

Operation Manual
(Translation of the original operating instructions)

7821-9001-000
03-2016

Contents

1	Preface	4
1.1	Information on the instructions	4
1.2	Manufacturer's Address	6
1.3	Customer service	6
1.4	Declaration of conformity	7
1.5	Successful Milking	8
2	Safety	9
2.1	Owner's obligation of care	9
2.2	Explanation of safety symbols	10
2.3	Warning signs and stickers	10
2.4	Basic safety instructions	21
2.5	Qualification of personnel	21
2.6	Dangerous areas	22
2.7	Protective Devices	23
2.8	Use the lockout/tagout procedure for all work on the installation	25
3	Description	26
3.1	Intended Use	26
3.2	Product Changes	26
3.3	Structure of the product	27
3.4	Milking	38
3.5	DairyPlan - Further settings for the milking system	58
3.6	Operating parameters	59
3.7	Technical Data	61
3.8	Design guidelines	65
3.9	Default setting	76
4	Operation	77
4.1	Special personnel qualification required for operation	77
4.2	Safety Instructions for Operation	77
4.3	Workplaces for operating personnel	80
4.4	Description of the control elements	80
4.5	Training phase - Getting used to the automatic milking system	86
4.6	Adding a new animal to the herd	89
4.7	Milking in manual mode	92
4.8	Milking in automatic mode	98
4.9	Monitored milking	101
4.10	Milking animals without responders	103
4.11	Letting an animal out manually (e.g. exit block)	104
4.12	Taking calf milk	105
4.13	Separating of non-saleable milk	106
4.14	Sampling	7821-2503-000
	109	
4.15	Clean	110
4.16	Feeding in the automatic milking system	112
4.17	Herd management with the herd management PC and DairyPlan	117
4.18	Restarting milking after a power failure	120
4.19	Animal segregation	121

5	Operating faults	124
5.1	Special personnel qualification required for troubleshooting	124
5.2	Safety Instructions for Troubleshooting	124
5.3	Fault messages and troubleshooting help	125
5.4	Alarms	126
5.5	Opening the control cabinet without switching off the milking system	134
5.6	Frequency converter parameters	135
5.7	Process visualization	138
5.8	Milking in emergency mode	144
6	Maintenance by the farmer	147
6.1	Safety instructions for maintenance	147
6.2	Maintenance requirements	149
6.3	Eliminating cleaning problems	156
7	Decommissioning	158
7.1	Special personnel qualification required for decommissioning	158
7.2	Safety instructions for decommissioning	158
7.3	Temporary decommissioning	159
7.4	Final decommissioning/disposal	160
8	Appendix	161
8.1	Abbreviations	161
8.2	Lockout/Tagout procedure	162
8.3	Quick guide	163
8.4	Servicing instructions for the operator	168

1 Preface

1.1 Information on the instructions

We reserve 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, technical terms, special names or jargon used in this manual are explained in greater detail in the Appendix.

This manual is supplied with the product.

- It 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 refer to the corresponding documents and manuals.
This applies especially for safety information!

Required documents:

This manual is only part of the product documentation.
The complete documentation consists of the following manuals:

part no.	Description
7821-90 . . -000	Instruction manual
7821-90 . . -001	Installation instructions
7821-90 . . -002	Installation drawings for wiring and piping
7801-90 . . -045	Sampling device
7820-90 . . -005	DairyProQ Automatic milking system - milking place module

Pictograms used



Note!

This pictogram indicates information that will help towards better understanding of a procedure or operation.



This pictogram indicates a special tool required for installation.



This pictogram refers to a setting that can be made in DPSetup.




This pictogram refers to another document or another section of this manual.


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-	Englisch (Amerika)	-9034-	Slovak
-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-	Slovenian		
Under certain circumstances, not all of the above-mentioned languages are available.					

1.2 Manufacturer's Address

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

 +49 (0) 2383 / 93-70

 +49 (0) 2383 / 93-80

 contact@gea.com

 www.gea.com

1.3 Customer service

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

 +49 (0) 2383 / 93-70


 +49 (0) 2383 / 93-80


 contact@gea.com


 www.gea.com

US Contact Information:

GEA Farm Technologies, Inc.
1880 Country Farm Dr.
Naperville, IL 60563


 +1 630 369 - 8100

 +1 630 369 - 9875

 contact_us@gea.com

 www.gea.com

1.4 Declaration of conformity

Manufacturer:	GEA Farm Technologies GmbH Siemensstraße 25-27 D-59199 Bönen	
Product name:	Automatic milking system	
Product Name or Model Number:	Monobox	
The product referred to complies with the provisions of the following European directives: 2006/42/EC Machinery Directive		
Conformity with the requirements of these directives is testified by complete adherence to the following standards:		
<ul style="list-style-type: none"> • Harmonized European standards <ul style="list-style-type: none"> EN 349 (2009-01) Minimum distances to prevent pinching parts of the body EN 953 (2009-07) Safety of machinery Separating safety devices EN 983 (2009-06) Safety requirements for fluid installations and their components - pneumatics EN 12100 (2011) Safety of machinery - General principles for design - Risk assessment and risk reduction EN ISO 13732-1 (2008-12) Ergonomics of the thermal environment - Methods for the assessment of human reaction on contact with surfaces - Part 1: Hot surfaces EN ISO 13850 (2008-09) Safety of machinery Emergency stop - design principles EN ISO 13857 (2008-06) Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs EN 60204-1 (2007-06) Electrical equipment of machines EN 61310-1 (2008-09) Safety of machinery Requirements for visual, acoustic and tactile signals EN 61439-1 (2012-06) Low-voltage switchgear combinations Rules, field of application, amendment service 		
In addition the requirements of the following standards are fulfilled:		
<ul style="list-style-type: none"> • National Standards: <ul style="list-style-type: none"> NFPA 70 National Electrical Code NFPA 79 Electrical Standard for Industrial Machinery UL508A (2012-12) Industrial control panels ANSI Z535 American National Standards Institute Safety Instructions and signal words ANSI Z244.1 Control of Hazardous Energy Lockout/Tagout and Alternative Methods 		
Person responsible for compiling the relevant technical documents:	Josef Schröer GEA Farm Technologies GmbH Siemensstraße 25-27 D-59199 Bönen ☎ +49 (0) 2383 / 93-70	
Bönen, 01. March 2016		Henrik Boettner (Head of Research and Development Automated Dairy Farming)
The undersigned is acting by virtue of power of attorney from the management board of: GEA Farm Technologies GmbH, Siemensstraße 25-27, D-59199 Bönen		
This declaration certifies compliance with the guidelines indicated, but does not establish any guarantee in the sense of paragraphs 443, 444 of the BGB.		

1.5 Successful Milking

Prerequisites for successful milking:

- A properly designed and adjusted milking installation.
The milking vacuum, the pulsation and automatic cluster removal must be set correctly to suit the animals.
Regular checks and adjustments to suit changing herd characteristics will ensure successful milking in this case as well.
- A timely maintenance and cleaning of the milking installation.
Regular and thorough cleaning and disinfecting of the milking installation directly after milking will contribute towards animal health, the quality of the milk and therefore a good milk result.



See also the section entitled:
Eliminating cleaning problems

- Only use original parts when exchanging.
- Setting recommendations must be checked regularly and adjusted if necessary. They do not apply in connection with products by other manufacturers.
- Separating of non-saleable milk.
 - Separate milk not suspected of containing inhibitors
Animals in order of milking: 2. + 3.
 - Separate milk suspected of containing inhibitors
Animals in order of milking: 4.



Please make sure to read the following section:
Operation / Separating of non-saleable milk

Milking order

Prescribed milking order during operation:

1. milk inconspicuous animals
2. milk newly lactating animals
(milk not suspected of containing inhibitors)
3. milk sick animals that are not receiving treatment
(milk not suspected of containing inhibitors)
4. milk animals that have received medication and whose milk is subject to a delay time
(milk suspected of containing inhibitors)



Important! Suspected inhibitors

If the milk is suspected of containing inhibitors, a short clean of the milk-bearing areas is not sufficient!
In such a case, the animals must be milked and a system clean started immediately after milking.

2 Safety

2.1 Owner's obligation of care

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 read the instructions (especially the safety instructions and warnings) and signs to confirm that they have understood them and will act accordingly!
- A complete and legible copy of the manual must always be available at the place where the product is installed.
- Anyone performing work on the product must be able to consult the manual at any time.
- The instructions given in the section "Basic safety instructions" must be observed.
- The legal requirements are observed.
- Operating instructions are produced for the farm. These must be especially adapted to the conditions of the business, once again, expressly taking account of 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 equipment, in particular, must be checked regularly to ensure it is working properly.
- The work to be carried out may only be performed by a suitably qualified person.
- 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. 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!
- Escape routes must be indicated by signs in accordance with national regulations.
- Any personal safety equipment required for the operating, maintenance or repair personnel must be provided and used.
- 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 signaling words



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 signal word "Attention" indicates important information on risks for the product or the environment.

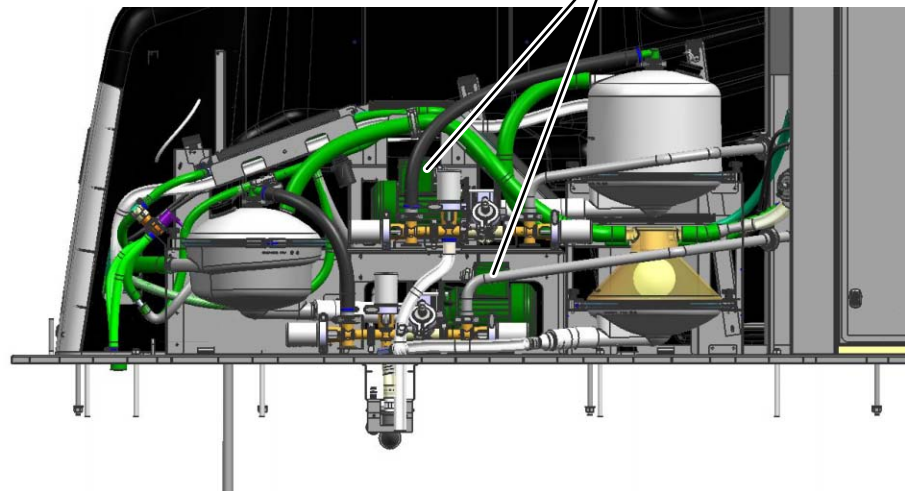
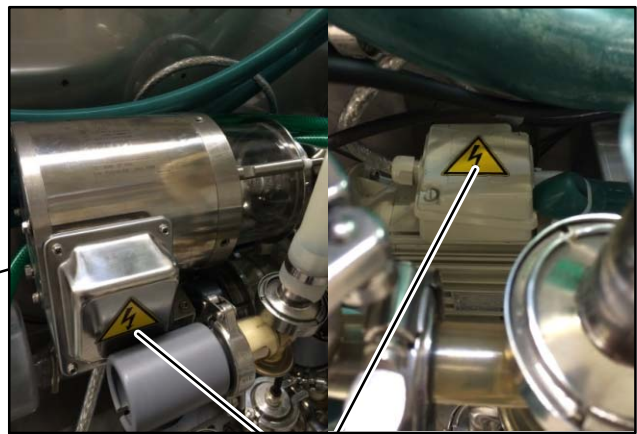
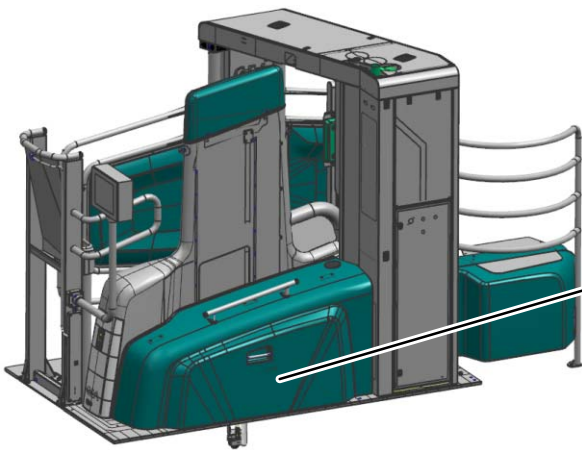
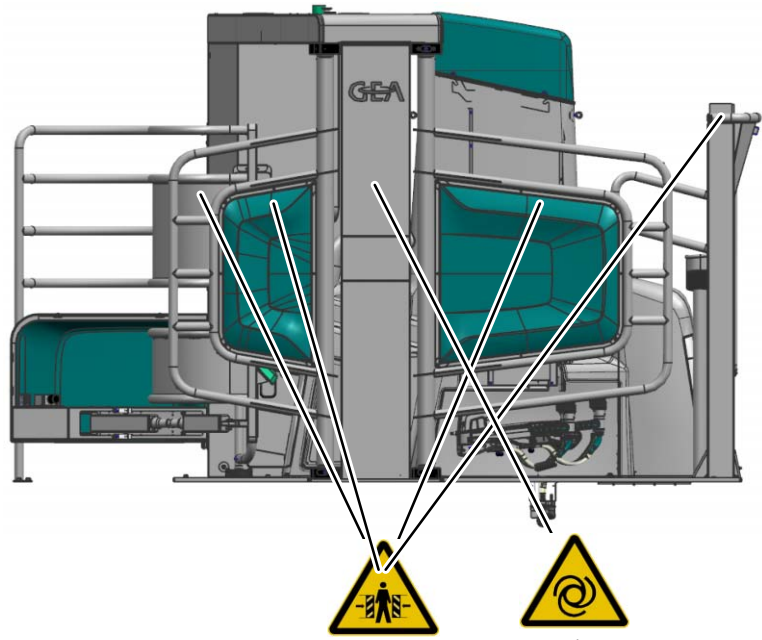
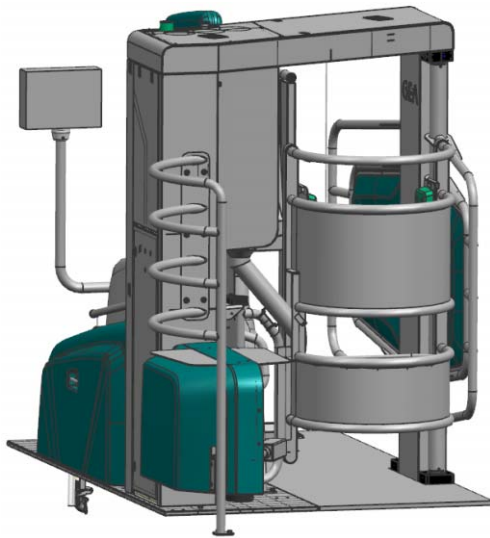
2.3 Warning signs and stickers

Replace any safety markings, signs, labels on the product if they become illegible or lost.

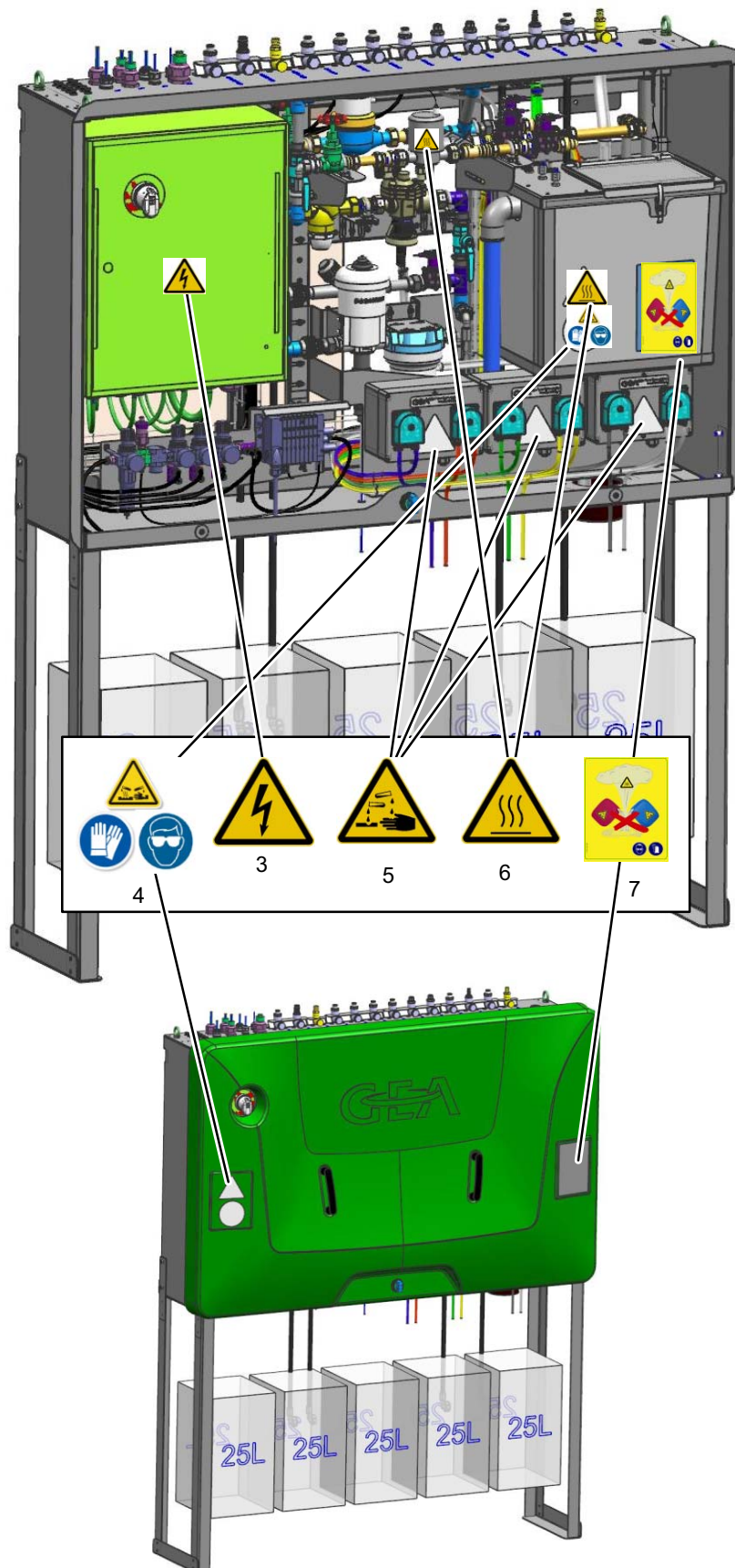
2.3.1 European warning signs

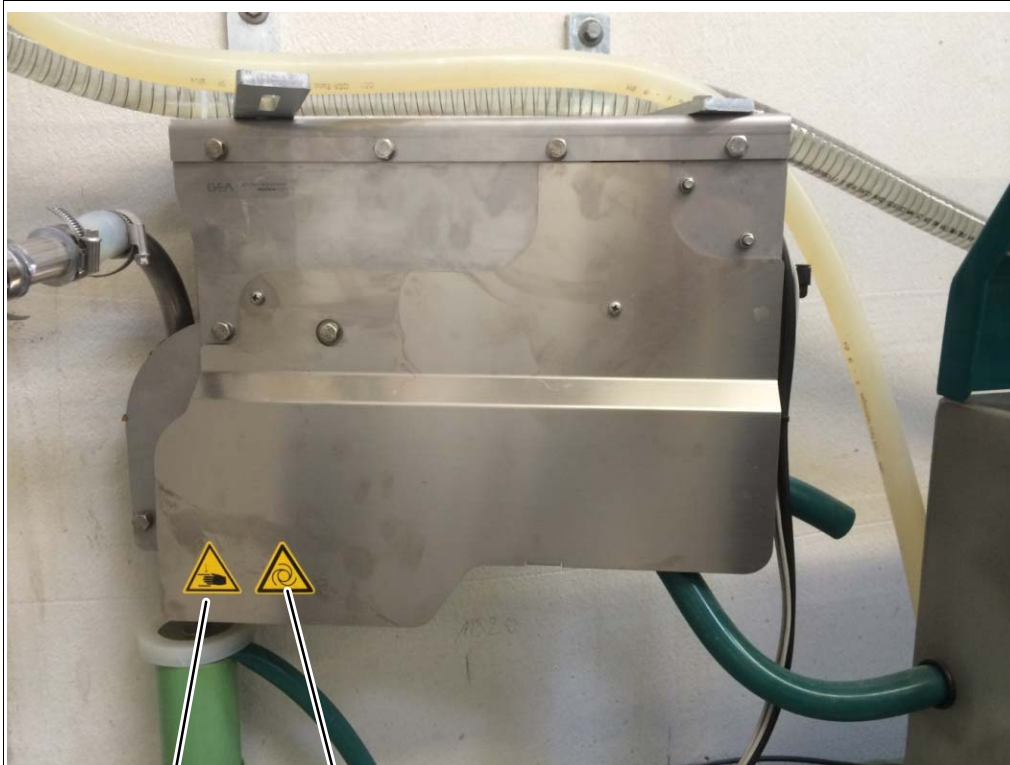
Item	part no.		Description	
	7821-9926-010		Set of warning signs	4 x 0024-6061-000 4 x 0024-6062-000 4 x 0024-5467-000 2 x 0024-8000-020 3 x 0024-6131-000 2 x 0024-6281-000 2 x 7015-2792-070 2 x 0024-6063-000 1 x 0024-6060-000
1	0024-6061-000		Danger sign	Automatic start Size: 10/8,6cm
2	0024-6062-000		Danger sign	Risk of destruction
3	0024-5467-000		Danger sign	High voltage (<1000V)
4	0024-8000-020		Danger sign	Protective measures
5	0024-6131-000		Danger sign	Caustic substances
6	0024-6281-000		Danger sign	Hot surfaces
7	7015-2792-070		Sticker	Do not mix cleaning agents and disinfectants
8	0024-6063-000		Danger sign	Injury to hands
9	0024-6060-000		Danger sign	Automatic start Size: 4,5/4,1cm

Milking box



Supply unit



Milk separation MS1

8



9

Milk separation MS20



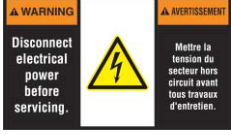





8



1

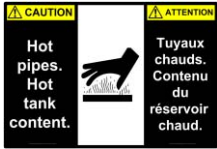
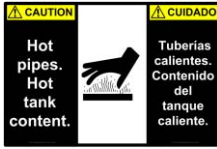








2.3.2 USA warning signs (ANSI Z535.4)

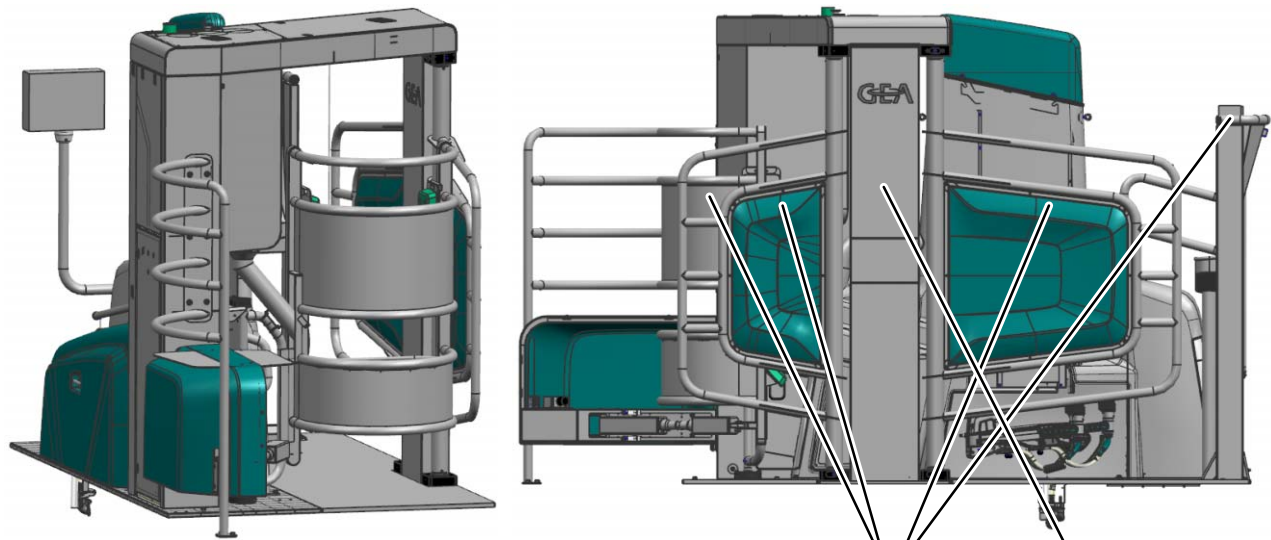
Item	part no.	Language	Description
	7821-9926-020	English / French	<div>4 x 0024-8000-030</div> <div>3 x 0024-8000-050</div> <div>3 x 0024-8000-070</div> <div>1 x 0024-8000-090</div> <div>2 x 0024-8000-110</div> <div>4 x 0024-8000-130</div> <div>2 x 0024-8000-150</div>
	7821-9926-030	English / Spanish	Set of warning signs <div>4 x 0024-8000-040</div> <div>3 x 0024-8000-060</div> <div>3 x 0024-8000-080</div> <div>1 x 0024-8000-100</div> <div>2 x 0024-8000-120</div> <div>4 x 0024-8000-140</div> <div>2 x 0024-8000-160</div>
2	0024-8000-030	English / French	 Disconnect electrical power before servicing.
3	0024-8000-040	English / Spanish	 Disconnect electrical power before servicing.
4	0024-8000-050	English / French	 Highly corrosive chemicals. Risk of severe eye and skin injuries. Avoid contact wear eyes & body protection.
5	0024-8000-060	English / Spanish	 Highly corrosive chemicals. Risk of severe eye and skin injuries. Avoid contact wear eyes & body protection.
6	0024-8000-070	English / French	 Equipment starts automatically Lockout and Tagout before servicing.
7	0024-8000-080	English / Spanish	 Equipment starts automatically Lockout and Tagout before servicing.

