GEA Farm Technologies

Automatic milking system MIone

International Sample unit

Instruction Manual / Installation Instructions / Parts List
(Translation of the original operating instructions)

7801-9001-005
03-2010

GEA Farm Technologies - The right choice.

Contents

1 Preface

1.1 Information on the instructions

These instructions are supplied with the product.

- They are designed modular and are only in relation to the mentioned product.
  For details of the components which are relevant to the product, please refer to the appropriate manuals.
  This applies especially for safety information!
- 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.

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, even of extracts, require written authorization from the manufacturer.

Abbreviations, units, specialist terms, special names or specialist terminology are explained in more detail in the "Appendix".

Pictograms used


This pictogram indicates information that will help towards a better understanding of the working processes.


This pictogram indicates a special tool required for installation.

A correction bar in the margin indicates changes to the previous edition.

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 chapter.

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

	Language		Language		Language
-9000-	German	-9013-	Dutch	-9032-	Serbian
-9001-	English (Great Britain)	-9015-	English (America)	-9034-	Slovakian
-9002-	French (France)	-9016-	Polish	-9036-	Lithuanian
-9003-	Italian	-9021-	Danish	-9038-	Portuguese (Brazil)
-9004-	Romanian	-9022-	Hungarian	-9039-	French (Canada)
-9005-	Spanish	-9023-	Czech	-9040-	Latvian
-9007-	Swedish	-9024-	Finnish	-9041-	Estonian
-9008-	Norwegian	-9025-	Croatian	-9043-	Spanish (North America)
-9009-	Russian	-9027-	Bulgarian		
-9010-	Greek	-9029-	Slovene		
Possibly not all above-mentioned languages are available.					

1.2 Manufacturer's address

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1.3 Customer service

Authorised Technical Dealer

If necessary, please contact your nearest authorised technical dealer.

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

- www.gea-farmtechnologies.com

European Contact Information:

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1.4 Declaration of conformity

Declaration of conformity in accordance with the machinery directive:
2006/42/EC- Annex:II A

Manufacturer:	**GEA Farm Technologies GmbH** **Siemensstraße 25-27** **D-59199 Bönen (Germany)**
Product category:	**Sampling device**
Name / Model:	**MIone (Metatron)**

The named product is in conformity with the requirements of the following European directives:

2006/42/EC	Machinery Directive
2004/108/EC	Electromagnetic compatibility directive

Conformity with the requirements of these directives is testified by complete adherence to the following standards:

- Harmonized European standards

EN 12100-1 (2009-10)	Machine safety, basic terms, general design guidelines. Part 1: Basic terminology, methods
EN 12100-2 (2009-10)	Machine safety, basic terms, general design guidelines. Part 2: Technical guidelines and specifications
EN ISO 14121-1 (2007-12)	Safety of machinery - Risk assessment - Part 1: Principles
EN 61000-6-2 (2006-03)	Electromagnetic compatibility (EMC) Basic technical standard on testing the immunity of devices in industry
EN 61000-6-3 (2007-09)	Electromagnetic compatibility (EMC) Basic technical standard on measuring the interference emitted by devices in the domestic, business and commercial field

Person responsible for compiling the relevant technical documents:

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Bönen, 16.12.2009

Reinhard Frenser
(Head of Research and Development)

The undersigned is acting by virtue of power of attorney from the management of:
GEA Farm Technologies GmbH, Siemensstraße 25-27, D-59199 Bönen (Germany)

This declaration certifies compliance with the guidelines indicated, but does not establish any guarantee in the sense of paragraphs 443, 444 BGB.
This declaration of conformity becomes invalid if design changes are made which affect the technical data given in the instructions and the correct use of the product, thereby significantly altering the machine!

2 Safety

2.1 Owner's obligation of care

The product has been designed and constructed while taking account of a potential risk analysis and after careful selection of the harmonized standards and other technical specifications to be complied with. It therefore guarantees 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 owner's obligation of care to plan these measures and check that they are carried out.

The owner must ensure the following:

- Anyone who performs work or activities relating to the machine must carefully read the manual and sign to confirm that they have understood it and will act accordingly!
- The manual must always be available, in a legible and complete condition, at the place where the product is used.
- Anyone performing 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 must be observed.
- The farmer must produce special operating instructions for his farm, that are appropriate to the conditions on that farm and which, once again, expressly take account of the safety aspects.
- 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 work to be carried out may only be performed by a suitably qualified person.
- These personnel are regularly instructed in all relevant matters of safety at work and protection of the environment and be 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 stickers which are attached to the product must be replaced immediately if they become illegible or are lost!
- There must not be any unauthorized persons (e.g. children) in the danger areas and they must not have access to the cleaning and disinfecting agents.

2.2 Explanation of the safety symbols used

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 signaling word

WARNING!
The indication "Warning" signals danger to life or health of personnel. Death or serious injury may result if the danger is not avoided.

Attention!
The indication "N.B." signals important information on risks for the product or the environment.

2.3 Basic safety instructions

Note!
There are warnings about specific residual dangers in the corresponding chapters.

- There are dangers involved in the operation and maintenance of dairy farm equipment. For your own safety, please carefully read and observe the operating instructions (especially the section on "Safety instructions")!
- 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, and 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. Under no circumstances may water jets or high-pressure cleaners be directed at these!

2.4 Personnel qualification

All personnel who perform work on or with the product must carefully read and understand the instructions and act in accordance with them!

In addition, special qualifications are required for the following activities:

- Installation
- Commissioning
- Operation
- Troubleshooting
- Repairs

Note!
If the work requires special qualifications, these are described in the corresponding chapters!

2.5 Protective devices

- Cover plate, protective hood
- Safety symbols, warnings, warning signs and labels

3 Description

3.1 Correct applications

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

The international sampling device is intended only for automatic milk sampling in MIone milking systems with Metatron milk meters.

Any applications that are not listed here are not part of the intended purpose 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.

- The manufacturer expressly points out that only original parts and original accessories have been adapted, tested and authorized for use with the product.
- 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.

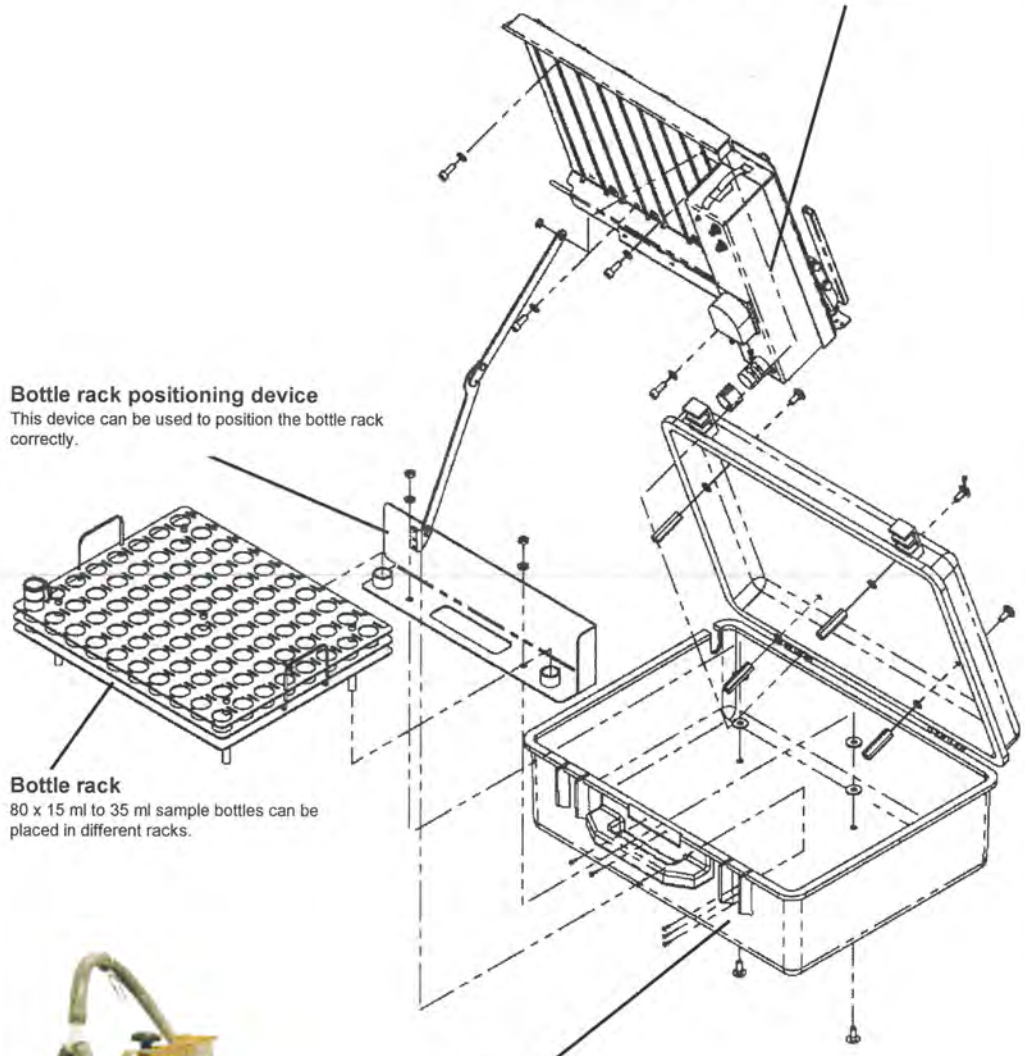
3.2 Changes to the product

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

Any planned changes must be approved by the manufacturer in writing.

3.3 Design of the equipment

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)

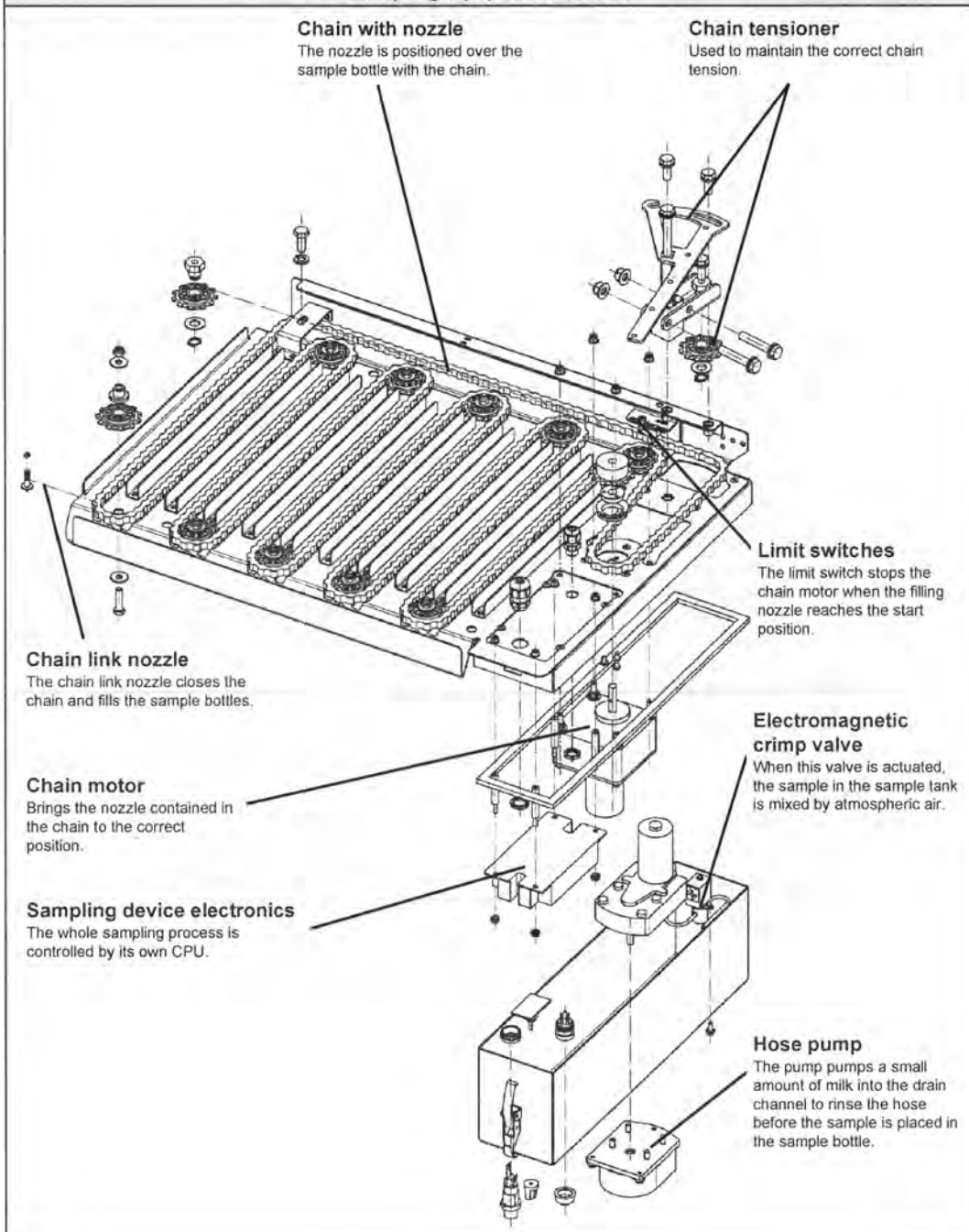
Bottle rack positioning device
This device can be used to position the bottle rack correctly.

