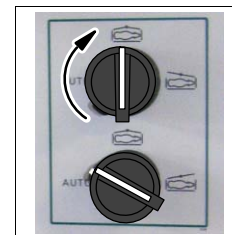
5.7.2 Stop sampling

- Interrupt milking at one milking box
  - Open menu item

RDM	**Robot Data Manager**
	Herd / Sampling / Operations
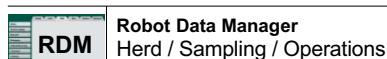
- Interrupt sampling
  Press the button shown (1. X)
- Milking box ready for change
  (colour of fields change).
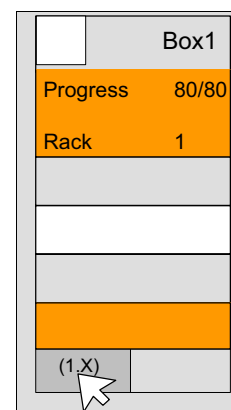
5.7.3 Change the bottle rack

- Change bottle rack
  - Open the sampler cover.
  - Remove the rear drain channel from the positioning device.
  - Replace bottle rack.
  - Push rear drain channel onto the positioning device.
  - Press the "RESET" button.
    (the filling nozzle will be heard moving to the start position)
  - Close the sampler cover.

● Enter the number of the new bottle rack.

  - Click the button (1. X)

  - Enter number of accept suggestion
    Please note!
    The number can only be entered with the on-screen keypad (click on the figures).
    Make sure that numbers are not duplicated.

  - Save the setting (2. X)

	Box1
Progress	80/80
Rack	1
	(1.X)
2	
	(2.X)

5.7.4 Resume sampling

● Continue sampling

  - Click the button (X)

	Box1
Progress	0/80
Rack	2
	(X)

5.7.5 Resume automatic operation

● Switch entry gate into the milking box to automatic mode.
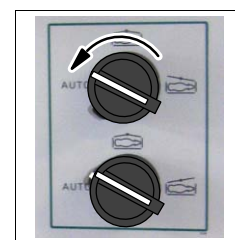
## 5.8   End sampling

5.8.1   Stop automatic operation

● Close entry gates to all milking boxes.

  - Wait until the animals have left the milking boxes.
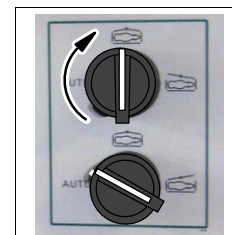
5.8.2   Stop sampling

● Stop sampling

  - Open menu item

RDM	**Robot Data Manager** Herd / Sampling / Operations

  - Click on the button. (X)

Operations

Start Probenentnahme   (X)   Export Probenentnahmedaten

5.8.3   Create the sample file

● Export sampling data.

For further information, see section
"Sample data export".

5.8.4 Transfer the sample bottles

The sample bottles in the bottle rack are filled in this order at each individual milking box.

The sample bottles are assigned to the individual cows in the same order when the data is exported.

Attention!

Incorrect sequencing when transferring the sample bottles to the laboratory unit can result in incorrect test results!
► When transferring the sample bottles to the laboratory unit, make sure that the order corresponds to the order of examination in the laboratory!

● Open the sampler cover.

● Transfer the sample bottles to the laboratory unit.

- 1 → 1
- 2 → 2
- 3 → 3
- ...

Example:
Dutch laboratory unit

● Close the sampler cover.

5.8.5 Start the system clean

The sampling device is cleaned with the short clean and the system clean.

This means that scheduled system cleans are performed even when a sampling session is running.

> ⚠️ **Warning!**
>
> **Risk of scalding**
> Hot steam generated during the main system clean can cause scalding if the device cover is left open!
> ► Do not open the cover during the main system clean.

> ℹ️ **Note**
> It is not necessary to remove the bottle rack before the system clean begins.

Once sampling has been completed, start a system clean to clean the sampling device.

● Start system clean

| RDM | **Robot Data Manager**
Herd / Cleaning / Operations |

> ℹ️ **Note**
> It is not necessary to remove the bottle rack before the system clean begins.

5.8.6 Disconnect and remove the sampling device

> ℹ️ **Note**
> The red suction hose should be disconnected from the lid of the sample tank at the end of the system clean and placed in a vessel containing hot water. The pump in the sampling case should then be run manually for about 1 minute. In this way, residual milk is flushed from the suction hose.

Once the system clean has ended, the sampling devices must be removed from all of the boxes.

● Carry out the steps described for setting up and connecting the device, but in reverse order.
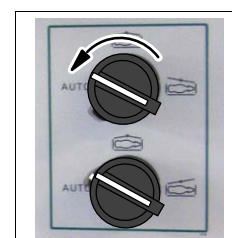
> ℹ️ **Note**
> The sample tank unit remains with the sampling device.
> It is used to carry out measurements on that sampling device.
>
> To extend its service life, the sampling device should be kept clean and it should be stored in a dry place at room temperature.

5.8.7 Resume automatic operation

● Switch entry gates to all milking boxes to automatic mode.

5.9 Displaying information about the current sampling process

5.10   Clean

The milk-carrying parts of the installation are cleaned fully automatically by the automatic milking system.

> **ℹ Note**
> Carry out cleaning directly before and after sampling.

Cleaning is performed with the individual phases of the system clean (pre-rinse, main clean and final rinse) and also with the short clean.

> **⚠ Warning!**
>
> **Risk of scalding by hot cleaning solution!**
> Hot steam generated during the main system clean can cause scalding if the device cover is left open!
> ► Do not open the cover during the main system clean.

- The hose pump runs several times for approximately 1 minute and remains stationary briefly.

- The mixing valve opens and the hoses are drained by the incoming air.

> **ℹ Please note!**
> The red suction hose should be disconnected from the lid of the sample tank at the end of the system clean and placed in a vessel containing hot water. The pump in the sampling case should then be operated using the "Pump" button for about 1 minute to flush residual milk from the suction hose.
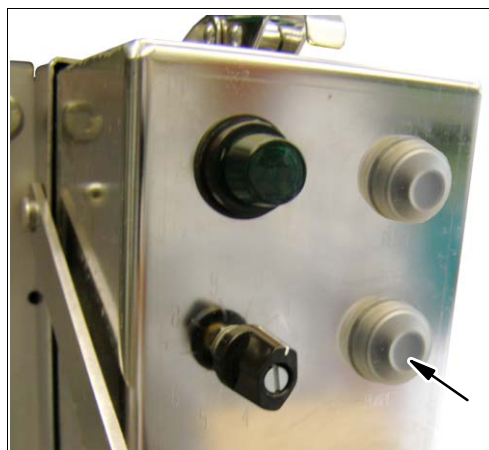
Also clean the sampling device manually, inside and out, after each session.

- Never clean electrical equipment with water or similar fluids.

> **Attention!**
>
> **Damage can be caused if fluid gets in!**
> Protect any electrically conductive components from the effects of moisture.
> ► Do not clean the sampling device with a high pressure cleaner or jet of water!

- Clean the sampling equipment in the case lid with a damp cloth and then wipe dry.

- Clean the plastic case and the stainless steel components in the bottom of the case with a brush or sponge and warm cleaning solution.
  Next wipe with a clean, damp cloth and then wipe dry.

> **ℹ Note**
> Empty bottle racks and the drain channels can be cleaned in a dish washer.

6   Sample data export

The sample data can be exported in different ways:

Country-specific export files

(on the connected herd management PC with DairyPlan C21)

Available to date:

Germany (DE)	ADIS data in accordance with ADR directive 1.2 and national Data Dictionary AGRO2012
The Netherlands (NL)	ADIS data in accordance with EDI - Electronische Melkmeting EDI-EMM, Version 1.1., November 1998 and new issues
France (FR)	ADIS Data Entity 880022

Raw data

(on the robot PC)

Call up from RDM on the robot PC and create file (.csv).

RDM	**Robot Data Manager** Herd / Sampling / Operations

6.1   Installation

All of the files required for the set language are installed with the "normal" DairyPlan C21 installation on the herd management PC.

No further installation is required.

See instructions for further information on the subject
7160-90 . . -531   DairyManagementSystem "DairyPlan C21"

6.2 To call up the program

> **Note**
> A country-specific sample data export can only be started on the herd management PC.
> A sample data export can only be started on the robot PC with RDM.

### 6.2.1 Sample data export for Germany (DE)

The sample data export is started on the herd management PC.

If the HM-D program module has been purchased (not obligatory for exporting sample data but necessary for importing milk control results, exporting control messages, etc.):

- Call up from the DP menu ("Datenaustausch", "LKV-Kopplung Deutschland" ["Data exchange", LKV connection Germany"].
- Start the application DPMiko.

If it is not in the DPMenu, start the program DPMiko.exe directly from the DairyPlan installation folder with Windows Explorer or set up a link to DPMiko.exe and use that to start the program later.
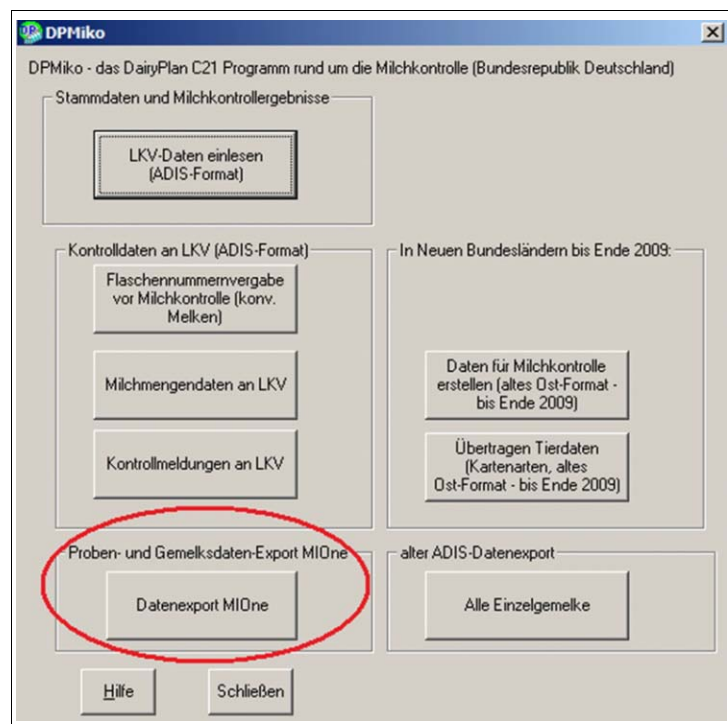
- In DPMiko select the button "Datenexport MIOne" [MIOne data export].
- Start the application "Robotermilchmengen_an_LKV" (based on DPRequest.exe).

6.2.2 Sample data export for Holland (NL)

The sample data export is started on the herd management PC.

> **ℹ️ Note**
> Make sure that "DPMenue_NL" is active in the DP menu ("M" button on the right next to the menus).

● Start sample data export with "Monstername Export" from the "Monstername" menu.

6.2.3 Sample data export for France (FR)

The sample data export is started on the herd management PC.

At this time it is not possible to call up from the DP menu.

Alternatively, a link file, with the name "lancer FR_Export_Donnees_Echantillonnage.lnk" is copied into the DairyPlan installation directory during installation.
This file can be dragged from the DairyPlan directory onto the desktop so that it can be used as a shortcut.

● Call up the application from the link as follows:

<DP-Installationspfad>\DPRequest.exe Export_Donnees_Echantillonnage /IS /NatFR

> **ℹ️ Note**
> This link only works if the DairyPlan program is installed in the directory "C:\DairyPln".
> This is the standard installation path on the herd management PC.
> Otherwise adjust the DP installation path in the link file "Properties".

6.2.4 Raw data export

Raw data export is started on the robot PC.

The export format is a simple list of values. It is used for countries that do not define a specific format. This comma-separated values text file (.csv) can, for example, be processed using a spreadsheet program.