Safety

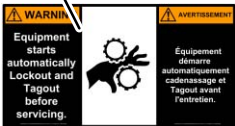
Warning signs and stickers

Item	part no.	Language	Description
8	0024-8000-090	English / French	 <p>Hot pipes. Hot tank content.</p> <p>Tuyaux chauds. Contenu du réservoir chaud.</p>
9	0024-8000-100	English / Spanish	 <p>Hot pipes. Hot tank content.</p> <p>Tuberías calientes. Contenido del tanque caliente.</p>
10	0024-8000-110	English / French	 <p>Wear face shield, gloves, protective clothing.</p> <p>Porter une protection du visage, des gants et des vêtements de protection.</p>
11	0024-8000-120	English / Spanish	 <p>Wear face shield, gloves, protective clothing.</p> <p>Usa siempre protección facial, guantes e indumentaria de protección.</p>
12	0024-8000-130	English / French	 <p>Risk of entrapment.</p> <p>Risque d'accident par coincement.</p>
13	0024-8000-140	English / Spanish	 <p>Risk of entrapment.</p> <p>Peligro de lesión por atrapamiento.</p>
14	0024-8000-150	English / French	 <p>Do not interchange containers. Do NOT mix chemicals.</p> <p>Ne pas échanger les réservoirs. Ne pas mélanger les produits chimiques.</p>
15	0024-8000-160	English / Spanish	 <p>Do not interchange containers. Do NOT mix chemicals.</p> <p>No cambie el depósito. No mezcle los productos químicos.</p>

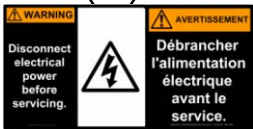
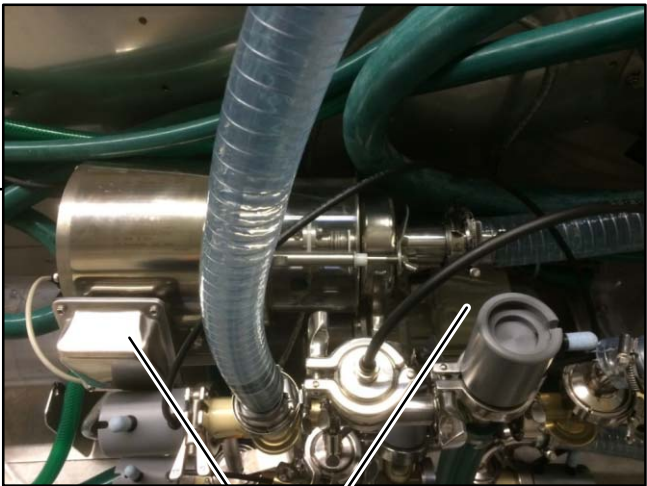
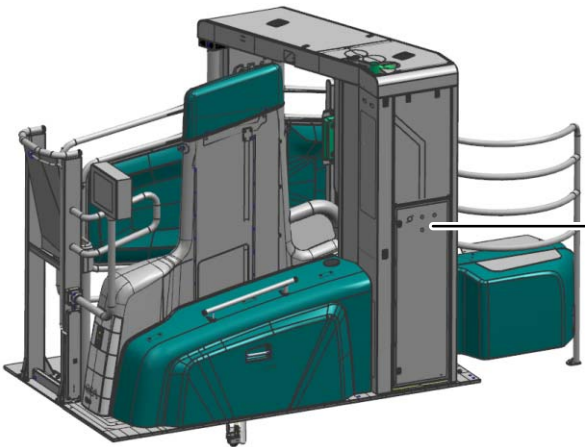
Milking box



12/13

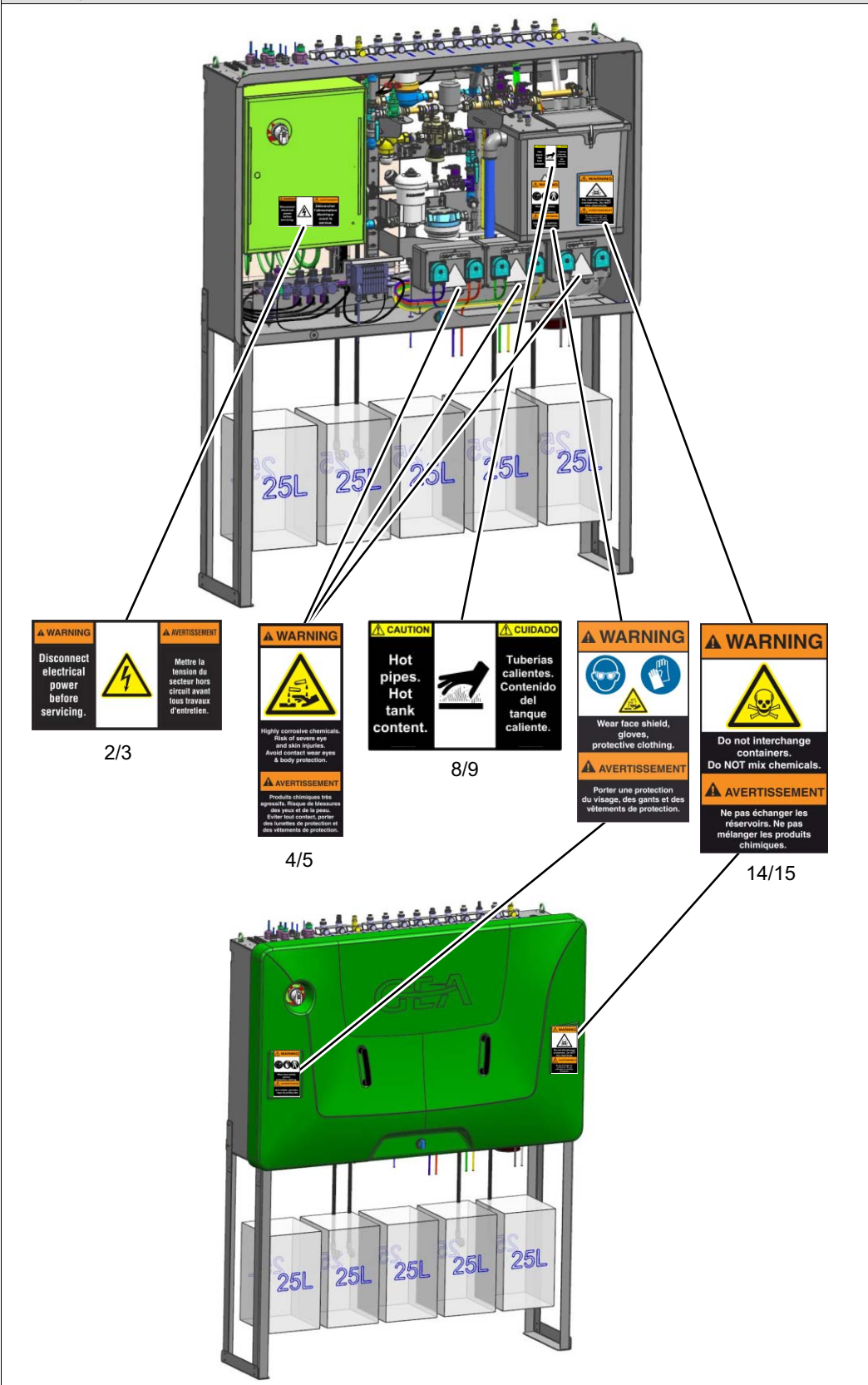


6/7

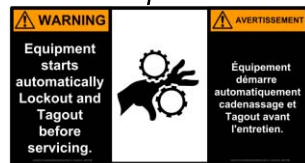


2/3

Supply unit

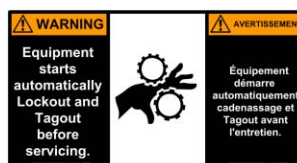
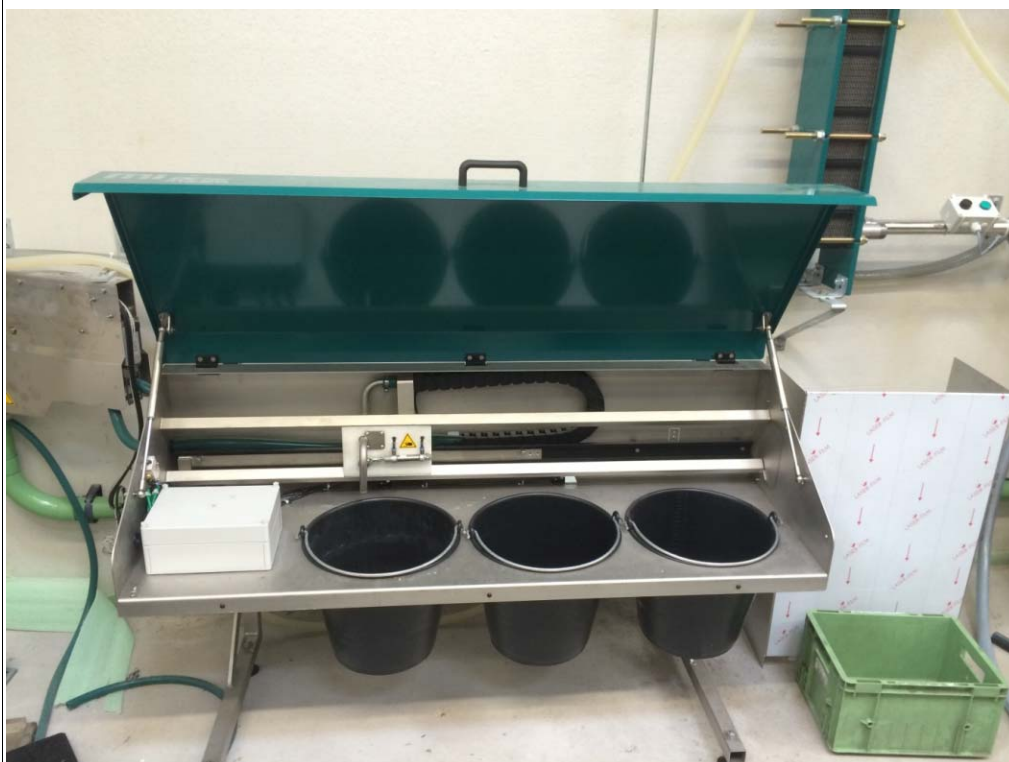


Milk separation MS1

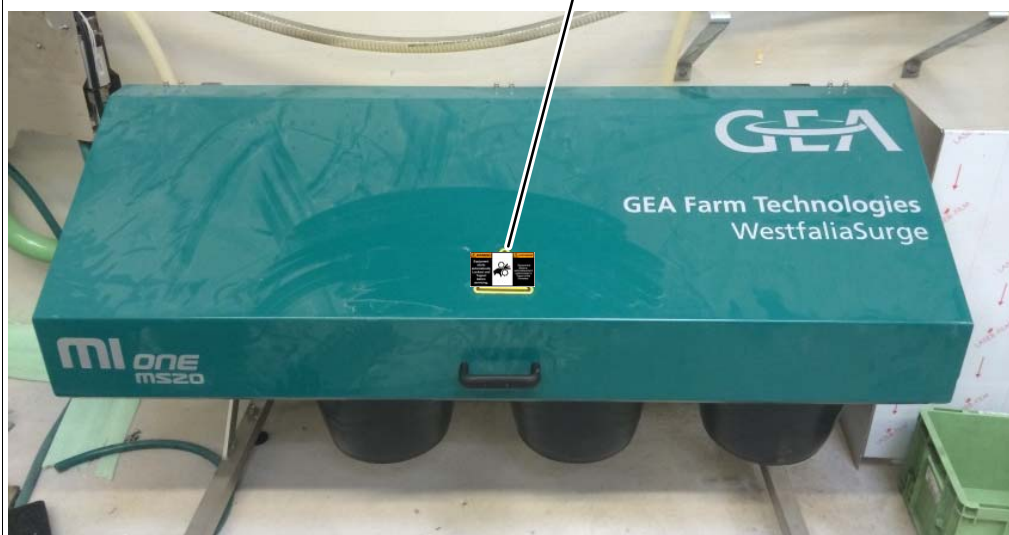


6/7

Milk separation MS20



6/7



2.4 Basic safety instructions



Note!

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

- Remote control of the automatic milking system is not permitted!
- 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!
- 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)!
- Regarding products from other manufacturers, always heed the warnings given in the safety data sheets and the operating instructions from the product manufacturer.
- Observe measures on protection against noise!
- Do not stand underneath suspended loads.
- 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!

2.5 Qualification of personnel

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

- Relevant product training must be attended.



Attention!

Particular qualifications are described in the corresponding chapters!

2.6 Dangerous areas



Warning!

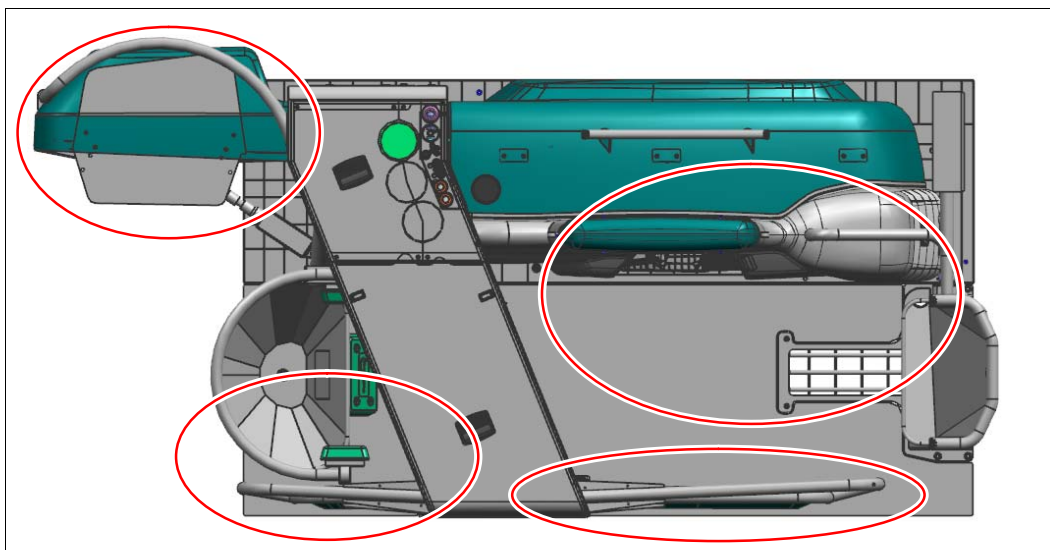


While the milking system is in operation there is a risk of injury by crushing, for example within the operating range of the robot arm for cluster application or the box gates.



It is strictly forbidden to enter these danger areas during automatic mode.

- Danger areas in automatic mode



Entry into danger areas



Danger!

The danger area may only be entered if the installation has been switched to "Maintenance" mode at the key switch on the control cabinet.

"Automatic" Mode"	"Maintenance" mode

In "Maintenance" mode all the gates operate with greatly reduced pressure in order to avoid crushing injuries.

- Turn the key switch to the right to the "Maintenance" position.
- Withdraw the key.



2.7 Protective Devices

Emergency stop switch (1)

Pressing the emergency stop button stops the gates moving (the gates are pressure-free).

All components can move freely.

Key switch (2)

Operating the key switch reduces the closing force of the doors, and the cow trainer is deactivated.

- Turn the key switch to the right to the "Maintenance" position.



Indication if the emergency stop circuit is active

The alarm shown on the right will displayed in the system program:
Emergency stop has been activated)



For more details see the following Chapter:
Description of the control elements

Unlocking safety device

- Pull out the emergency stop button.



Resetting the emergency stop circuit

- Press pushbutton.



Reduce the closing force of the doors

- Turn the key switch to the right to the "Maintenance" position.
- Withdraw the key.

We reserve the right to modify the construction and design in all cases!

The cow trainer is also deactivated in this switch position.



Reset the reduced gate closing force

- Insert the key in the switch.
- Turn the key switch to the left to the "Automatic" position.



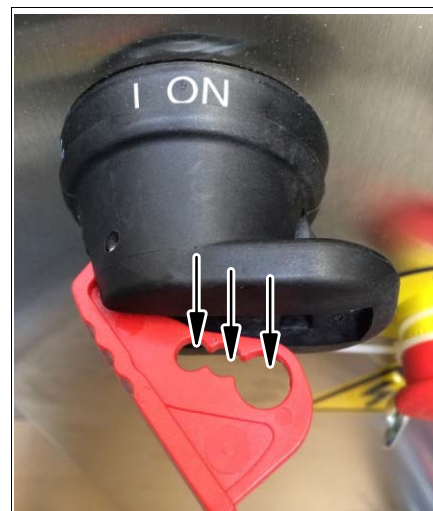
2.7.1 Main switch

Main switch (1)

The main power switches are used to switch off the power supply to the milking box and the supply unit.



When switched off, the main power switches can be secured against being switched back on by up to 3 padlocks.



2.8 Use the lockout/tagout procedure for all work on the installation

Lockout/Tagout is a planned safety measure that consists of switching off energy sources at machinery and equipment during maintenance work and repairs.

The procedure protects staff from the risks posed by machinery that is switched on, or live electricity.

The procedure ensures that there are never any risks from machinery that is switched or live electricity when work is being carried out.



The "Lockout/Tagout Procedure" is summarised on a pull-out page in the "Appendix" chapter.

3 Description

3.1 Intended Use

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

It is exclusively designed for milking cows and and restraining them securely in the milking system for the duration of the milking.

The automatic milking system is intended exclusively for automatically milking specified cows and restraining them securely in the milking system for the duration of the milking

Any applications which 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, original accessories and original chemical substances have been adapted, tested and authorised 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 Product Changes

Unauthorised product modifications can have a negative impact on the safety, service life and functionality of the product.

Any modifications not described in the product documentation are deemed to be prohibited.

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

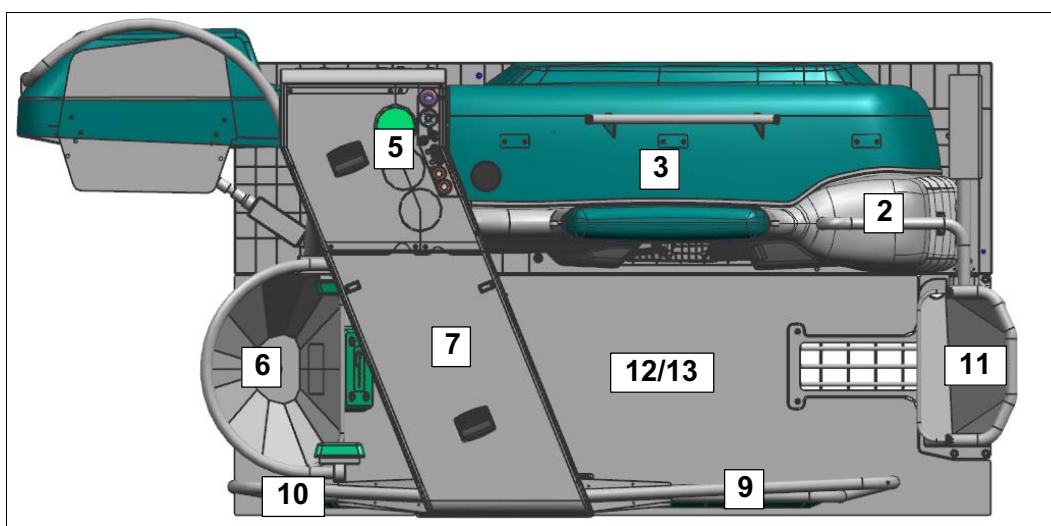
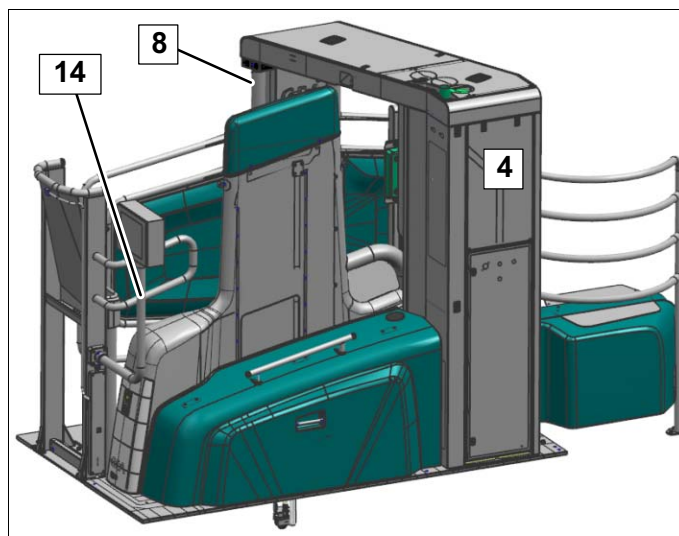
Planned changes must be approved by the manufacturer in writing.

Unauthorized, unapproved changes to the product will invalidate the warranty and might also invalidate the manufacturer's declaration or declaration of incorporation.

3.3 Structure of the product

The automatic milking system has a modular structure and consists of the following main components:

- Milking box

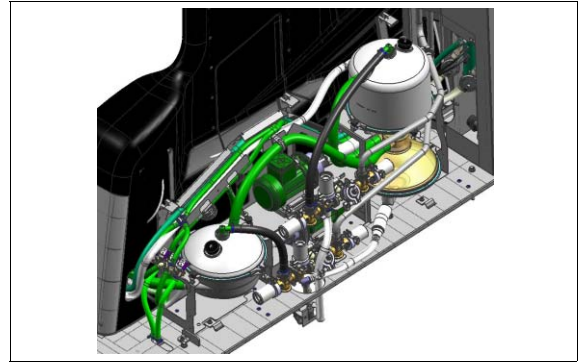


Item	part no.	Description
1	7829-6100-000	Main module (items 2 - 6)
2	7820-3000-020	Milking place module
3	7821-5001-000	Milk receiver unit
4	7821-5572-020	Right post
5	7821-5600-010	Feeding
6	7821-5545-010	Trough door
7	7821-5485-020	Crossbar
8	7821-5572-040	Left post
9	7821-5546-010	Entrance gate
10	7821-5545-030	Exit gate
11	7821-5515-010	Rear barrier
12	7821-5648-010	Floor mat
13	7821- 5530-030	Identification frame
14	7821-2369-010	Arm for industrial PC

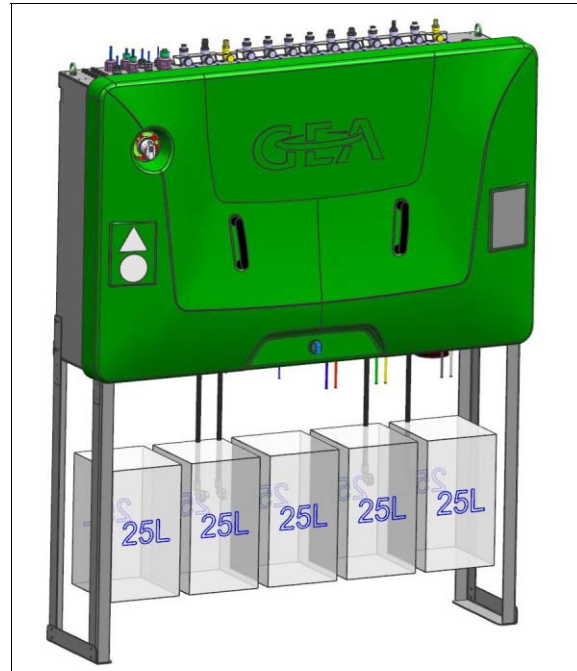
Description

Structure of the product

- Milk receiver unit



- Supply unit



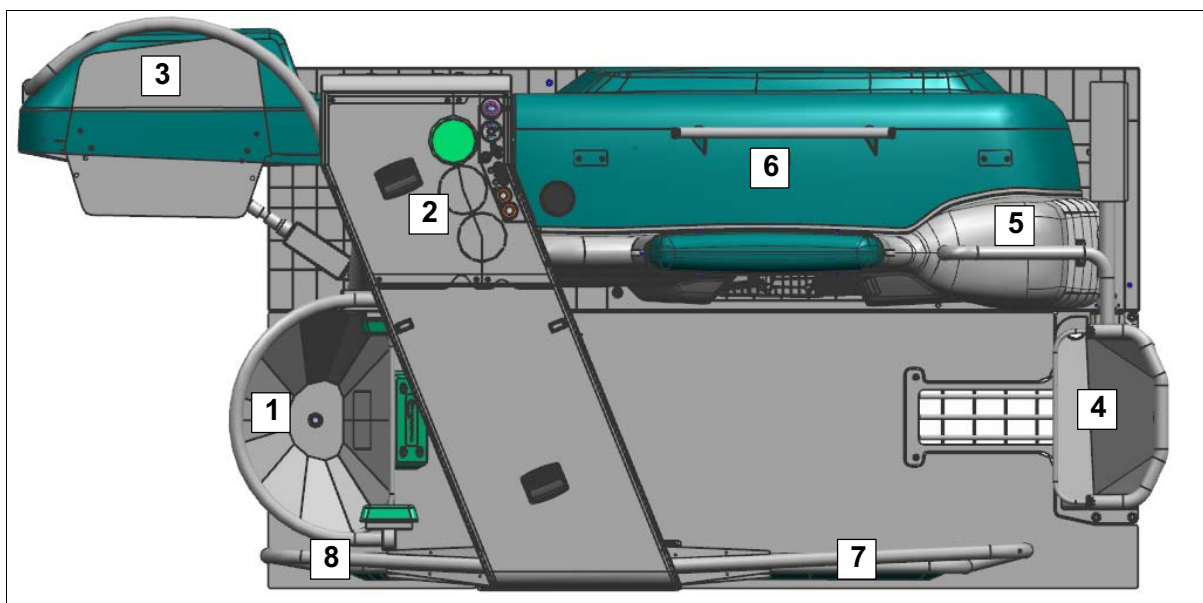
Each milking box contains its necessary control equipment, a cluster application robot and an animal identification unit.

The supply unit supplies the milking box:

- with compressed air
- with water
- with water for cleaning
- with disinfectant

3.3.1 Milking box

Milking box design



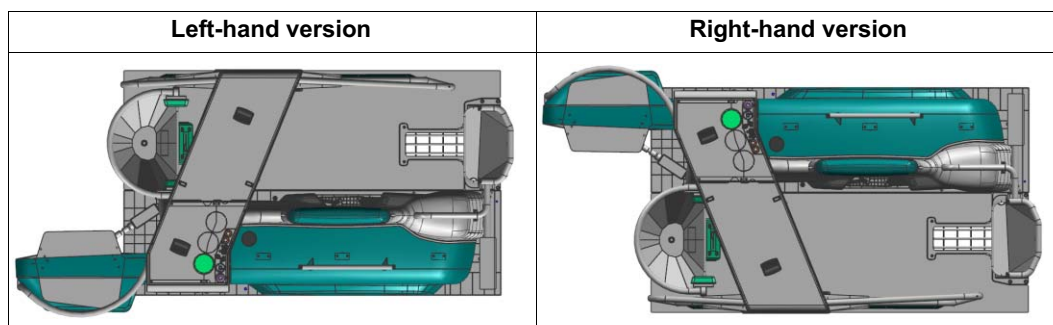
Legend:

1	Trough door for indexing	5	Milking place module
2	Feedings unit and to animal exit	6	Milk receiver unit
3	Trough cover	7	Entrance gate
4	Dung channel	8	Exit door (option)

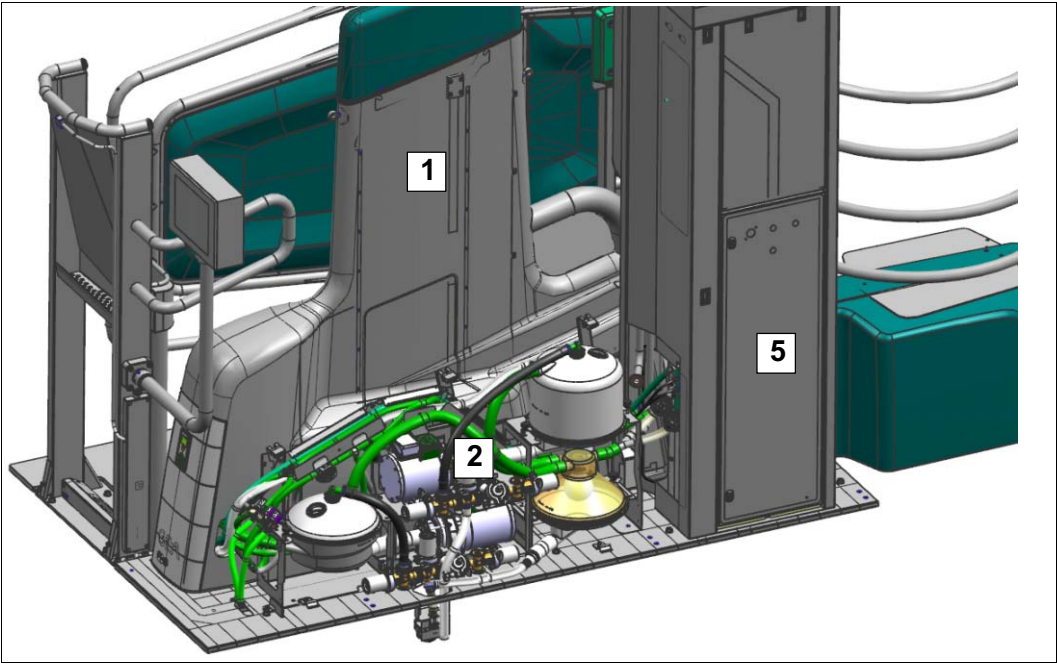
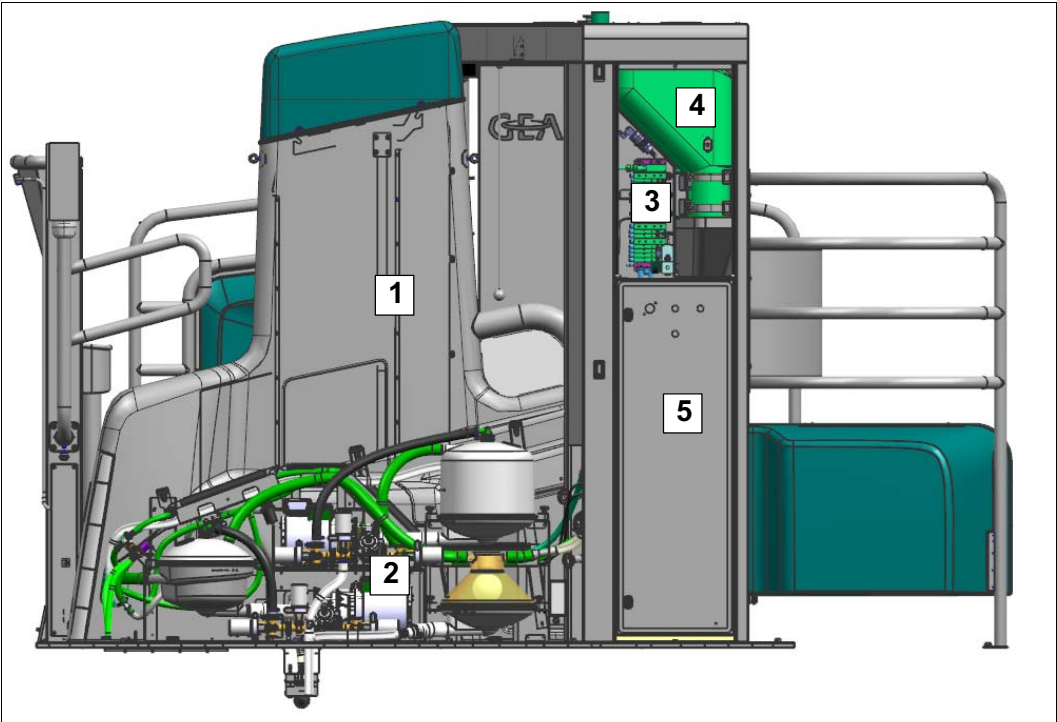
Milking box variants

The position of the entrance and exit doors depends upon the direction of the animal traffic.