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

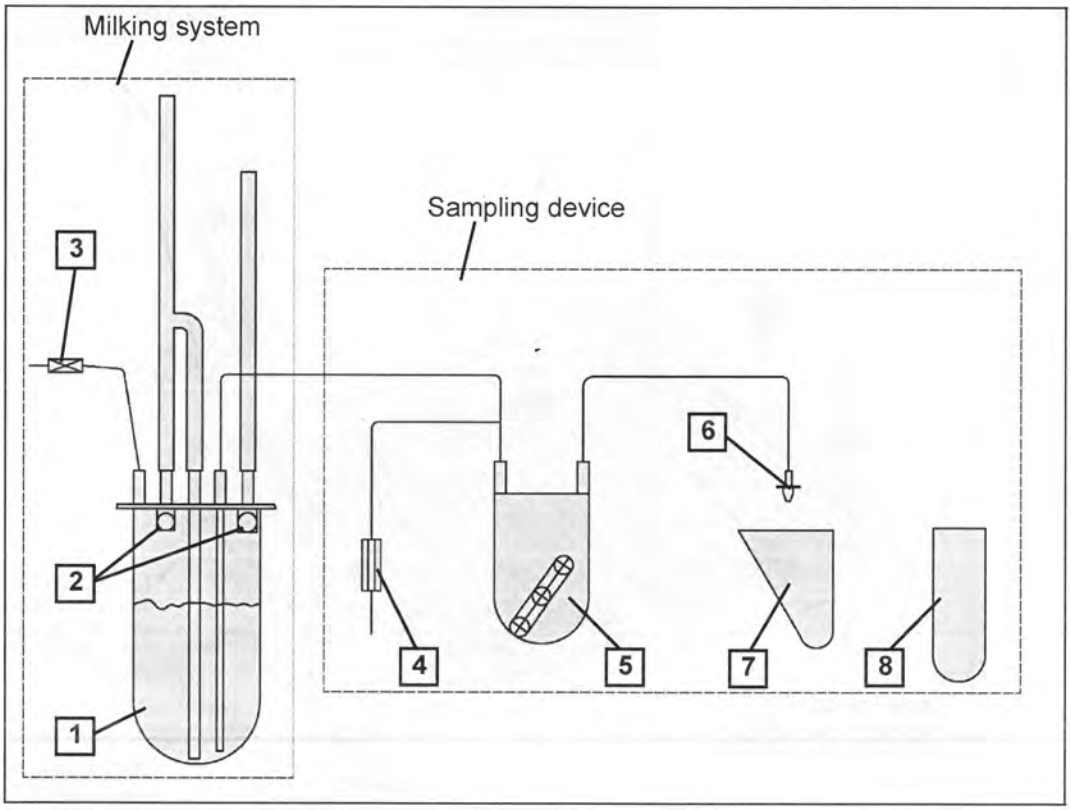
Sampling case
This case contains all of the accessories for the sampling device.

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 through the sampling tube.

Sampling equipment in the lid



3.4 Functional description

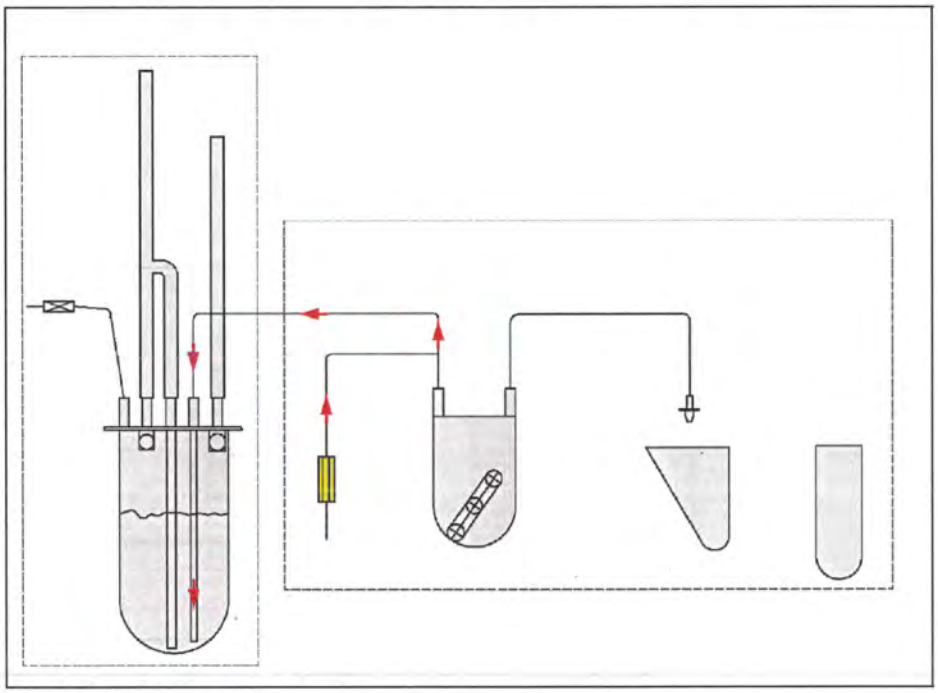


Legend:			
1	Sample tank	5	Hose pump
2	Stop balls	6	Filling nozzle
3	Air intake valve	7	Drain channel
4	Mixing valve	8	Sample bottle

The following diagrams show how the sampling device works:

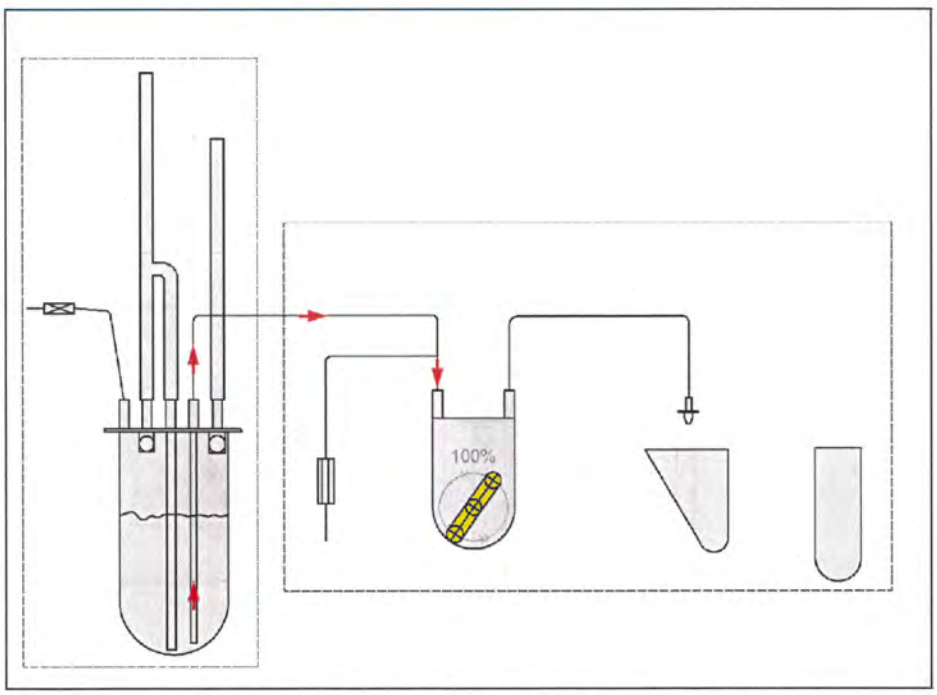
3.4.1 Mix sample

- The sample tank is filled with milk during the milking process.



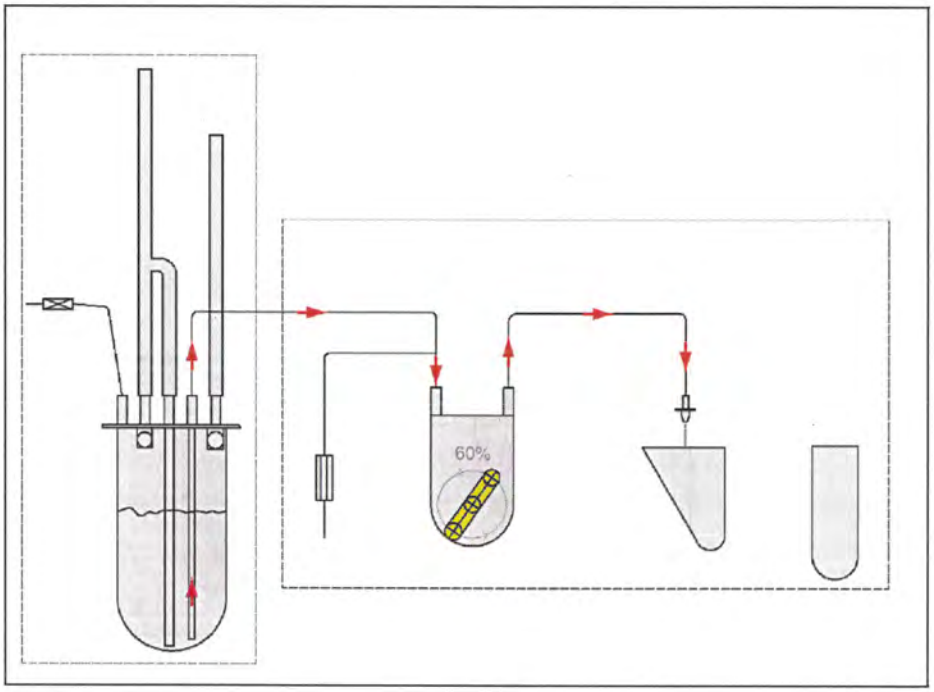
- After milking, atmospheric air flows through the open mixing valve and mixes the sample in the sample tank.

3.4.2 Draw sample



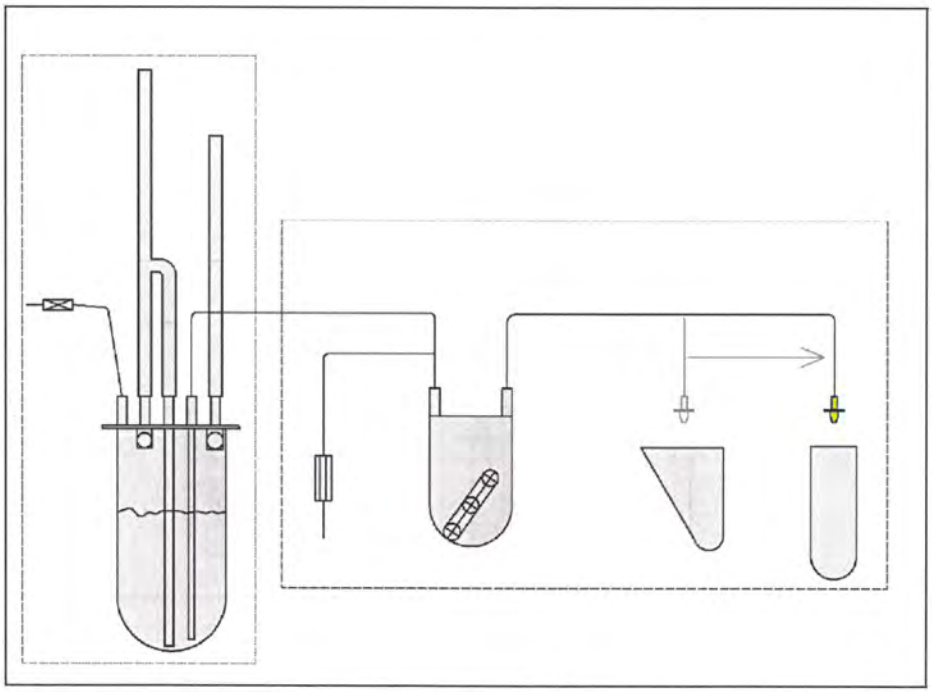
- The hose pump (turning 100%) draws the sample out of the sample tank.

3.4.3 Rinse lines with milk



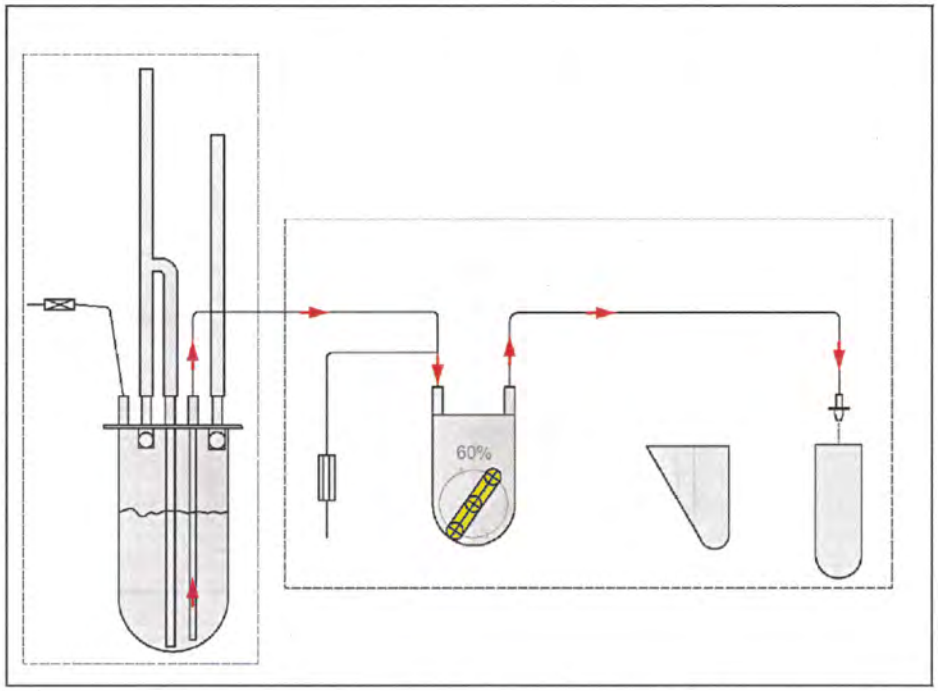
- The hose pump (turning 60%) pumps the first part of the sample into the drain channel.