> **Note**
> Do not use the raw data export for countries that have a specially defined export format; always use the country-specific sample data export.
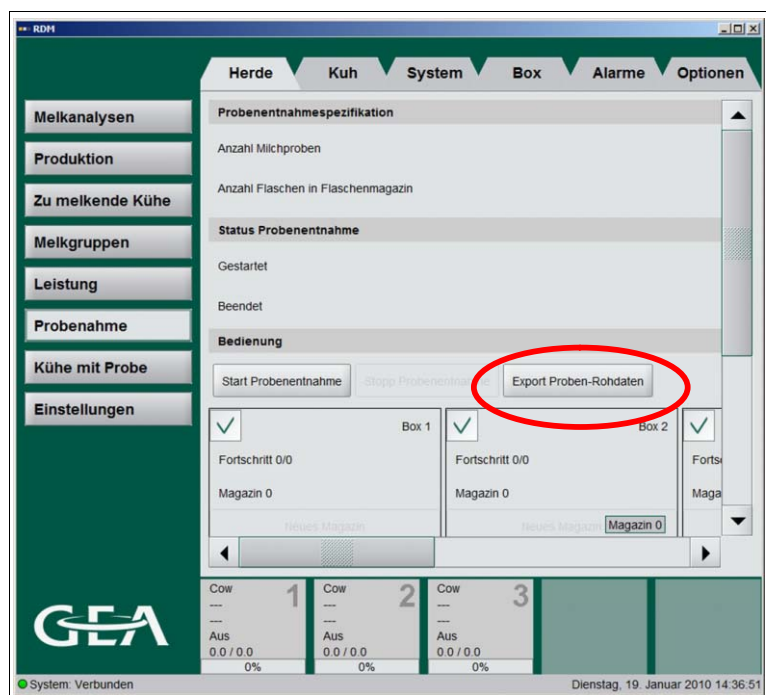
The raw data export is started in the RDM program in the "Herd" / "Sampling" screen (with the "Export raw sample data" button.

- Call up the menu point.

RDM	**Robot Data Manager** Herd / Sampling / Operations

Example (DE):

- Press the "Export Proben-Rohdaten" [Export raw sample data] button.

6.3 Program execution

If a country-specific sample data export is specified:

Another DPRequest application is started depending on the language set:

Germany (DE)	Robotermilchmengendaten_an_LKV
The Netherlands (NL)	ExportMonstername
France (FR)	Export_Donnees_Echantillonnage

The sequence is very similar. Only the fields that have to be completed for the country in question are shown.

If no country-specific sample data export is specified:

Use the raw data export.

6.3.1 DPRequest application main dialogue

Enter the following:

● Farm number that should be included in the data.

● Restricted to groups or second group number (described in German as an "Abrechnungseinheit" "AE" - "accounting unit") if data is not to be sent for all lactating cows.

> **Please note!**
> If samples were taken from all the animals in a herd, these fields must be left empty.

● Name of the target file. The following are pre-set:
- DE: DPADISproben.ads
- NL: MELKCTRL.EMM
- FR: Export_Donnees_Echantillonnage.ads

> **Please note!**
> The name can be changed and a path can also be entered.
>
> Example:
> A USB flash drive is displayed as drive "E".
> ⇒ E:\DPADISproben090723.ads
>
> If a path is not entered, the file will be saved in the DairyPlan installation directory (generally "C:\DairyPln").

Example (DE):

● Press the "OK" button to create the data and call up the next step.

6.3.2 Farm data dialogue box

Depending on the language set, different fields are displayed that have to be completed:

	DE	NL	FR
● Farm number (Same value as in the main dialogue box, check. This farm "registration number" should generally be entered without any spaces. If necessary, check with the LKV or control centre.)	❏	❏	❏
● Type of farm number (Ask the relevant LKV or control centre if necessary.)	❏		
● Second farm name (give the name that is to be included in the export data.)		❏	
● Postal code		❏	
● Town / Address	❏	❏	
● Telephone number		❏	
● Data centre (code numbers and name are offered for the data centre. Only the code number is included in the data. If another data centre has to be given, find the corresponding code number and enter directly in the field).		❏	
● Laboratory (code numbers and name are offered for the laboratory. Only the code number is included in the data. If another laboratory has to be given, find the corresponding code number and enter directly in the field)		❏	

❏ Field is displayed

Example (DE):

Example (NL):

● Press the "Next" button ["Weiter"] to call up the next step.

6.3.3 MLP (milk yield test) settings dialogue box (DE only)

Details have to be entered on the milk yield test:

- Test method (who performed the test)
- Test diagram (usually "S", occasionally also special solutions which are not listed)
- Test interval (how often testing is performed)
- Milking frequency (always "R" for milking with a robot)

> **Note**
> The exact details should be agreed with the relevant control centre.

Example (DE):

- Press the "Next" button ["Weiter"] to call up the next step.

6.3.4 Dialogue for single milking and sample export

There are two time periods for which data can be exported:

1. **Export individual milkings for the period between the previous and the present sampling (the sample bottle number is exported as zero)+++**
(The time period between the end of the previous official sampling and the beginning of the current sampling.)

Most control centres use milking data from this time to establish a yield assessment. To ensure that these data do not include any sample bottle or sample box numbers that come from other sampling operations (for health monitoring for example) and might confuse the control centre computer, these data are exported in DairyPlan so that there are always zeros for the sample numbers.

Only the start of this time period (date and time) is entered, this corresponds to the end of the previous sampling.
The end of the time period is calculated based on the start of the time period in the following section.

> **i** **Note**
> Remove the tick if no data are to be exported from this period.+++

2. **Export individual milkings from sampling with sample bottle numbers (enter the date and time)+++**
(Time period of the actual sampling)

Single milk output data, with the bottle and box numbers saved, are exported here.

● Enter the beginning and end of the time period (date and time).

Example (DE):

Example (NL):

Example (FR):

Attention!	

Compare the bottle numbers

The bottle numbers for the animals and the numbers on the bottles in the sample box must correspond.

► Use the display screen to check carefully.

The functions of the data display buttons are described below.

● Print a sample data document.

Start the process by clicking on the corresponding button (below date/time of the sampling period).

Note
The printed sample data document is added to the sample box (or bottle rack) and is sent with it to the laboratory.
The sender of the samples and the number of boxes and bottles can be taken from the printed document.

Milk dry animals and colostrum cows
(only for sample data export Germany)

If this function is activated, a segment is added to the data which registers the dry and colostrum animals with the LKV.
These data are taken from the sampling data for conventional dairy farms and is referred to as "Entity 880033" by the data centres.

> **ℹ Note**
> Not all computer centres can process this data for a milking robot.
> Check in advance whether your computer centre can read the data entity 880033 from a farm using robots.

Attention!

Data about dry animals and colostrum cows can only be generated on the sampling day.
► If data is reported at a later date, omit the data entity 880033 because the program only exports the dry cows and colostrum animals that are currently in the data set.

● Start data export with the "OK" button.

"Anzeige Betrieb + allgemeine Daten" button ["Display farm + general data] (DE and NL only)

This button can be used to display the data to be exported (general details of the farm or herd):

● Click on the button.

● "DPList" will open in a separate window.

Example (DE):

Display data that are to be sent to the control centre as "Entity 880001 Betriebsdaten" (farm data).

Example (NL):

Display data that are to go to the control centre as "Entity 204008 Gebeurtnis Bedrifsgegevens" (farm data) and "Entity 204010 Gebeurtnis Registratie" (list of animals on the farm).

"Daten anzeigen" button ["display data"] for both time periods.

This button can be used to display the rows of data for the corresponding period:

- Click on the button.

- "DPList" will open in a separate window.

Example (DE):

Displays data that are to be transmitted as "Entity 880022 Einzelgemelke" (single milk output).

> **Note**
> The ear marker numbers of all animals for which data will be exported must be clearly entered as a 15-figure number.

Example (NL):

Display data that are to be transmitted as "Entity 204250 Gebeurtnis Monstername Koe".

> **Note**
> For France, the data are transmitted in an amended form of the German "Entity 880022".

> **Note**
> The (1st) period after the end of the previous sampling (usually several weeks) may be too large to be able to display all of the rows of data in the DPList screen.
> To check all of the rows of data, use DPList to export the data ("File" menu, "Transfer file") to an ASCII file or an Excel table.
> (see DPList program for the exact process)
> If the computer has a printer installed, alternatively all of the pages can be viewed with "File" and "Page view".

Attention!

Data processing error caused by unofficial samplings
There must be a zero for all of the sample box and bottle numbers for the period after the end of the previous sampling.
This is important because unofficial samplings may interfere with the processing of the data in the laboratory.
► The number of bottle numbers listed must be the same as the number of sample bottles filled.

"Additional Data Milk Control" button (NL only)

For exporting data in Holland, it is possible to mark individual, conspicuous animals (sick animals for example) with a specific code.
Although that code will then be in all of the single milk output rows for that animal. It is not possible to enter it only for specific single outputs.

The code is entered with the program in "Details", "Letztes Gemelk" ["Last Milking"] dialogue page in the field "Zusatzcode (PRLMU)" ["Additional code"].

A screen showing the animals with a code can be called up with the button described here:

● Click on the button.

● "DPList" will open in a separate window.

> **Note**
> The exact codes can be obtained from the relevant control centre.

6.3.5 Creating the export data

As described in the section on "Dialogue box for single milk output and sample export", the data export is started by pressing the "OK" button.

● When the data export has been successful, a message will appear.

Example (DE):

● Confirm the display with "OK".

ⓘ Note

If the data export has not been successful, error messages will be displayed together with suggestions for correcting them.

The file is saved as described in the section on "DPRequest application main dialogue".

● Send the file to the relevant control centre.

6.3.6 Creating raw data

If raw data are generated instead of country-specific export data, start the RDM program as described in "Call up the program / Raw data export".

● A window will open.

Example (DE):
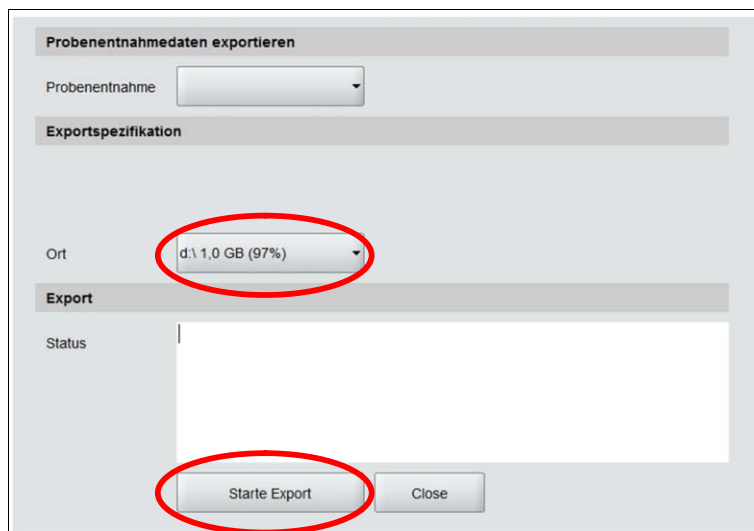
● For "Location" enter a drive. This might be a hard disk or a connected USB stick (recommended)).

Attention!

"C" drive loss of data

Data that was created on the "C" drive can no longer be found after a system restart.

► As far as possible do not use drive "C"!

● Press the "Start Export" button to start the data export.

The milking data from the last sampling period are written to a file on the specified drive.

> **Note**
>
> When a drive letter is entered as "Location", the file will be saved in the main directory on that drive.
> If a drive letter is not entered, the file will be written to the DairyPlan folder (generally "D:\DairyPln").
>
> The file name is composed as follows:
>
> <YearMonthDayHourMinuteSecond>DefaultCSVSampleOutput.csv

● After a successful data export, there will be a message in the "Status" window for "Export".