A distinction is therefore made between left or right versions of the milking system.



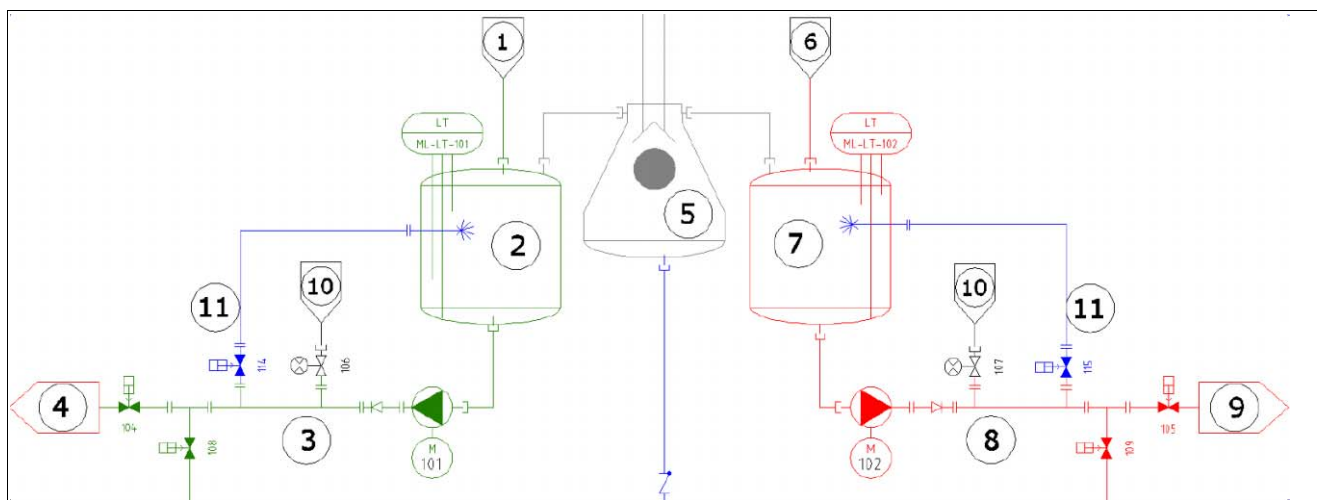
Milking box components (front)



Legend:		Function:
1	Milking place module	
2	Milk receiver unit	
3	Pneumatic valve block	Control of valves and gates
4	Feed dispenser	Feed metering
5	Milking box switchgear cabinet	

Milk receiver unit

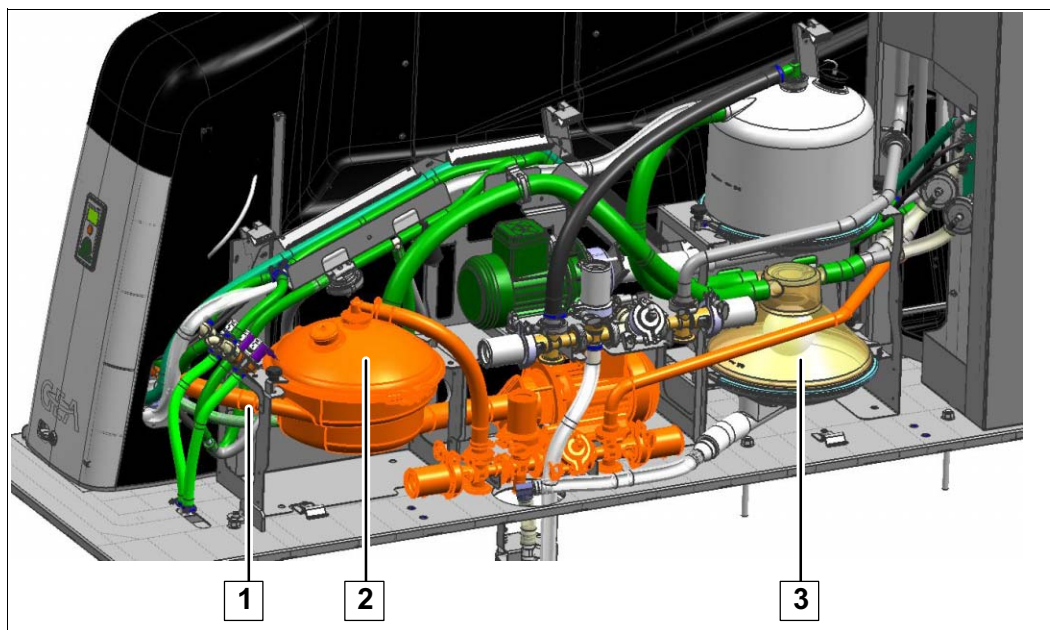
Saleable and non-saleable milk are routed separately (see the illustrations below).



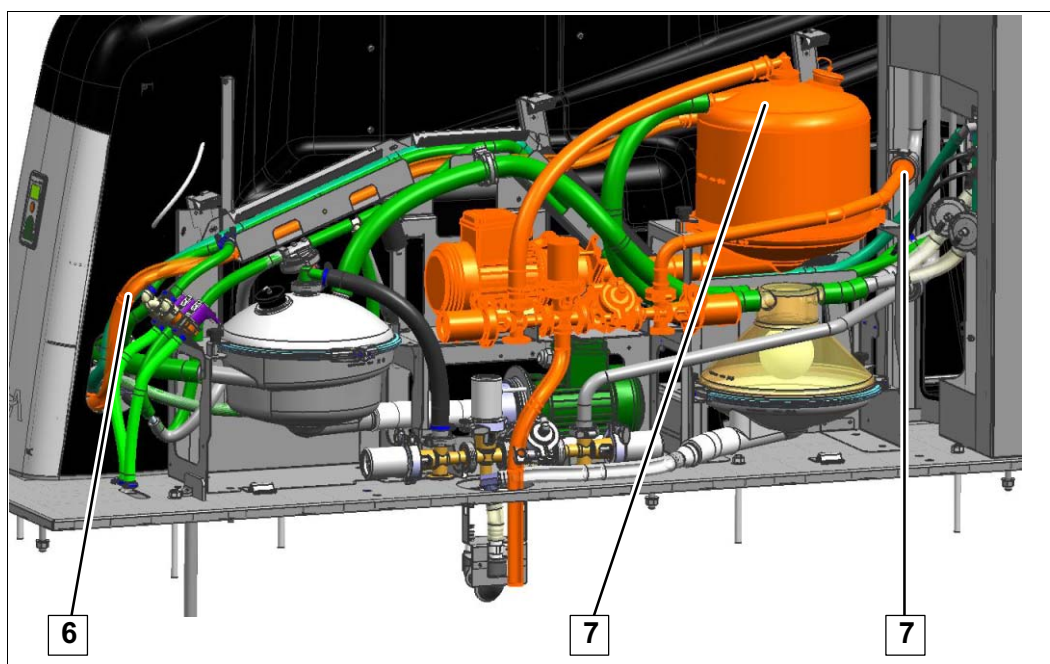
Legend:

1	Saleable milk form the milking box	7	Milk receiver for non-saleable milk
2	Milk receiver for saleable milk	8	Milk line for calf milk
3	Milk line for saleable milk	9	to milk separation (MS1 / MS20)
4	to main tank	10	Blowdown valve
5	overflow safety device	11	CIP line
6	Calf milk from the milking box		

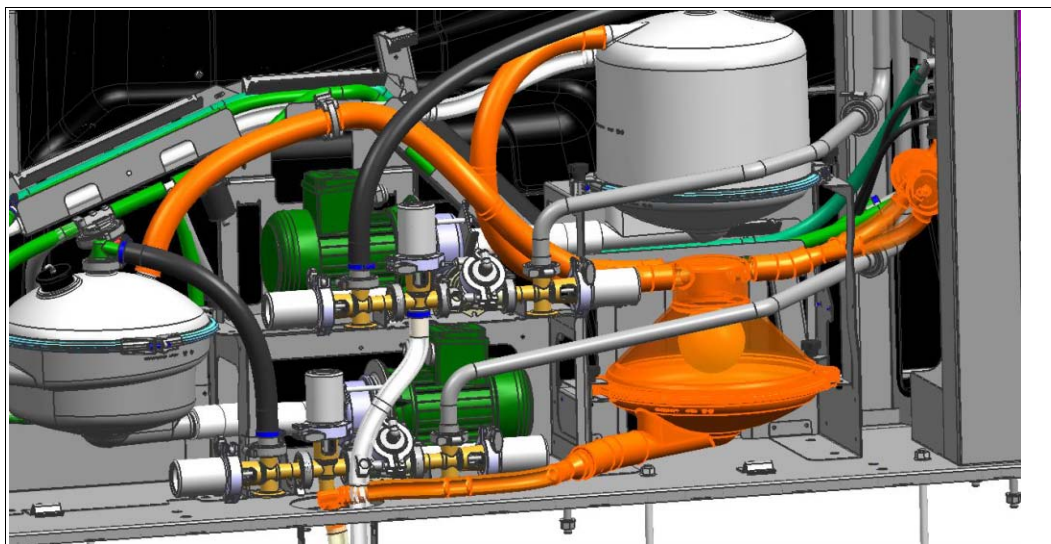
Milk path for saleable milk



Milk path for calf milk and non-saleable milk

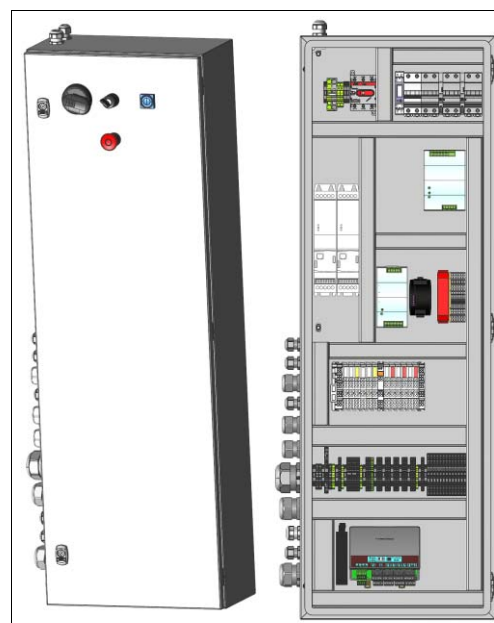


Overflow safety device and vacuum connections



Milking box switchgear cabinet

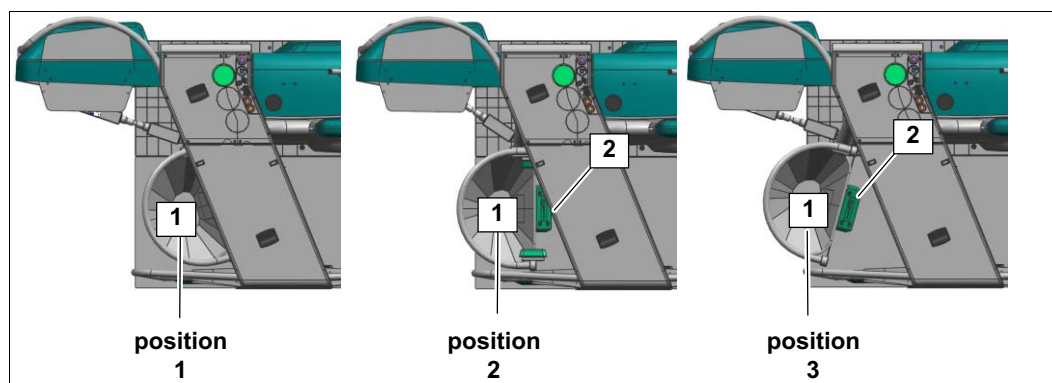
The switchgear cabinet contains the electric and pneumatic control components for the corresponding milking box.



Description

Structure of the product

Feed trough



Legend:

1	Rotatable feed trough	2	Animal identification
---	-----------------------	---	-----------------------

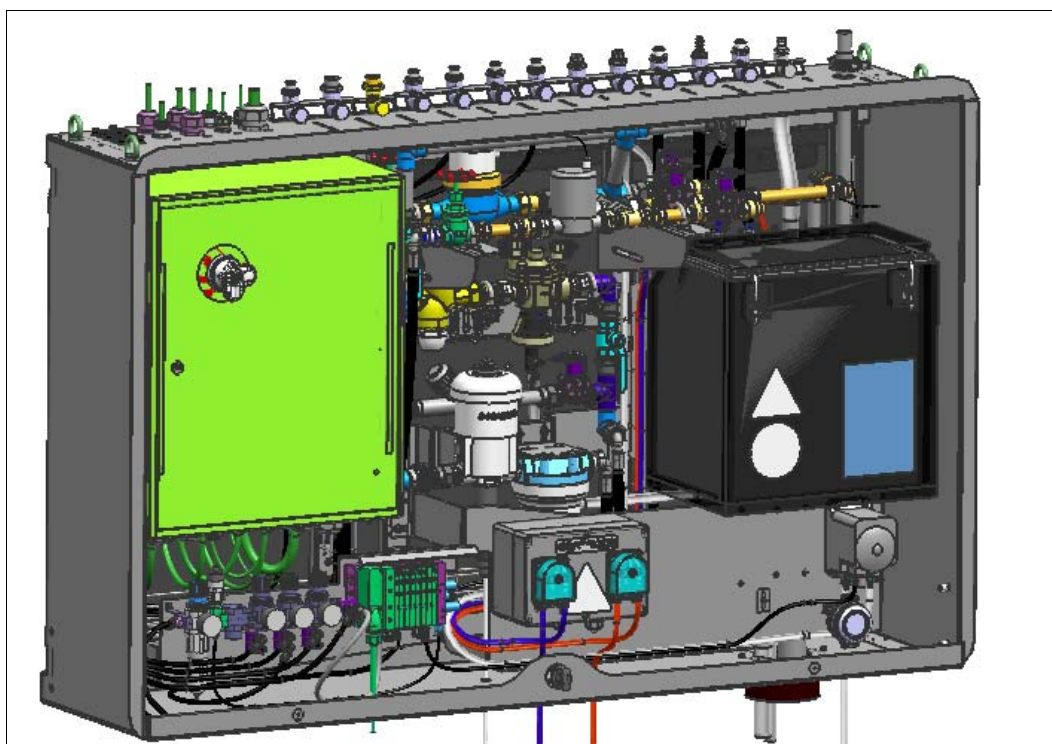
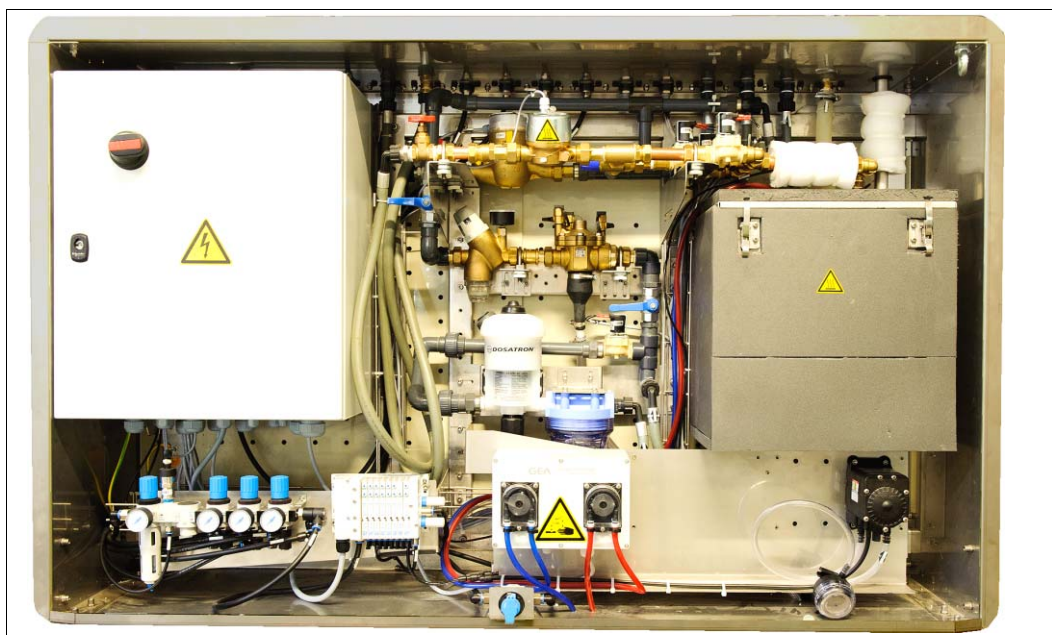
Cow trainer



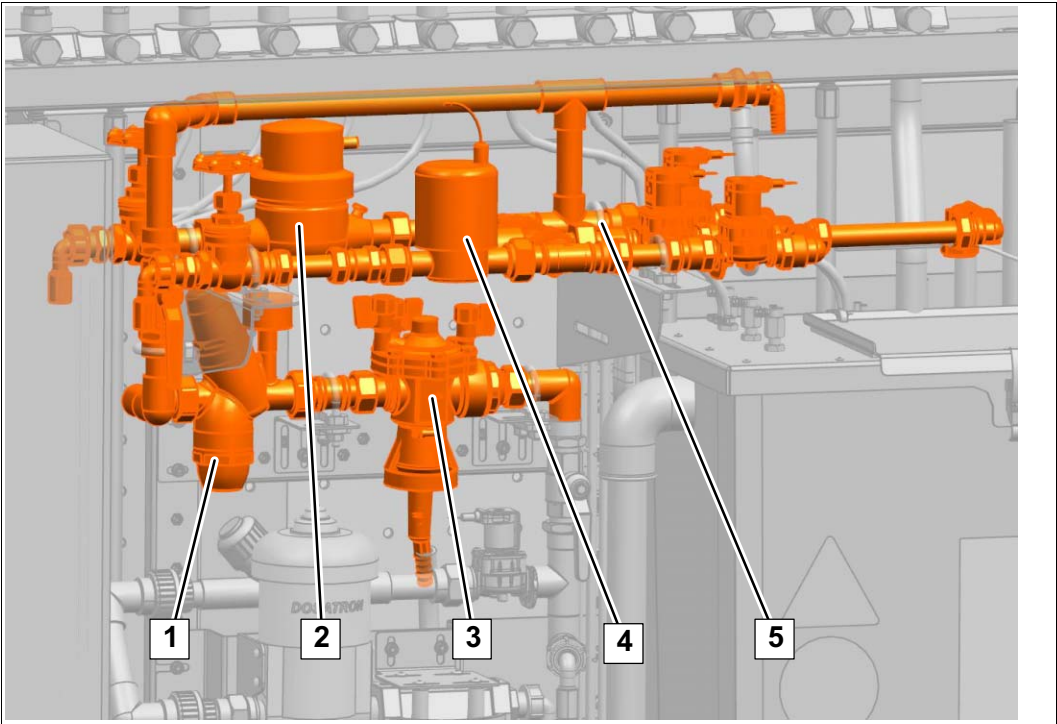
The integrated cow trainer ensures that the animal leaves the milking box after milking.

3.3.2 Supply unit

Supply unit components



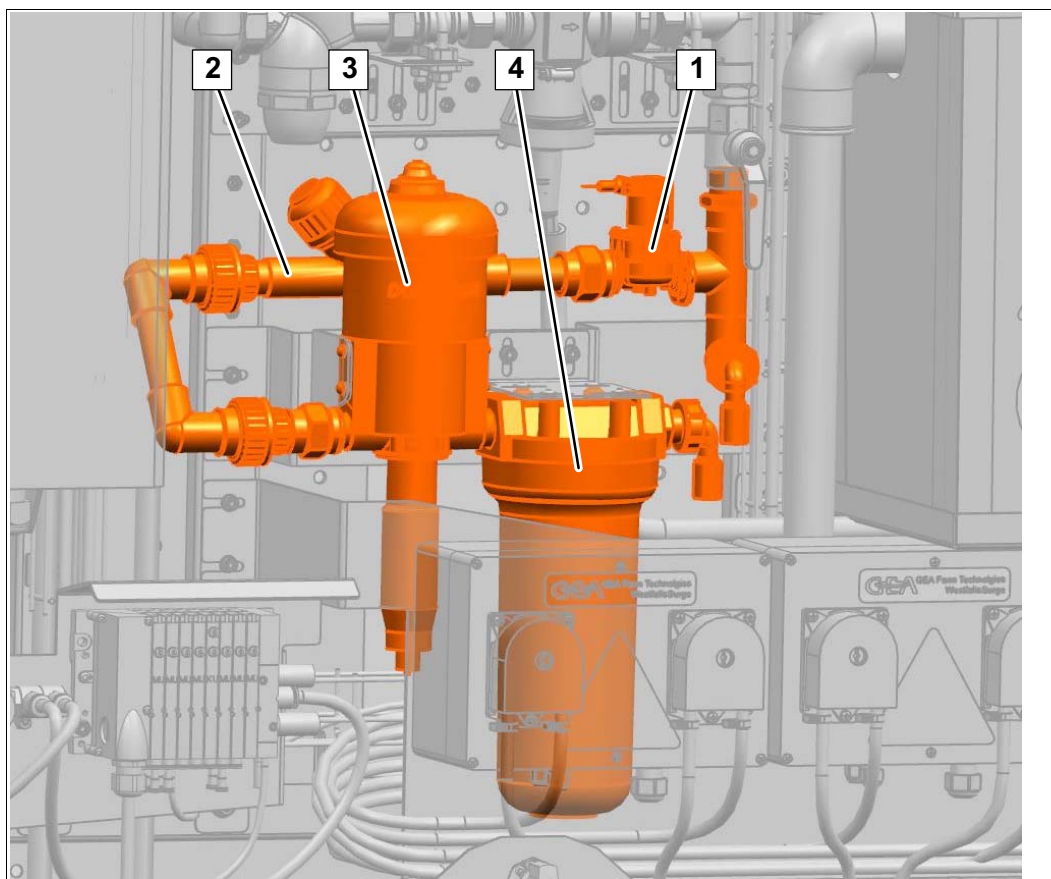
Water treatment



Legend: Milking box components (back)

1	Air pressure regulator	4	Hot water meter
2	Cold water meter	5	Mixing valve
3	System separator		

Disinfection



Legend:

1	Shut-off valve	3	Dosatron
2	Check valve	4	Mixing container

Milking place module (DairyProQ)



For further information, see the following manual:
7820-90 . . -005 Milking place module

3.4 Milking

The functionality of the milking system depends upon the system status.

- System started
 - Milking can be carried out in the milking boxes in different modes.
If the conditions for milking in automatic mode are fulfilled, several animal visits per day are supported, during which the whole milking process is controlled with individual settings for each animal.



For further information, please refer to section:
Prerequisites for milking in the automatic milking system

This method of working is stress-free for the animal and has a positive effect on milk yield, udder health and number of lactations.

- Herd management with DairyPlan
- System stopped
 - Data updating with DairyPlan

The animal from the perspective of the automatic milking system

To control daily milking operation, the system makes a distinction between the following conditions:

Animal has milking authorization

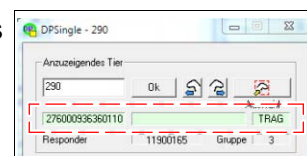
An animal has milking authorization when it fulfils the following requirements:

- is producing milk

The following animal statuses are not permitted for this:

Calf / B-Clf / Heifr / Dry / Lead

When an animal is producing milk, the following fields are highlighted green in DPSSingle.



- Lactation number: at least 1
- No milking ban

One of the following conditions must also be fulfilled:

- The time since the last milking is longer than the minimum milking interval.



Settings in DPSetup under:
"Herd Management-> Groups-> Milk"

- The last milking was incomplete and the milking cut-off limit has not yet been reached.
- The milking cut-off limit has been reached, but ...
(condition depends on the milking block)
 - Milking block not active:
The milking cut-off limit has been reached, but the time since the last incomplete milking is longer than the minimum milking interval.
 - Milking block active:
The milking cut-of limit has been reached, but the time since the last incomplete milking is longer than the time set for milking block.



Settings in DPSetup under:
"Herd Management-> Groups-> Milk"

- Special milking authorization



For further information, please refer to section:
Operation / Milking in automatic mode / Special milking authorization

Other settings may influence milking authorization.

Animal is overdue

An animal is overdue when the minimum milking interval has been exceeded by 50%.

Animal is a manual cow

An animal is a manual cow if one of the following manual interventions is required during milking:

Manual intervention	Reason
Apply teat cups manually	Animal setting: Manual application
	Animal has reached a milking cut-off limit and is automatically set for one-off manual application.
Let animal out of the box manually	Animal setting: Let-out block

Animal is a training animal

An animal is a training animal when it is in the training phase and has the corresponding animal setting.

The animal will be trained in the milking system as follows:

- When it visits it is not milked but it might be fed.
- Driven out after a short time

Animal is an automatic cow (normal case)

An animal is an automatic cow when it is neither a manual cow nor a training cow.

incomplete milking

Examples of incomplete milking:

- Application unsuccessful.
- No milk flow-controlled removal and milk quantity not reached.