3.4.4 Position filling nozzle



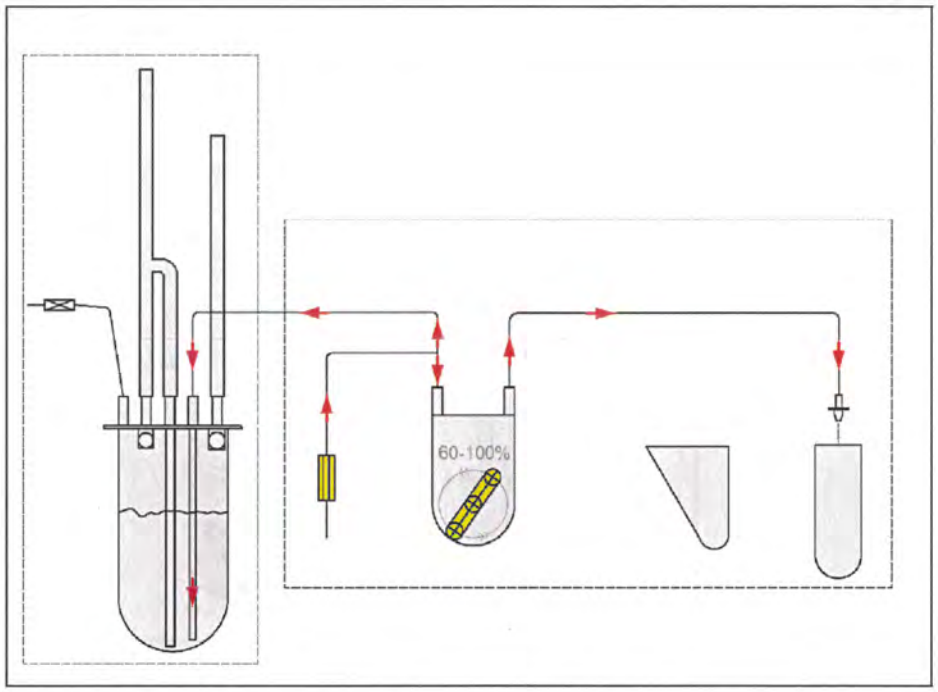
- The filling nozzle is positioned over the next sample bottle.

3.4.5 Fill sample bottle



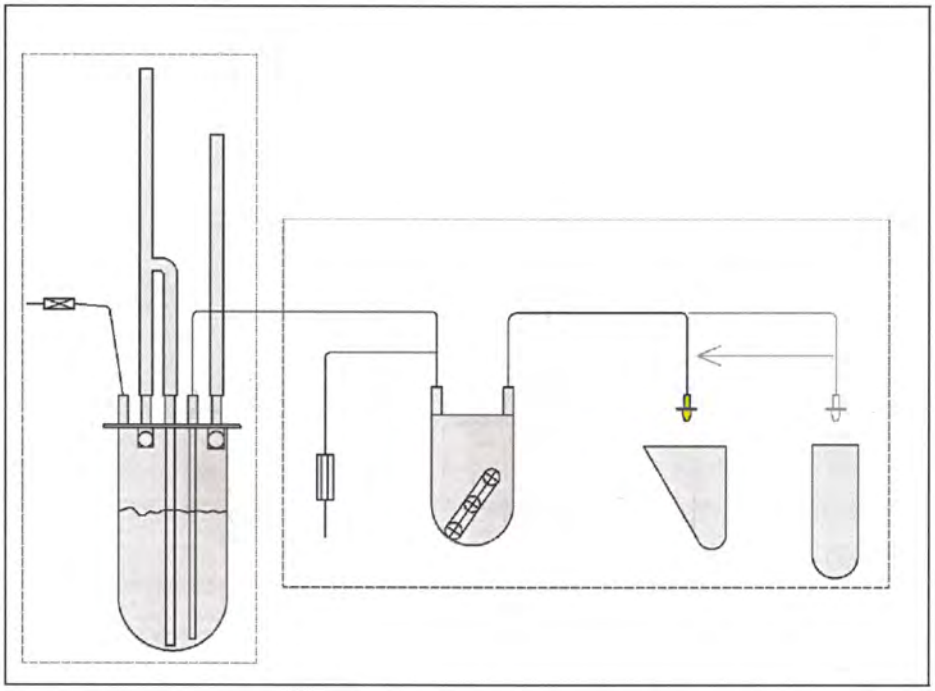
- The hose pump (turning 60%) fills the sample bottle with the sample.

3.4.6 Drain lines



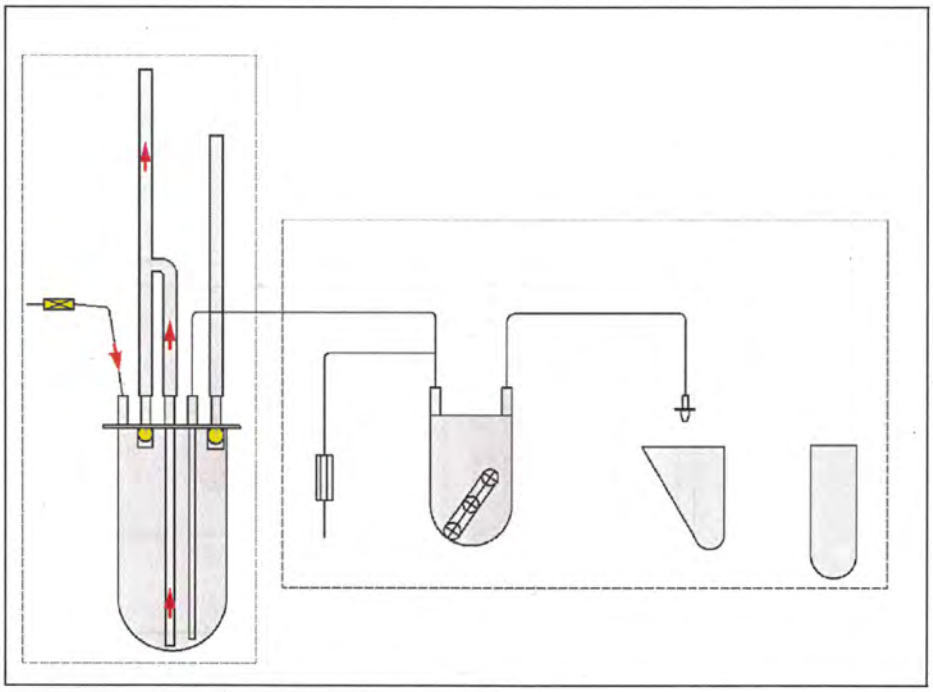
- atmospheric air flows in through the open mixing valve and drains the intake line.
- The hose pump (turning 60-100%) also drains the pressure line.

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

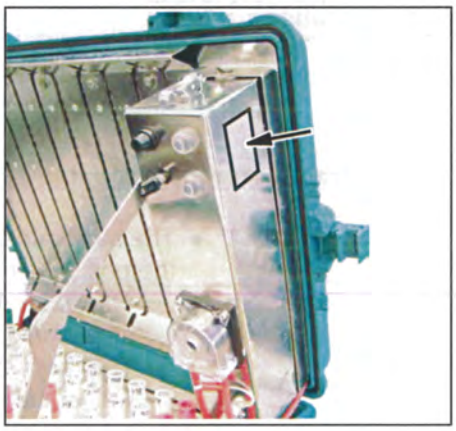
Dimensions (width x height x depth)	650 x 530 x 240
Weight of the case (without bottle rack)	24,5 kg

Electrical data

Electrical connection	24 V DC

Rating plate

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



4 Transport

4.1 Safety instructions for transport

Also read the chapter on "Safety".

Special transport hazards:

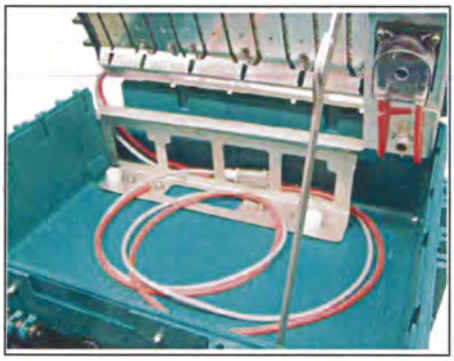
- Projecting sharp edges may cause cuts.
- Parts which are stacked too high can collapse.
- There is a fire hazard due to the highly flammable packing material - open flames and smoking prohibited!

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.

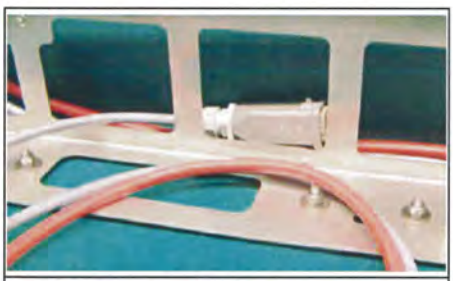
Transport requirements:

- 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!
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.

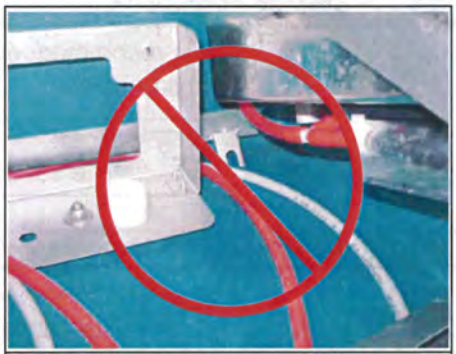
Note!
Not recommended! The total weight will then be more than 25 kg.

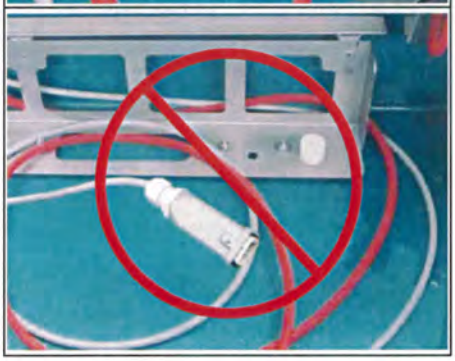
Transport problems

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.

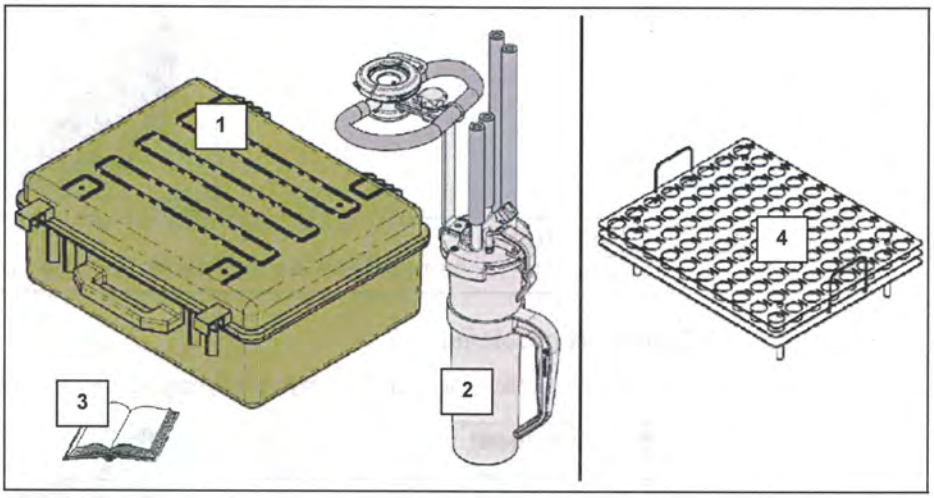
Attention!
Never leave the drain channels loose in the box.
Never leave the connecting cable plug loose in front of the positioning device.
This may cause damage to components (hose pump, hose, etc.) when the sampler is closed, or during transport.





4.3 Includes

Check the goods supplied against the packing list enclosed for completeness and damage.



Legend:	
1	Sampling device
2	Sample tank unit
3	Operating manual with installation instructions
4	Bottle rack to hold up to 80 sample bottles (Optional)

4.4 Storage conditions

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

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 is to be handled properly and disposed of carefully in accordance with the valid local regulations on waste disposal and utilisation.

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.


Also see 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:

- Only fit or use the product for its intended purpose.
- 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.


Also read the chapter on "Safety".

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
- The method of operation
- The immediate environment

Carry out the following checks before every start:

- Check and make sure that all operating media is suitable, present and connected.
- 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.

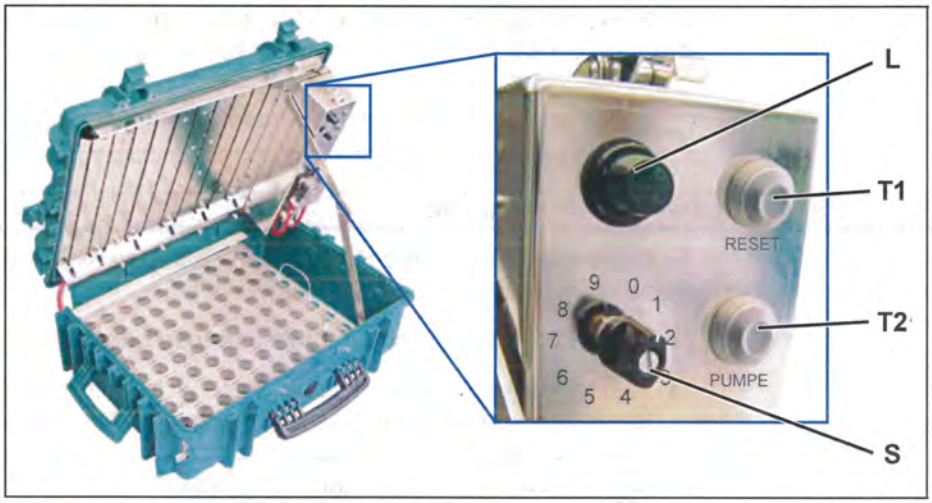
During sampling:

- 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.