The following data fields will be exported:

- Barn number   (cowNr)
- Ear marker number   (earTag)
- Milking box number   (boxNr)
- Date of milking   (date)
  The date is shown according to the language (in the order Day/Month/Year).
- Time of milking   (time)
- Quantity of milk from this milking   (yield)
  The decimal marker (point or comma) is shown according to the language.
- Box number   (rackNr)
- Bottle number   (bottle)

> **Note**
>
> The first row lists the abbreviated designations of the data fields.
> The values are separated from each other by a semicolon.
>
> Example:
>
> ```
> cowNr;earTag;boxNr;date;time;yield;rackNr;bottle
> 3;276000579311111;2;12.01.09;7:34;16,42;12345;1
> 5;276000579611112;5;12.01.09;8:04;21,85;12345;2
> ```

● Send the file to the relevant control centre.

7 Operating faults

If necessary, please contact your nearest authorized technical dealer.

7.1 Special personnel qualification required for troubleshooting

Troubleshooting may only be performed by specially qualified personnel in accordance with the safety instructions.

They must be trained in operating and setting up the sampler, have experience of working with it and must have read and understood this manual.

See also the section on "Personnel qualification".

7.2 Safety Instructions for Troubleshooting

To prevent damage to property and/or life-threatening injury to personnel, the following must always be observed:

● First of all, prevent the product from being restarted accidentally.

● Ensure that safe disconnection can be carried out by a second person at any time.

Read the "Safety" section as well.

Special dangers involved in troubleshooting:

● If energy sources are switched on unintentionally this may lead to serious damage to property and/or life-threatening injuries to people and animals.

● Electrostatic processes may damage electronic components.

Attention!
Electrostatic discharge! Circuit boards can be damaged by electrostatic discharge. ► Avoid electrostatic charge (e.g. from clothing) and only touch the edges of circuit boards.

7.3 Possible faults and troubleshooting help

Malfunction	Possible cause	Solution
Green indicator lamp does not come on	Cable not connected	Check and connect correctly if necessary
	Faulty LED	Replace LED
No sample in the sample bottle	Sampling hose is not connected correctly, or is blocked, kinked or torn	Check and replace if damaged
	Hose pump defective	Replace faulty parts
	Crimp valve and/or air inlet hose for mixing open	Check and replace any defective parts
Too much or too little sample in the sample bottle	Sampling hose is the wrong length	Use the original length
	Wrong switch position	Reset the quantity
To little sample in the sample bottle	Reducing hose pump capacity	Readjust the quantity with the switch
		Replace the hose of the hose pump
	Sampling hose (red) is kinked	Adjust the sampling hose until it is no longer kinked
	Air inlet hose for mixing is leaking	Check and replace if damaged
	Suction hose (red) is caseated	Disconnect the suction hose from the tank and hold it in a vessel containing hot water; run the pump manually for one minute to flush the hose.
Different sample volumes in sample bottles	Suction hose (transparent) is sucking itself onto the tank.	Push the suction hose in the tank up to the lid nozzle and attach it to the draw tube using a sealing ring
Sample is missing the sample bottle	Chain and/or chain sprockets are worn out	Replace faulty parts
	Limit switch is being passed	Check and adjust the limit switch trigger point
	The encoder of the drive motor is faulty	Check the encoder, and replace the motor, if necessary

Malfunction	Possible cause	Solution
The sample is not being drawn or not being drawn completely from the sample tank	The ball catch under the lid is not seated correctly; the balls in the lid of the sample tank are not closing properly.	Remove the lid from the tank, loosen the nuts, align the ball catch, retighten the nuts.
	The air intake-valve filter is blocked	Clean the filter
	The air intake valve is faulty	Replace the air intake valve
Samples are not being drawn from the sample tank	Cable not connected	Check the connecting cable, connect properly, if necessary
At the beginning of sampling from a new cow, residue from the suction hose flows back into the tank.	Residue from the previous sample remains in the suction hose. The hose in the mixing valve is not opening completely when the lines are emptied.	Solution 1: Replace the hose of the mixing valve Solution 2: Replace the mixing valve
Sample is not being mixed properly	Hose in the mixing valve is not opening completely during mixing	Solution 1: Replace the hose of the mixing valve Solution 2: Replace the mixing valve

8 Maintenance

If necessary, please contact your nearest authorized technical dealer.

8.1 Special personnel qualification required for maintenance work

Maintenance work may only be performed by specially qualified personnel in accordance with the safety instructions.

They must be trained in operating and setting up the sampler, have experience of working with it and must have read and understood this manual.

See also the section on "Personnel qualification".

8.2 Safety instructions for maintenance

To prevent damage to property and/or life-threatening injury to personnel, the following must always be observed:

● Only use original spare parts / original wearing parts / original accessories.
  In the case of products by other manufacturers it cannot be ensured that they have been designed and produced from the point of view of loads and safety.

● All of the steps involved in the maintenance work must be worked through in the order specified.

● The maintenance work specified in the instructions (adjustment, cleaning, lubrication, inspection, etc.) must be performed at the times specified.

● Maintenance work should only be performed with the tools envisaged for this purpose.

● Also note the special information in this manual for the individual components.

● Only use the operating media specified.

● Immediately replace any components that are not in perfect condition.

Read the "Safety" section as well.

Before carrying out maintenance work, make sure of the following:

● Before performing any work on electrical installations or equipment (components, housing, etc.) switch off all power supplies and make sure they cannot be switched back on again. Put up a sign warning against switching them back on again.

● all components have cooled to room temperature

Special risks involved in maintenance work:

- Serious damage to property might occur if incorrect replacement or wearing parts are installed.

- If energy sources are switched on unintentionally, this may lead to serious bodily injury or damage to property.

- Electronic components may be damaged by electrostatic processes.

Note

Only touch the edge of the printed circuit board and avoid static caused for example by clothing.

On completion of the maintenance work, check that:

- The installation values set before the work was performed have not been changed by the work (see settings report).

- all screwed connections that were loosened earlier have been tightened.

- All safety devices, guards, tank covers, etc. that were removed previously have been put back correctly.

- All safety equipment is working perfectly again.

- Have all of the tools, materials and other equipment that were used been removed from the working area again?

- Operation has been checked after maintenance work has been completed or parts replaced. Produce a full test report if necessary.

8.3   Inspections and preventive maintenance

| Interval* (samples filled)	Description	Action
After every session	Milk sampling device	Clean thoroughly inside and out
every six months (7500-9000)	Hose pump hose	replace
once a year (15000-18000)	All hoses, wearing parts	replace
	Filling position	Check and adjust limit switch if necessary
every 3 years (45000-60000)	Chain, driving pinion, chain sprockets	Check, replace if necessary
	Hose pump	replace

*   Period of constant use (several times a week)

Carry out regular checks on electrical equipment:

● Tighten any loose connections

● Replace damaged lines or cables immediately

● Close off any cable openings that are not being used

8.3.1   Replacing wearing parts on the sample tank

Wearing parts come together in a set of replacement parts.

● Replace wearing parts

7801-9905-130
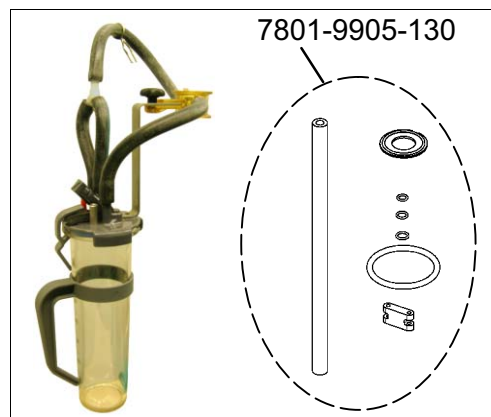
8.3.2   Replacing the hose pump hose

Replace the hose every year to ensure reliable operation.
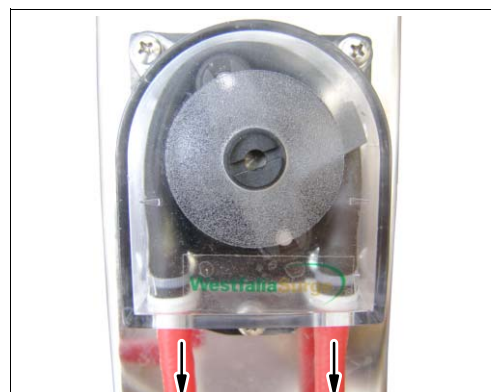
> ⚠️ **Attention!**
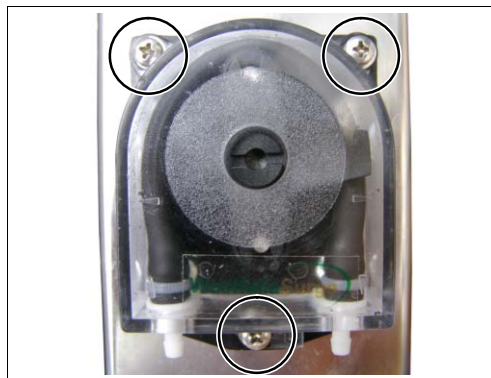> Only replace the hose when the hose pump is off.

> **Attention!**
> Only replace the hose when the hose pump is off.
> ► Switch off the hose pump before replacing the hose.

● Pull the hose out from the hose pump.

● Undo the three screws in the housing cover.

● Remove the housing cover form the hose pump.
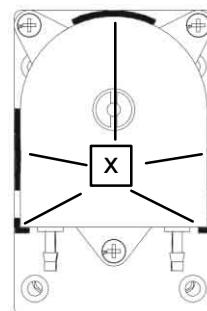

● Take the hose out of the housing cover.

● Insert a new hose in the housing cover.

● Screw the housing cover onto the hose pump.

Attention!
Not fitting the housing cover properly can damage the hose or cause fluctuation of the pump output.   ► Make sure that the housing cover is positioned correctly between the guide marks (x)!   - The housing cover must be flush

● Connect the houses onto the outside of the hose pump again.

The pump can now be used again.

> **ℹ Note**
> After replacing the hose, reset the sample quantities required on the unit and carry out a trial run.

8.3.3 Replacing the chain and sprockets

The chain comes correctly pre-tensioned from the factory.

It is not necessary to re-tension the chain because of the very slight wear.

As a rule the chain will not have to be changed for several years.

⚠️ **Warning!**
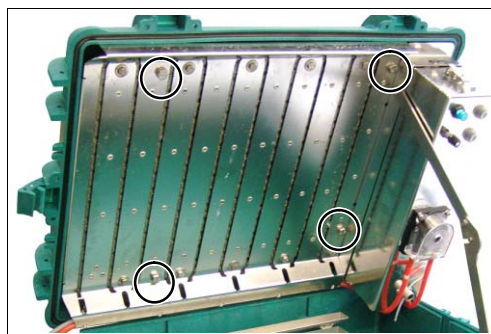
Danger from automatic start
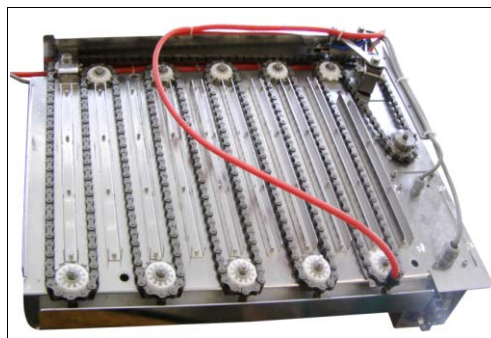The conveyor chain can start to move when work is being carried out.
There is a risk of crushing and electric shock.
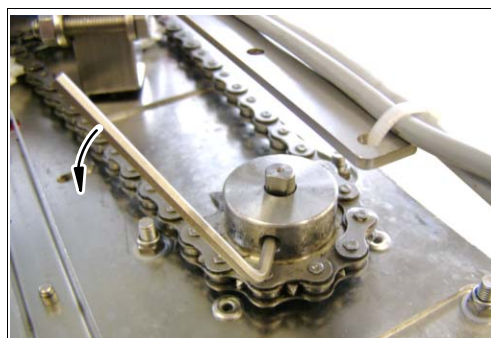► Disconnect the cable from the power supply before starting the work.