For further information, please refer to section:
Description / DairyPlan

- No milk flow on a teat that is to be milked (in automatic milking).

3.4.1 Prerequisites for milking in the automatic milking system



For further information, see the following manual:

7820-90..-005 Automatic milking system DairyProQ - Milking place module

Requirements for problem-free animal movements

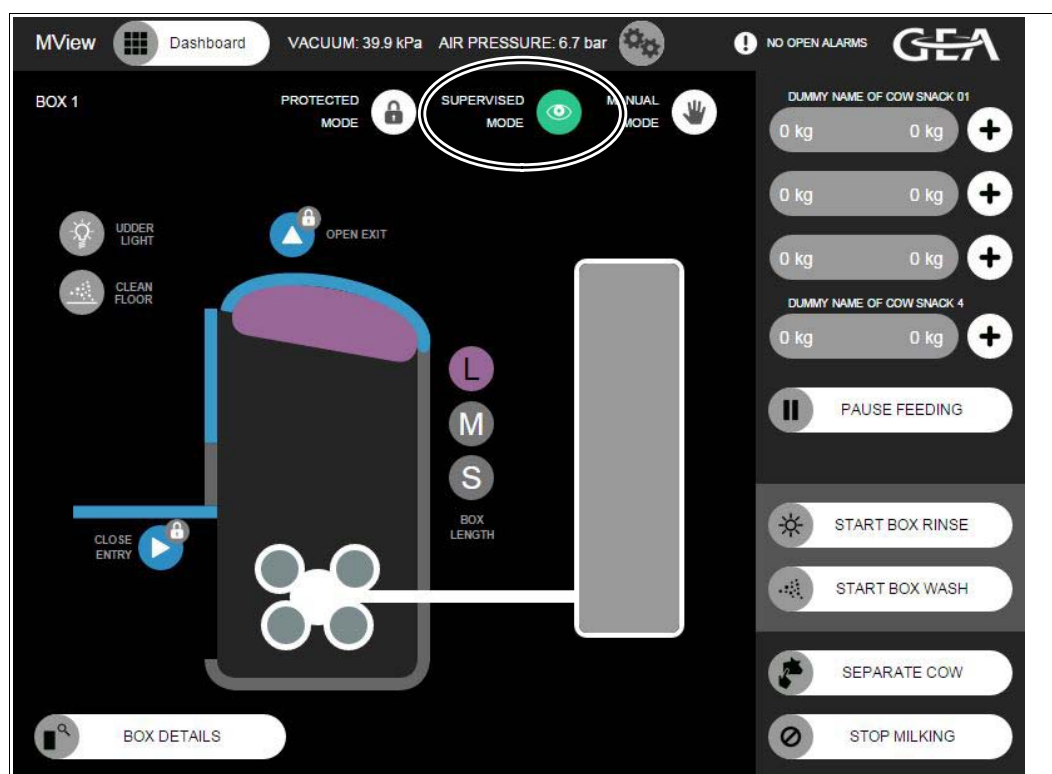
- Healthy animals.
- Healthy and regularly trimmed hoofs.
- Well-ventilated spaces.
- Reacting to alarms in good time.
- Regular herd inspections.
- A stress-free, quiet environment in the milking system has a positive effect on the animals and on the result.

3.4.2 Monitored milking

The philosophy of automatic, unmanned milking cannot always be implemented to the letter. Animals sometimes need manual intervention for which an operator must be present.

With monitored milking, while he is present, the operator switches the milking system to a mode in which animal access to the waiting area (milking system) is authorized by settings in the system program.

As soon as an application procedure is unsuccessful, the cluster is released and prepared for manual application.


Note!

Unmonitored milking is effective in all milking box operating modes.

Examples:

- Manual milking only.
Automatic cows do not have access or are not milked.
- Continue automatic milking and also milk manual cows.
All animals with milking authorization have access and are milked if applicable.


Note!

Animals in a milking box in automatic mode that need to have the cluster applied manually are not let straight back out again but are kept waiting for manual application.

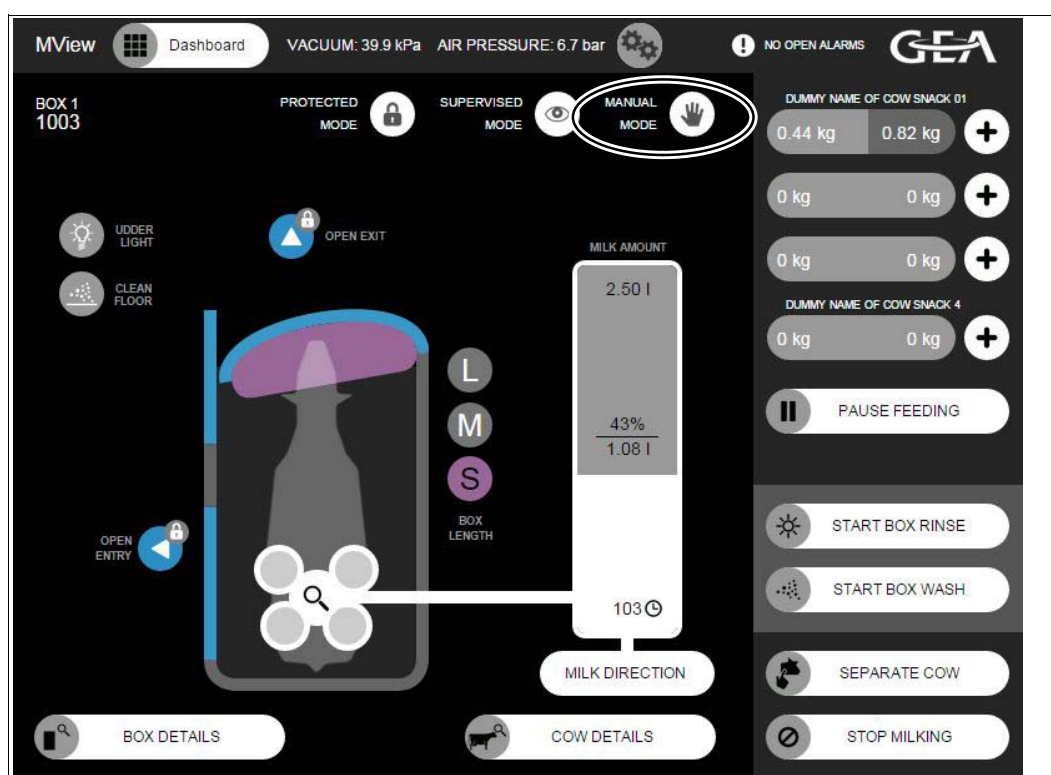
3.4.3 Milking box mode

A milking box can be selected to operate in manual or automatic mode.

Milking phase	Operating mode	
	Automatic mode	Manual mode
	Automatic application	Manual attaching of cows
	Automatic start of milking	Manual start of milking
	Automatic milking	
	Automatic removal	

Automatic mode

- The entire milking process is carried out automatically at the milking box.
- Clusters can be attached manually in automatic mode as well if necessary.



Manual mode



Warning!



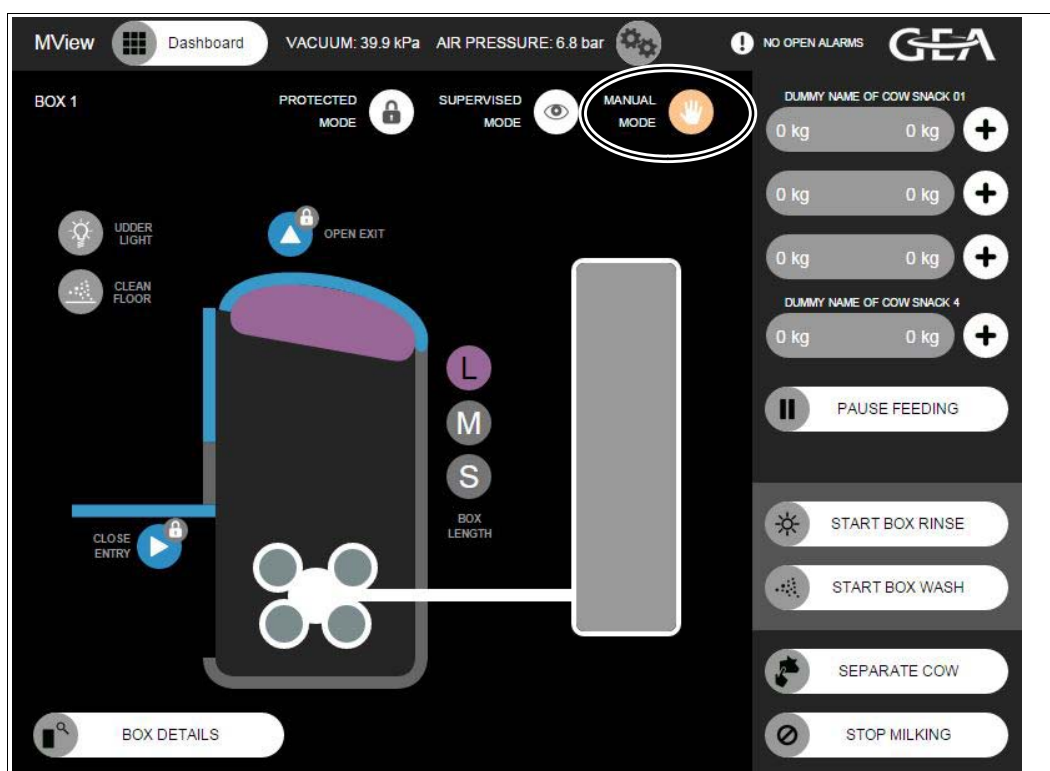
All automatic gates in the milking parlour continue to open and close automatically in manual mode.

(e.g. segregation gate before the waiting area, access gate to the passageway, milking system entrance and exit doors)



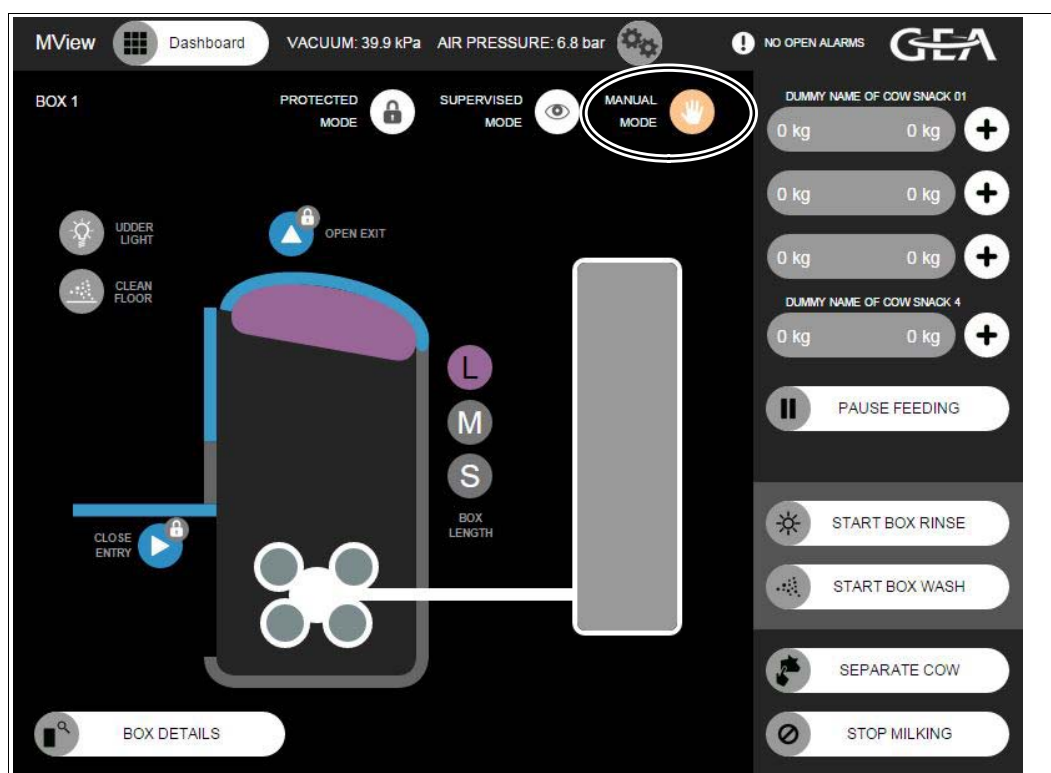
Do not enter these danger areas during milking.

- The cluster is applied and milking is started manually. Milking is performed automatically.



Switching between modes (automatic / manual)

Milking boxes can be switched from automatic to manual mode if required.



Switching from automatic mode to manual mode

- Switching during automatic cluster application.
 - Application is stopped.
 - The cluster must be applied manually.
- Switching during milking.
 - The animal completes milking.
A milking process that is in progress is not interrupted.
 - Application robot moves to the parking position.
 - Animal is let out.
 - The next animal must have the cluster applied manually.

Switching from manual to automatic mode

- Switching during milking.
 - The animal completes milking.
A milking process that is in progress is not interrupted.
 - Animal is let out.
 - The next animal has the cluster applied automatically.

3.4.4 Washing

The following procedures are applied in the automatic milking system to ensure the highest possible milk quality:

Teat cleaning

- Teats cleaned automatically after each application.

Cup Disinfection

- Automatic disinfection of teat cups after every milking.

Box rinsing/cleaning

All milk-carrying parts of a milking box that have carried non-saleable milk are cleaned automatically after milking.

This can also be started manually.

This cleaning can be carried out using water alone (box rinsing) or alternatively with water and cleaning agent.

An automatic start takes place:

- After each milking of non-saleable milk.
Automatic start with corresponding animal setting.
(adjustable in DPSingle)



Attention!

A short cleaning is strongly recommended after the milking of non-saleable milk.



For more details see the following Chapter:
Separating of non-saleable milk

- After a set short clean interval after the last milking.
The milking box is cleaned regardless of visits.

SYSTEM CLEANING
LAST CLEANING:
NEXT CLEANING:

SHORT CLEANING INTERVAL
SHORT CLEANING INTERVAL:
50

SCHEDULED CLEANINGS

START SYSTEM CLEANING **CHANGE INTERVAL** EDIT SCHEDULE

CLEANING HISTORY

HISTORY PER BOX SYSTEM HISTORY

[missing "en-US.cleaning.box.filter.all" translation] PlaceControlUnit_1

Date ▼	Type	Box number	Overflows	Dumps	Cleaning duration
14.06.2015	Short	2	2	4	03:54
17.06.2015	Short	2	2	4	03:54
18.06.2015	Short	2	2	4	03:54
19.06.2015	Short	3	2	4	03:54

« 1 2 3 »

- If the color sensor identifies a change.

duration:

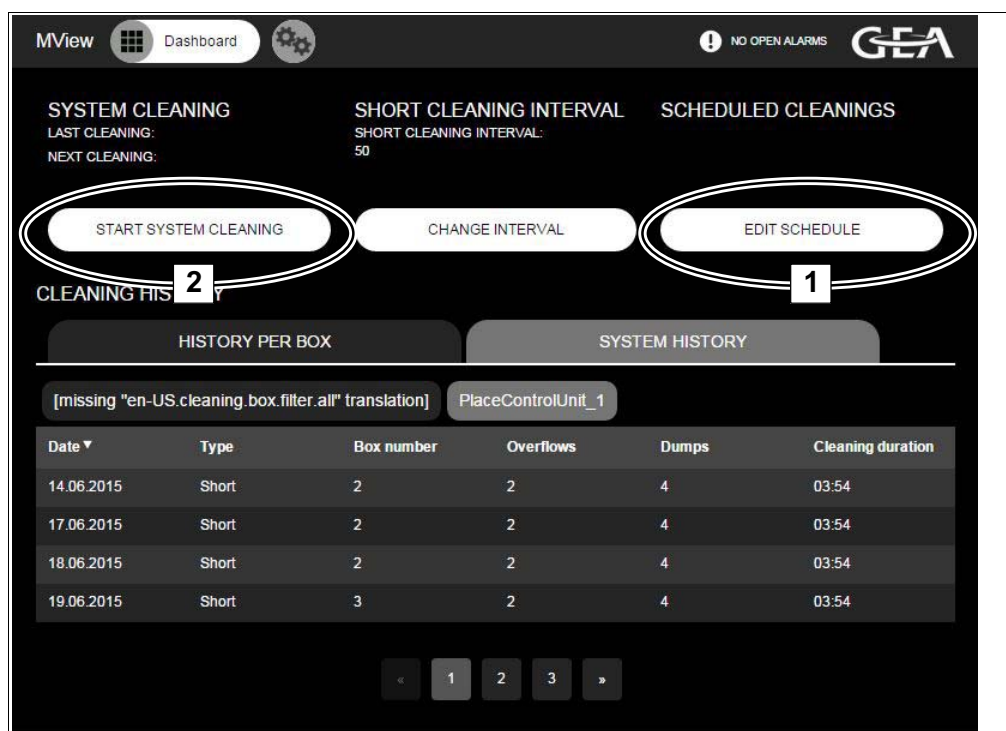
- Box rinsing approx. 5 minutes
- Box cleaning approx. 10 minutes

System cleaning

Automatic cleaning of the whole milking system, including the milk lines to the milk cooling tank, takes place at the set times (1).

- The application robot is in the parking position.
- The teat cups are in the cluster receptacle.

This can also be started manually (2).



- Cleaning phases
 - Pre-rinse
All remains of milk rinsed out with warm water.
 - Main wash
All milk-carrying parts cleaned with warm cleaning solution (acidic / alkaline).
 - 2nd rinse
Cleaning solution rinsed out with cold water
- Duration: approx. 25 minutes

Single milk filter

The milking system is fitted with a single milk filter.

A clean filter must be fitted immediately after system cleaning.

- Press the filter change luminous pushbutton
- Change the filter after the indicator lamp lights up

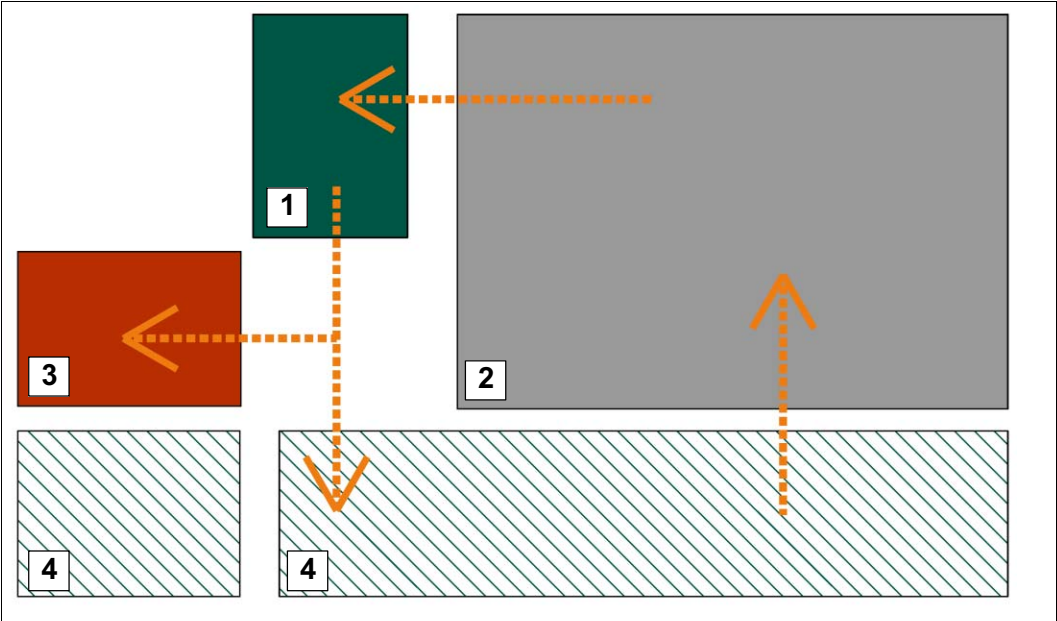
Dual milk filter

The milking system can be fitted with a dual milk filter as an option.

Whenever the system is cleaned the milking system automatically switches to the clean filter after the pre-rinse.

3.4.5 Movement of animals and sequence of milking in automatic mode (example)

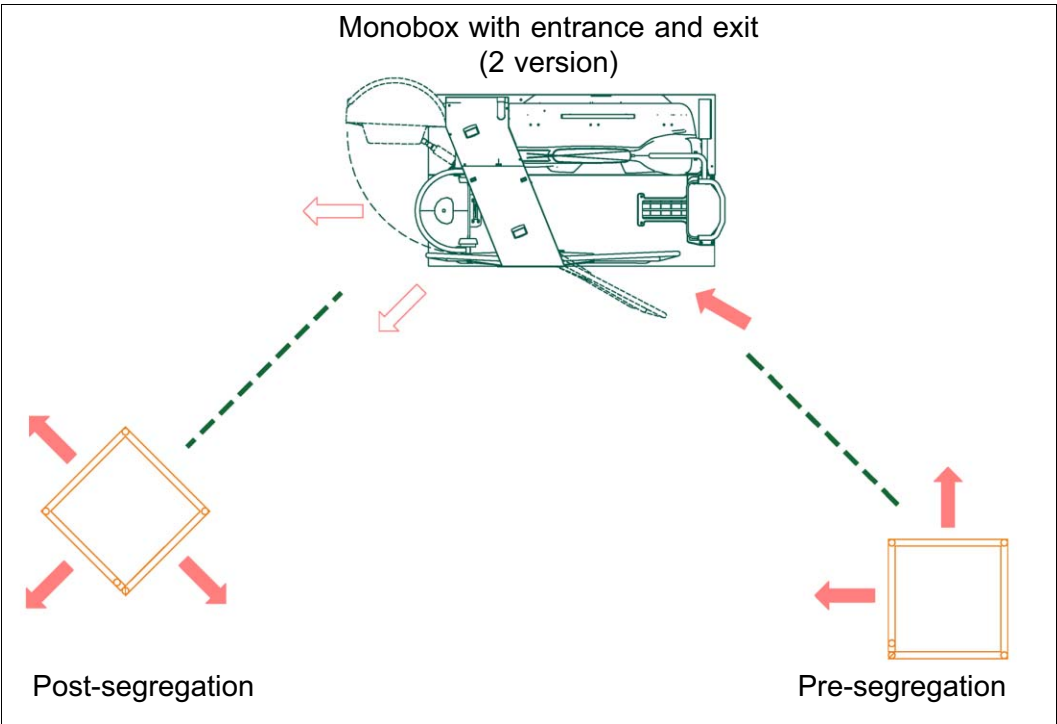
Structure of the milking installation



Legend:	
1	Milking area
2	Barn / lying area
3	Segregation area
4	Feeding area

A pre-segregation process directs animals that are due to be milked to the holding area, and animals not due to be milked to the feeding area.

After milking in the monobox, the animal can be either segregated out by a post-segregation process, sent back to the holding area in the event of an error message, or sent back to the feeding area.



Occupying a milking box

Milking box not occupied, entrance door open, exit door closed.

- Animal enters the milking box.
- Animal identification
Animal data received.
 - Animals without milking authorization are fed if applicable and then driven out.
- Milking box entrance door closes.
- Box length is adjusted to the animal.
- Feed is delivered



For further information, please refer to section:
Feeding

attachment

For further information, see the following manual:
7820-90..-005 Automatic milking system DairyProQ - Milking place module

Milking process

- Teat cleaning
- Preliminary milking
 - Pre-milk and rinsing water are collected in the calf tank unit
 - Then switching to milking.
- Milking
During milking, the following actions are permanently performed:
 - Milk collected in the collection tank.
 - Conductivity measurement
 - Kickoff identification
 - Milk checked for discolouration (Option)
 - Milk flow control
 - Milk pumped out into the milk cooling tank
- Sampling (Option)
- End of milking according to the settings for milk flow monitoring
- Cup disinfection
- Calf tank unit is emptied
- Short clean (if set)

Exiting

- Trough door swings out sideways
- Exit door opens (optional)
- Cow trainer supports exiting if required.
- Exit door closes.
- Entrance door opens.

Post-segregation

Depending on the milking result and program settings, the animal is directed into the corresponding area by the segregation gate.

- Feeding, resting area
- Separation area
- Holding area (waiting yard)
- Pasture



For further information, please refer to section:
Segregation areas

3.4.6 Segregation areas (segregation methods)

Resting areas, feed and water must be available in the segregation area.

Provide resting areas for 10% of the milking herd.

Animals can be segregated out for checks and vet actions as a function of the segregation criteria.

Access to holding area (segregation method 7)



Note!

This segregation method can be used for all segregation gates (pre-, post- or additional segregation).

An animal that is to be milked in the automatic milking system must have access to the holding area.

If a milking box is in automatic mode, the conditions for access to the holding area are animal-dependent, as follows:

Automatic cow / Manual cow



Note!

In "monitored milking" mode, manual cows must be given preference according to the settings.



For further information, please refer to section:
Monitored milking

For access, the animal must fulfil the following conditions:

- Have milking authorization



For more details see the following Chapter:
Milking

- Other settings may influence access (see the illustration below).

The screenshot shows the GEA MView interface with a 'Dashboard' tab selected. A red alarm icon indicates '4 OPEN ALARMS'. The main section is titled 'Cows expected for milking'. Below this is a table with the following data:

Cow number ↓↑	Time since last complete ▼	Entitlement Milk/Access	Specifies	Destination	# incomplete milkings	Location
6	67:06	true/true	BlockExit	Milchtank	2	1 B
110	40:20	true/true	BlockExit	Milchtank		1 Z
160	529:59	true/true	BlockExit	Milchtank		1 C
172	264:20	true/true	BlockExit	Milchtank		1 B
178	266:03	true/true	BlockExit	Milchtank		1 Z
181	266:01	true/true	BlockExit	Milchtank + Abfluss		1 Z
182	266:24	true/true	BlockExit	Milchtank + Abfluss		1 Z
183	266:30	true/true	BlockExit	Milchtank		1 Z
188	265:05	true/true	BlockExit	Milchtank		1 B
194	266:46	true/true	BlockExit	Milchtank		1 Z
199	264:40	true/true	BlockExit	Milchtank		1 B

At the bottom of the table, there is a pagination bar with buttons for 1, 2, 3, 4, 5, ..., 10, and a right arrow. A red circle highlights the 'ALLOW CERTAIN COW ONCE' button in the top right corner of the table area.

Training animal

For access, a training animal must fulfil the following condition:

- The time since the last visit is longer than the minimum visit interval.



Settings in DPSetup under:
"Herd Management-> Groups-> Milk"

Segregating to separation area (segregation method 10)



Notes!

- Only automatic and manual cows are segregated.
- Animals with special milking authorization (setting) are not segregated!

An animal is always segregated under the following condition:

- The number of incomplete milkings has reached the milking cut-off limit.

An animal is also segregated with the following settings:



Setting in DPSetup under:

"Herd Management-> General Information-> Robot Other

- Low milk yield at last single milking
- Low milk yield in last 24 hours



For further information, please refer to section:
RobotDataManager / Herd / Milk analysis

- Last milking incomplete (regardless of the milking cut-off limit)
- Segregation flag (1-6) set
- Conductivity alarm through the automatic milking system
- Coloration alarm through the automatic milking system (only if there is a colour sensor)

Pasture (segregation method 11)

The general conditions for going to pasture are set in DairyPlan.

- Pasture from / to (Time)
- Going out to pasture until % milking interval
- Ban on going out to pasture for animals separated with segregation method.



For a description of the settings, see the section on:
Description / RobotDataManager

Essential all animals without a ban on going out to pasture can be directed to the pasture.

- Ban on going out to pasture



Setting in DPSingle under:

"Details-> Process Control-> Segregation flat 6

Feeding, resting area

If an animal does not fulfil the conditions for access to other segregation areas, it is directed to the feeding and resting area.