Sampling device



Legend:		
L	Indicator lamp	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 / system program operating unit.
Operated by touching the screen.

For further information on the subject, see the manual 7801-90 . . -001

5.4 Overview of the steps involved in the sampling process

WARNING!
There is a risk of being crushed between moving and stationary parts.
It is strictly forbidden to stand in the danger area.

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 in the system program for 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

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.

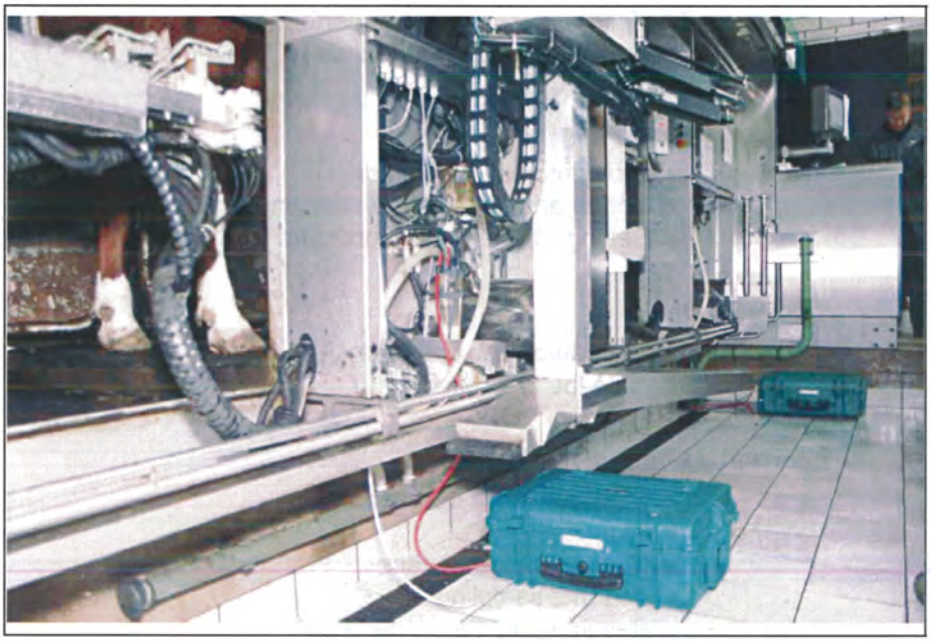
5.5.1 Stop automatic operation

- 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

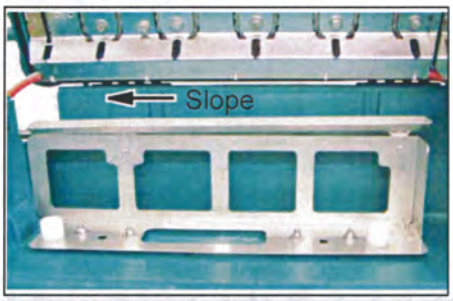
The sampling device must be set up on the floor so that the robot can move freely.



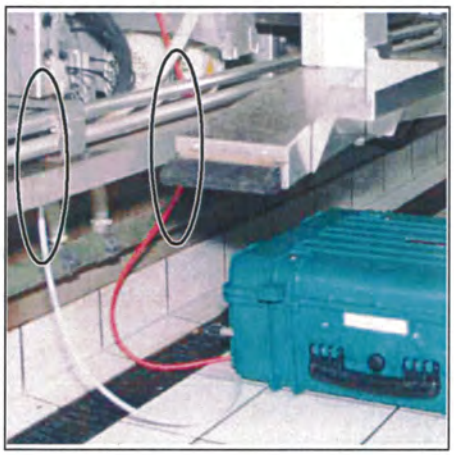
Note!
One sampling device is required for each milking box.

The sampling device is drained through the internal drain channels.

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



Attention!
The sampling hose and connecting cable must be fed beneath 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.

Switch position									
0	1	2	3	4	5	6	7	8	9
11-13	15-17	19-21	23-25	27-29	31-33	34-36	38-40	42-44	45-47
Sample quantity [ml]									

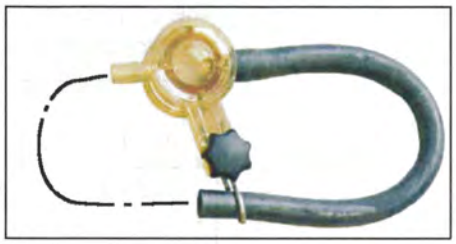
Note!
The sample quantities actually filled may differ from the values given in the table. They depend upon:
- correct hose lengths
- Vacuum level
- amount of wear on the hose pump

- Set the switch as indicated in the table.

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

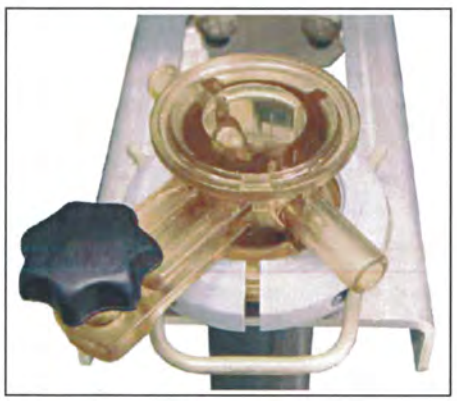
When commissioning for the first time, the sampler has to be mounted beneath the milk meter tank.



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

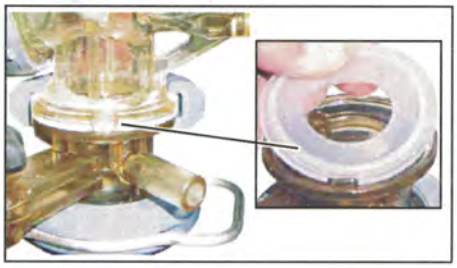
Attention!
The lip of the flange must be pointing upwards and forward.

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



- Place milk meter tank on the sampler and fasten.
- Connect Hose.

Attention!
The lip on the sampler must fit into the groove in the gasket and the milk meter tank.



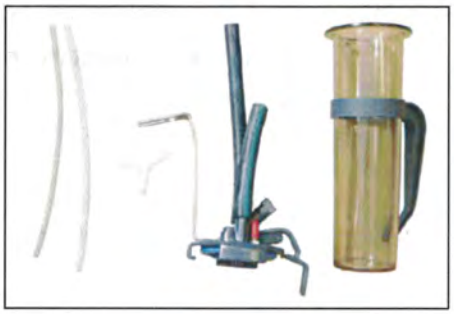
Attention!
Never remove the lip from the sampler!
Corrupted measurement results may be produced if it is removed.

Note!
The sampler remains on the milk meter tank even after sampling.

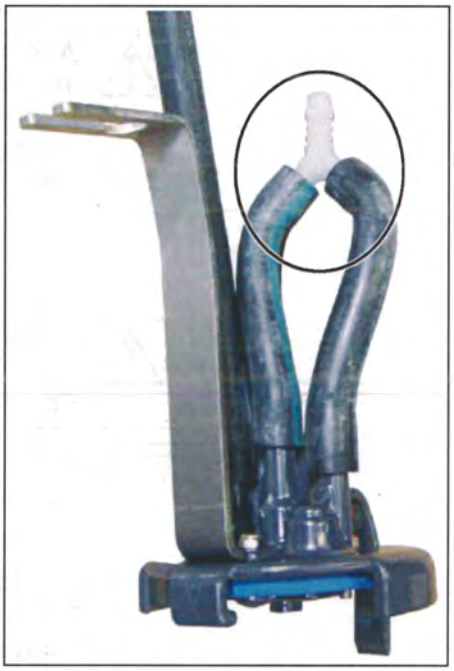
- Connect the two connecting pieces together with the milk tube.
- Push the hose holder into the sampler holder and tighten the knob.
- Position the hose in the holder so that the two bends in the hose run evenly and no kinks are produced.

Assemble the sample tank

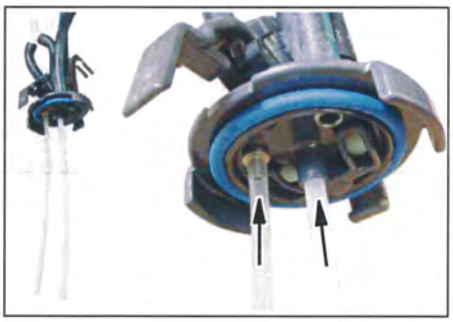
The sample tank must be assembled before it is installed.



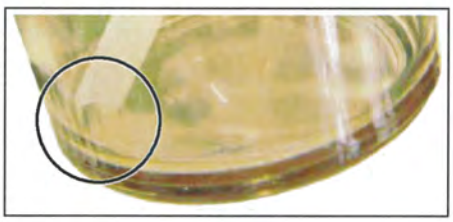
- Fit Y-hose connectors.



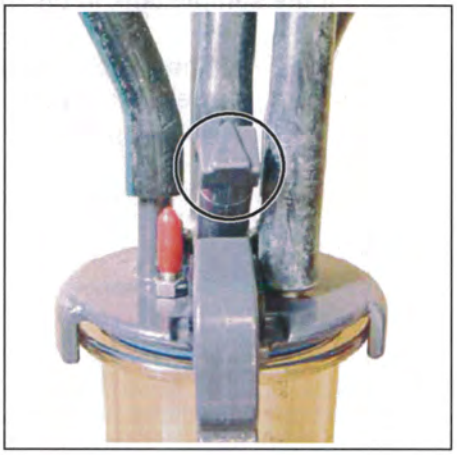
- Fit hose and intake tube.



- 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.



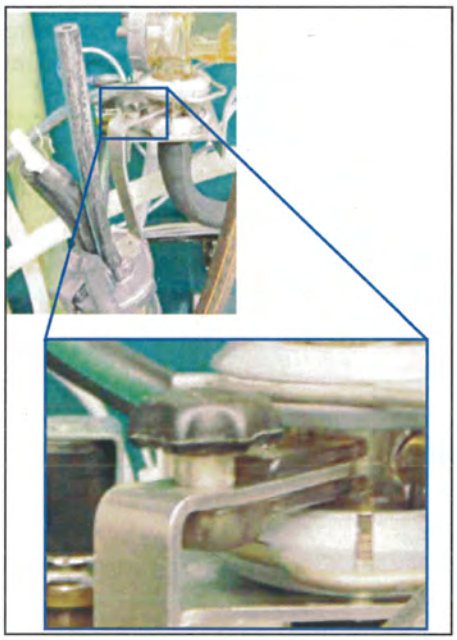
Note!
The arrow on the plug must be pointing up for operation.

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.

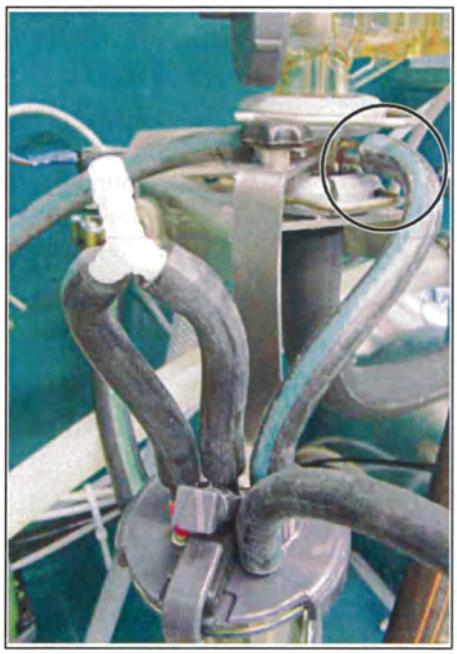
- Remove hose from the right-hand connector on the sampler

- Fasten sample tank to the sampler with holder and knob.

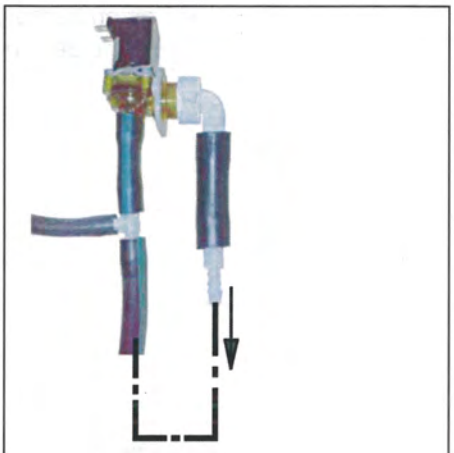


Attention!
The hose and intake tube from the cover must end at the lowest point in the sample tank.

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

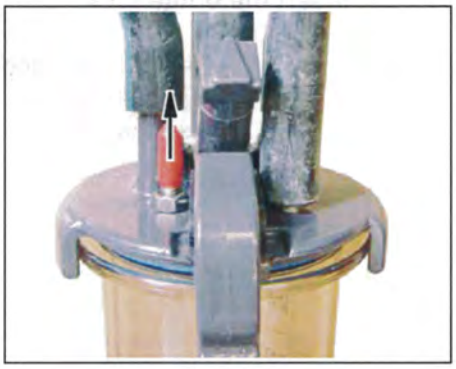


- Fit the hose from the air inlet valve on the sample tank.

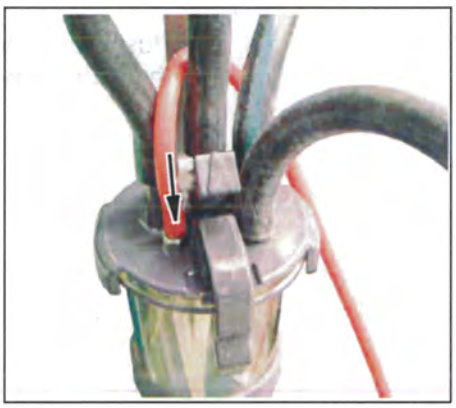


- Connect the hose from the left-hand connector on the sampler to the Y-connector on the sampler.