● Undo the four screws holding the sampling equipment in the lid.
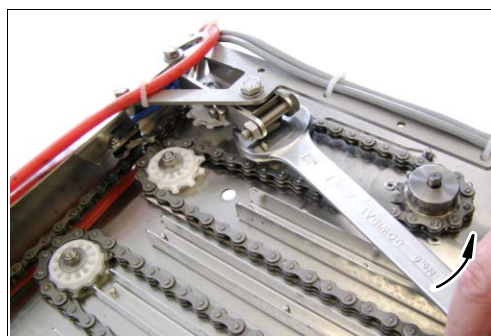

● Turn the sampling equipment out of the lid so that the chain is on top.

● Loosen the threaded pin on the sprocket (drive) with a spanner.

● Place a spanner on the square of the chain tensioner and loosen the chain.

- Remove the sprocket from the drive shaft.

- Replace any defective parts (e.g. chain or sprockets).

- Place sprocket with chain on the drive shaft, loosening the chain with the spanner.

- Turn the sprocket until the threaded pin is pointing towards the flat surface of the drive shaft.
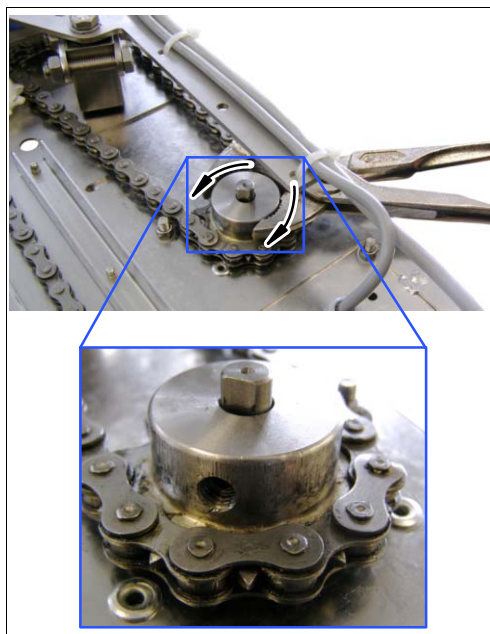
- Position the sprocket at the required height on the drive shaft.
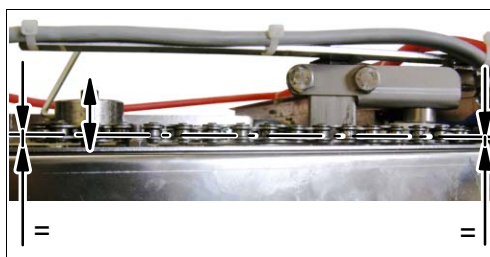
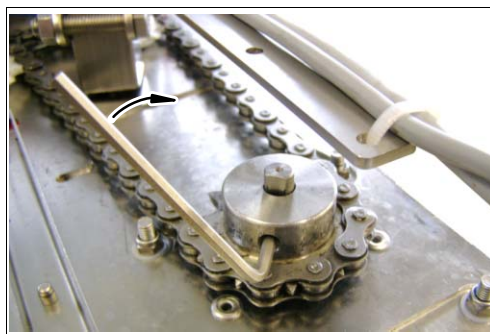- Tighten the threaded pin on the sprocket (drive) with a spanner.

- Re-assemble the sampling device.

8.3.4   Checking and adjusting the limit switch trigger point

The trigger point may change over time and therefore has to be checked regularly.

● Connect the cable to the automatic milking system.

● Press the "RESET" button.

- The filling nozzle will be heard moving to the start position.

● Open the catch on the top of the cover.

● Briefly press the button on the right of the electronic card.

- The filling nozzle moves one position further.
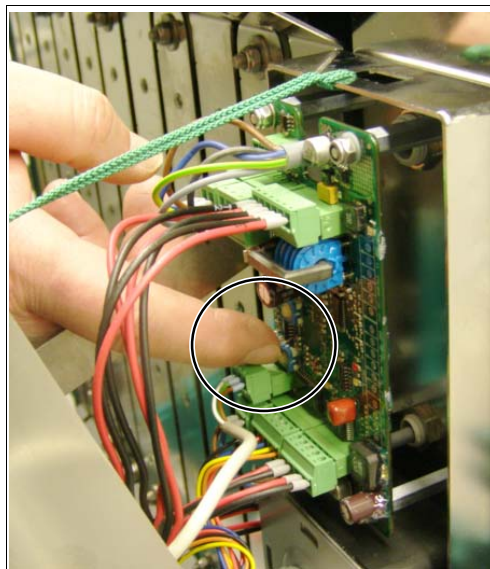
● Check the nozzle's first filling position.

- The filling positions are marked by notches.
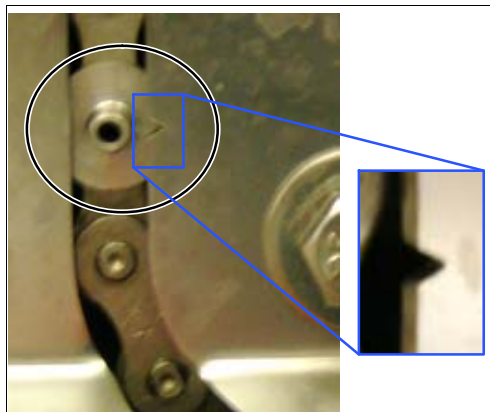
● Press the "RESET" button.

- The filling nozzle moves back to the start position.

● Press and hold down the button on the right of the electronic card.

 - The filling nozzle travels to position 41.

● Check the nozzle's filling position.

 - The deviation may not be more than +/- 1.5 mm.
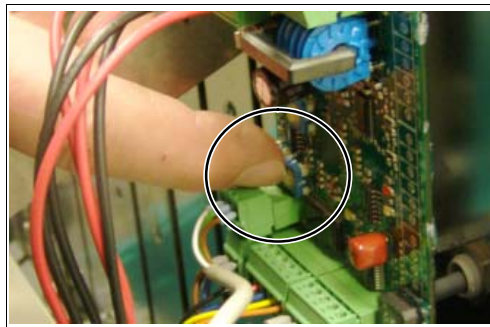
If the first filling position is not correct:

⚠ **Warning!**

Danger from automatic start
The conveyor chain can start to move when work is being carried out.
There is a risk of crushing and electric shock.
► Disconnect the cable from the power supply before starting the work.

● Take the sampling device out of the lid as described in "Replacing the chain and sprocket" and turn over.

 - The limit switch is accessible.

● Change the position of the limit switch so that the filling nozzle is exactly on the marking for the first filling position.
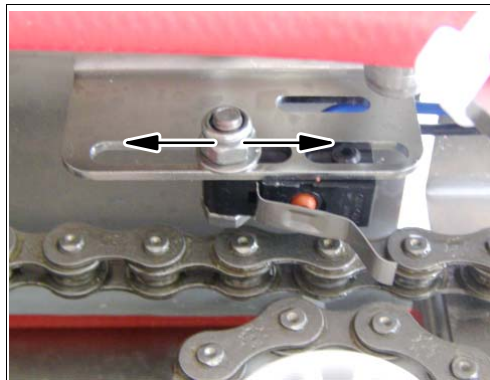
● Re-assemble the sampling device.

● Check the nozzle's first filling position again as described above.

9 decommissioning

Decommissioning may only be performed by specially qualified personnel in accordance with the safety instructions.

See also the section on "Personnel qualification".

9.1 Safety instructions for decommissioning

To prevent damage to property and/or life-threatening injury to personnel, the following must always be observed:

- All of the steps involved in the decommissioning work must be worked through in the order specified.

- First of all, make the operating area for decommissioning completely safe.

- Make sure that operating media are disposed of without harming the environment.

Read the "Safety" section as well.

Special risks during initial commissioning:

- Leaking lubricants, solvents, preservatives, ... can cause injury if they come into direct contact with the skin.

- Components which have not been removed correctly may fall off or twist.

- Exposed sharp-edged components/tools/.... may cause injury.

9.2 Temporary decommissioning

- Stop sampling.

To extend its service life, the sampling device should be kept clean and it should be stored in a dry place at room temperature.

9.3 Final decommissioning/disposal

You are strongly advised to contact the supplier if the system is to be decommissioned.

- Stop sampling.

- Take components out of the automatic milking system.
  (in the reverse order as described in the section entitled ?Prepare for sampling?)

After final decommissioning, handle all components properly and dispose of them in accordance with valid local regulations on waste disposal and utilisation.
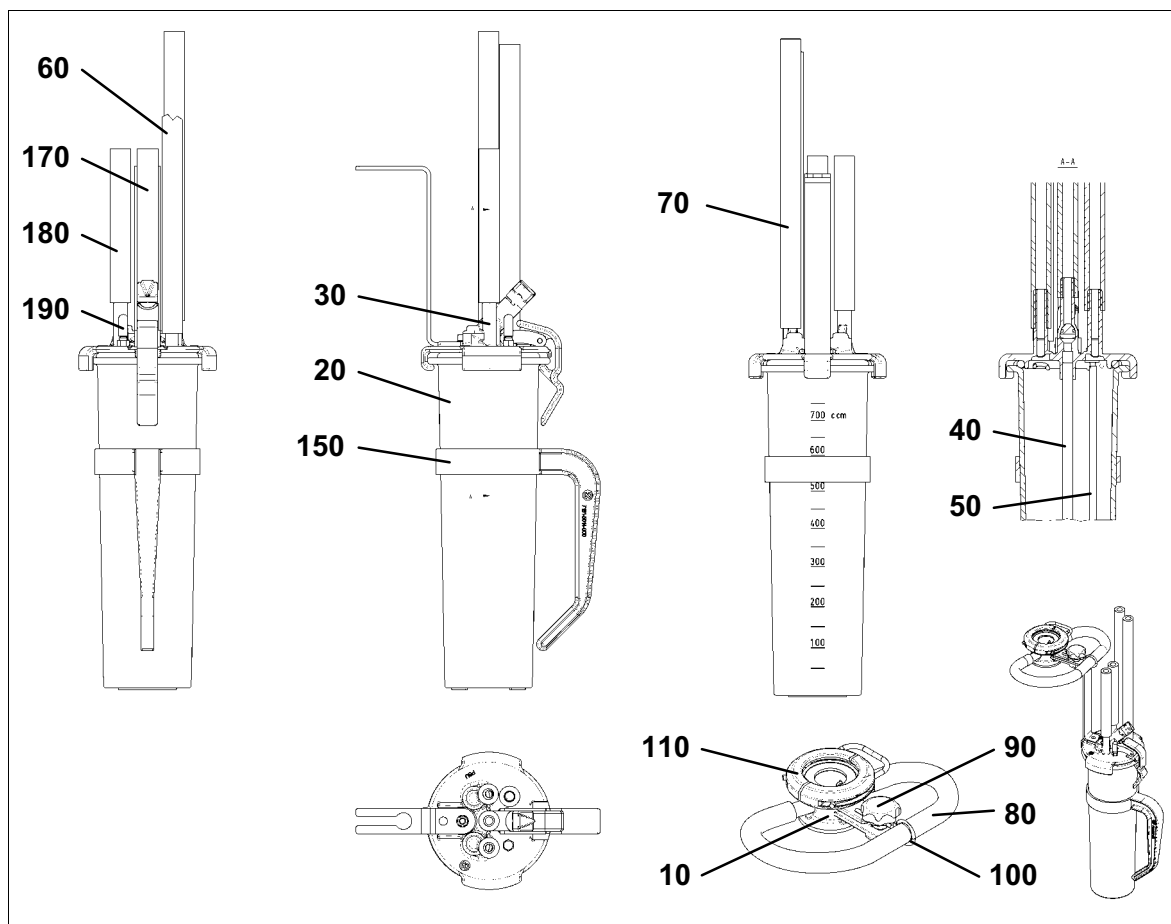
Note
The system contains components (metals, electrical components, plastics, etc.) which are not biodegradable.
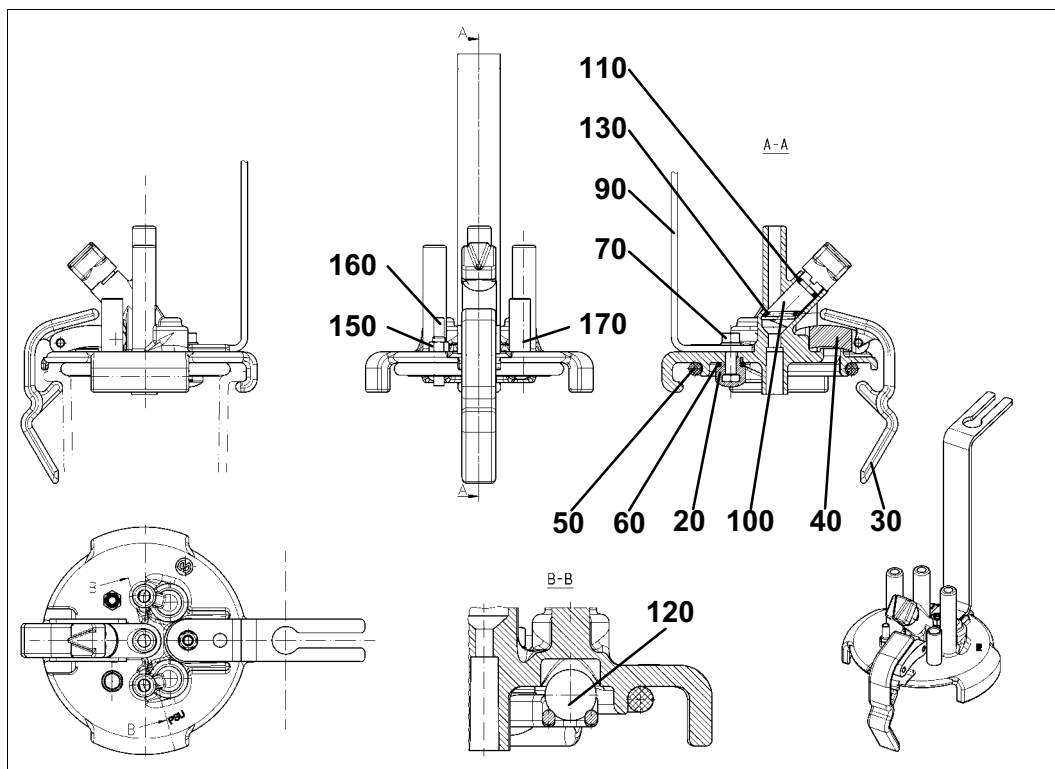
10 Spare Parts