3.4.7 Feeding

Feeding setup

Feeding is controlled DairyPlan.

Feeding is set up as part of commissioning.



For more details see the following Chapter:
Commissioning



Notes on feeding

- Do not select feed quantities that are too large.
If there is too much feed the animals block the milking box even after milking has ended.
- Make sure there is always a sufficient stock of feed in the feeding area (day and night).

Feed delivery (feed per day)

The animals' individual daily feed quantities are delivered over 24 hours in the milking system, at feed boxes if applicable.

The part-quantities delivered depend upon the time of the last feed and are offset against each other.

- All animals with feed entitlement, even those with a milking ban, receive the calculated quantity of feed concentrate.
- An animal with feed entitlement and a milking ban (e.g. heifers) are held in the milking box for one minute to feed.

Exceptions

- The delivery of feed stops when milking ends.



Notes!

- Does not apply for animals with a milking ban.
 - Delivery of feed after the end of milking can be authorized on the system computer with DPService.
- A quantity of feed that was delivered when cluster application was stopped will be deducted from the feed for the next application.
 - Absence for more than 23 hours:
The set feed quantity (daily quantity) is delivered.
 - Absence less than the value set:
No feed is delivered
 - No feed quantity set:
No feed is delivered
 - The output of additional feed quantities via the milking box operating unit are also offset.

Settings in DairyPlan

- Feed quantity / Milking ban

3.4.8 Milking

The philosophy of automatic, unmanned milking cannot always be implemented to the letter. Animals sometimes need manual intervention for which an operator must be present.

A fundamental distinction is made between automatic and manual cluster application.

Automatic application

With automatic application, the operator has an observer function and only intervenes in the event of a fault (e.g. unsuccessful application).

Manual attaching of cows

With manual application, the operator attaches the cluster by hand.

- each animal individually:
if an animal has been tagged accordingly
- at certain stall units
if automatic application is blocked at a milking place module

Milking sequence

- Animal enters the box
- Animal is identified
(individual milking place identification)
- Animal is confirmed in place
(light scanner)
- Cluster is automatically attached
Or
Press the Start button and attach the cluster manually
- Automatic teat cleaning
- animal is milked
- colour and conductivity check during milking
- teats are dipped
- Cluster is automatically detached
- Cluster and optical sensor are cleaned
(milk cup cleaning)
- Animal leaves the box

3.4.9 Clean

The following procedures are applied in the automatic milking system to ensure the highest possible milk quality:

Teat cleaning

- Teats cleaned automatically after each application.
(until the set total teat cleaning time is reached)

Milking cup cleaning

- Automatic cleaning of the teat cup (and the camera) after each milking.

Cup Disinfection

- Automatic disinfection of the teat cups after each milking.



For more details see the following Chapter:
Operation

3.4.10 Milking sequence in automatic mode (example)



For further information, see the following manual:
7820-90..-005 Automatic milking system DairyProQ - Milking place
module

Occupying the box

- Animal enters the box
- Animal identification
Animal data received.

attachment

- Robot arm swings out under the animal
- Optical sensor detects the teat and teat cup positions.



Attention!

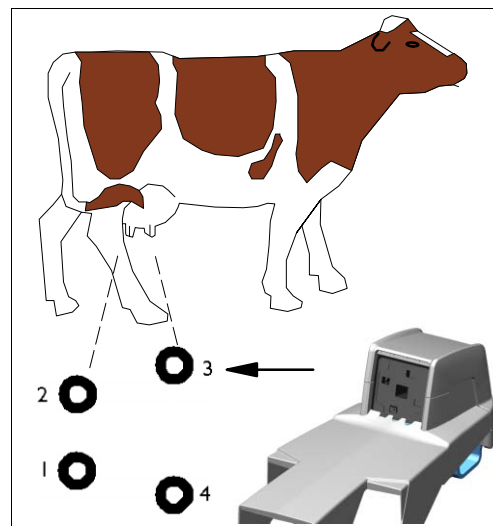
For precise and accurate detection, the teat cups must be fitted with the appropriate ring, depending on whether a rubber or silicone teat liner is used.

The surface must point towards the camera.

Caps that have rotated or slipped downwards have a direct effect on the application quality.



The teats are numbered consecutively by the optical sensor during the recording.



Teats are detected in 2 phases:

- Rough recording
Detecting the udder position for the application process.
The coordinates are saved in the animal data after successful application.

The rough recording is not required if the coordinates exist in animal data.

- Fine adjustment
The exact position of the teats is recorded again every time a cluster is applied.
- Teat cups are placed on the teats one after the other.

Milking process

- Teat cleaning
- Preliminary milking
 - Send pre-milk and rinsing water to the dump line
 - Then switch over to milking
- Milking
During milking, the following actions are permanently performed:
 - Send milk to the milk line via the measuring cup
 - Conductivity measurement
 - Kickoff identification
 - Milk checked for discolouration
 - Milk flow control
 - Milk pumped out into the milk cooling tank
- Sampling on milk inspection days

Removal

- End of milking according to the settings for milk flow monitoring
- Dipping
- Teat cups are removed
- Cleaning of teat cups and optical sensor

Description

DairyPlan - Further settings for the milking system

3.5 DairyPlan - Further settings for the milking system

incomplete milking



For further information, see the following manual:

7820-90..-005 Automatic milking system DairyProQ - Milking place module

Access for manual cows in automatic mode

The following settings allow manual cows access to the waiting area during automatic milking (milking box in automatic mode).

- General access
Access whenever the function is active.
- Time controlled access

Access when the function is activated but only at the set times.

Automatikbetrieb: zeitgesteuerter Zugang für Handkühe				<input checked="" type="checkbox"/>
von	5:00	bis	7:00	
von	15:30	bis	17:00	



Setting in DPSetup under:

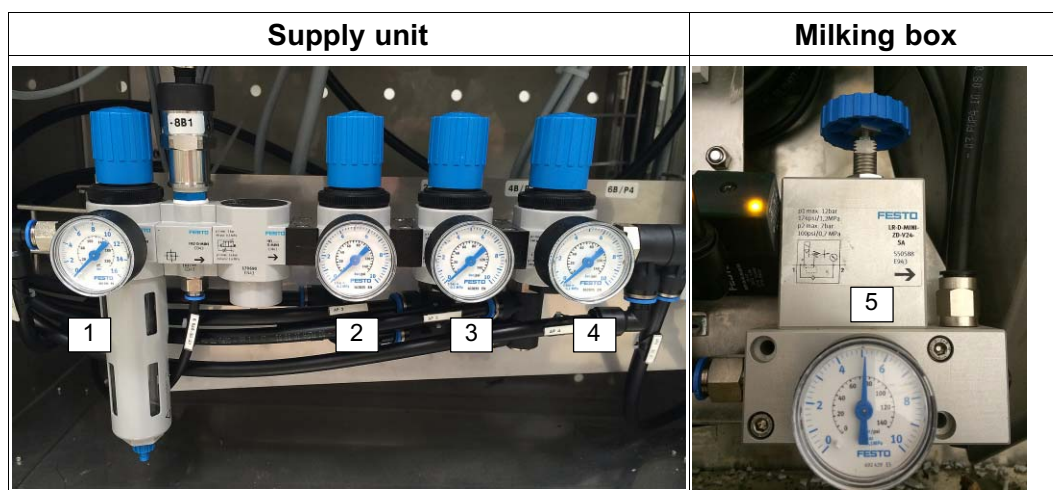
"Herd Management-> General Information-> Robot Entrance-> Automatic mode: time scheduled entrance for manual cows"

Examples:

- Fill waiting area with manual cows (preparation for monitored milking)
- Allow manual cows access to parlor feeding throughout the day.

3.6 Operating parameters

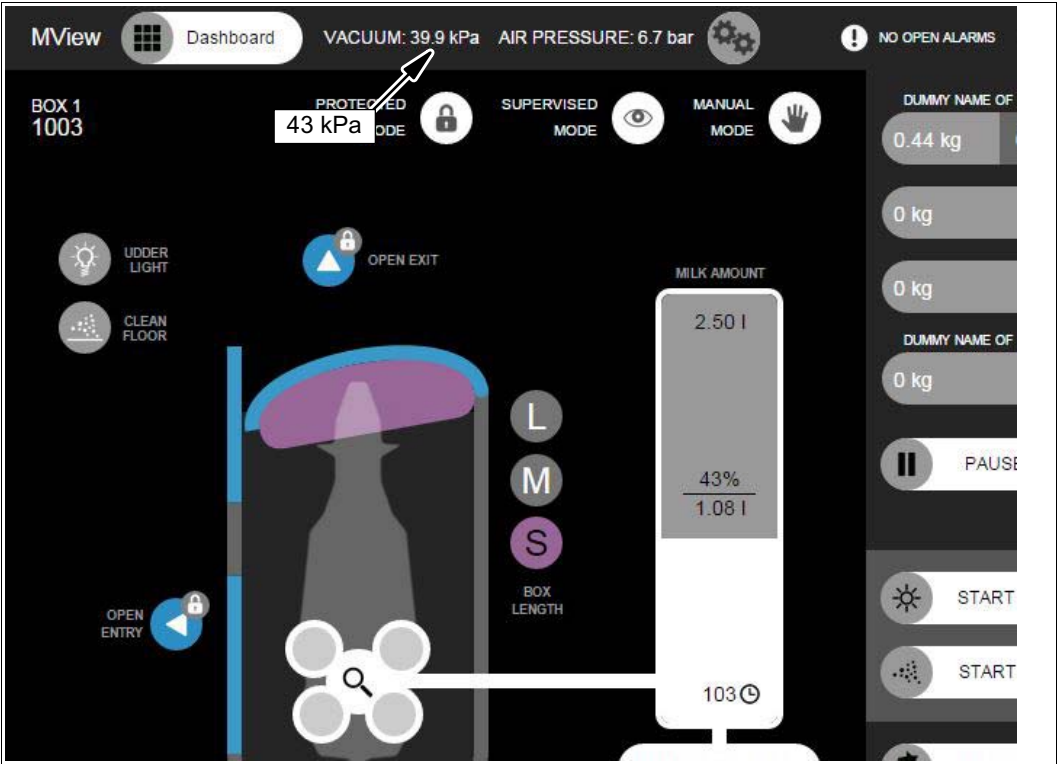
Operating air pressure



Supply unit		
0Z1/A	compressor	~ 8 bar [~ 116 PSI]
1	Milking parlour	~ 6,5 bar [94 PSI]
2	Dipping / milking place module	5 bar [72 PSI]
3	Compressed air draining	~ 2,5 bar [~ 36 PSI]
4	Valves	~ 4 bar [~ 58 PSI]

Milking box		
5	Reduced door closing force	1-1,5 bar [14,5-22 PSI]

Operating vacuum



Water temperature

Pre-rinse	37 °C [99 °F]
Main wash	80 °C [176 °F]

Operating Temperature

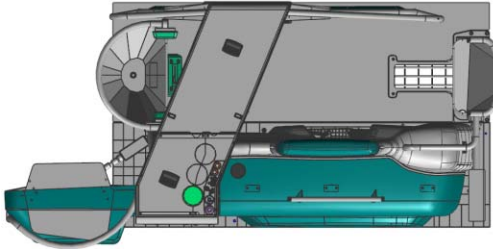
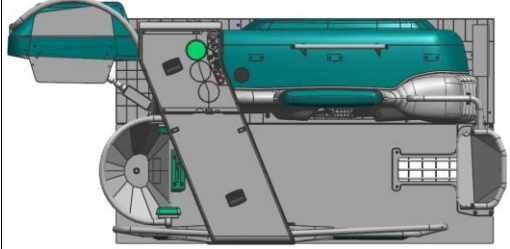
Installation room	1° to 40°C [34°-104°F]
-------------------	------------------------

Noise emission

Measurement	Sound pressure level (mean values)
The measurements are taken in a tiled room at a distance of one metre from the main source of the noise in the middle of the milk receiver unit cover.	
• Milking including changing the animals and pumping out the milk	64 dB(A)
• Average continuous sound pressure level of the entire system cleaning	70 dB(A)

3.7 Technical Data

Dimensions with closed doors

Left-hand version	Right-hand version
	
Overall length	3362 mm
Overall width	1677 mm
Milking stall module height	2114 mm

Minimum height of the installation room

Minimum room height	2600 mm
---------------------	---------

Electrical data

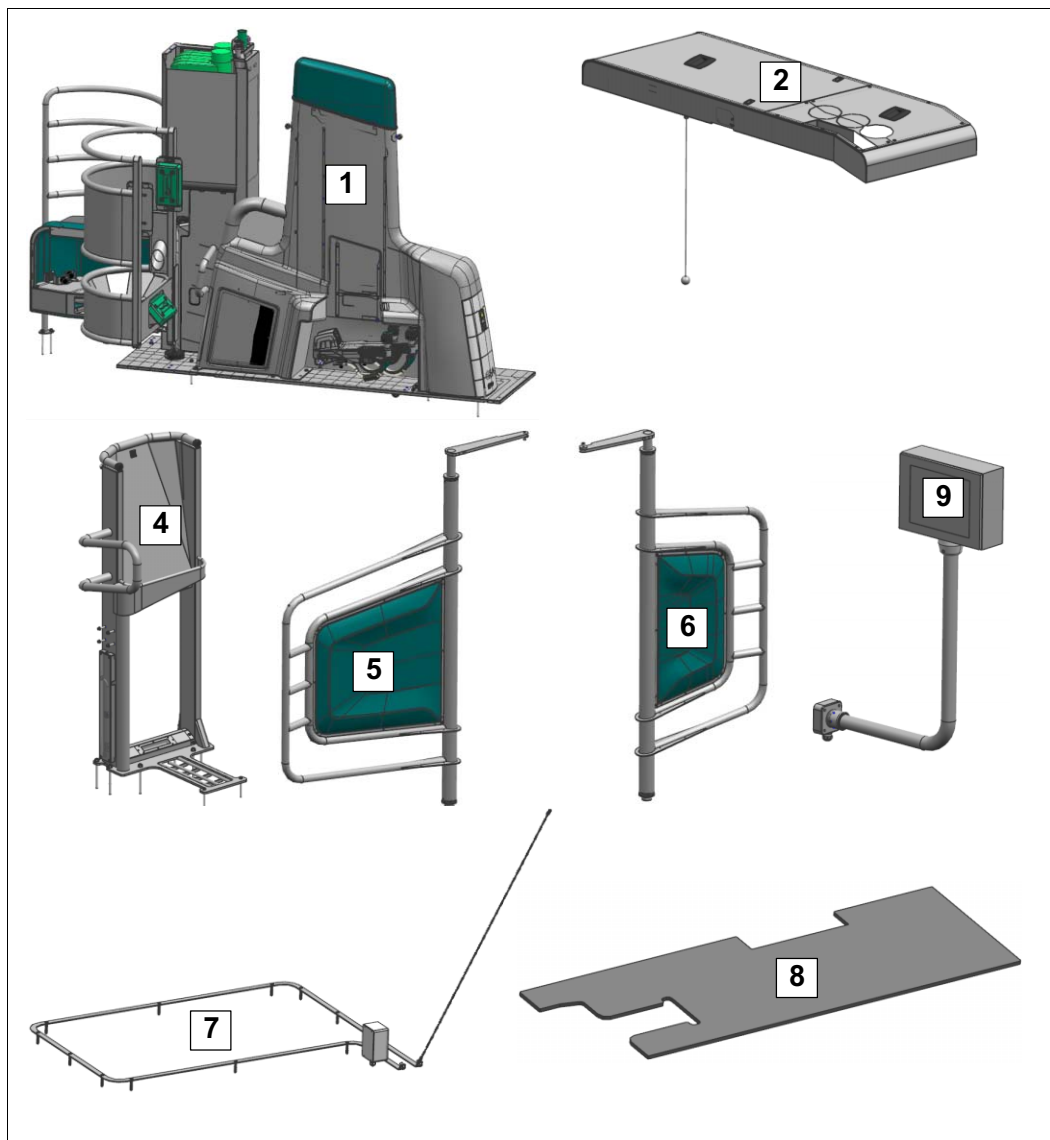
maximum connected load	Total power	Minimum fuse
Supply unit	0,4 kW	16 A
Milking box	4,5 kW	20 A

supply voltage	230-240V ACP/N/PE (+/-10%)
Mains frequency	50/60Hz

Vacuum pump air consumption RPS 400

Line diameter	90 mm [3.5"]
---------------	--------------

3.7.1 Dimensions and weight of shipping units



Item	Description	Length x width x Elevation [mm]	Weight [kg]
1	Main module	3269 x 864 x 2139	approx. 1000
2	Crossbar	1500 x 1056 x 135	approx. 60
3	Post	1970 x 590 x 140	approx. 45
4	End frame	1656 x 811 x 770	approx. 80
5	Entrance gate	2034 x 1595 x 120	approx. 45
6	Exit gate	2034 x 1114 x 120	approx. 39
7	Identification frame	1070 x 948 x 25	approx. 6
8	Rubber plate	2546 x 807 x 19	approx. 40
9	Data monitor	1067x710x110	approx. 15

3.7.2 compressor (Atlas Copco)

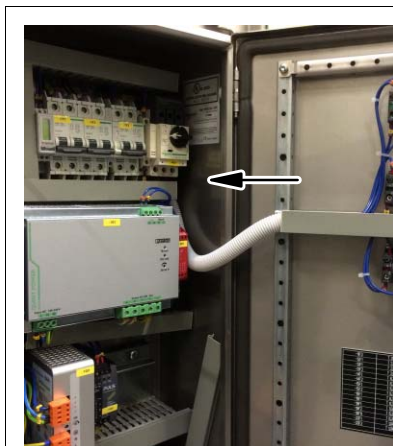
supply voltage	400 V, 3-phase (16A fuse per phase) + neutral
----------------	---

Number of milking boxes	part no.	Compressor designation	Electric motor (kW)
1-2	7015-2201-020	Atlas Copco SF 2	2.2
3-5	7015-2201-040	Atlas Copco SF 4	3.7
10	7015-2201-030	Atlas Copco SF 8T	2x3.7

	Boxes		
	1-2	3-5	2x4 + 2x5
● maximum pressure (bar) [psi]	8 [116]		
● Air supply (l/min)	240	400	790
● Compressed air reservoir (l) - With automatic draining	240	270	500
● Electric motor (kW) [Hp]	2,2 [3]	3,7 [5]	2x3,7 [2x5]
● Pressure dew point for coolant dryer	4 °C [39°F]		
● Air inlet filter	< 1 μm		
● The air system must be absolutely oil-free.			

3.7.3 Rating plates

Milking box

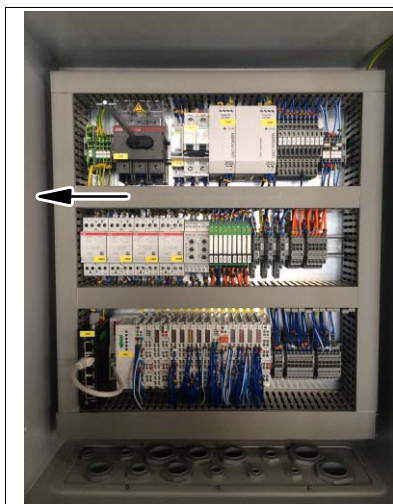


GEA Farm Technologies
Siemensstr. 25-27
59199 Bönen / Germany



Product Name or Model Number:	RU_7821-3350-000
Part No.:	7821-4444-050 / 060
Circuit diagram	RU_7821-3350-000D
Operating voltage:	230-240 VAC 1P-N/2P/PE 50/60Hz
Control voltage	24 VDC
maximum Motor current	2,7 A
Resistance to short-circuiting:	10 kA
Full load:	10,5 A / 2500 W
Serial no.:	-----
Protection class:	NEMA 4x (I66)

Supply unit



GEA Farm Technologies
Siemensstr. 25-27
59199 Bönen / Germany



Product Name or Model Number:	SU_7821-3350-000
Part No.:	7821-5980-030
Circuit diagram	SU_7821-3350-010 F
Operating voltage:	230-240 VAC 1P-N/2P/PE 50/60Hz
Control voltage	24 VDC
maximum Motor current	1,0 A
Resistance to short-circuiting:	10 kA
Full load:	1,6 A / 370 W
Serial no.:	-----
Protection class:	NEMA 4x (I66)

Tank connection (USA only)



GEA Farm Technologies
Siemensstr. 25-27
59199 Bönen / Germany



Product Name or Model Number:	TU_7821-3350-000
Part No.:	7821-5980-040
Circuit diagram	TU_7821-3350-020
Operating voltage:	230-240 VAC 1P-N/2P/PE 50/60Hz
Control voltage	24 VDC
maximum Motor current	1,0 A
Resistance to short-circuiting:	10 kA
Full load:	1,6 A / 160 W
Serial no.:	-----
Protection class:	NEMA 4x (I66)

3.7.4 Subsystems (to be provided by the client)



All informations on this subject, please see the manufacturers instructions.

3.7.5 Capacity of the automatic milking system

The capacity depends, amongst other things, upon the following factors:

- Size of the herd
- Yield of the herd
 - Number of milkings per animal
 - Quantity of milk per animal
- Animal health
- Speed of milking
- Threshold for removal: 400 - 600 g [.9 - 1.3 lb]
- Structure of the milking installation
- Animal traffic

3.8 Design guidelines

In an automatic milking system the animals are milked without any operating personnel.

Carefully planning of the milking installation and animal traffic is therefore required if the working processes are to run smoothly.

3.8.1 Milk cooling

Milk can be pre-cooled with a plate cooler with mains or spring water.
(Plate cooler is available as an option)



Note!

Pre-cooling may be required by regional regulations

Check regional requirements!

If spring water is used in the plate cooler, it must meet the quality requirements.

See section on: Milking system installation room

3.8.2 Milking system installation room

**Attention!**

Take account of any country-specific laws and dairy farming requirements when planning the room.
Check the plans and if necessary adapt them to the requirements of the country-specific laws and dairy farming.

requirements

- The room must be frost-free and well ventilated.
 - Access to the operating side of the milking system through a closed, clean room with a door.
 - Provide spaces for maintenance work!
 - Operating temperature: 1°C - 40°C
-

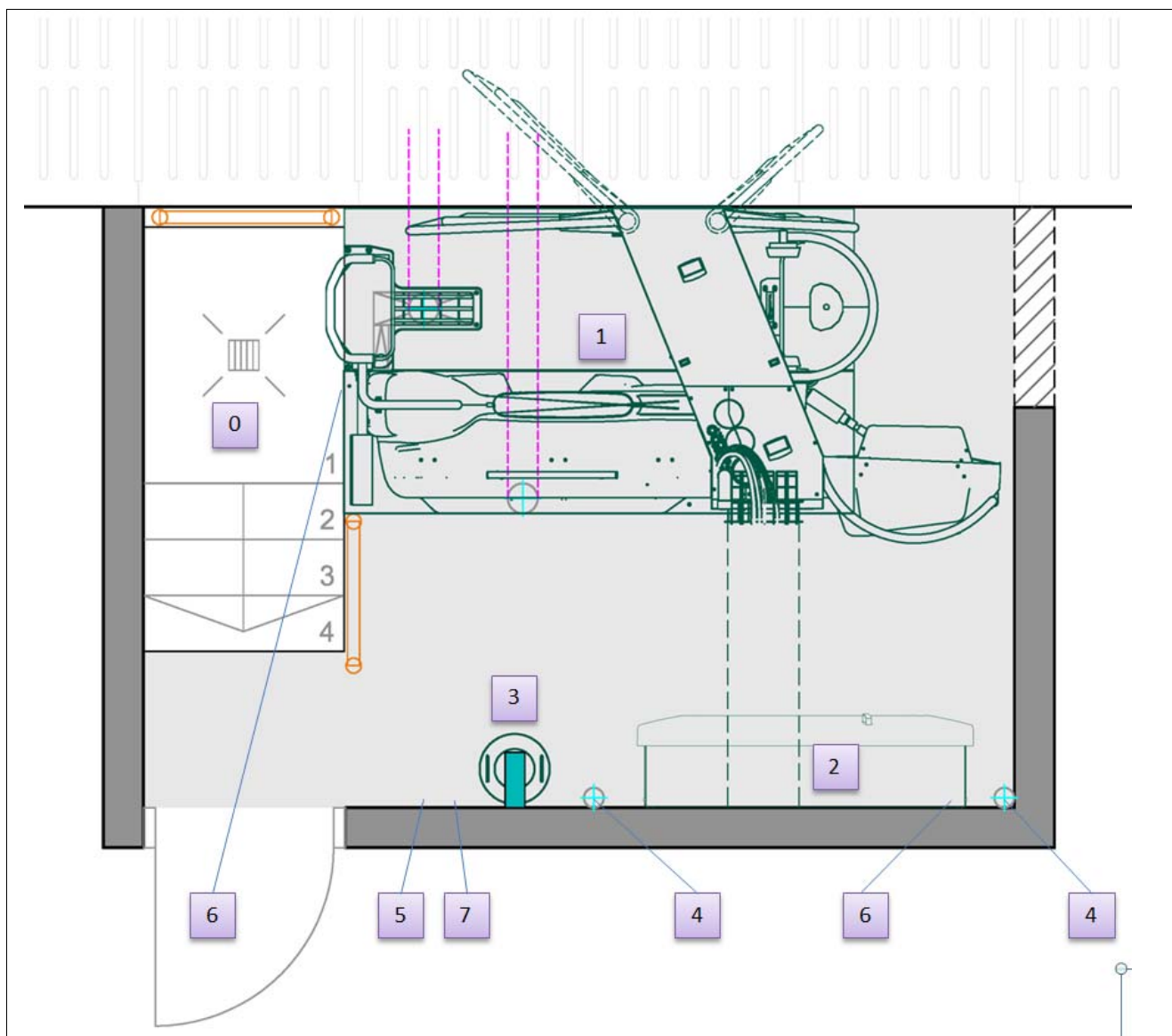
**Attention!**

Preferably heat the room with indirect heating.
Never direct a hot air fan at the milking system!

- Lighting: 200 Lux

Adjoining rooms

- Separate machine room
For the compressor and the cooling unit for the milk cooling tank for example.
- Tank room
Distance between installation room and tank room as small as possible.
Distance from milk cooling tank to ceiling min. 700 mm [27.5"]
- Separate hygienic ante-room with facility for changing and a toilet and shower.