- Remove the cap from the sampler cover.



- Connect the sampling tube on the sampling device to the sample tank.

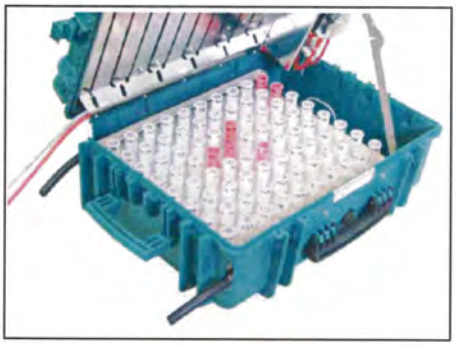


Attention!
The sampling tube must be fed beneath the robot rail so that the robot can move freely.

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

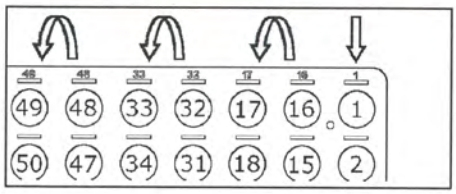
Before sampling begins, the drain channels must be fitted and a bottle rack inserted.



- 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!



Note!
The bottle rack can only be inserted or removed without the rear drain channel fitted.

- Push rear drain channel onto the positioning device.

Note!
The bottle rack numbers are allocated automatically by the system program.

- Box 1 Rack 1
- Box 2 Rack 2
- etc.

If other rack numbers are to be used change them before starting sampling.

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

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

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

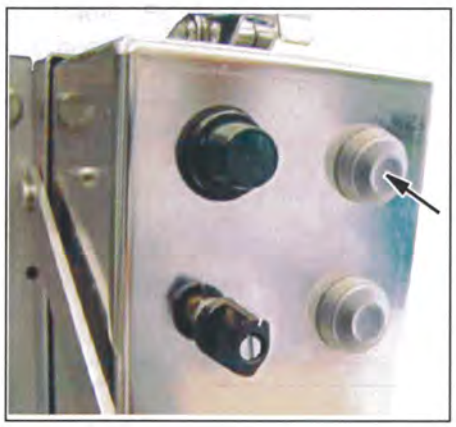
The sampling device receives the electricity it needs from the automatic milking system.

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.



5.5.3 Settings in the system program for the automatic milking system

- Entering settings
  - Call up menu point

RDM	**Robot Data Manager** Herd / Sampling / Session specification

  - Set number of milk samples per animal
  - Set number of bottles in the bottle rack

For further information on the subject, see the manual 7801-90 . . -001

5.6 Take samples

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

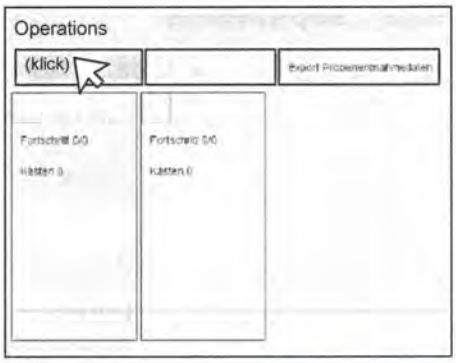
For information on this subject see the section entitled "Cleaning"

5.6.1 Start automatic operation

- Start sampling
  - Call up menu point

RDM | Robot Data Manager
Herd / Sampling / Operations

  - Click on the button. (klick)



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

Note!

- If a cow produces less than 2 kg of milk (for example if the cluster has been inadvertently removed, the data are not recorded and no sample is 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
  - Call up menu point

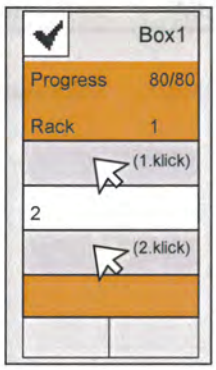
RDM | **Robot Data Manager**
Herd / Sampling / Operations

  - Interrupt sampling
    Press the button shown (1. klick)
  - Milking box ready for change.
    (Tick appears, colour of the fields changes)

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.
  - Press button (1. klick)
  - Enter number of accept suggestion
    Note!
    Make sure that numbers are not duplicated.
  - Save setting (2. klick)

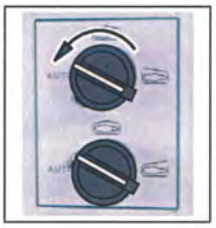


5.7.4 Resume sampling

- Continue sampling
  - Press button (klick)

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
  - Call up menu point

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

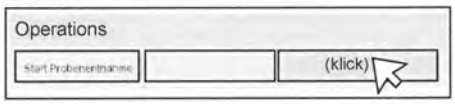
  - Click on the button. (klick)

5.8.3 Create the sample file

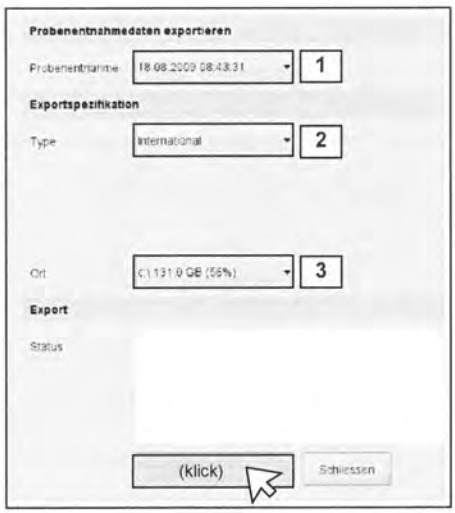
- Export sampling data.
  - Call up menu point

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

  - Click on the button. (klick)



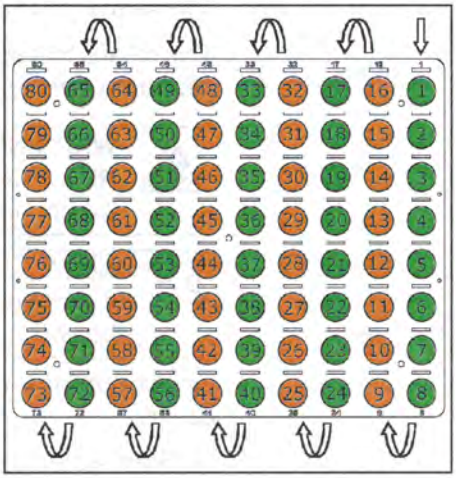
  - Program window appears.
  - Select sampling. (1)
  - Select file format. (2)
    Country-specific file formats are possible with a DairyPlan connection.
  - Specify target directory. (3)
  - Start data export. (klick)
    File is saved.



For further information on the subject, see the manual 7160-90 . . -536

5.8.4 Transfer the sample bottles

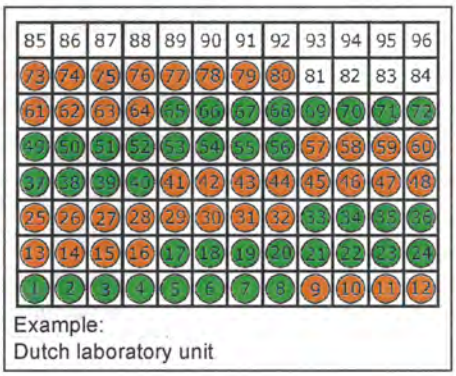
The sample bottles in the bottle rack are filled in this order at each individual milking box.



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

Attention!
When transferring the sample bottles to the laboratory unit, make sure that the same order also 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 by hot cleaning solution!
Do not open the cover during the main system clean.

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
System / Cleaning / Operations

Note!
If a system clean is not performed the sampling device must be cleaned manually.

5.8.6 Disconnect and remove the sampling device

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.

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 Cleaning

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

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!
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.

Note!
Fluid can also be drawn in and pumped through the system by the hose pump when the "PUMP" button is pressed.

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.

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

6 Operating faults

If necessary, please contact your nearest authorised technical dealer.

6.1 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.


Also see the section on "Personnel qualification".

6.2 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.


Also read the chapter on "Safety".

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

6.3 Troubleshooting possible faults

Malfunction	Possible cause	Remedy
Green indicator lamp does not come on	Cable not connected	Check and connect correctly if necessary
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 defective 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 hose or the hose pump
	Air inlet hose for mixing is leaking	Check and replace if damaged
Sample is missing the sample bottle	Chain and/or chain sprockets are worn out	Replace defective parts Check and adjust the limit switch trigger point

7 Maintenance

If necessary, please contact your nearest authorised technical dealer.

7.1 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.


Also see the section on "Personnel qualification".

7.2 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 media specified.
- Immediately replace any components that are not in perfect condition.


Also read the chapter on "Safety".

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

- Before performing any work on electrical installations or equipment (components, housing, etc.) switch off all sources of voltage 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 may 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.
- Electrostatic processes can cause damage to electronic components.

> ☞ **Note!**
> Only touch the edge of the printed circuit board and avoid static caused for example by clothing.

After completing the maintenance work, check the following:

- The installation values set before the work are not altered by the work (report).
- Any 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.

7.3 Scheduled maintenance responsibilities

Interval* (samples filled)	Description	Action
After every session	Sampling device	Clean thoroughly inside and out
Once a year (15000-18000)	All hoses, wearing parts	replace
	Hose pump hose	
	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)

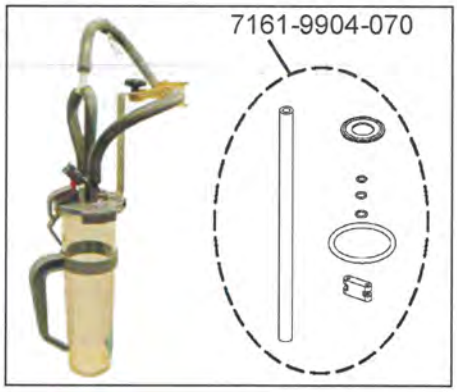
Carry out regular checks on electrical equipment:

- Retighten any loose connections
- Replace damaged lines or cables immediately
- Close off any cable openings that are not being used

7.3.1 Replacing wearing parts on the sample tank

Wearing parts come together in a set of replacement parts.

- Replace wearing parts



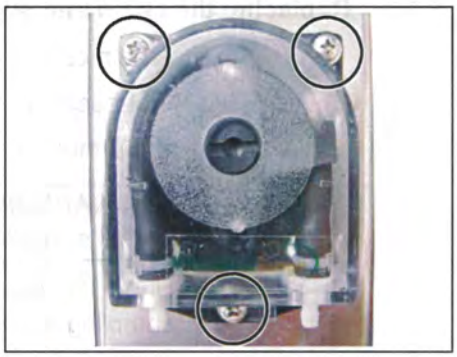
7.3.2 Replacing the hose pump hose

Replace the hose every year to ensure reliable operation.

Attention!
Only replace the hose when the hose pump is off.

- 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!
Note the correct position of the housing cover!

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

The pump can now be used again.

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

7.3.3 Replacing the chain and sprockets

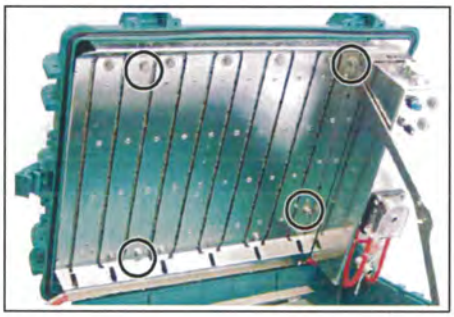
The chain comes correctly pre-tensioned from the factory.

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

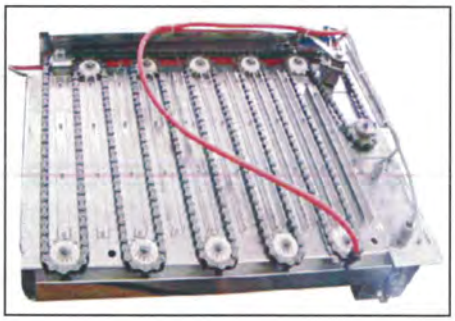
As a rule the chain will not have to be changed for several years.

WARNING!
Disconnect the cable from the power supply before starting the work.

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

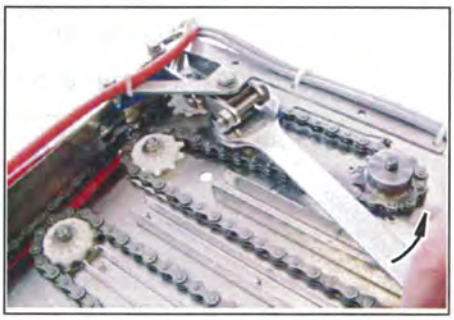


- Turn the sampling equipment out of the lid so that the chain is on top.

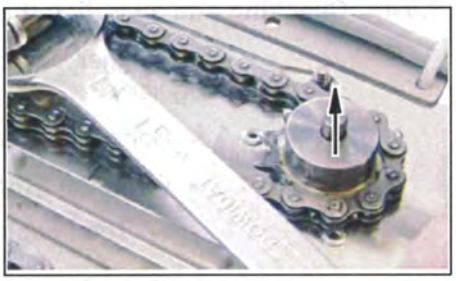


- Loosen the threaded pin on the sprocket (drive) with a spanner.

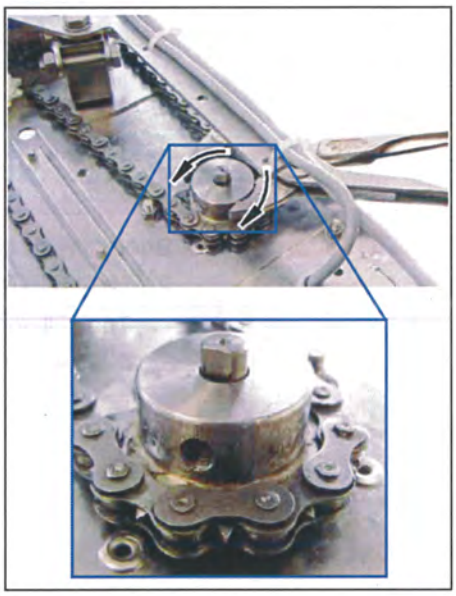
- Place a spanner on the square of the chain tensioner and loosen the chain.