10.1 Milk sampling device

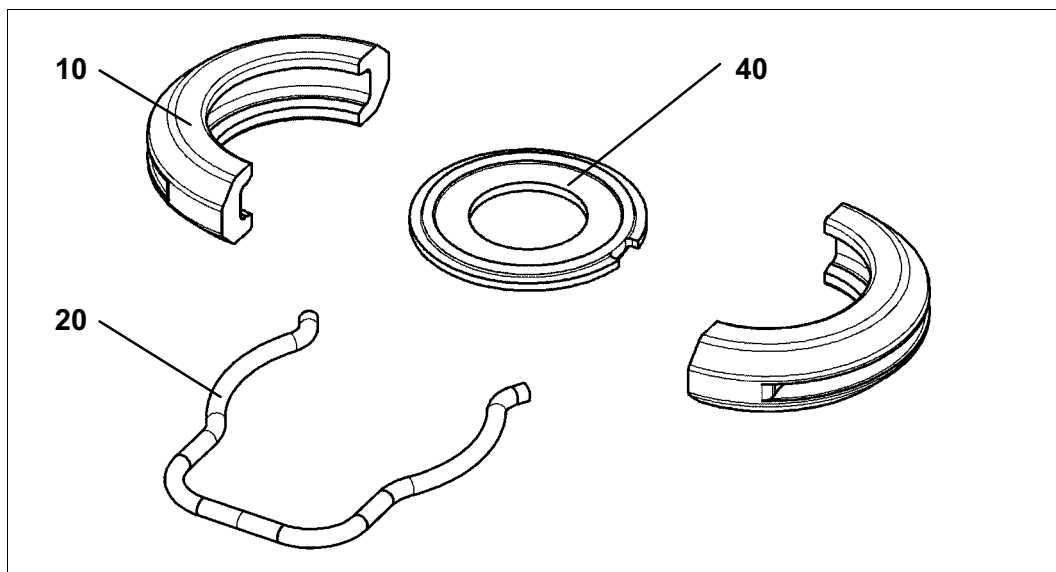| Item		Part no.	Description	
		7801-2503-000	**Milk sampling device (without bottle rack)**	**MI*one* Metatron**
0020		7801-2187-070	Bracket, complete	
0030	◯	7801-2503-020	Sampler complete	
0040		0019-5575-300	Saucer-head screw	M8x25
0050		0026-1345-300	washer	8,4
0060		0019-9101-300	Cheesehead screw	M4x20
0070	◯		Milk sampling device	MI*one* Interrior
0080		7800-0025-657	Cover holder	
0090		7800-0025-663	Distance bush	M8x56
0100		0019-6901-300	Hexagon head bolt	M8x16
0120		0026-0439-300	washer	8,4x24x2
0130		7800-0025-678	Lock washer	7
0150		7801-1268-020	Drain channel, welded	Duo Compact II
0160		7801-1268-000	Drain channel, welded	rear
0170		0019-9100-300	Cheesehead screw	M4x16
0180		0026-0429-300	washer	5,3x15x1,2
0190		0026-1362-300	washer	4,3
0200		0013-0310-300	Hexagon Head Nut	M4
0210		0019-6845-300	Hexagon head bolt	M6x25
0220		0026-0922-300	washer	6,4x18x1,6
0230		0013-0294-300	Hexagon Head Nut	M6
◯		**See corresponding parts list/drawing for further breakdown of components.**		

10.1.1 Sampler complete

Item		Part no.		Description	
		7801-2503-020		**Sampler complete**	
0010		7161-2513-010		Sampler	Metatron
0020		7161-5588-030		Box	ø96x257 / 700 ccm
0030	◯			Cover for sampler complete	
0040	x	0018-0380-848	x	Pipe (170 mm)	8x1 (available by the metre)
0050		0018-4376-898	x	tube (160 mm)	4x1,5 (available by the metre)
0060		7021-7102-018	x	Milk hose	8,5x3,75 (Meterware)
0070					
0080		7036-7101-010	x	Milk hose	8,5x3,75x320
0090		0021-3134-700		Star knob	32/M6
0100		7161-2084-130		Tube holder	ø16x60
0110	◯	7161-3270-000		Clip complete	
0150		7161-5014-000		Handle	
0160		0018-5324-820		Y-hose connector	10
0170		7021-7102-018	x	Milk hose	8,5x3,75 (available by the metre)
0180					
0190		0026-2249-890		Cap	4x15
-	◯	7801-9905-130		Set of spare parts	
x -		**Wear part, see section on "Maintenance" for maintenance interval Included in set of spare parts (7801-9905-130).**			
◯		**See corresponding parts list/drawing for further breakdown of components.**			

Cover for sampler complete

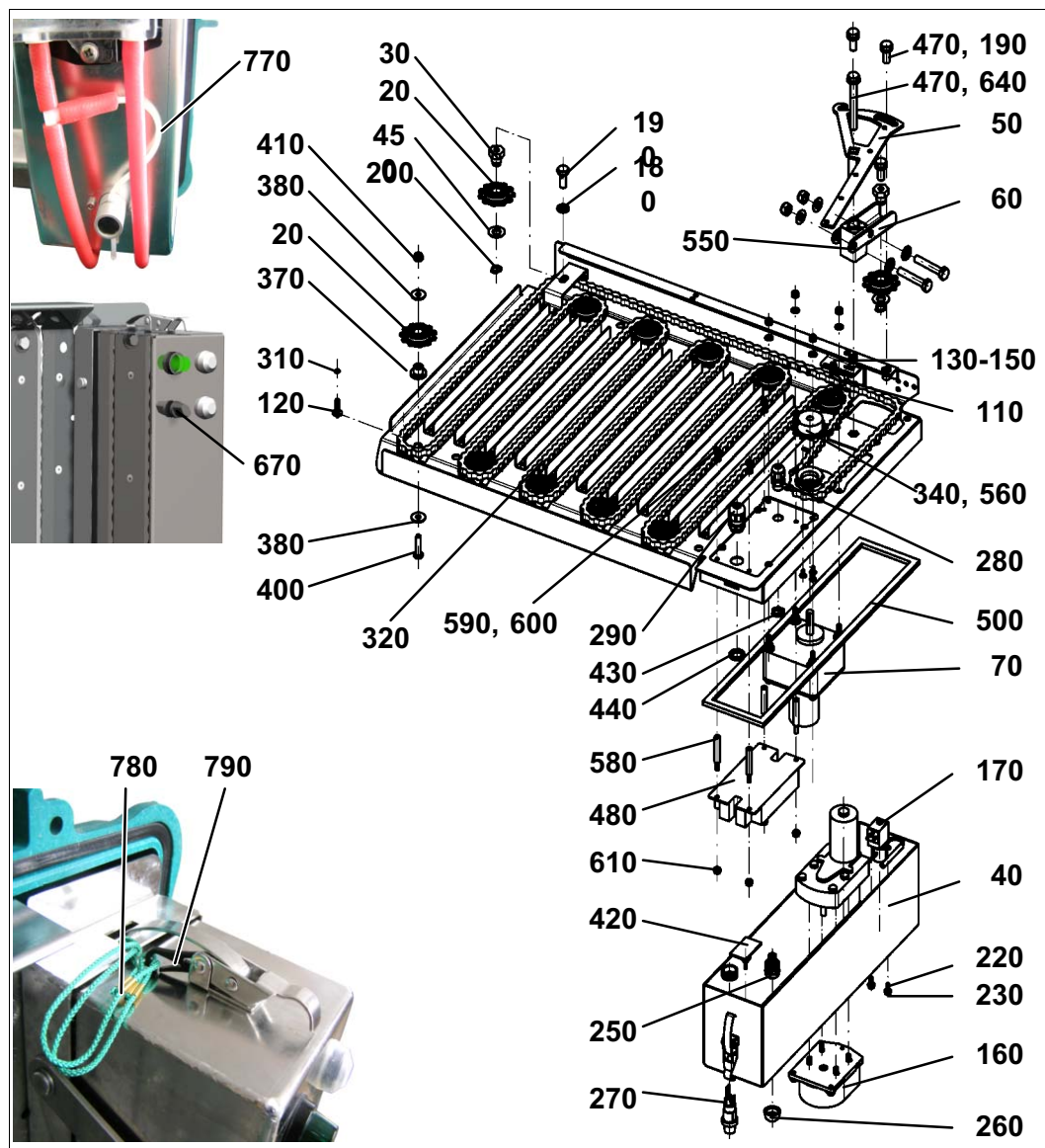| Item		Part no.		Description	
		7821-2758-000		**Cover for sampler complete**	
0020		7161-2298-010		Guide piece	
0030		7161-5566-000		Lever	
0040		7161-1467-000	x	Sealing panel	36x20xø4
0050		0007-2060-700	x	Sealing ring	66x6
0060		0007-1818-700	x	Sealing ring	9x2
0070		0013-0311-300		Hexagon Head Nut	M5
0090		7161-2084-140		Bracket	
0100		7161-6708-000		Plug complete	ø12 Metatron (with 110, 130)
0110		0007-2509-700	x	Sealing ring	8x2
0120		0026-1508-890		Ball	12mm
0130		0007-1974-700	x	Sealing ring	10x2
0150		0013-0276-300		Hexagon Head Nut	M6
0160		7801-4807-000		connector	RMS
0170		7051-2045-000		hose connector	
-	⬭	78019905-130		Set of spare parts	
x -		**Wear part, see section on "Maintenance" for maintenance interval Included in set of spare parts (7801-9905-130).**			
⬭		**See corresponding parts list/drawing for further breakdown of components.**			