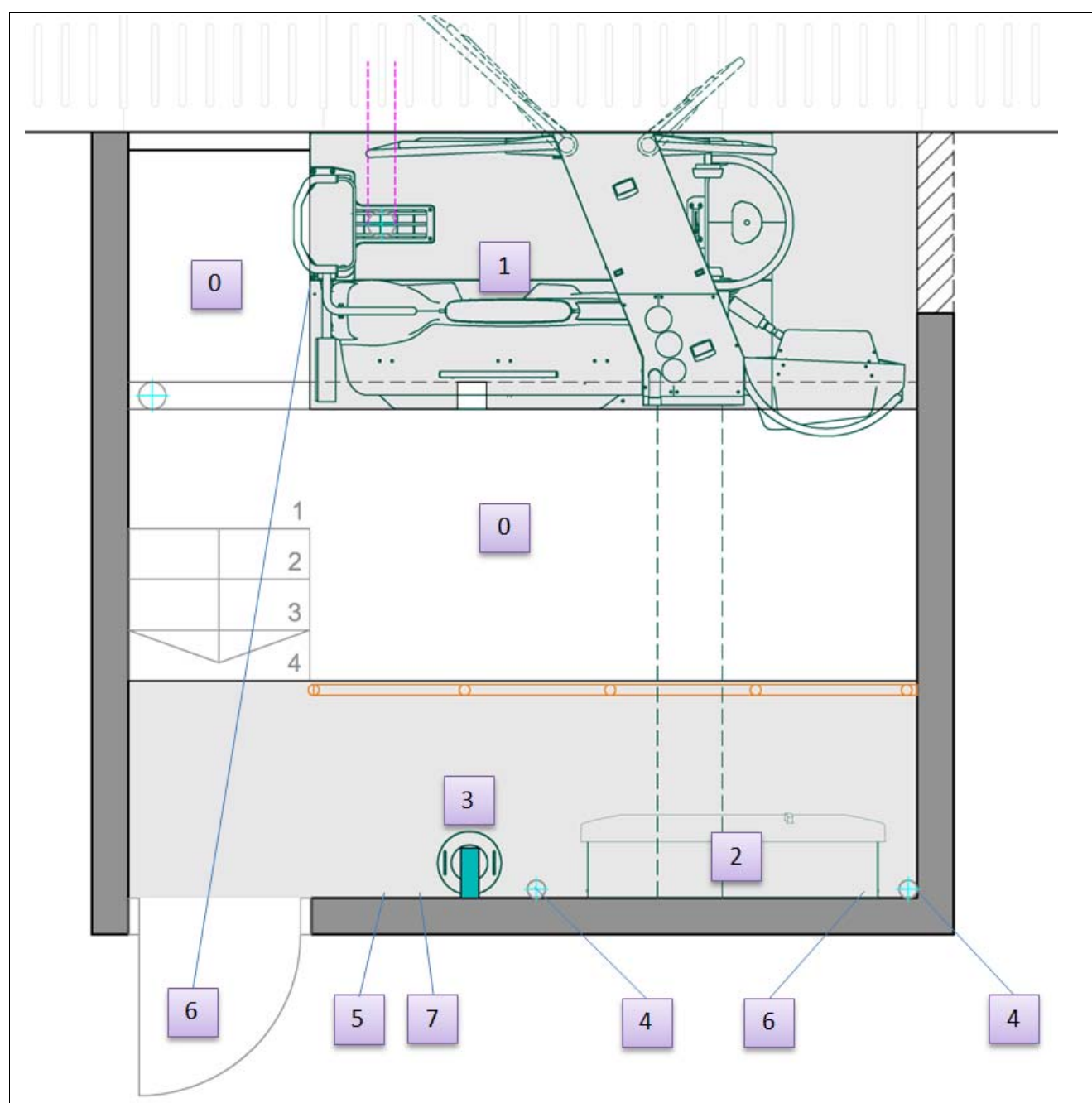


Legend:

0	Manual cluster application pit
1	Monobox
2	Supply unit
3	Milk separation MS1 / MS20
4	Drain (minimum diameter 100 mm)
5	Power points
6	Equipotential bonding (foundation earth)
7	Water connection <ul style="list-style-type: none"> • cold Water: 15l/min • hot water: 10l/min (85°C)

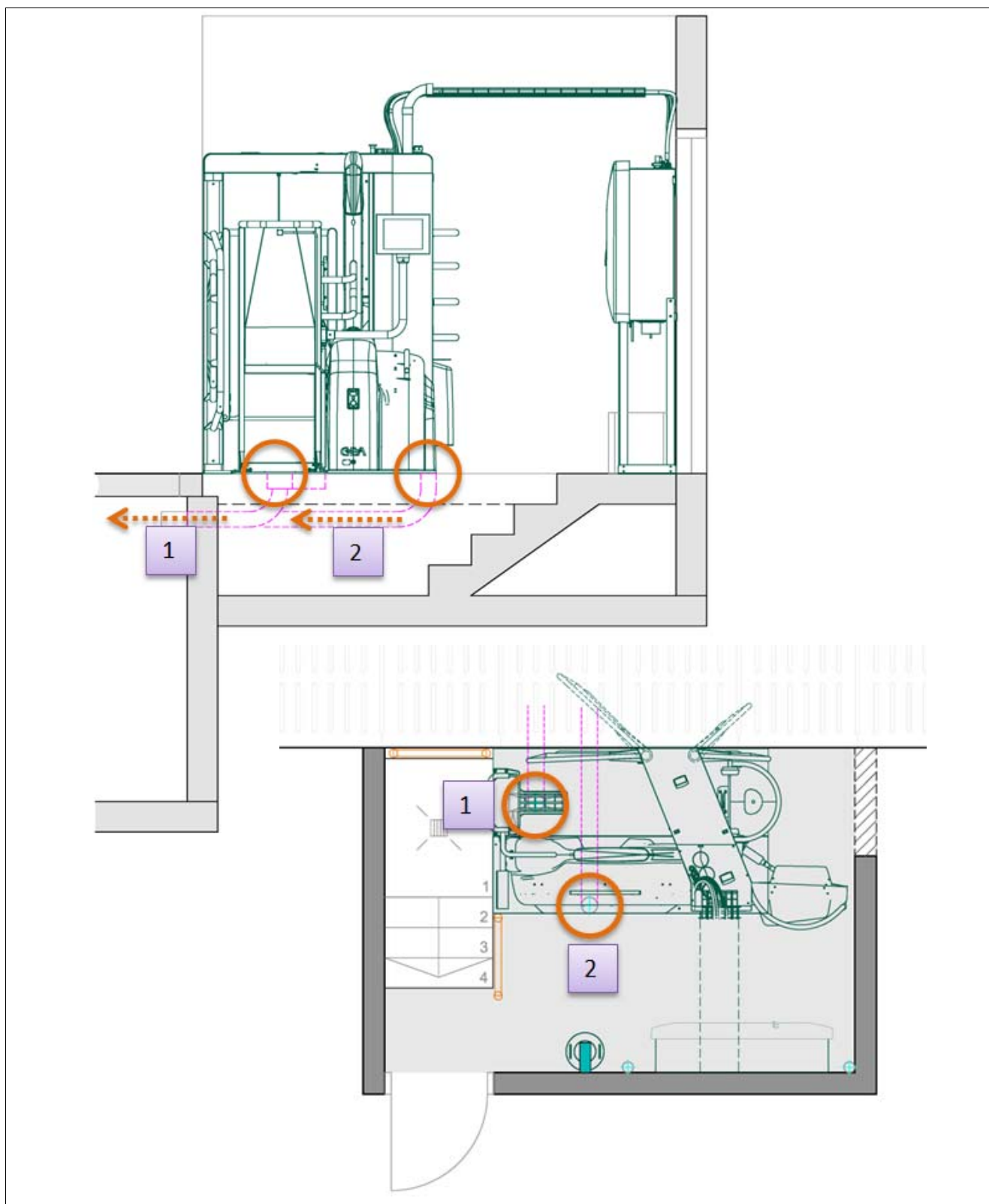
Description

Design guidelines



Legend:

0	Manual cluster application pit
1	Monobox
2	Supply unit
3	Milk separation MS1 / MS20
4	Drain (minimum diameter 100 mm)
5	Power points
6	Equipotential bonding (foundation earth)
7	Water connection <ul style="list-style-type: none"> ● cold Water: 15l/min ● hot water: 10l/min (85°C)

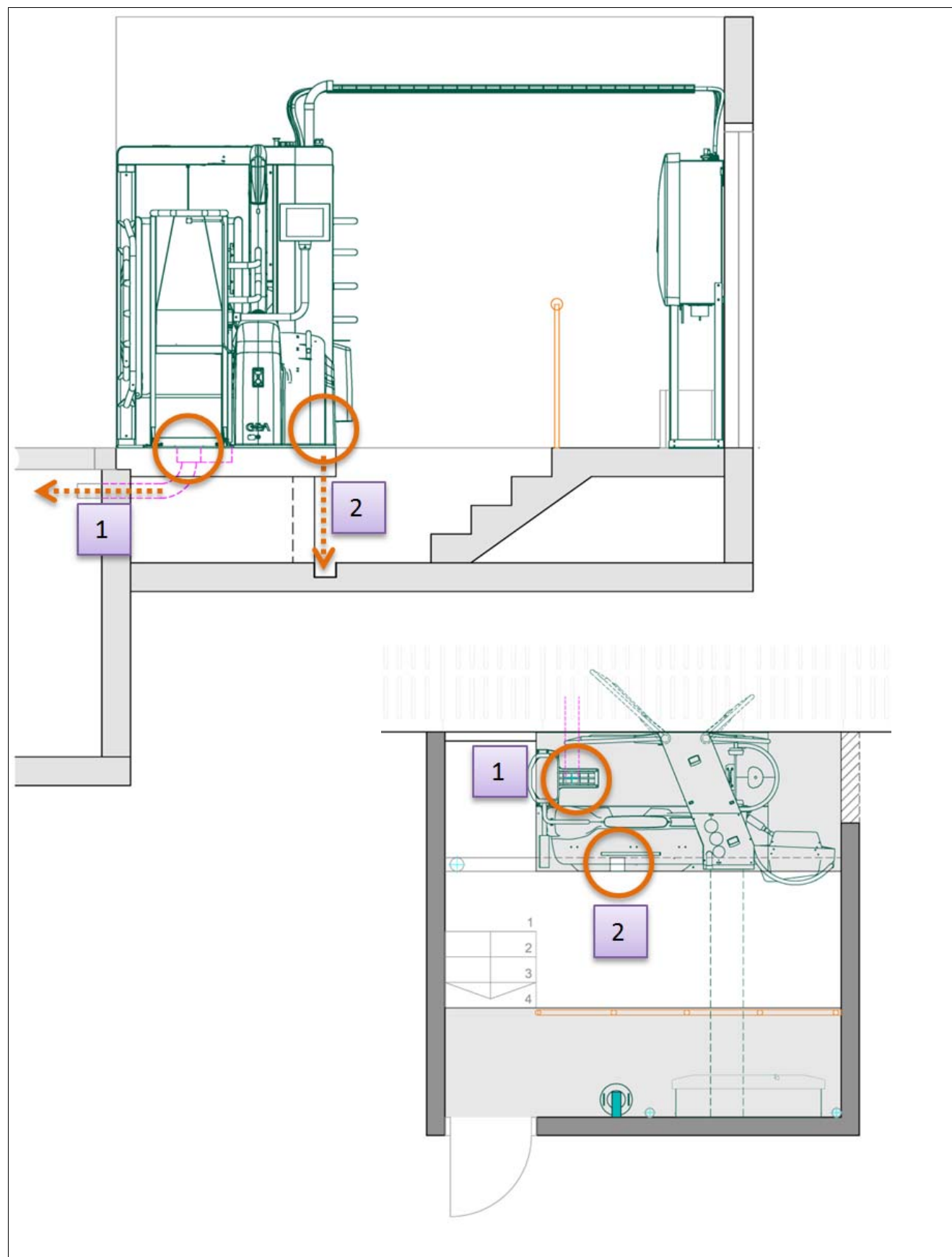


Legend:

1	Slurry drain, PVC pipe (minimum diameter 150 mm)
2	Cleaning fluid drain, PVC pipe (minimum diameter 150 mm)

Description

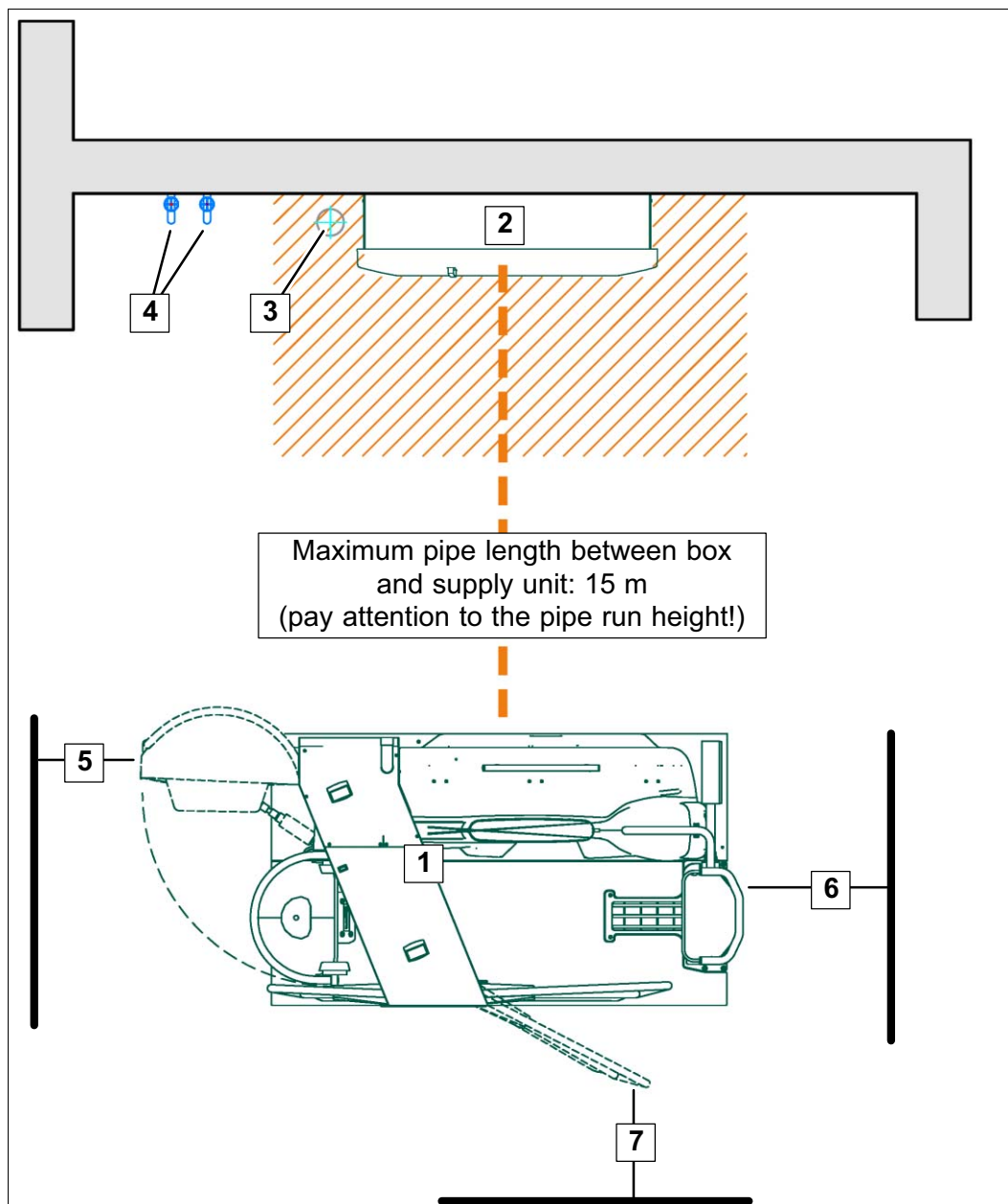
Design guidelines



Legend:

1	Slurry drain, PVC pipe (minimum diameter 150 mm)
2	Cleaning fluid drain, PVC pipe (minimum diameter 150 mm)

Supply unit



Legend:

1	Monobox
2	Supply unit
3	Drain with at least 150 mm diameter
4	Water connection <ul style="list-style-type: none"> • cold Water: 15l/min • hot water: 10l/min (85°C)
5	Space at the front for maintenance: 200 mm
6	Space at the rear for maintenance: 800 mm
7	Space at the front for maintenance: 100 mm

Spaces for maintenance work

The dimensions given in this manual and the overall detailed plans of the milking system are sufficient during operation.

However it is useful to provide additional spaces above for maintenance work

Minimum room height	2600 mm
---------------------	---------

Water supply

Water connections for milking system

The milking system has connections for hot and cold water.

requirements	
External hot water heater	90°C [194°F]
Temperature of hot water supply	max. 90°C [194°F]
water pressure	3-8 bar [29 - 116 psi]
Inside diameter of the pipe (min.)	22 mm [1"]
The pipe must have a non-return valve with vent.	

Water connections in the installation room

Water connections for cleaning should be provided in the room opposite each milking box.

Operation with spring water



Recommendation!

Because of the differing quality of spring water a mains water supply is recommended.

This will prevent contamination in the supply mains.

If the water supply is from spring water, the quality should be investigated before installation.

Quality requirements for spring water	
iron	< 0,2 mg/l [< .01 g/gal]
manganese	< 0,05 mg/l [< .003 g/gal]
nitrate	< 50 mg/l [< 2.92 g/gal]
nitrite	< 0,1 mg/l [< .005 g/gal]
hardness	< 30 °dH [g/gal]
TACC90	< 60 mg/l [< 3.5 g/gal]
PH-value	6,5 - 9,5
Chloride	< 150 mg/l [< 8.7 g/gal]
Germ count at 22°C	< 100/ml
coliform bacteria	< 1/100 ml
sand	0,0 mg/l [0.0 g/gal]



Note!

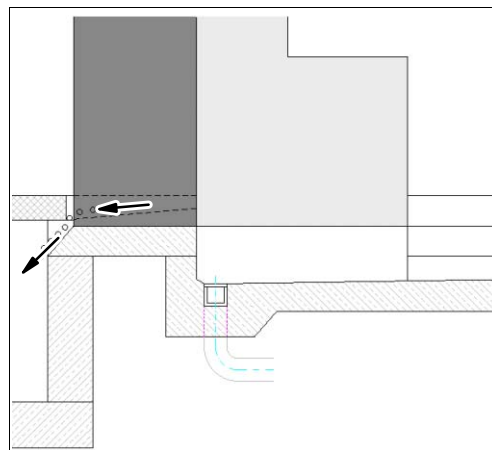
Contact the manufacturer if the values from the spring water analysis are different.

Waste water disposal

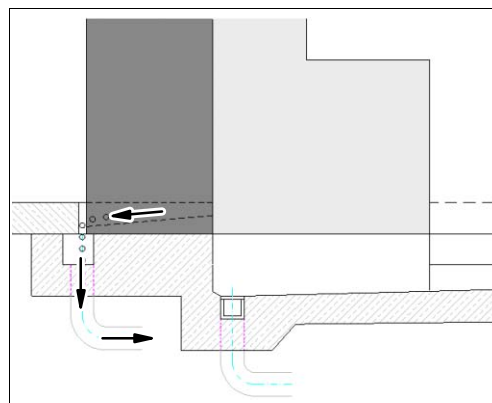
Slurry drain

Slurry flows through an integrated drain out of the milking box towards the holding area.

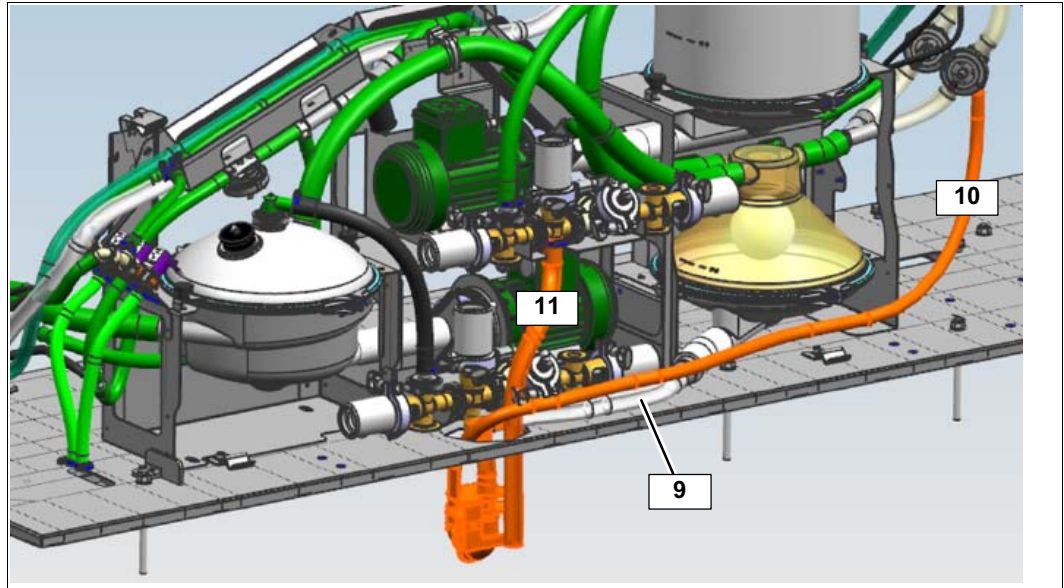
- If the holding area has a slatted floor the slurry can run directly underneath it.



- If the holding area before the milking box is solid, the drain should go from the milking box to the slurry channel. Slope: min. 1%

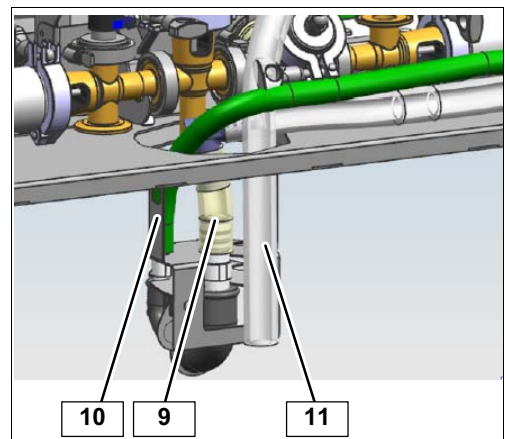


Drains



Cleaning water is taken through various pipe systems into a waste water pit and pumped out with a submersible pump.

- Drain for overflow safety device (9)
Diameter: min. 80 mm [3"]
Slope min. 1%
- Vacuum system drain (10)
- Drain for non-saleable milk (11)



Telephone / Internet connection

Send alarm

The milking system informs the operator of any faults via the existing DPNotify Internet connection.

Alternatively, the information can be sent via a connected modem.

The modem is situated in a communication unit (CI box) installed near the herd management PC.

Required Components:

part no.	Description	
7801-9046-000	modem	GPS
7801-5530-040	antenna	GPS
7801-2985-000	Battery pack An optional battery pack ensures operation even if there is a power failure.	24V DC 0,8 Ah

Remote maintenance

The milking system can be operated over the Internet.
(Access is password protected)

Requirements

- fast Internet connection with an Ethernet interface
- safety router for industrial networks

Components required

part no.	Description	
7801-9046-050	Router	Ethernet, for VPN support

Wall sockets

Provide one wall socket on the wall opposite each box and one on the wall next to the maintenance and supply unit.

3.8.3 Cow holding area

- The floor of the holding area must be non-slip and wear-resistant.
- The floor of the holding area and the floor of the milking boxes must be on exactly the same level.
- Provide an opening for the farmer.
width: 30cm [12"]
- Lighting: 100 Lux
- Clearance in front of the box: 5m
- no water trough in the holding area
- no cow brush in the holding area

3.8.4 Segregation area

Resting areas, feed and water must be available in the segregation area.

Provide resting areas for 10% of the milking herd.

Animals can be segregated out for checks and vet actions as a function of the segregation criteria.

3.9 Default setting

Other settings can be used!

Changes may only be made by trained personnel.

Check all factory settings before commissioning and adjust to the individual requirements of the installation or animal if necessary.



Attention!

Incorrect settings can have a negative effect on the health of the animals, the quality of the milk and milking results!

4 Operation

4.1 Special personnel qualification required for operation

Operation must be performed by specially qualified personnel in accordance with the safety instructions.

The operator may only carry out work on the product if he has been trained, instructed and authorised to do so by the owner.



See also the section on "Personnel qualification".

4.2 Safety Instructions for Operation

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

- Use the product for its intended purpose only.
- The product may only be operated from the workstation indicated.
- During operation, operating personnel may only stand at the specified workplaces.



See chapter on "Work stations for operating personnel"

- No safety devices may be removed or deactivated during operation.
- During operation, it is strictly forbidden to remain within the hazard area!
- Operating personnel should make sure that no unauthorized personnel are in the working area.
- If the correct procedure is not followed in case of an emergency, this can result in serious injury to personnel and damage to property - therefore familiarise yourself with the instructions on what to do in an emergency.



Also read the chapter on "Safety".

Prior to operation, the operator should be adequately familiar with the following:

- The operating and control elements
- The equipment included
- The method of operation
- The immediate surroundings
- The safety devices



For further information, please refer to section:
Protective Devices

Special dangers involved in operation and normal operation:

- Incorrect use may lead to serious damage to property and/or life-threatening injury to people.
- Improper use of cleaners and disinfectants can result in a build-up of gas or caustic burns.
- Danger from animals.


Daily checks

The following checks should be performed at least once a day:

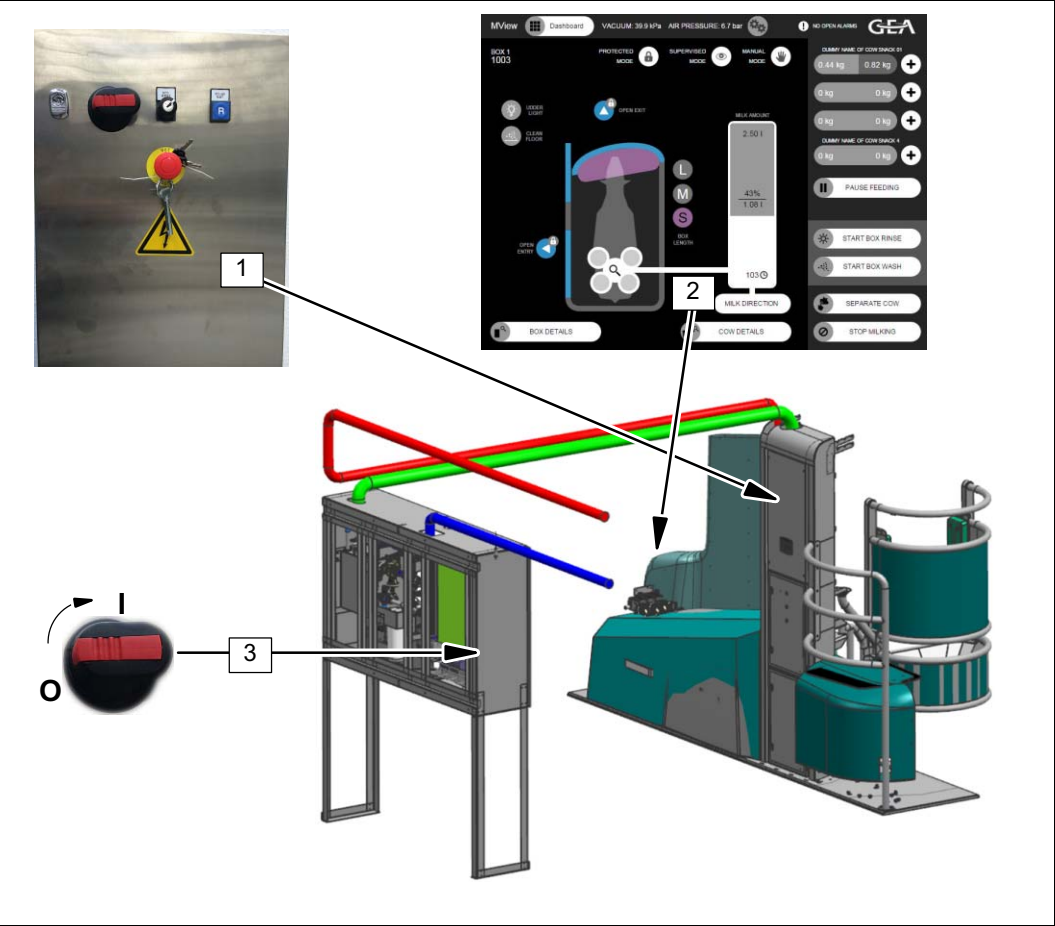
- Check and make sure that all operating media is suitable, present and connected.
- Check and make sure that all of the safety devices (deflector plates, emergency-off switches, etc.) are present and working.
- Check the product for visible damage; any faults found should be repaired immediately (note personnel qualifications required) or referred to the specialist dealer - the product may only be used if it is in perfect condition.
- Check and make sure that only authorized personnel are in the work area of the machine and no other people will be endangered by the machine starting.
- Check and make sure that there are no objects or materials in the working area if they are not necessary for operation.
- Check that all pneumatic and hydraulic hoses are leak tight and connected correctly.
- Check the conductivity sensor for dirt.
- Check the optical sensor for dirt and clean if necessary.
- Check pressure ranges (e.g. operating vacuum).
- Check the level of the cleaning agent canister.
(system clean)
- Dipping agent level in the canister
- Check hose connections and air inlet on at the teat cup.
- Check that teat cleaning is working.
- Test the operation of the teat cup disinfection.
- Check all information areas.
 - Check the milking control unit check list (especially milking ban and milk separation)
 - Check overdue animals at least 3 times a day
 - Check the performance figures of the box at least 3 times a day

4.3 Workplaces for operating personnel

The automatic milking system is operated from the preparation area.