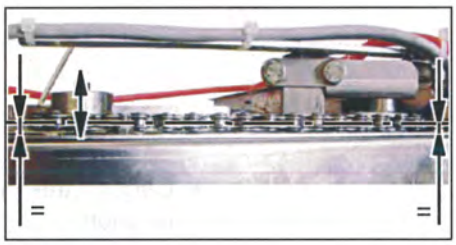
- Remove the sprocket from the drive shaft.



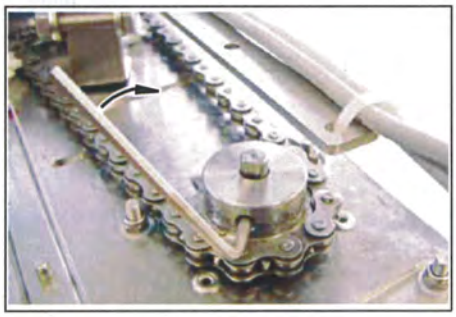
- Replace any defective parts (e.g. chain or sprockets).
- Place sprocket with chain on the drive shaft, loosening the chain with the spanner.
- Turn the sprocket until the threaded pin is pointing towards the flat surface of the drive shaft.



- Position the sprocket at the required height on the drive shaft.



- Tighten the threaded pin on the sprocket (drive) with a spanner.



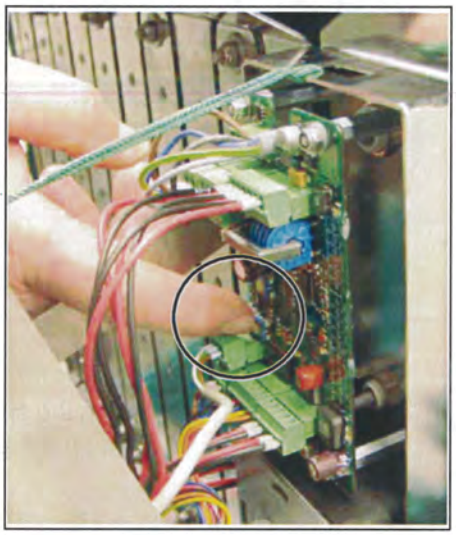
- Re-assemble the sampling device.

7.3.4 Checking and adjusting the limit switch trigger point

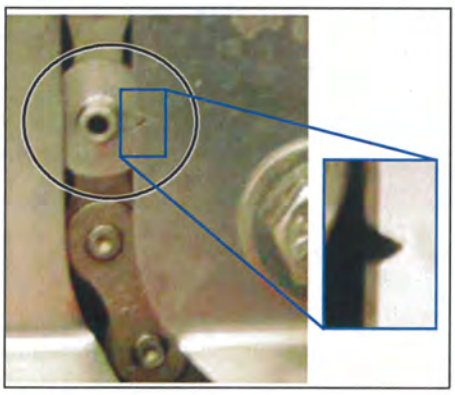
The trigger point may change over time and therefore has to be checked regularly.

- 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.

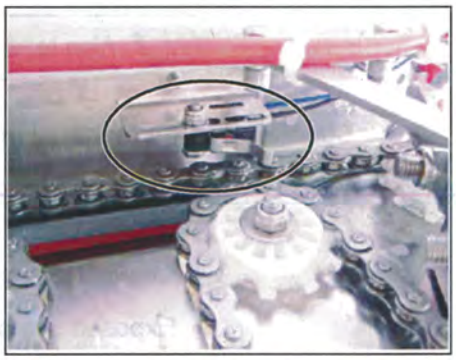
- Press and hold down the button on the right of the electronic card.
  - The filling nozzle travels to position 41.

- Check the nozzle's filling position.
  - The deviation may not be more than +/- 1.5 mm.

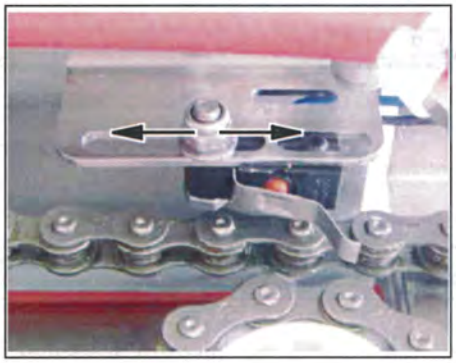
If the first filling position is not correct:

WARNING!
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.

8 Decommissioning

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


Also see the section on "Personnel qualification".

8.1 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.


Also read the chapter on "Safety".

Special dangers involved in decommissioning:

- Leaking lubricants, solvents, preservatives, ... can cause injury if they come into direct contact with the skin.
- Components that are not removed correctly may fall down or tip over.
- Exposed sharp-edged components/tools/.... may cause injury.

8.2 Temporary decomissioning

- 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.

8.3 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 utilization.

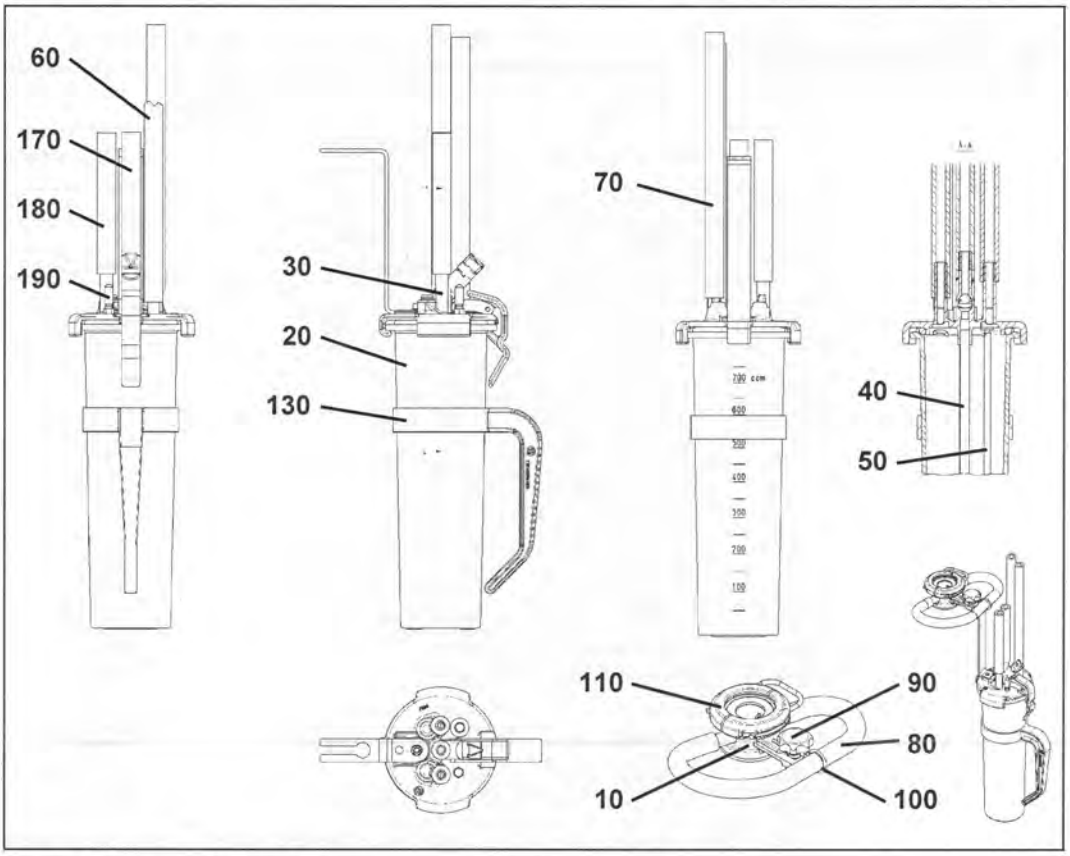

Note!
The system contains components (metals, electrical components, plastics, etc.) which are not biodegradable.

9 Spare parts

9.1 Sampling device

Pos.		Part No.		Description	
		7801-2503-000		**Sampling device (without bottle rack)**	**MIone Metatron**
0020		7801-2187-070		Support complete	
0030	○	7801-2503-020		Sampler complete	
0040		0019-5575-300		Truss-head screw	M8x25
0050		0026-1345-300		Washer	8,4
0060		0019-9101-300		Cheesehead screw	M4x20
0070	○			Sampling device	MIone 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	front
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.**				

9.1.1 Sampler complete

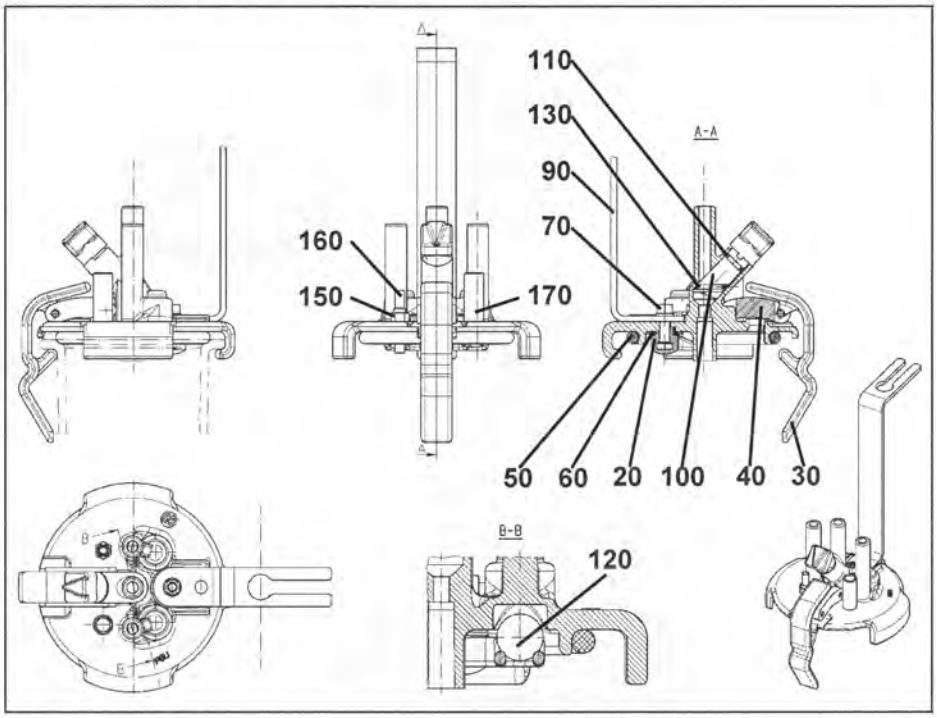


Pos.		Part No.		Description	
		7801-2503-020		**Sampler complete**	
0010		7161-2513-010		Sampler	Metatron
0020		7161-5588-030		Vessel	ø96x257 / 700 ccm
0030	○			Cover for sampler complete	
0040		0018-0380-848		Pipe	8x1 (available by the metre)
0050		0018-4376-898		Hose	4x1,5 (available by the metre)
0060 0070		7021-7102-018		Milk tube	8,5x3,75 (available by the metre)
0080		7036-7101-010	x	Milk tube	8,5x3,75x320
0090		0021-3134-700		Star knob	32/M6
0100		7161-2084-130		Tube holder	ø16x60
0110	○	7161-3270-000		Clip complete	
0130		7161-5014-000		Handle	
0160		0018-5324-820		Y-connection piece	10
0170 0180		7021-7102-018		Milk tube	8,5x3,75 (available by the metre)
0190		0026-2249-890		Cap	4x15
-	○	7161-9904-070		Set of spare parts	

x - Wear parts, interval of maintenance in chapter Maintenance".
Included in set of spare parts (7161-9904-070).

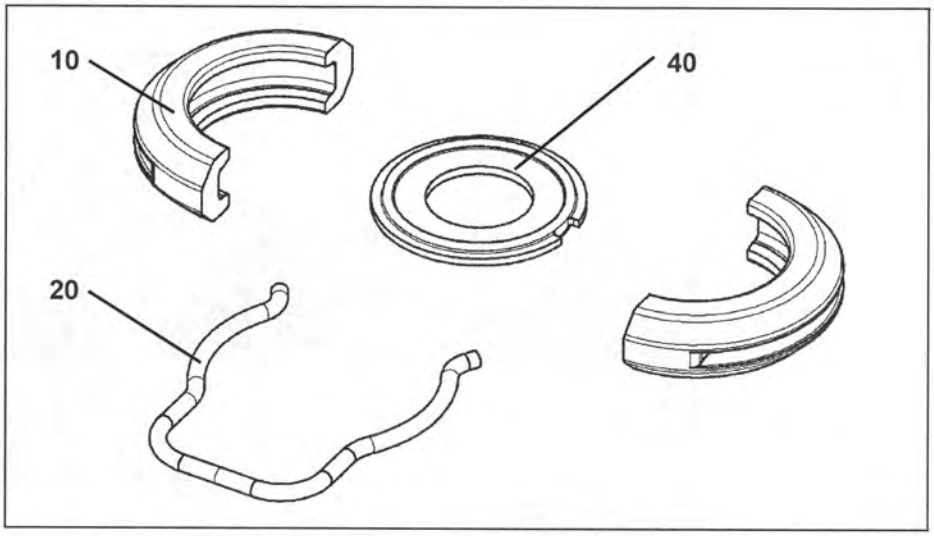
○ See corresponding parts list/drawing for further breakdown of components.