Clip complete

Item	Part no.		Description	
	7161-3270-000		**Clip complete**	
0010	7161-2097-140		Clamp	øo69x17
0020	7161-2653-000		Clamp	55xø4
0040	0007-3239-890	**x**	Sealing ring	25 Tri-Clamp øo50,5xøi25,3
x -	**Wear part, see section on "Maintenance" for maintenance interval** **Included in set of spare parts (7801-9905-130).**			
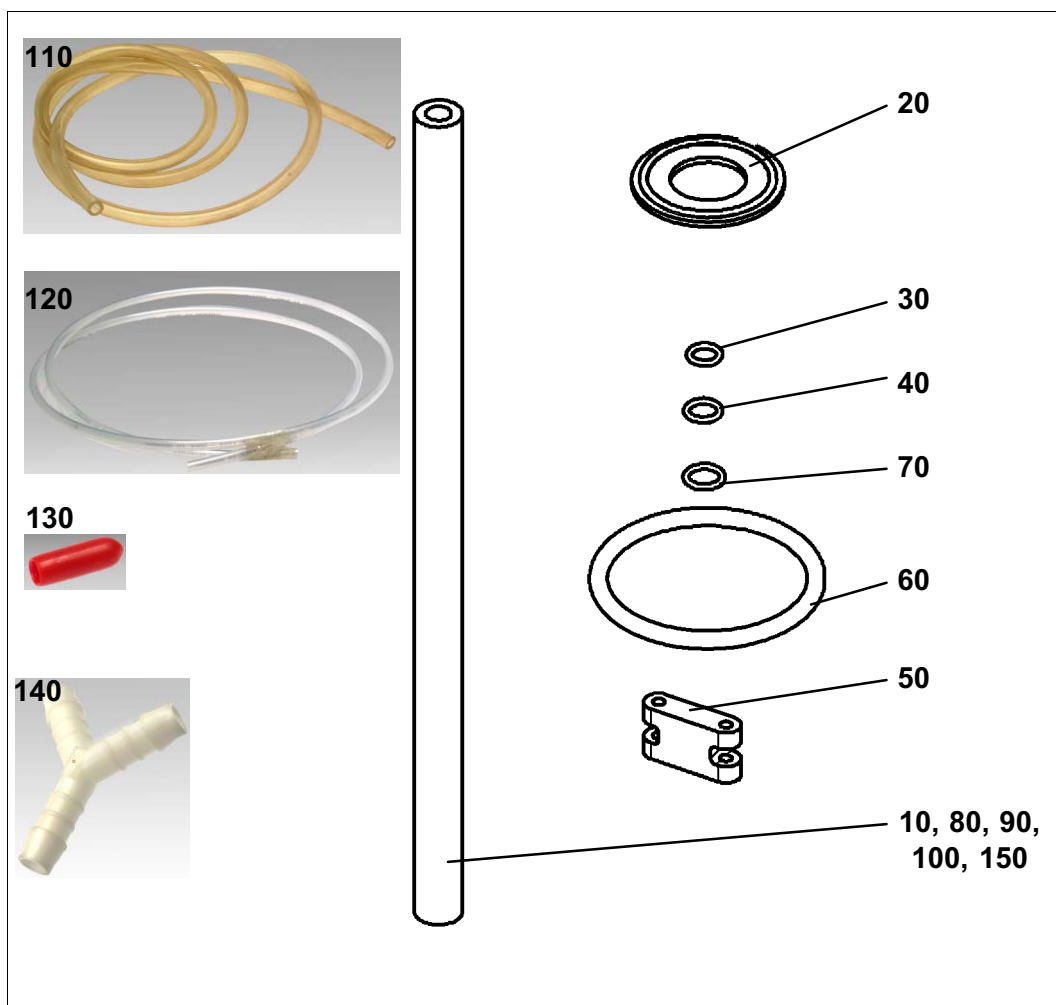
Set of spare parts

|	**7801-9905-130**	**Set of spare parts**	
0010	7021-7106-060	Milk sampler hose, silicone	8,5x3,75x320 Sil gn
0020	0007-3239-890	Sealing ring	D1in Tri-Clamp Sil
0030	0007-2509-700	Sealing ring	8 X 2
0040	0007-1974-700	Sealing ring	10x2
0050	7161-1467-000	Sealing panel	36x20xD4
0060	0007-2060-700	Sealing ring	66 x 6
0070	0007-1818-700	Sealing ring	9 x 2
0080	7021-7106-058	Milk sampler hose, silicone	8,5x3,75(x25.000) Sil gn (210 mm)
0090	7021-7106-058	Milk sampler hose, silicone	8,5x3,75(x25.000) Sil gn (110 mm)
0100	7021-7106-058	Milk sampler hose, silicone	8,5x3,75(x25.000) Sil gn (120 mm)
0110	0018-4376-898	tube	ID4xOD7(xL25.000) Sil tp (250 mm)
0120	0018-0380-848	Pipe	OD8xID6 Pla na (270 mm)
0130	0026-2249-890	Cap	ID4 Pla rd

10.1.2 Milk sampling device (MI*one* Interior)

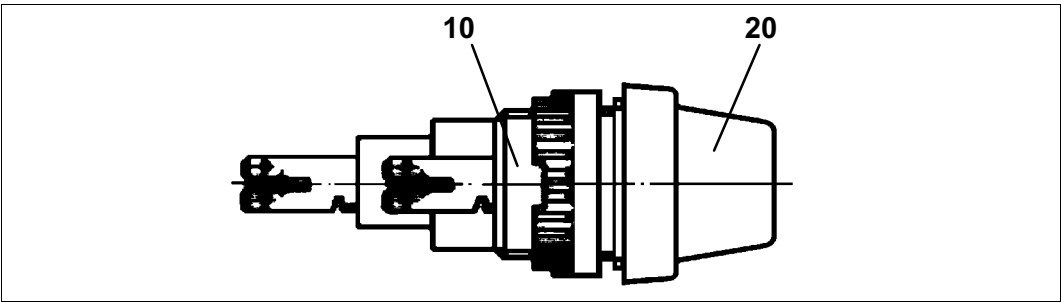| Item		Part no.		Description	
				Milk sampling device	**MI*one* Interrior**
0020		7801-5306-000	x	Sprocket	Leadership
0030		7800-0025-633		Shaft	ø12x19,5
0040		7801-2160-000		Cover complete	
0050		7801-5566-000		Lever	
0060		7801-6915-000		Tensioner	
0070		7801-5300-000		Drive unit	
0080		0005-3301-000		Sub-unit terminal block	MSTB2,5-2-ST-5,08
0090		0005-3302-000		Sub-unit terminal block	MSTB2,5-3-ST-5,08
0100		7800-0025-646		V-Ring	ø22
0110		7801-5847-010		Limit switch, complete	
0120		7800-0025-647	x	Connector complete	ø5
0130		0013-0310-300		Hexagon Head Nut	M4
0140		0026-1362-300		washer	4,3
0150		0019-6787-300		Hexagon head bolt	M4x16
0160	⬭	7801-2981-000		Hose pump	
0170		7801-2695-010		Crimp valve	
0190		0019-6901-300		Hexagon head bolt	M8x16
0200		0026-5872-300		Circlip	10x1

0210		0026-1380-840		washer	5,3
0220		7800-0005-264		cylindrical head screw	M8x70
0230		7800-0002-841		cylindrical head screw	M3x12
0240		0013-0311-300		Hexagon Head Nut	M5
0250		0005-0135-890		push button	0,7A / 250V / 1S
0260		0005-3381-700		Sealing cap	18
0270	◯	0005-3768-880		Illuminated pushbutton complete	green
0280		0005-4485-900		Cable Screw-Joint	M12x1,5x3-7
0290		0005-4486-900		Cable Screw-Joint	M16x1,5x5-10
0300		0013-0291-300		Hexagon Head Nut	M8
0310		7800-0004-304		Circlip	5
0320		7801-4617-000	x	Chain	12,7x404=5130,8mm
0340		0019-6307-400		Threaded pin	M6x8
0370		7800-0025-653		Shaft	ø12x12,5
0380		0026-0922-300		washer	6,4x18x1,6
0400		0019-6845-300		Hexagon head bolt	M6x25
0410		0013-0294-300		Hexagon Head Nut	M6
0420		7801-9047-040		Electronic card	sample quantity
0430		0013-0129-630		Nut	M12x1,5 SW15
0440		0013-0130-630		Nut	M16x1,5 SW19
0450		0026-1348-300		washer	10,5
0460		0019-1026-300		oval head screw	A4x8
0470		0026-1345-300		washer	8,4
0480		7801-9047-030		Electronic card	CPU
0490		0005-8001-100		Blanking cap	HAN 3A-AK-QB
0500		0004-3079-828		Sealing strip	9x2
0510	◯	7801-6933-010		Cable, complete	Connection
0520		7801-6933-020		Cable, complete	Hose pump
0550		7800-0025-601		Support buffer	20x40x45
0560		7800-0025-609	x	Sprocket	Drive unit
0580		7800-0007-492		Distance bush	M4x35x9
0590		0019-6077-300		cylindrical head screw	M4x10
0600		0026-1362-840		washer	4,3
0610		0013-0310-300		Hexagon Head Nut	M4
0620		0019-6910-300		Hexagon head bolt	M8x45
0630		0013-0295-300		Hexagon Head Nut	M3
0640		7801-2456-000		Bearing bush	
0650		0026-0439-300		washer	8,4x24x2
0660		7801-5026-020		Bushing	
0670		7801-2914-000		Turning knob	
0680		7800-0025-022	x	Silicone tube	ø 3x8 (available by the metre)
0690		0026-1382-300		washer	6,4
0700		0018-6276-820		T-Hose connector	4
0710		0005-4343-000		Sub-unit terminal block	MC 1,5 / 5-ST-3,81
0720		0005-4341-000		Sub-unit terminal block	MC 1,5 / 3-ST-3,81
0730		0019-6841-300		Hexagon head bolt	M6x16
0740		0005-3536-900		Cable tie	145x3
0750		0005-1299-060		light emitting diode	28 V AC/DC, BA9s
0760		7051-2479-190		gasket	16x22x1
0770		7801-7106-010	x	Silicone tube	øi 1 / øo 3 (available by the metre)
0780		7161-2492-000		Tension relief	
0790		7161-2281-020		Hook	32x10x3

| **x -** **Wear part, see section on "Maintenance" for maintenance interval** |
|------|
| ◯ **See corresponding parts list/drawing for further breakdown of components.** |