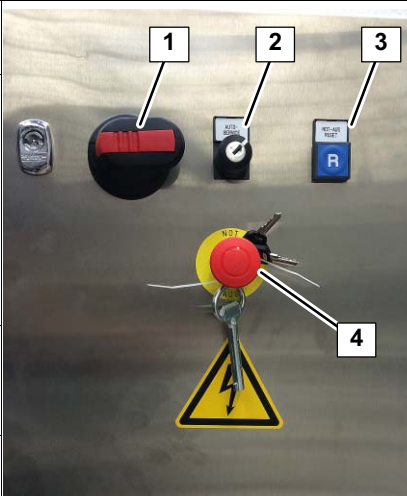
 See also the section entitled:
Dangerous areas

4.4 Description of the control elements



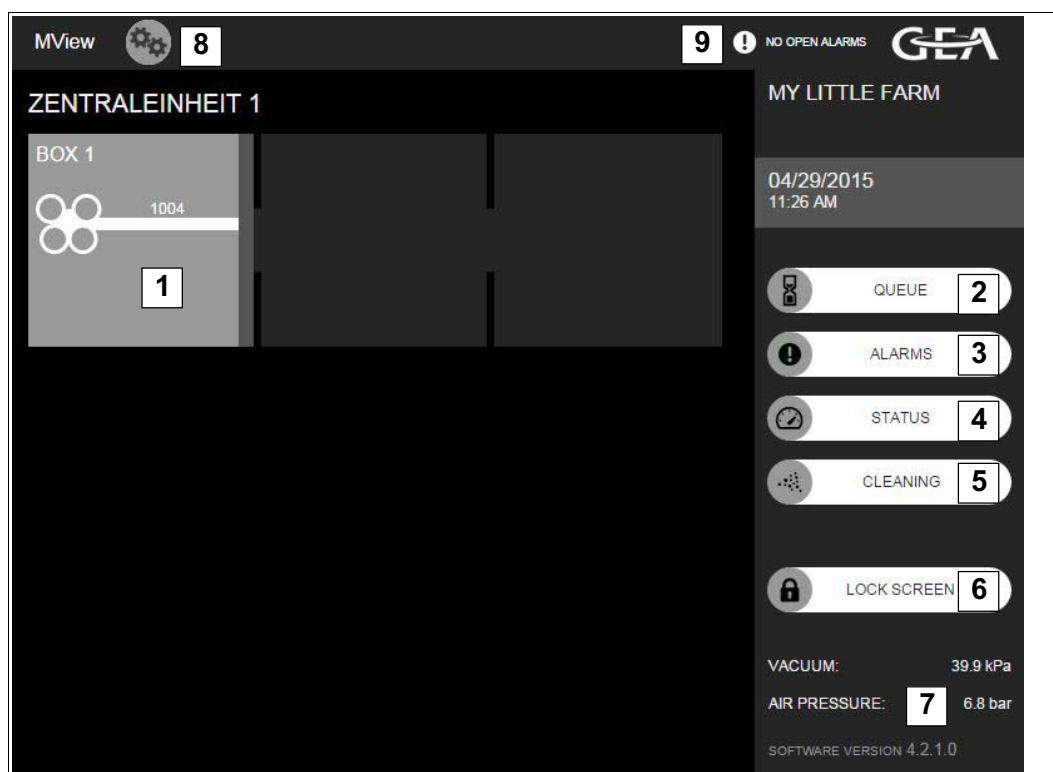
Item	Description
1	Milking box control panel
2	System program
3	Supply unit main power switch

Milking box control panel

Item	Description	Figure
1	Milking box main power switch	
2	Automatic / Maintenance mode key switch <ul style="list-style-type: none"> In "Maintenance" mode, the pressure at the entry and exit doors is reduced and the cow trainer is deactivated. 	
3	Reset emergency stop <ul style="list-style-type: none"> Rests the emergency stop switch. 	
4	Emergency-off button	

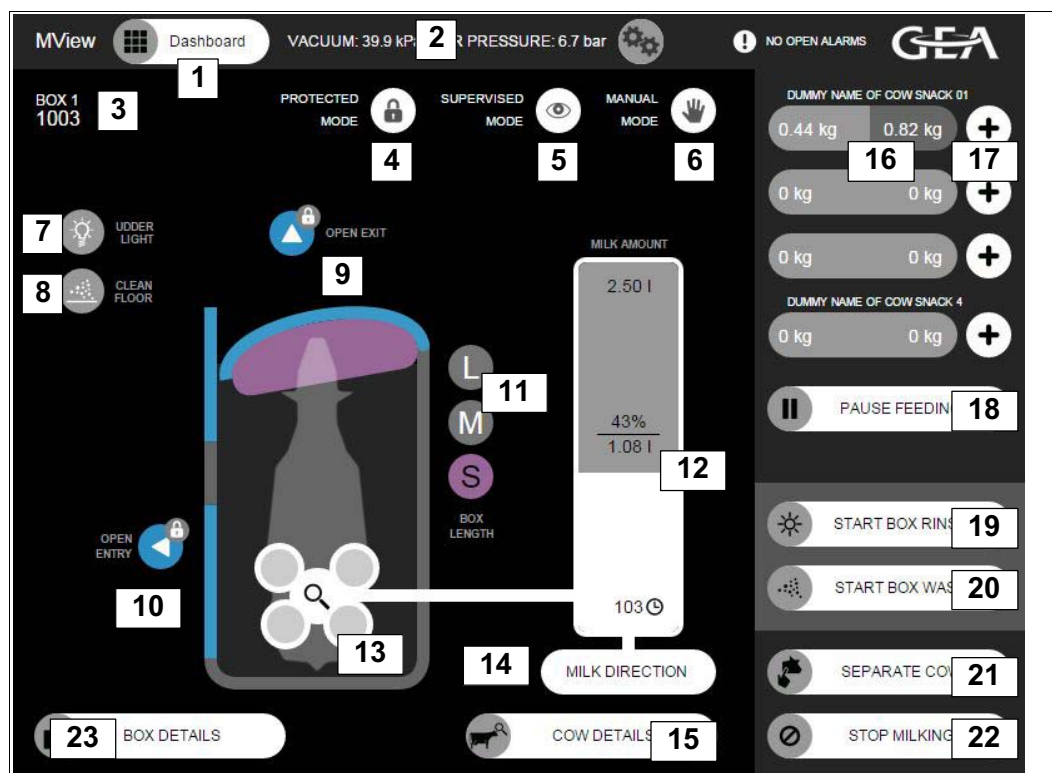
System program control unit

System overview (Dashboard)



Legend:		Legend:	
1	Selects milking box view	6	Locks screen briefly to carry out cleaning
2	Animals to be milked view selection	7	Vacuum and compressed air supply display
3	Selects alarm view	8	Selects settings view (found in every view)
4	Selects system status view	9	Number of unconfirmed alarms (appear in every view)
5	Selects system cleaning view		

Milking box view



Legend:

1	Selection of Dashboard (system overview)	13	Individual quarter information display
2	Vacuum and compressed air supply display	14	Display and change milk path
3	Display of current milking box and animal number	15	Selects animal details
4	Switches door control manual mode on/off	16	Display of feed quantity dispensed Display of allocated feed quantity
5	Switches monitored milking on/off	17	Extra feed allocation (+100 g)
6	Switches manual mode on/off	18	Pauses feeding
7	Switches milking box lighting on/off	19	Starts/stops milking box rinsing (clear water)
8	Switches on milking box floor cleaning	20	Starts/stops box cleaning (with cleaning agent)
9	Opens/closes exit doors (only possible in door control mode)	21	Separate current cow
10	Opens/closes entrance doors (only possible in door control mode)	22	End milking and let animal out
11	Display and change box length	23	Selects milking box details
12	Expected milk quantity (top) Actual milk yield (middle) Milking duration (bottom)		

System cleaning view

SYSTEM CLEANING
LAST CLEANING:
23.07.2014, 12:45 PM
NEXT CLEANING:
24.07.2014, 12:45 PM

SHORT CLEANING INTERVAL
SHORT CLEANING INTERVAL:
37 MINUTES

SCHEDULED CLEANINGS
DAILY AT 11:00 AM

START SYSTEM CLEANING CHANGE INTERVAL EDIT SCHEDULE

CLEANING HISTORY

History per box System history

All boxes Ost Nord

Date ▼	Type	Box number	Overfloodings	Drainings	Cleaning duration
24.06.2015	Short	3	2	4	03:54
19.06.2015	Short	3	2	4	03:54
18.06.2015	Short	2	2	4	03:54
17.06.2015	Short	2	2	4	03:54
14.06.2015	Short	2	2	4	03:54

Legend:

1	Selects dashboard (system overview)
2	Display of last and imminent system cleaning
3	Starts / stops system cleaning
4	Sets box cleaning interval
5	Change the box cleaning interval
6	Sets automatic system cleaning
7	Change the automatic system cleaning settings
8	Box cleanings carried out
9	System cleaning carried out

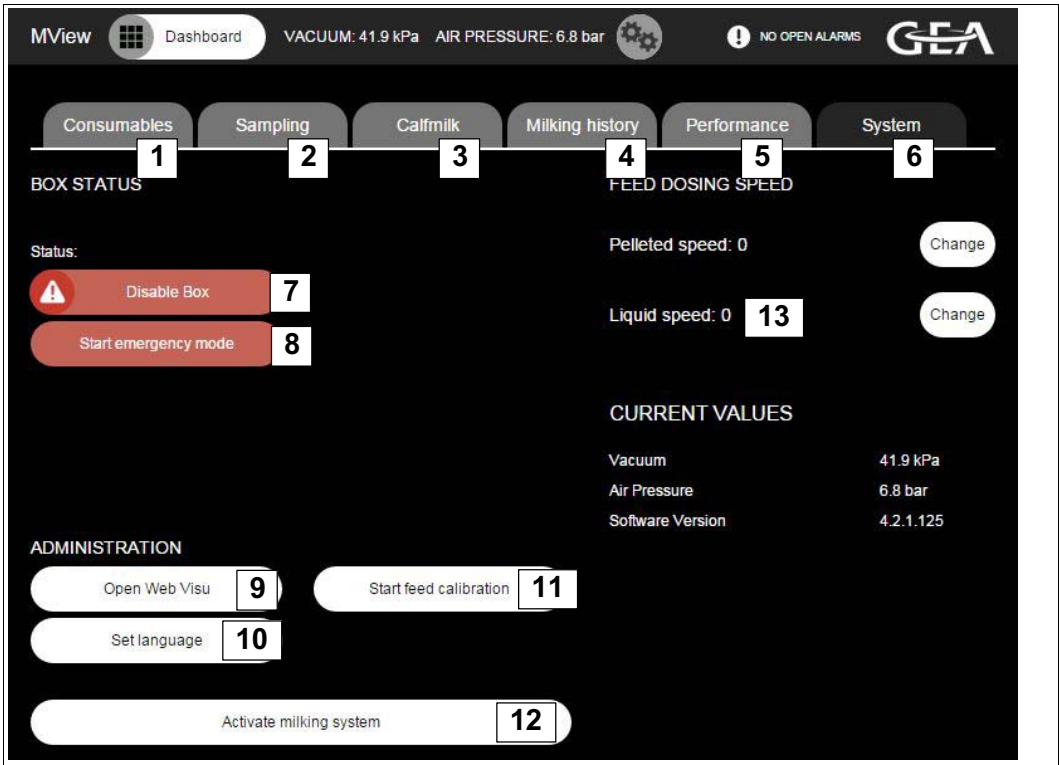
"Animals for milking" view

[illegible]

Legend:

1	Animal must be milked urgently
2	Number of successive incomplete milkings Note: check with particular care as from 2 animals
3	One-off milking authorization for one animal

Selects system status view



Legend:	
1	Selects overview of filling levels in supply canisters
2	Selects sampling overview
3	Selects calf milk overview
4	Selects consumption overview during milking
5	Selects performance parameters overview
6	Selects system overview (selected in the example)
7	Blocks a box for milking
8	Activate/deactivate emergency operation
9	Starts diagnostic overview
10	Select language
11	Start feed calibration
12	Switch off system operation
13	Set feed dispensing speed

Protective Devices

The movement of the box doors can be stopped by pressing the emergency stop button at any time



For further information, please refer to section:
Protective Devices

4.5 Training phase - Getting used to the automatic milking system

Experience shows that the learning process needed for herd and operator requires a period of several weeks. During this time the herd must be permanently taken care of by the operator.

Before the training phase

**Attention!**

Interfering external influences disturb the animals and make the training phase more difficult.

All stages of work involved in installation preparations, installation and commissioning must be successfully completed.



For further information, see the following manual:
7821-90 . . - 001 Installation instructions

Selection of animals

- Make sure that the animals meet the requirements for milking in automatic mode.



For further information, please refer to section:
Description

- Animals with more than 250 lactation days and production of less than 10-12 kg per day should not be milked automatically during the training phase. These animals should be integrated into automatic milking after calving.

Prepare animals

**Note!**

Animals associate an unpleasant treatment with the place of the treatment and may be reluctant to go back there.

Do not perform any treatments that are unpleasant for the animal in the milking box (e.g. burning off bristles).

- Shave the udder at least every 2 months and shorten the bristles at the end of the tail (makes it easier to detect the teats).
- Trim the hoofs one month before the training phase if the last trim was more than 5 months ago.

Tasks and objectives during the training phase

Technical dealer

- Coordinates the tasks during the training phase.
- Gives the farmer/operator the necessary knowledge.
- Present throughout the day during the first days of the training phase.

Farmer (operator)

**Note!**

Train a second person at the same time during the training phase.

- Schedule in enough time for instruction.
- After the training phase the person must be able to perform all of the work on his own.
- Also present during the night.
- Trains the herd.
- Monitors the milking system.

During the training phase



Note!

Check the herd regularly during the training phase.



Note!

In automatic mode the milking system works completely on its own. Nevertheless, constantly check the working sequences during the training phase.

Milking intervals

- At the beginning, milking in the milking system concentrates on the normal milking times in the mornings and evenings. After a few days this process will be adjusted and milkings divided evenly throughout the day.
- Recommended milking intervals (make the settings in DairyPlan)

Description of the animals	Milking interval
<ul style="list-style-type: none"> • Animals with a milk yield of < 10 kg/day • Animals towards the end of lactation 	1 x a day
<ul style="list-style-type: none"> • Animals with a milk yield of 10 - 20 kg/day 	2 daily
<ul style="list-style-type: none"> • Animals with a milk yield of > 20 kg/day • Animals at the beginning of lactation 	3 x a day
<ul style="list-style-type: none"> • Animals with a milk yield of > 30 kg/day 	4 x a day

Working with the animals

- Pasturing
Keep the animals in the barn at the beginning of the training phase (no going out to pasture).
Going out to pasture can interfere with the movement of animals.
- Amount of feed concentrate
In the first few weeks of the training phase do not give more than 1 kg of feed concentrate per scheduled visit.
After the first few weeks, slowly increase the portions up to the maximum amount.
- Create groups
To prevent disturbance within the herd, animals with the same milking times must be taken for milking together.
- Unfamiliar people
Visitors to the milking installation are not permitted during the first few weeks in order to prevent unnecessary distraction for the animals.

4.6 Adding a new animal to the herd

- Make sure that the animals meet the requirements for milking in automatic mode.



For further information, please refer to section:
Description

Set up new animal



For further information, see the following manual:
7160-90 . . -530

Enter animal data

Enter all the data needed for milking in milking operations into the DairyPlan herd management system.



For further information, see the following manual:
7160-90 . . -530

- Animal settings



Note!

In particular activate the "Training animal" setting.

- Check group settings.



Setting in DPSetup under:
Herd Management-> Groups

- Check milking system settings.

Guide the animal into the milking box

**Note!**

Training animals can be taken through the milking box without being milked.

Animals that do not enter the milking box (e.g. during the training phase) must be guided.

- Make sure that the animal's responder is identified.
 - Switch the milking box to manual mode.
-

**Warning!**

All automatic doors and gates in the milking parlour continue to open and close automatically in manual mode.



(e.g. segregation gate before the waiting area, access gate to the passageway, milking system entrance and exit doors)



Do not enter these danger areas during milking.



For further information, please refer to section:
Milking in manual mode

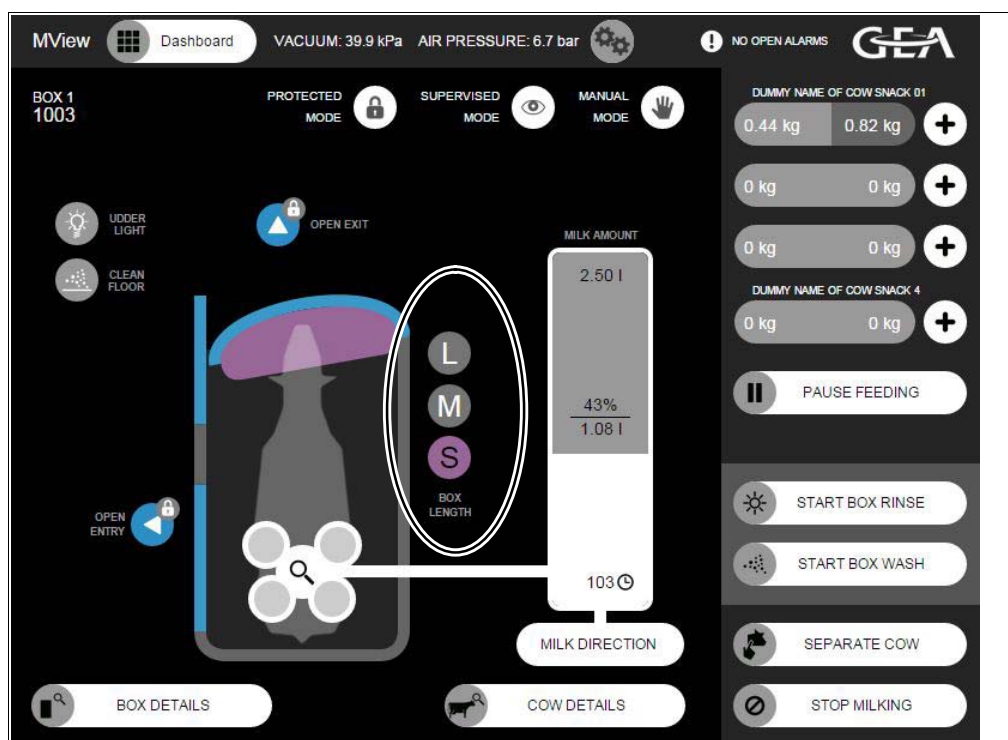
- Reducing the door closing force
-

**Note!**

This is the protective device that prevents injuries from the door movements.

- Turn the key switch to "Service".
- Withdraw the key
- The entrance door to a free milking box opens automatically.
- Guide the animal into the milking box.
- Once the animal has been identified, the entrance door closes automatically.

- Adjust the box length (1)
 - L = large
 - M = medium
 - S = small

**Note!**

Make sure that the animal is optimally positioned in the milking box and has a normal posture (no hunching).

- The back legs must be on the platform.
- The rear must be right up against the dung plate.

- Manual attaching of cows



For further information, please refer to section:
Milking in manual mode

- Automatic milking.



For further information, please refer to section:
Milking in automatic mode

- At the end of milking guide the animal out of the milking box.

4.7 Milking in manual mode



Warning!

All automatic doors and gates in the milking parlour continue to open and close automatically in manual mode.



(e.g. segregation gate before the waiting area, access gate to the passageway, milking system entrance and exit doors)



Do not enter these danger areas during milking.



Warning!

The feed trough moves automatically to the box length setting and may trap people or limbs.



Do not enter the milking box during milking operation.



Important! Suspected inhibitors



All animals whose milk is subject to a delay time because of treatment must be milked directly before a system clean!

A short clean is not sufficient!

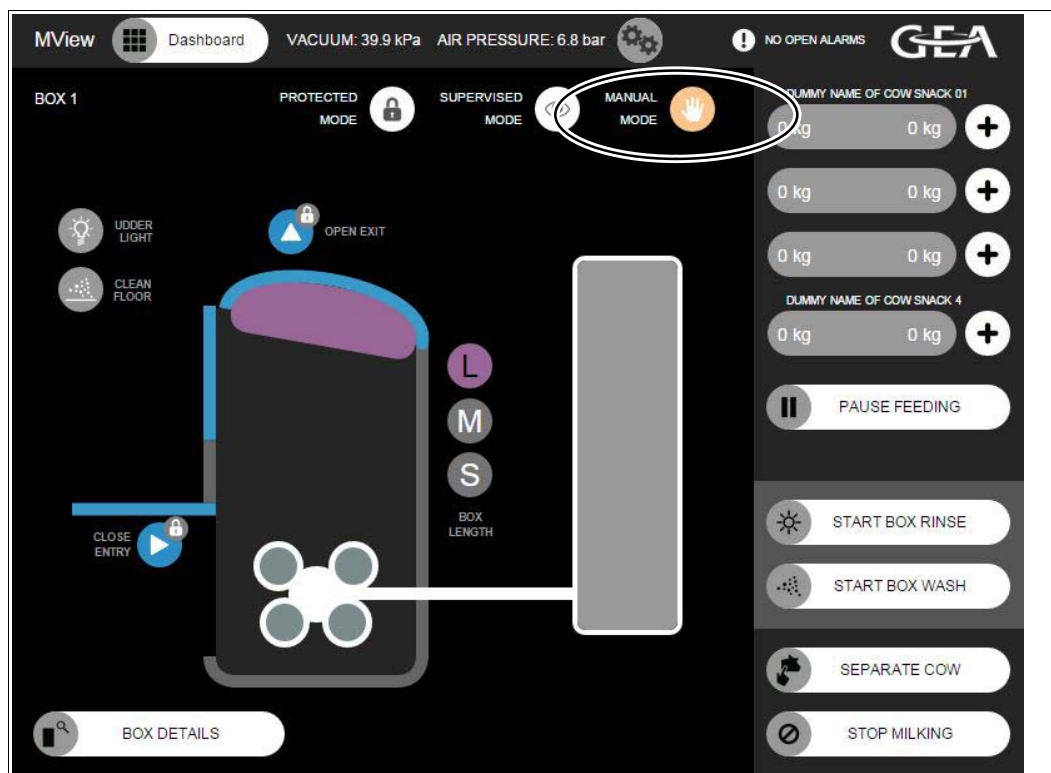


Please make sure to read the following section:
Separating of non-saleable milk

Animals must be milked in manual mode in the following cases:

- When there is a corresponding animal setting in DPSingle
- When the automatic application process has been stopped.

Switching to manual mode



- Application is stopped
- Application arm moves to the parked position

Manual start of milking



- Press the Start button to start milking

Legend:

T1	Press the start key
T2	Cancel button
LED	Display (green, red, yellow)

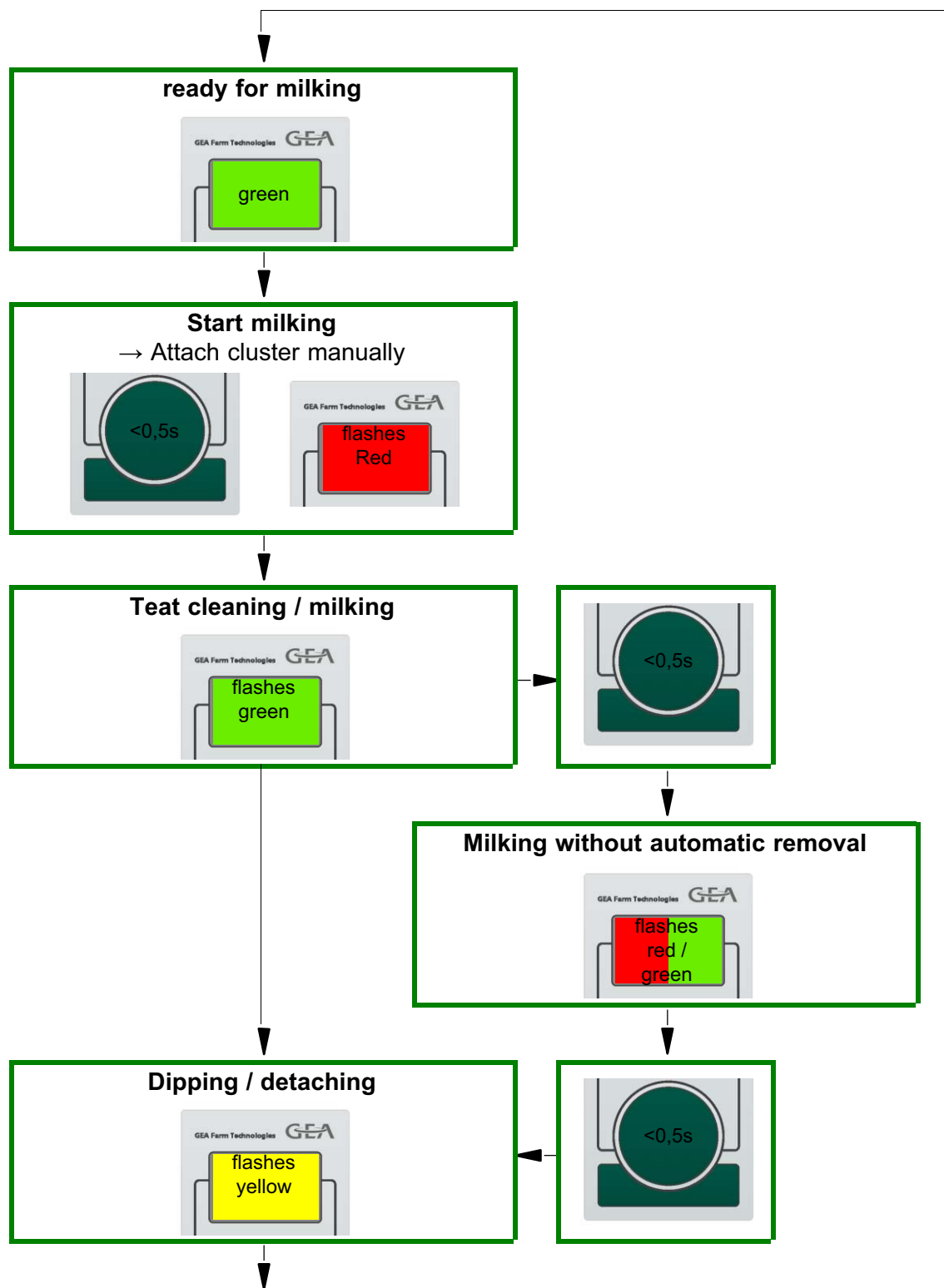


For further information, see the following manual:
7820-90...005 Automatic milking system DairyProQ - Milking place module

Automatic application



Manual attaching of cows



Note!