Cover for sampler complete



Pos.		Part No.		Description	
				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	Gasket	66x6
0060		0007-1818-700	x	Gasket	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	Gasket	8x2
0120		0026-1508-890		Ball	12mm
0130		0007-1974-700	x	Gasket	10x2
0150		0013-0276-300		Hexagon head nut	M6
0160		7801-4807-000		Connector	RMS
0170		7051-2045-000		Hose connector	
-	○	7161-9904-070		Set of spare parts	
x - **Wear parts, interval of maintenance in chapter Maintenance". Included in set of spare parts (7161-9904-070).**					
○ **See corresponding parts list/drawing for further breakdown of components.**					

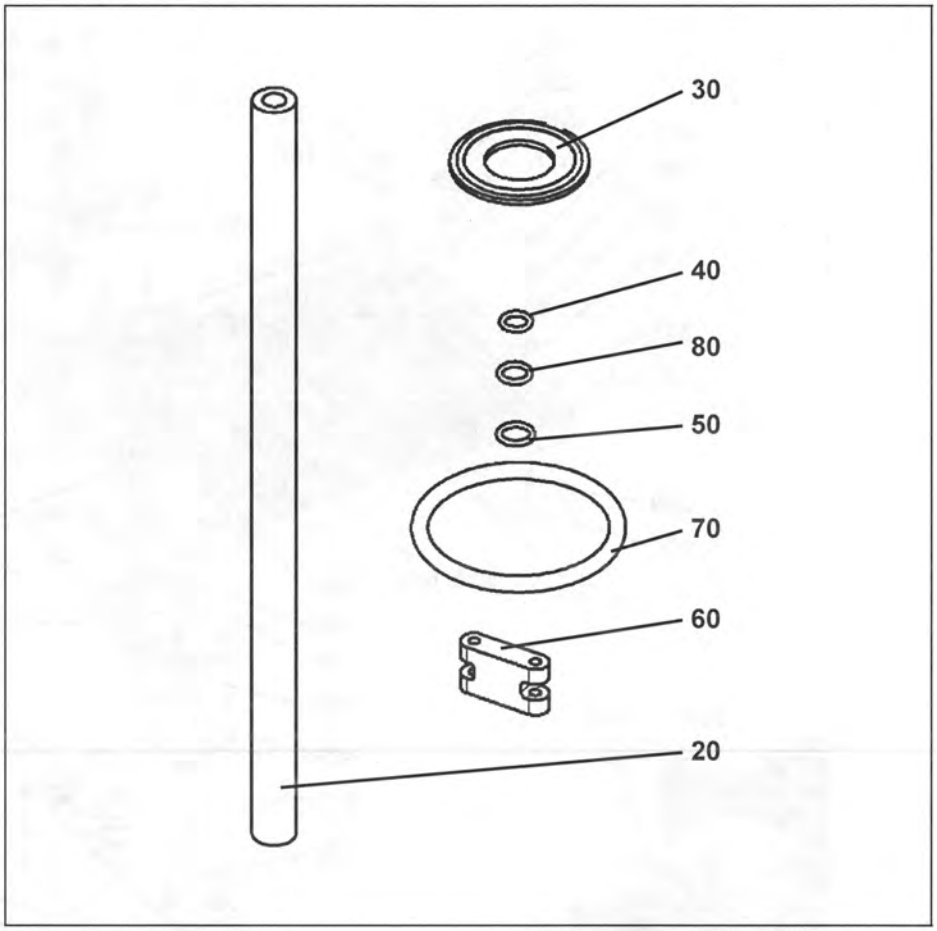
Clip complete



Pos.	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	Gasket	25 Tri-Clamp øo50,5xøi25,3

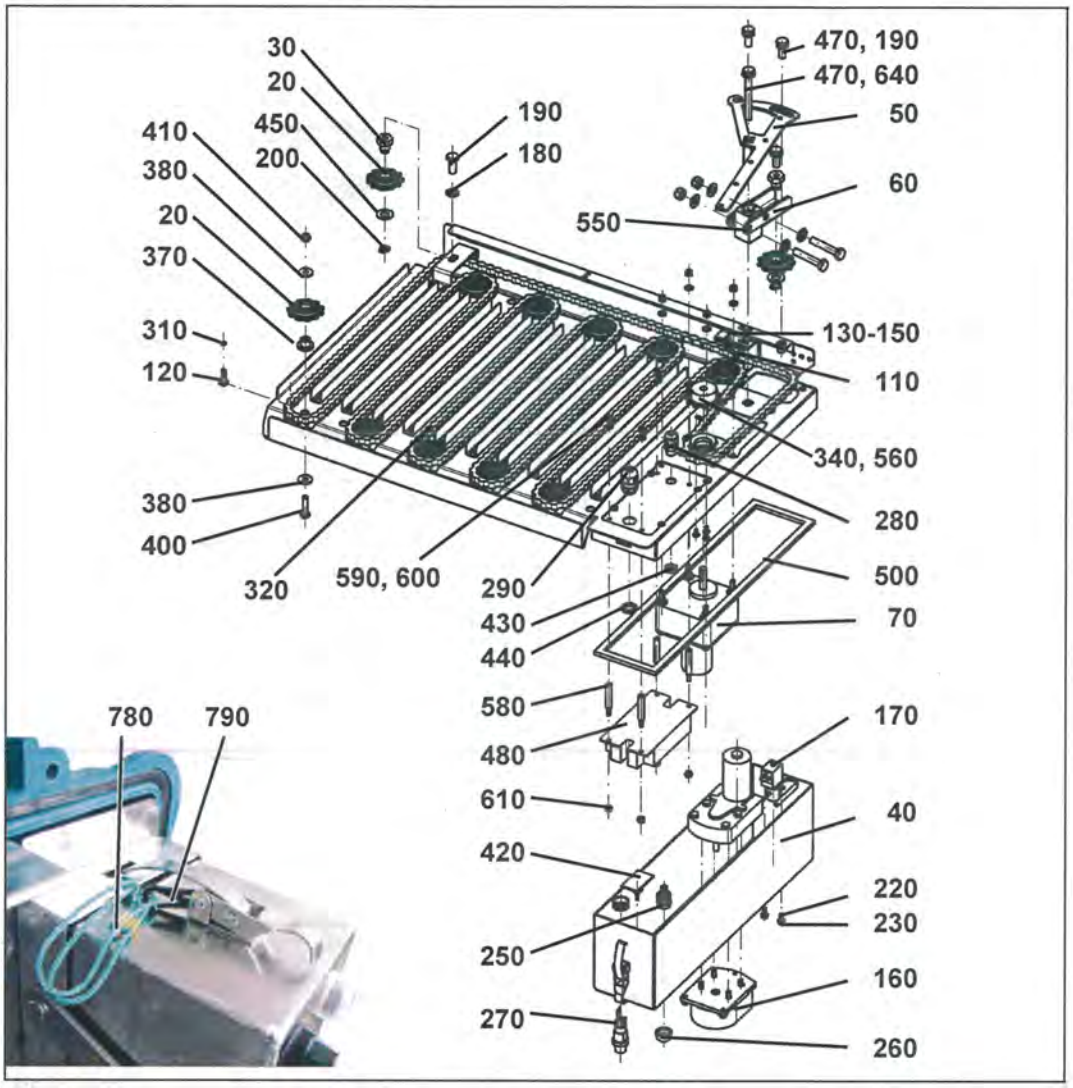
x - Wear parts, interval of maintenance in chapter Maintenance".
Included in set of spare parts (7161-9904-070).

Set of spare parts



Pos.	Part No.		Description	
	7161-9904-070		**Set of spare parts**	
0020	7036-7101-010		Milk tube	8,5x3,75x320
0030	0007-3239-890		Gasket	25 Tri-Clamp øo50,5xøi25,3
0040	0007-2509-700		Gasket	8x2
0050	0007-1974-700		Gasket	10x2
0060	7161-1467-000		Sealing panel	36x20xø4
0070	0007-2060-700		Gasket	66x6
0080	0007-1818-700		Gasket	9x2

9.1.2 Sampling device (MIone Interrior)

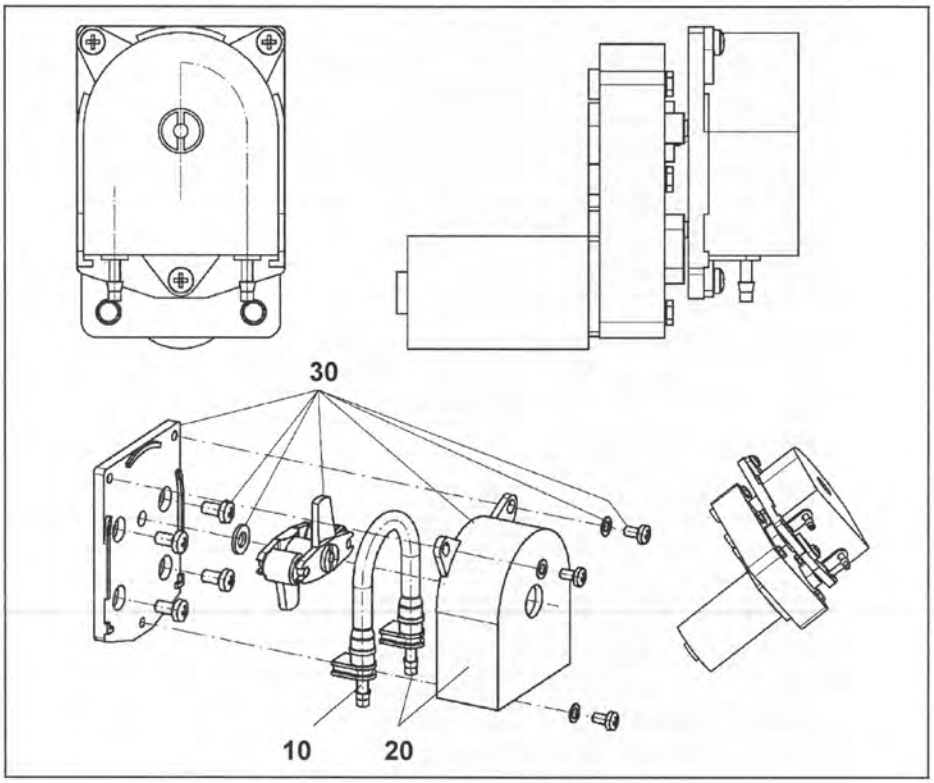


Pos.		Part No.		Description	
				Sampling device	**MIone Interrior**
0020		7801-5306-000	x	Sprocket	Guide
0030		7800-0025-633		Shaft	ø12x19,5
0040		7801-2160-000		Cover complete	
0050		7801-5566-000		Lever	
0060		7801-6915-000		Spanner	
0070		7801-5300-000		Drive	
0080		0005-3301-000		Sub-unit terminal 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	O	7801-2981-000		Hose pump	
0170		7801-2695-010		Crimp valve	
0190		0019-6901-300		Hexagon head bolt	M8x16

0200		0026-5872-300		Sealing ring	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	O	0005-3768-880		Illuminated pushbutton complete	green
0280		0005-4485-900		Cable gland	M12x1,5x3-7
0290		0005-4486-900		Cable gland	M16x1,5x5-10
0300		0013-0291-300		Hexagon head nut	M8
0310		7800-0004-304		Sealing ring	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		Electronics 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		Electronics card	CPU
0500		0004-3079-828		Sealing strip	9x2
0510	O	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
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		Sleeve	
0670		7801-2914-000		Turning knob	
0680		7800-0025-022	x	silicon tube	ø 3x8 (available by the metre)
0690		0026-1382-300		Washer	6,4
0700		0018-6276-820		T-piece for hose connection	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		Tie Wire Nylon	145x3
0750		0005-1299-060		LED	28 V AC/DC, BA9s
0760		7051-2479-190		Gasket	16x22x1
0780		7161-2492-000		Tension relief	
0790		7161-2281-020		Hook	32x10x3

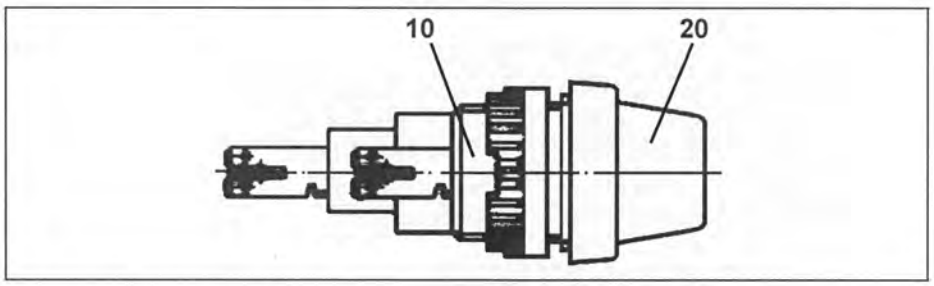
x -	Wear parts, interval of maintenance in chapter Maintenance".
○	See corresponding parts list/drawing for further breakdown of components.

Hose pump



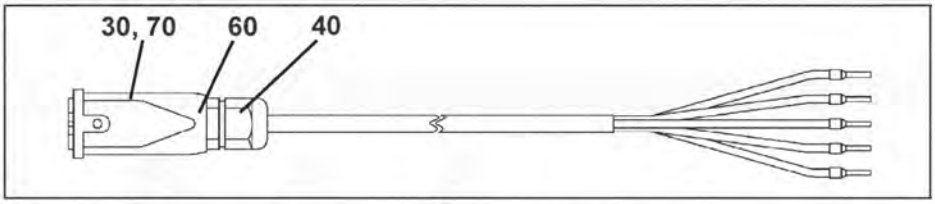
Pos.	Part No.		Description	
	7801-2981-000		**Hose pump**	
0010	7801-2635-000	x	Hose	
0020	7801-4900-000	x	Spare parts	Housing cover and hose
0030	7015-9902-200	x	Set of spare parts	
x - Wear parts, interval of maintenance in chapter Maintenance".				