Hose pump
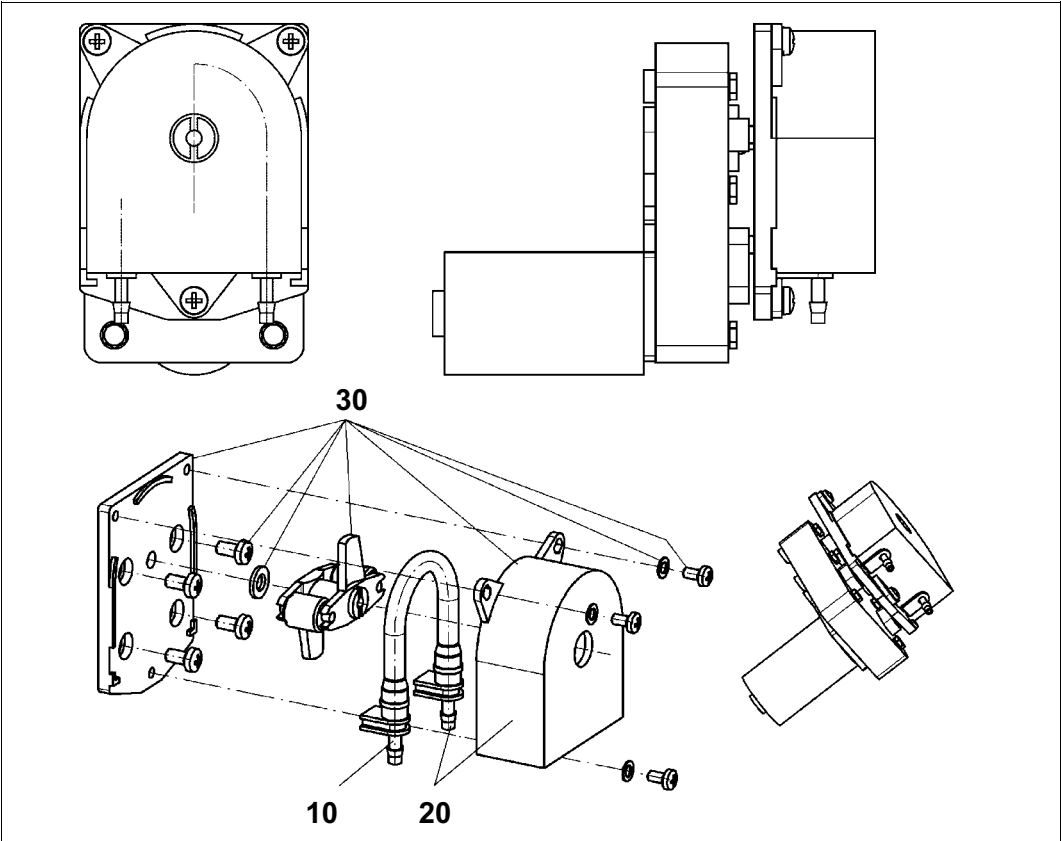
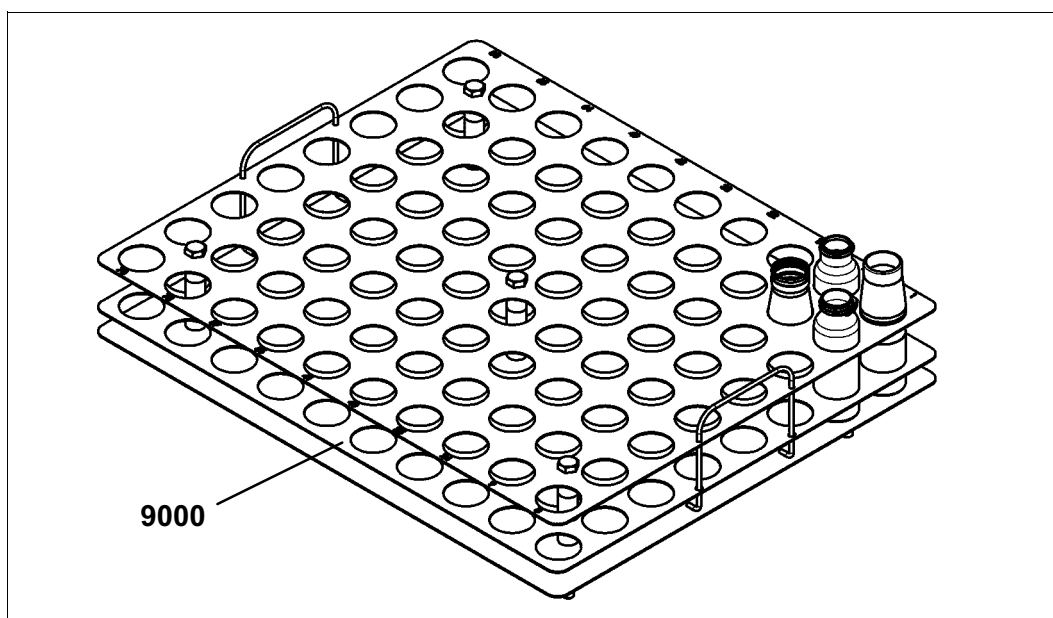| Item	Part no.		Description	
	7801-2981-000		**Hose pump**	
0010	7801-2635-000	**x**	tube	
0020	7801-4900-000	**x**	Spare Parts	Housing cover and hose
0030	7015-9902-200	**x**	Set of spare parts	
x -	**Wear part, see section on "Maintenance" for maintenance interval**			

Illuminated pushbutton complete

| Item	Part no.	Description	
	0005-3768-880	**Illuminated pushbutton complete**	**green**
0010	0005-1312-900	Indicator lights	
0020	0005-1343-910	Diaphragm	green

Cable, complete
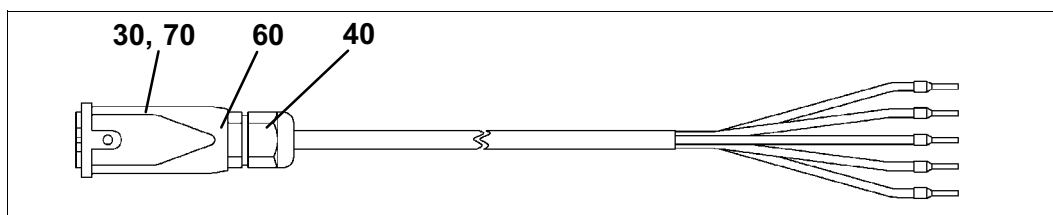
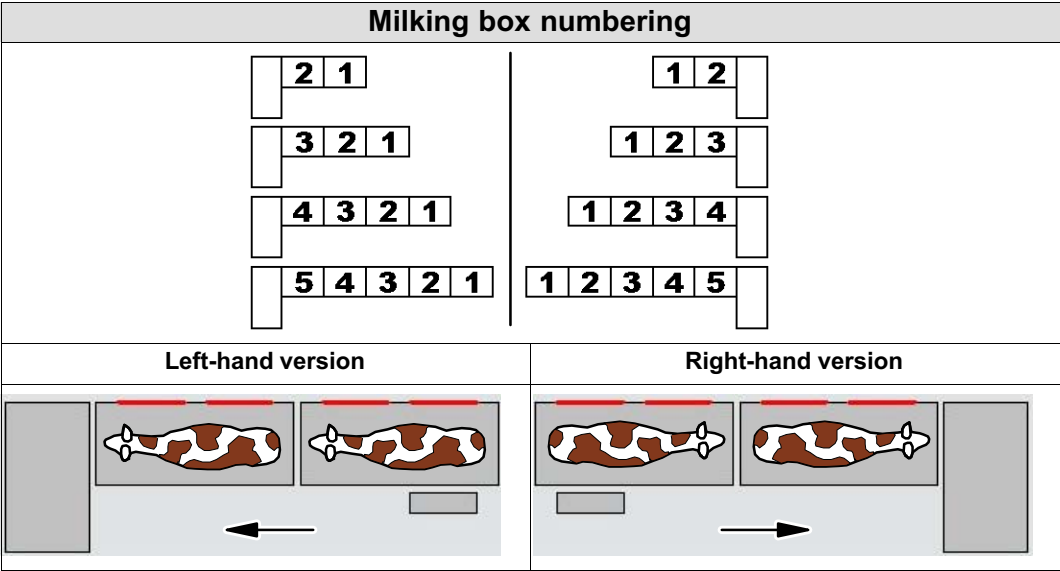| Item	Part no.	Description	
	7801-6933-010	Cable, complete	Connection
0030	0005-1773-040	Connector housing	HAN 3A-M20
0040	0005-4486-900	Cable Screw-Joint	M16x1,5x5-10
0060	0005-4465-900	reduction	M20x1,5 - M16x1,5
0070	0005-1773-030	Connector insert	HAN 4A-M

10.2 Bottle racks

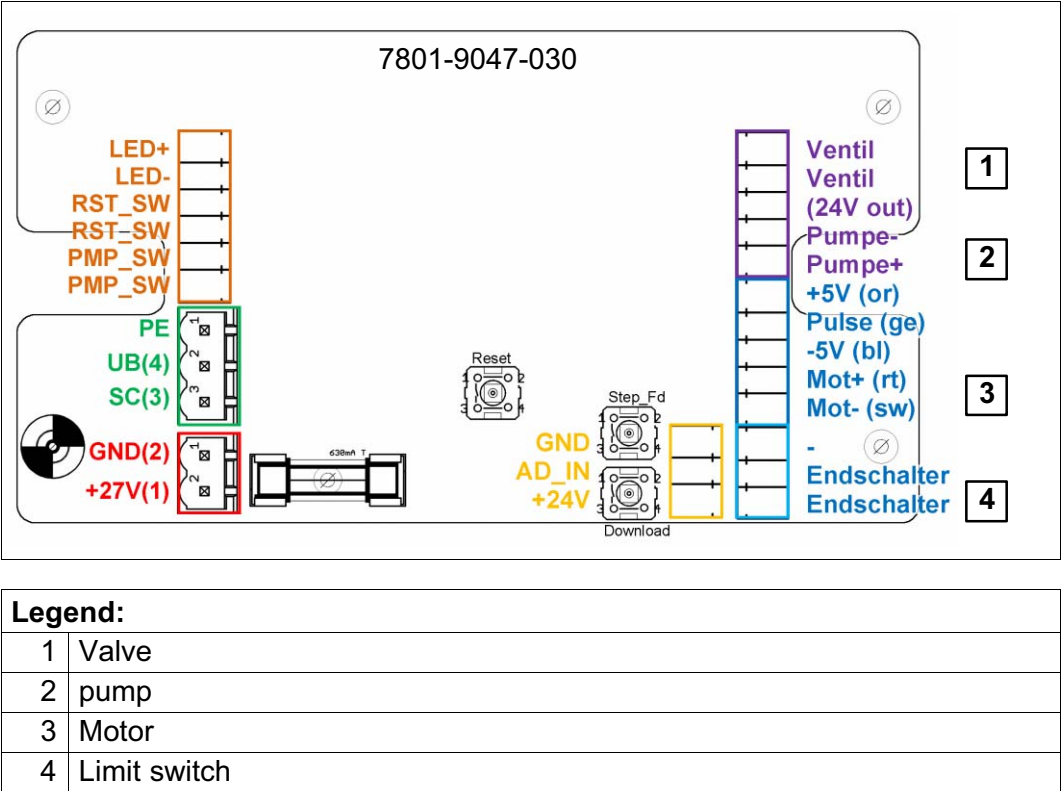| Item	Part no.	Description	
	7801-6451-000	Bottle rack	DE / CH / JP / PL
	7801-6451-010	Bottle rack	NL (new) / USA
	7801-6451-020	Bottle rack	NL (old)
9000	7801-6451-030	Bottle rack	SE
	7801-6451-040	Bottle rack	DK
	7801-6451-050	Bottle rack	FR
	7801-6451-060	Bottle rack	LT / USA
	7801-6451-070	Bottle rack	NO

11 Appendix

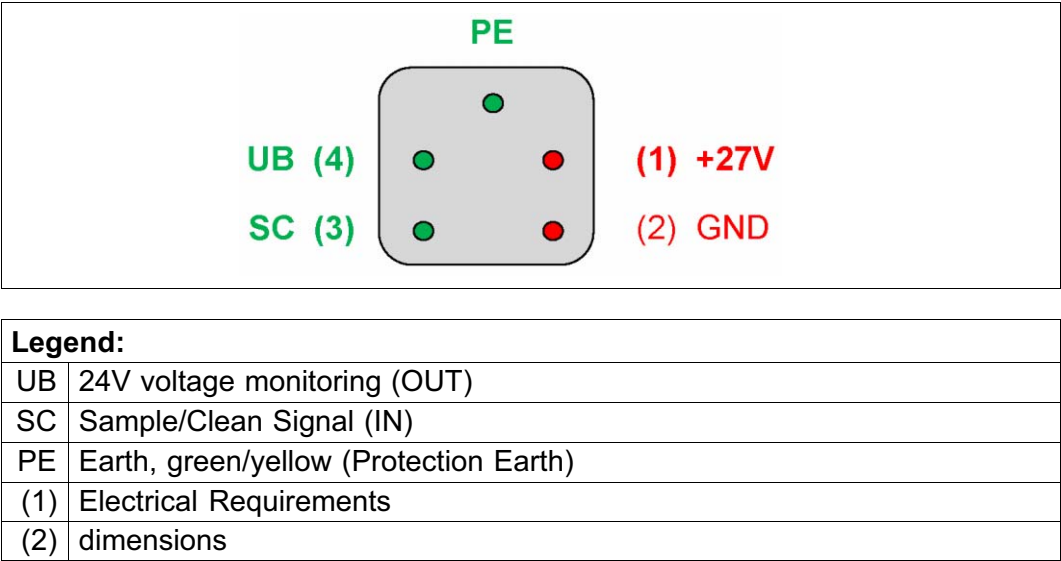## 11.1 Order of the sample bottles in the rack
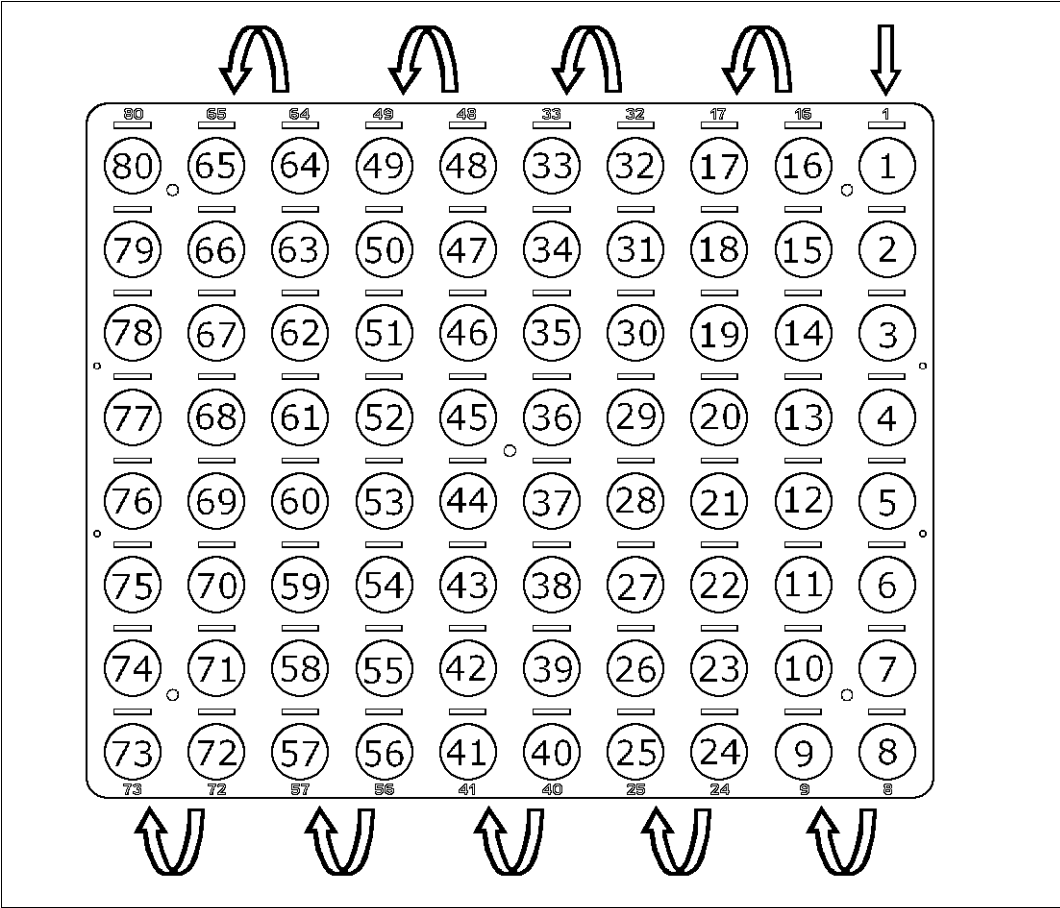
Legend:	
(45)	Sample bottle number
⟹	Order in which the sample bottles are filled

Milking box numbering

Left-hand version	Right-hand version

11.2   Terminal diagram for the CUP electronic card

Legend:	
1	Valve
2	pump
3	Motor
4	Limit switch

11.3   Pin assignment

Legend:	
UB	24V voltage monitoring (OUT)
SC	Sample/Clean Signal (IN)
PE	Earth, green/yellow (Protection Earth)
(1)	Electrical Requirements
(2)	dimensions

11.4 Abbreviations

| Term	Explanation
ADIS	International data exchange format, ISO 11787 (**A**gricultural **D**ata **I**nterchange **S**yntax)
CSV	Text file with values that are separated by a comma or similar symbol (**C**omma **S**eparated **V**alues)
DP	Herd management program (**D**airy**P**lan)
LKV	Landeskontrollverband [National control association] (Germany)
MLP	Milk yield test
MView	Milking system user interface
Ø	Diameter
øi	Inside Diameter
øo	O.D. outside diameter
%	Percentage

Units	
°	degrees (angles)
°C	Degrees Celsius/ Centigrade
s	Second
” (in)	inch (= 25.4 mm)
mm	Millimetres
m	meters
kg	Kilogram
kPa	Kilo-pascal

11.5 Quick guide

11.5.1 Start sampling

Stop automatic operation

● Close entry gates to all milking boxes.

- Wait until the animals have left the milking boxes.
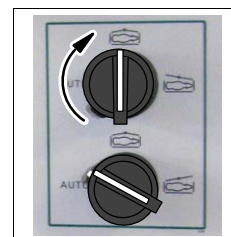
Set up and connect the sampling device

Set up the sampling device

The sampling device must be set up on the floor so that the robot can move freely.

Attention!
Risk of collision

The robot can collide with the sampling hose and connection cable.
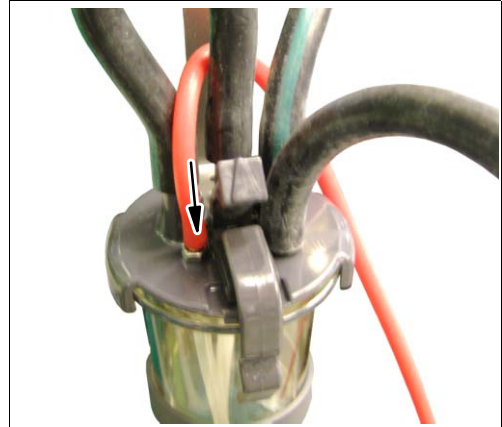► Run the connection cable and sampling hose under the robot rail so that the robot can move freely.

● Place the bottle rack in the positioning device.

Fit the sample tank in the milking system (Metatron)

● Connect the sample tank to the sampler and connect to the sampling device.
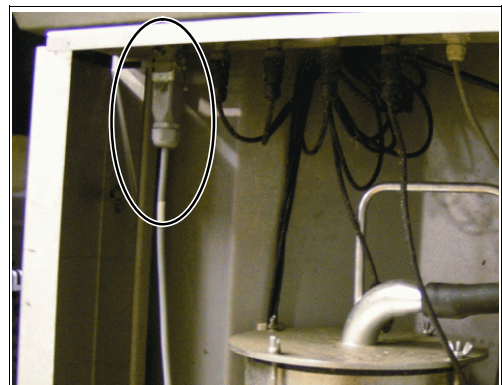

Connect the cable to the automatic milking system
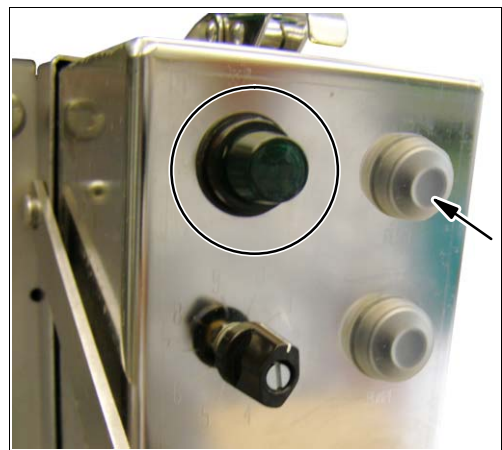
Attention!

Risk of collision
The robot can collide with the connecting cable.
► The connecting cable must be fed beneath the robot rail so that the robot can move freely.

● Connect the 5-pole plug on the connecting cable to the connector on the left beneath the control unit for the corresponding milking box.
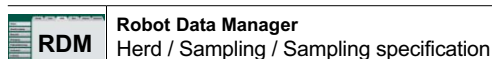

- The green indicator lamp on the sampling device will light.

● Press the "RESET" button.

- The filling nozzle will be heard moving to the start position.

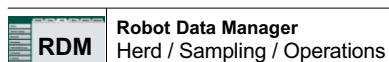### Settings on the user interface of the automatic milking system
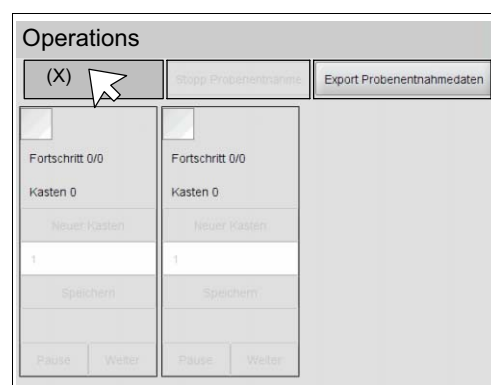
- Entering settings
    - Open menu item

	Robot Data Manager
RDM	Herd / Sampling / Sampling specification

    - Set number of milk samples per animal

    - Set number of bottles in the bottle rack

Start automatic operation

- Start sampling
    - Open menu item

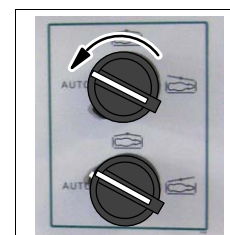|	**Robot Data Manager**
RDM	Herd / Sampling / Operations

    - Click on the button. (X)

- Switch entry gates to all milking boxes to automatic mode.

Note the box data

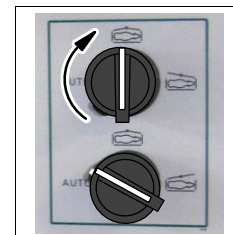Note the following data so that the data export can be checked:

- Sampling start time
- ID of the first cow in each box
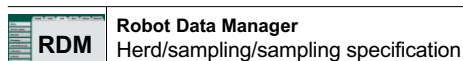
11.5.2 End of sampling

Stop automatic operation

- Close entry gates to all milking boxes.

    - Wait until the animals have left the milking boxes.

Stop sampling

- Stop sampling

RDM	**Robot Data Manager** Herd/sampling/sampling specification

    - Click on the button. (X)

Operations

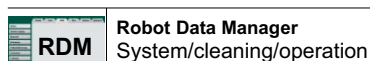Start Probenentnahme | (X) | Export Probenentnahmedaten

Create the sample file

- Export sampling data.

> For further information, see section
> "Sample data export".

Start the system clean

- Start system clean

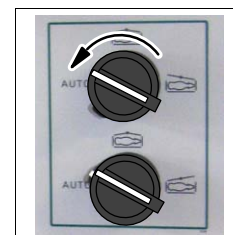| RDM	**Robot Data Manager** System/cleaning/operation

Disconnect and remove the sampling device

- Carry out the steps described for setting up and connecting the device, but in reverse order.

Resume automatic operation

- Switch entry gates to all milking boxes to automatic mode.

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