Illuminated pushbutton complete



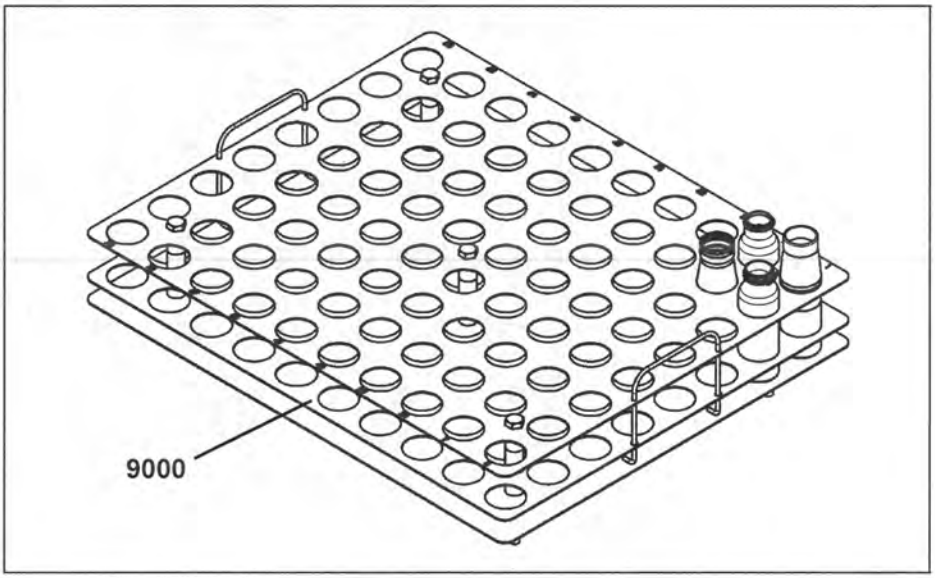
Pos.	Part No.		Description	
	0005-3768-880		**Illuminated pushbutton complete**	**green**
0010	0005-1312-900		Indicator lamp	
0020	0005-1343-910		Diaphragm	green

Cable complete



Pos.	Part No.		Description	
	7801-6933-010		**Cable complete**	**Connection**
0030	0005-1773-040		Connector housing	HAN 3A-M20
0040	0005-4486-900		Cable gland	M16x1,5x5-10
0060	0005-4465-900		Reduction	M20x1,5 - M16x1,5
0070	0005-1773-030		Connector insert	HAN 4A-M

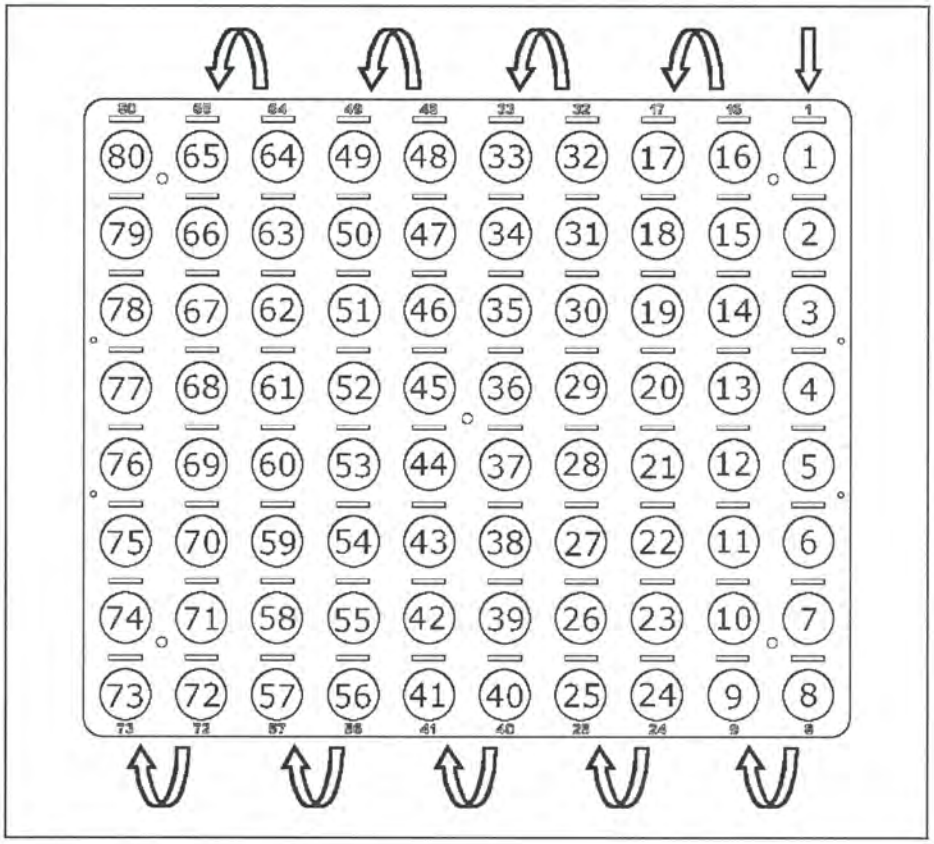
9.2 Bottle racks



Pos.	Part No.		Description	
9000	7801-6451-000		Bottle rack	DE / CH / JP / PL
	7801-6451-010		Bottle rack	NL (new) / USA
	7801-6451-020		Bottle rack	NL (old)
	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

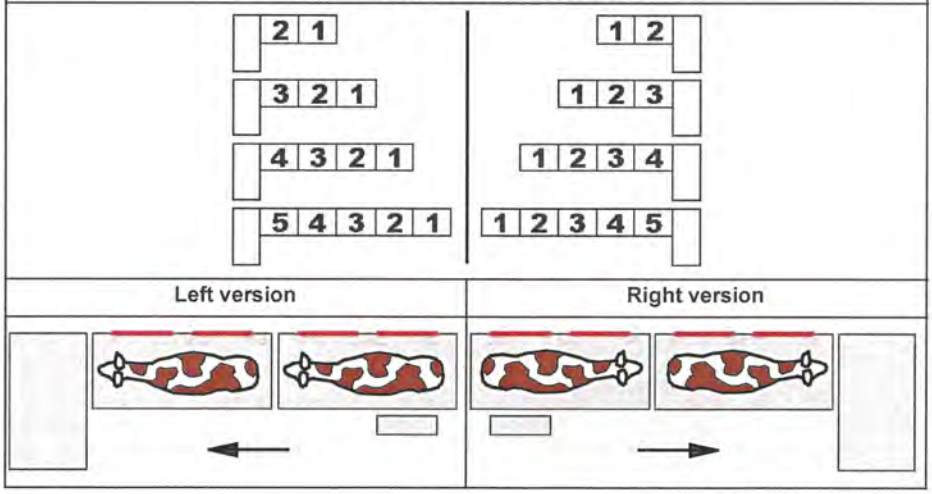
10 Appendix

10.1 Order of the sample bottles in the rack

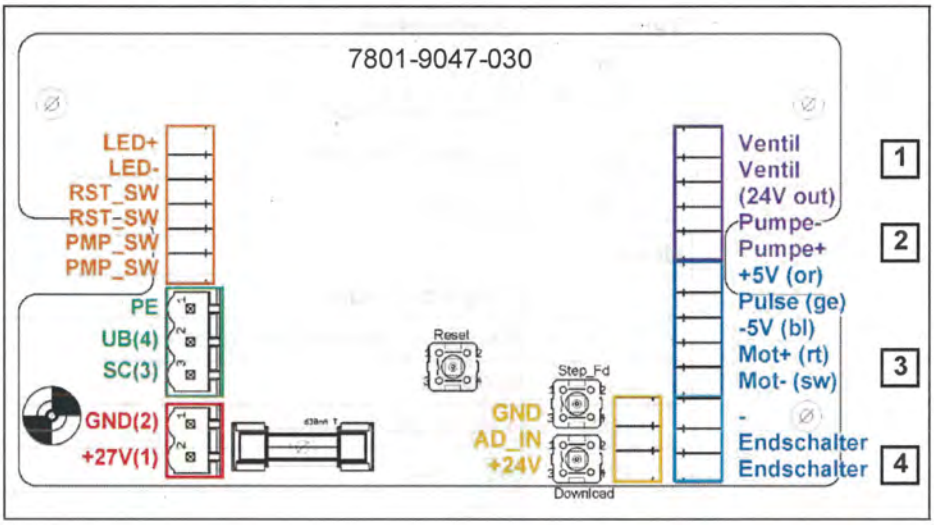


Legend:	
(45)	Sample bottle number
⇨	Order in which the sample bottles are filled

Milking box numbering

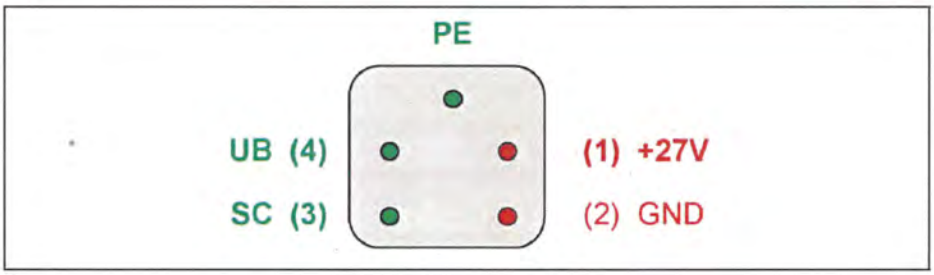


10.2 Terminal diagram for the CUP electronic card



Legend:	
1	Valve
2	Pump
3	Motor
4	Limit switches

10.3 Pin assignment



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

10.4 Abbreviations

Term	Explanation
Ø	Phase
øi	Inside Diameter
øo	Outside Diameter
%	Percent

Units	
°	Degrees (angles)
°C	Degrees Celsius/ Centigrade
s	Second
" (in)	Inch (= 25.4 mm)
mm	Millimeters
m	Meter
kg	Kilograms
kPa	Kilopascal

10.5 Quick-reference guide

10.5.1 Start sampling

Stop automatic operation

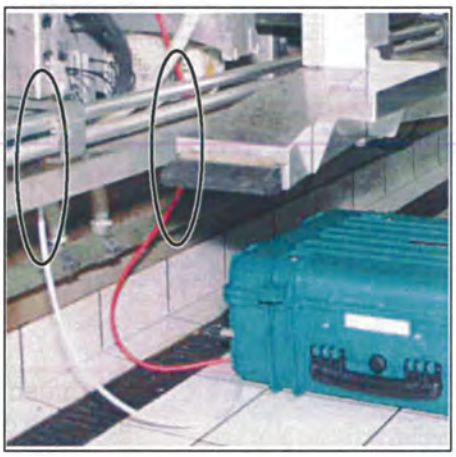
- Close entry gates to all milking boxes.
  - Wait until the animals have left the milking boxes.

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.

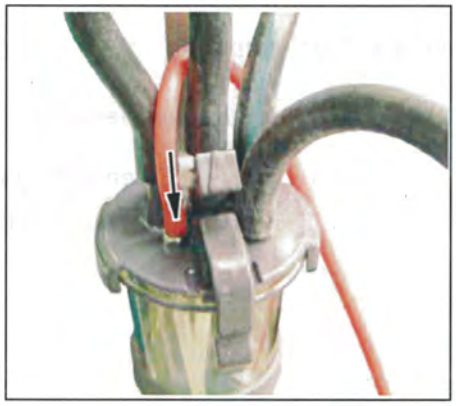
Attention!
The sampling hose and connecting cable must be fed beneath the robot rail so that the robot can move freely.



- 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!
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 in the system program for the automatic milking system

- Entering settings
  - Call up menu point

RDM	**Robot Data Manager** Herd / Sampling / Session specification

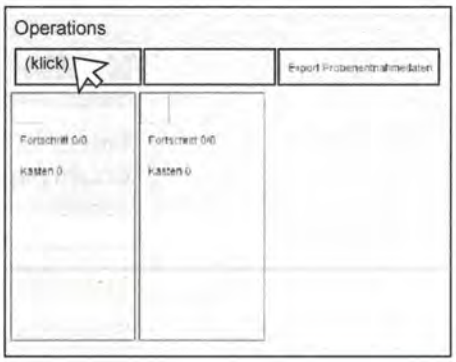
  - Set number of milk samples per animal
  - Set number of bottles in the bottle rack

Start automatic operation

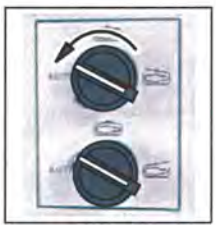
- Start sampling
  - Call up menu point

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

  - Click on the button. (klick)



- 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

10.5.2 End of sampling

Stop automatic operation

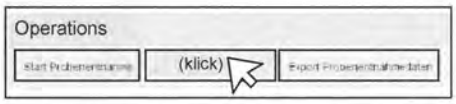
- Close entry gates to all milking boxes.
  - Wait until the animals have left the milking boxes.

Stop sampling

- Stop sampling

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

- Click on the button. (klick)

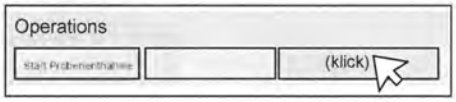


Create the sample file

- Export sampling data.

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

- Click on the button. (klick)



- Program window appears.
- Select sampling. (1)
- Select file format. (2)
  Country-specific file formats are possible with a DairyPlan connection.
- Specify target directory. (3)
- Start data export. (klick)
  File is saved.

For further information on the subject, see the manual 7160-90 . . -536

Start the system clean

- Start system clean

RDM **Robot Data Manager**
System / Cleaning / Operations

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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The right choice.

GEA Farm Technologies

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