When applying the cluster manually, apply it to the front teats first and then the rear ones
The application order differs from automatic application in this respect.



For further information, see the following manual:
7820-90..-005 DairyProQ Automatic milking system - milking place module

Automatic milking



For further information, see the following manual:

7820-90..-005 Automatic milking system DairyProQ - Milking place module

End of milking

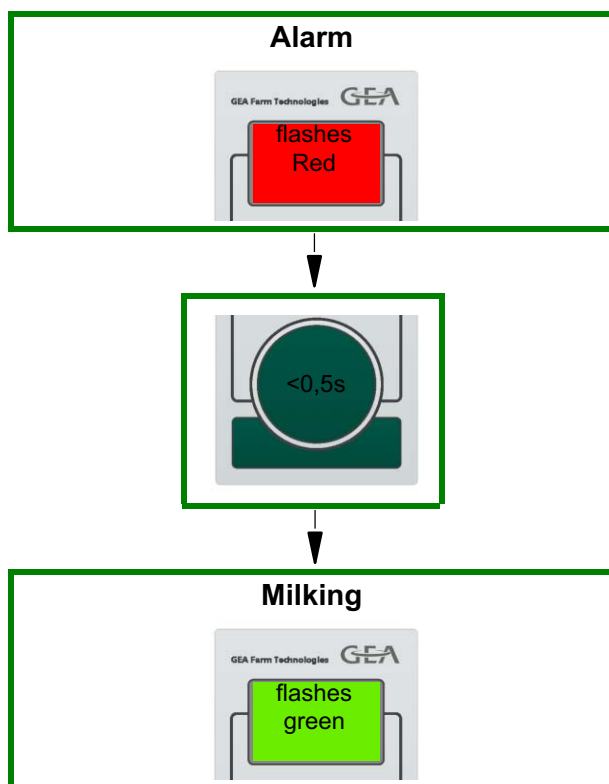
- All teat cups are removed automatically.
- The box is adjusted to the maximum length.
- Exit door and trough door open.
- Animal leaves the milking box.

**Note!**

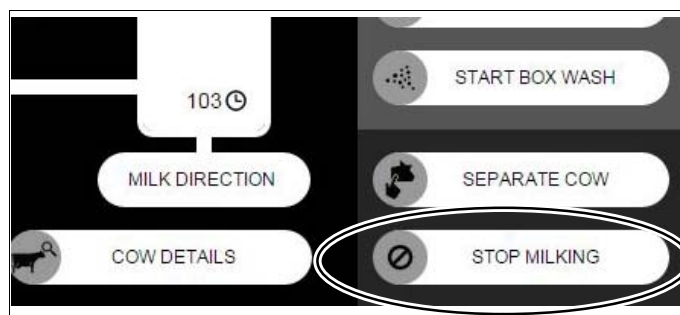
If the box length has been re-adjusted, the data will be stored in animal data at the end of milking.

End of milking with block

The end of milking is blocked if the minimum milk quantity has not been achieved.

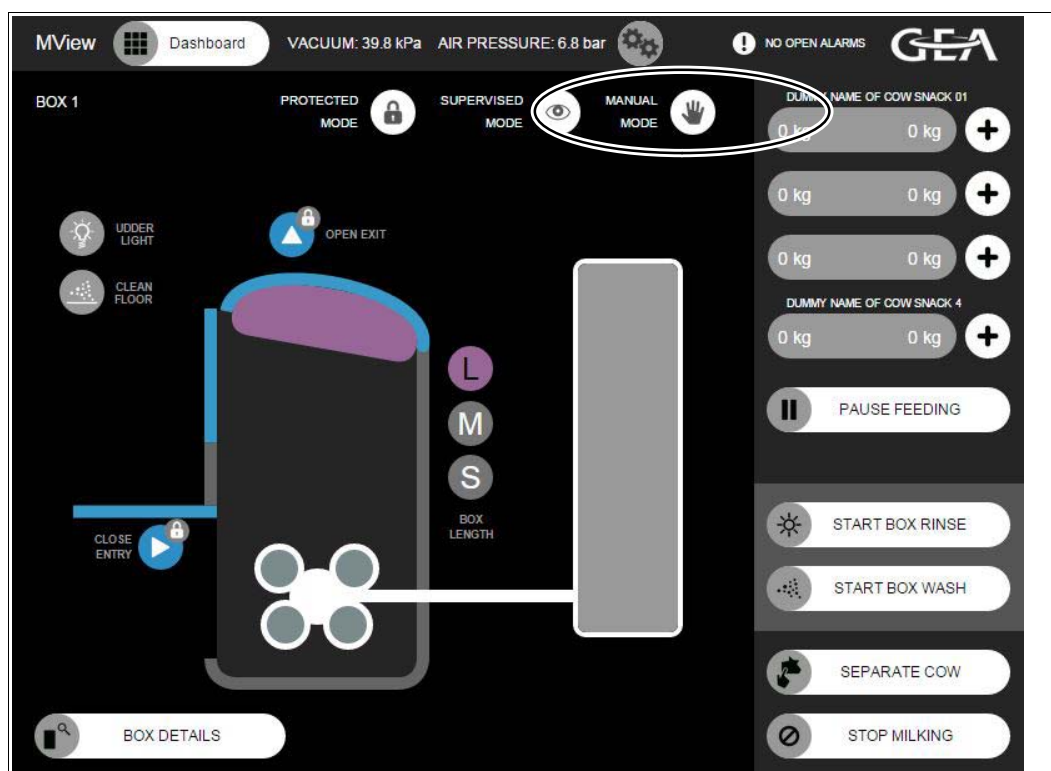


- End milking.



- All teat cups are removed automatically.
- The milking box is adjusted to the maximum length.
- Exit door and trough door open.
- Animal leaves the milking box.

Switching to automatic mode



4.8 Milking in automatic mode



Important! Suspected inhibitors



All animals whose milk is subject to a delay time because of treatment must be milked directly before a system clean!
A short clean is not sufficient!



Please make sure to read the following section:
Separating of non-saleable milk

Automatic application



Automatic milking

Normally no manual intervention is required during milking.



Note!

If manual intervention is necessary, start manual mode

End of milking

- All teat cups are removed automatically.
- The box is adjusted to the maximum length.
- Exit door and trough door open.
- Remaining milk is pumped to the cooling tank.
- Animal leaves the milking box.



Note!

At the end of milking, the coordinates from teat recording and the box length are saved in animal data.

4.8.1 Special milking authorization

**Note!**

Animals with a milking ban or training animals are not milked even though this setting is active.

Special milking authorization for one animal

If an animal is to be milked again despite not having milking authorization, milking authorization can be set once manually.

- Wait until the animal has left the box.
- Set milking authorization once



For more details see the following Chapter:
Description of the control elements - System program control unit

- The animal is milked at its next visit.
- Milk animal again
 - The function is reset automatically when the animal leaves the box.

Special milking authorization for the herd

A special milking authorization can also be given for the herd.

**Attention!**

- There is a risk that animals will be milked more than once.
 - The operator must be present while this function is active.
 - The function must be disabled again afterwards.
-

- Change the setting



For more details see the following Chapter:
Description of the control elements - System program control unit

4.9 Monitored milking



Note!

Monitored milking is effective in all milking box operating modes.
The operator must be present for any manual interventions that might be necessary.



Attention!

Regardless of the settings there is a risk, with monitored milking, that not all of the animals in the herd will be milked.
The function must be disabled again afterwards.



Important! Suspected inhibitors



All animals whose milk is subject to a delay time because of treatment must be milked directly before a system clean!
A short clean is not sufficient!

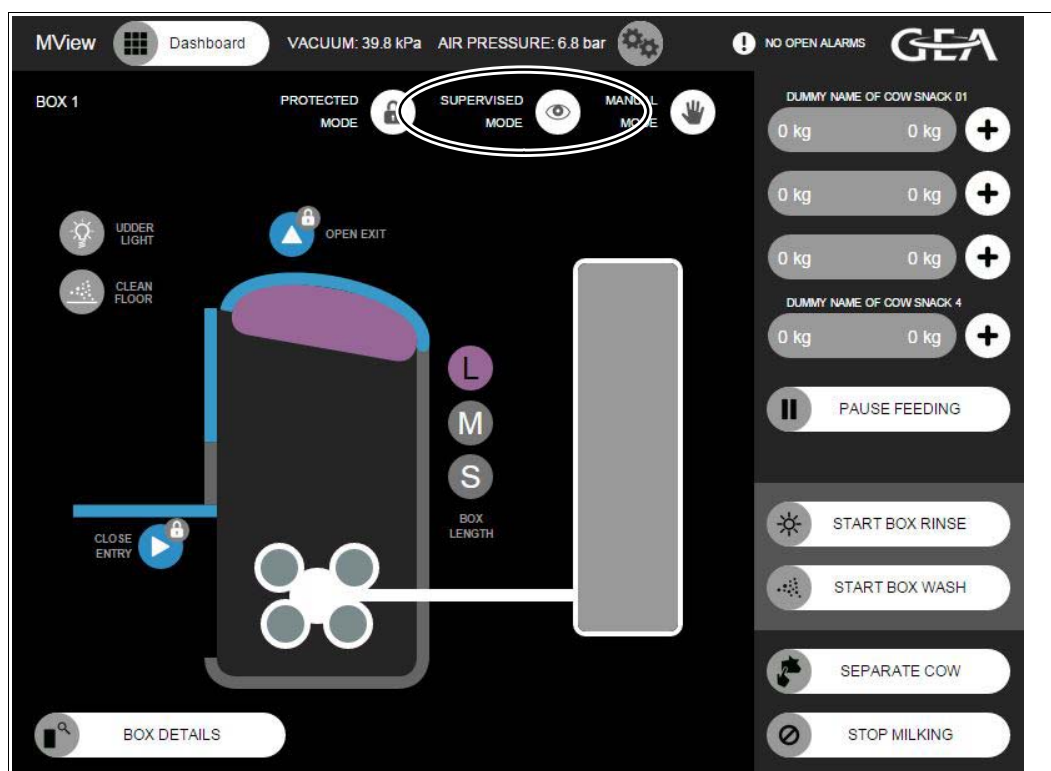


Please make sure to read the following section:
Separating of non-saleable milk



For further information, please refer to section:
Description

Activate monitored milking



Milking animals

- Carry out the milking process according to the milking box mode that has been set.



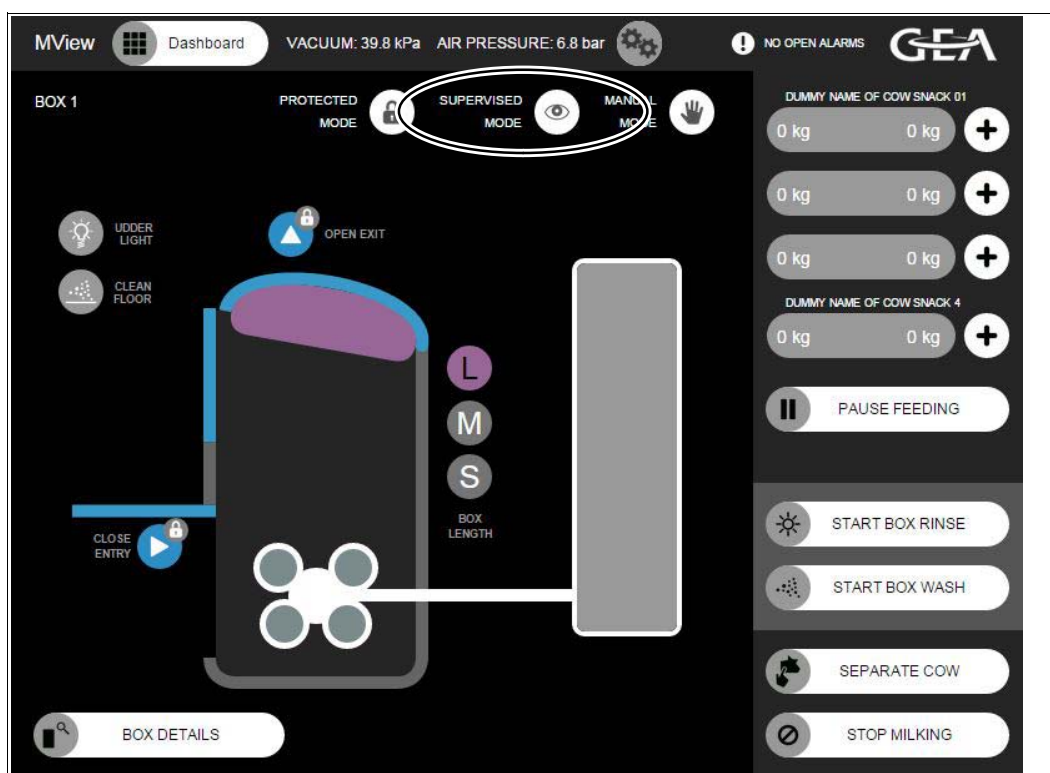
Note!

Animals in milking boxes (mode: automatic) that need to have the cluster applied manually are not let straight back out again but kept waiting for manual application.

- Check whether all expected animals have been milked.
 - System program "Queue"

Cow number	Time since last complete	Entitlement MilkAccess	Specifiers	Destination	# incomplete milkings	Location
6	67.98	true	BlockExit	Milchbank	2	1 B
110	40.20	true	BlockExit	Milchbank	1	1 Z
160	529.59	true	BlockExit	Milchbank	1	1 C
172	264.20	true	BlockExit	Milchbank	1	1 B
178	266.03	true	BlockExit	Milchbank	1	1 Z
181	266.01	true	BlockExit	Milchbank + Acluse	1	1 Z
182	266.24	true	BlockExit	Milchbank + Acluse	1	1 Z
183	266.30	true	BlockExit	Milchbank	1	1 Z
188	265.05	true	BlockExit	Milchbank	1	1 B
194	266.46	true	BlockExit	Milchbank	1	1 Z
199	264.40	true	BlockExit	Milchbank	1	1 B

Ending monitored milking



4.10 Milking animals without responders

If an animal without a responder enters the milking box, the input pane shown alongside is displayed.

An animal number can be entered manually before the time period expires (progress bar display).

The milking visit is carried out making allowances for the settings for individual animals.

If no input is made, the animal is released from the milking box when the time expires.

ENTER COW NUMBER

PlaceControlUnit_1: An animal was detected but couldn't be identified. Please enter an animal number or the animal will be auto released.

AUTO RELEASE IN 19 SECONDS

7 8 9

4 5 6

1 2 3

0 DEL

✓ OK

Operation

Letting an animal out manually (e.g. exit block)

4.11 Letting an animal out manually (e.g. exit block)

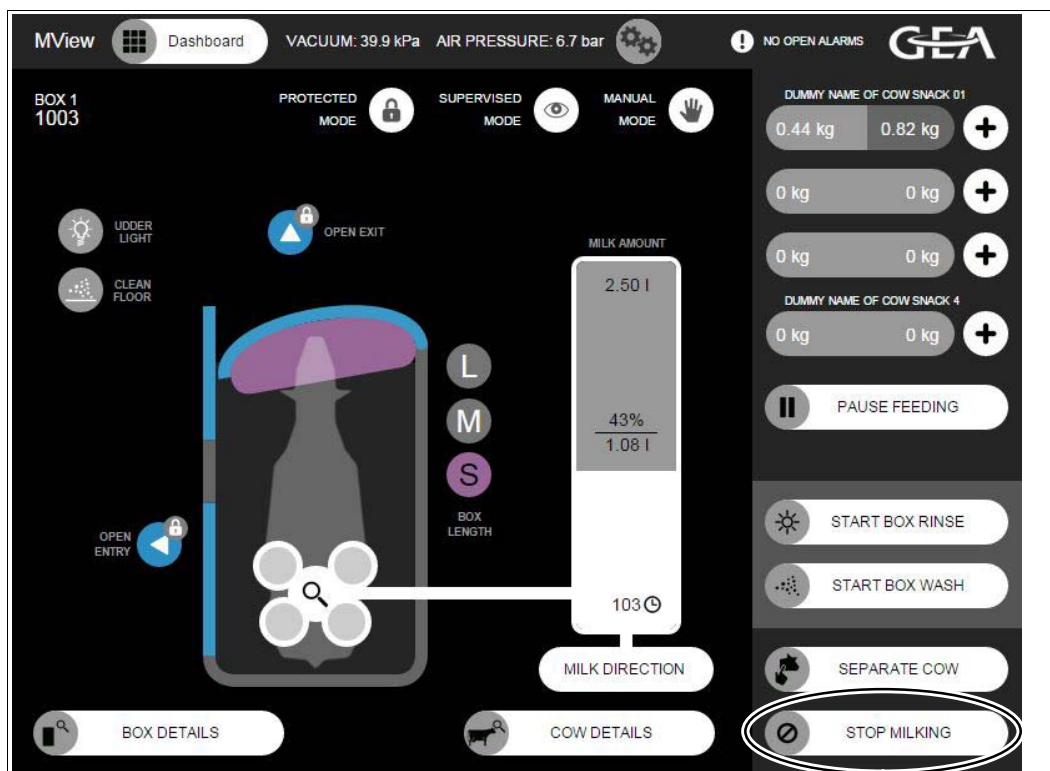
When an animal is let out of the box manually, the system program always considers the milking to be complete and the animal does not have milking authorization again until the minimum milking interval has been reached.

If the animal has to be milked again (e.g. because milking was incomplete), set the milking authorization manually.



For further information, please refer to section:
Milking in automatic mode

Letting an animal out manually



4.12 Taking calf milk

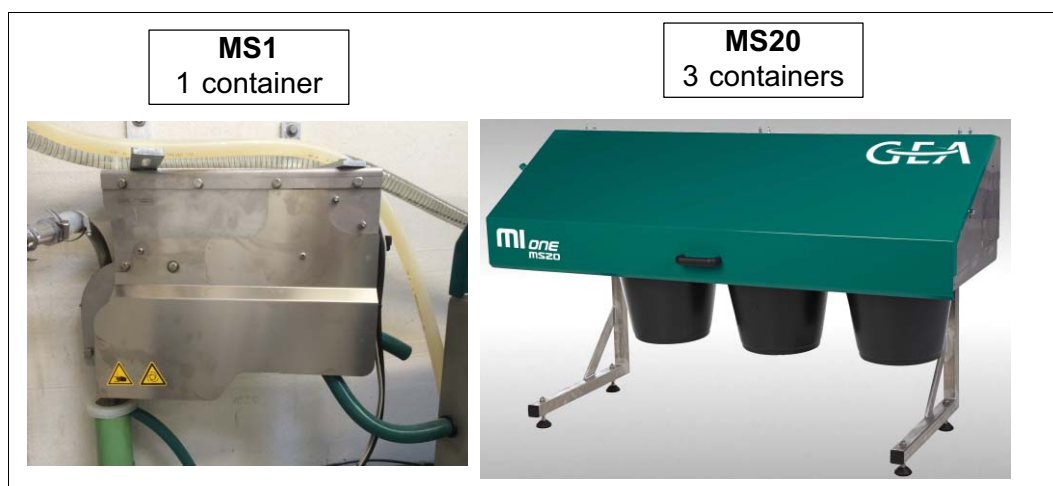
If calf milk is taken from an animal, a milk separator must be connected to the automatic milking system and a corresponding setting made in DairyPlan -> DPSingle.

When this animal is milked, calf milk is taken automatically.

Milk separation type

Three types of milk separation are available:

- Milk separation MS1
 - calf milk taken from all animals in one container
- Milk separation MS 20
 - calf milk taken in three containers
(can be expanded up to 9 containers)
- Milk separation as a combination of both systems MS1 / MS20
 - Taking calf milk from all animals in one container using MS1 milk separation (e.g. for a calf milk taxi).
 - The calf milk from individual animals is sent to the MS20 milk separator.



For further information, see the following manual:
7801-90 . . -011 Milk separation

Start the short clean after milking.
automatically using animal setting)



See section on:
Clean

4.13 Separating of non-saleable milk



Important! Suspected inhibitors

If the milk is suspected of containing inhibitors, a short clean of the milk-bearing areas is not sufficient!

In such a case, the animals must be milked and a system clean started immediately after milking.

If the milk of some animals in the herd is suspected of containing inhibitors, the following milking order is recommended:

- milk inconspicuous animals



For further information, please refer to section:
Milking in automatic mode

- milk newly lactating animals



For further information, please refer to the relevant part of this section.

- milk sick animals that are not receiving treatment



For further information, please refer to the relevant part of this section.

- milk animals that have received medication and whose milk is subject to a delay time



For further information, please refer to the relevant part of this section.

Milking sick animals (not receiving treatment) and newly lactating animals (milk not suspected of containing inhibitors)

The milk from sick and newly lactating animals must be collected separately using the calf milk unit or directed to the drain.

Enter the corresponding settings in Dairyplan -> DPSingle.

- Set the milk channel
 - If Drain is selected:
The animal is milked in accordance with the settings and the milk is directed into the drain.
 - When calf milk unit is selected:



For further information, please refer to section:
Taking calf milk

- After milking these animals, start a short clean.
automatically using animal setting)



For further information, please refer to section:
Clean

**milk animals that have received medication and whose milk is subject to a delay time
(milk suspected of containing inhibitors)**

All animals whose milk is subject to a delay time because of treatment must be milked directly before a system clean!

Enter the corresponding settings in Dairyplan -> DPSingle.



Attention!

The milk of animals who received treatment and are subject to a delay time must be directed into the drain!

Collecting the milk using the calf milk unit is not permitted!

- Set the milk channel

If Drain is selected:

The animal is milked as described and the milk is directed into the drain.



Note!

Settings that change this process may not be reset when milking animals that received medication (milk suspected of containing inhibitors)!

- Milk animal

There are several ways of milking in the recommended order.

An example is given below:

- Set the animal to manual application
- Activate monitored milking



See section on:
Monitored milking

- After milking these animals, a system clean must be started.
(automatically using system settings)



Attention!

Because of the risk of carryover, a subsequent short clean is not sufficient!



For further information, please refer to section:
Clean

4.14 Sampling

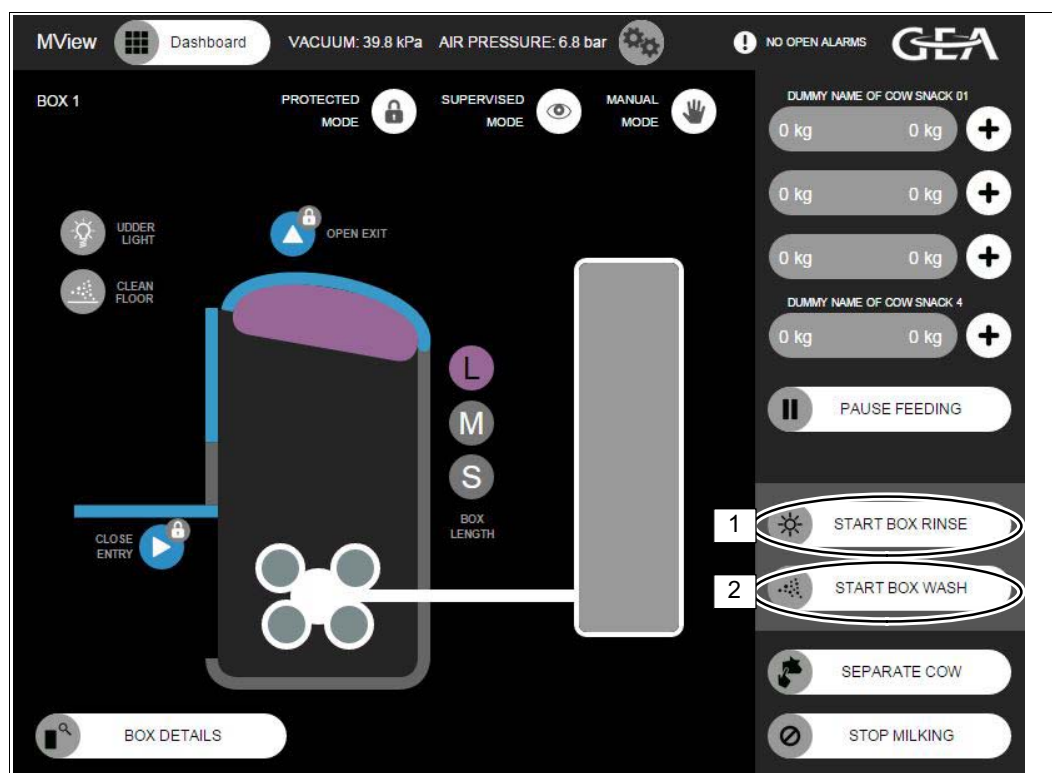
7821-2503-000



See instructions for further information on the subject
7801-90 . . -045

4.15 Clean

Start box rinsing/cleaning manually



Legend:

1	Start / stop box rinsing (with water only)
2	Start / stop box cleaning (with cleaning agent)



Note!

The required cleaning objective might not be achieved if the short clean is ended early.



Attention!

If a short clean is interrupted (e.g. power failure), the short clean must be repeated once the automatic milking system has restarted.

System cleaning

The screenshot shows the GEA MView dashboard for system cleaning. At the top, there's a navigation bar with 'MView', 'Dashboard', and a settings icon. A status bar indicates 'NO OPEN ALARMS'. The main content area is divided into three sections: 'SYSTEM CLEANING', 'SHORT CLEANING INTERVAL', and 'SCHEDULED CLEANINGS'. The 'SYSTEM CLEANING' section includes 'LAST CLEANING:' and 'NEXT CLEANING:' labels, and a 'START SYSTEM CLEANING' button circled with a '1'. The 'SHORT CLEANING INTERVAL' section shows 'SHORT CLEANING INTERVAL: 50' and a 'CHANGE INTERVAL' button. The 'SCHEDULED CLEANINGS' section has an 'EDIT SCHEDULE' button circled with a '2'. Below these is the 'CLEANING HISTORY' section, which has two tabs: 'HISTORY PER BOX' and 'SYSTEM HISTORY'. The 'HISTORY PER BOX' tab is active, showing a table of cleaning events. The table has columns for Date, Type, Box number, Overflows, Dumps, and Cleaning duration. The data shows four cleaning events on dates 14.06.2015, 17.06.2015, 18.06.2015, and 19.06.2015, all of type 'Short'. The 'Box number' is 2 for the first three events and 3 for the last. 'Overflows' and 'Dumps' are consistently 2 and 4 respectively. 'Cleaning duration' is 03:54 for all events. At the bottom, there are navigation buttons for pages 1, 2, and 3.

SYSTEM CLEANING
LAST CLEANING:
NEXT CLEANING:

1
START SYSTEM CLEANING

SHORT CLEANING INTERVAL
SHORT CLEANING INTERVAL:
50

CHANGE INTERVAL

SCHEDULED CLEANINGS

2
EDIT SCHEDULE

CLEANING HISTORY

HISTORY PER BOX

SYSTEM HISTORY

[missing "en-US.cleaning.box.filter.all" translation] PlaceControlUnit_1

Date ▼	Type	Box number	Overflows	Dumps	Cleaning duration
14.06.2015	Short	2	2	4	03:54
17.06.2015	Short	2	2	4	03:54
18.06.2015	Short	2	2	4	03:54
19.06.2015	Short	3	2	4	03:54

« 1 2 3 »

Legend:

- | | |
|---|---|
| 1 | A system clean is started or stopped manually via the system program. |
| 2 | Automatic system cleanings can entered here. |

4.16 Feeding in the automatic milking system

4.16.1 Calibrate feed type

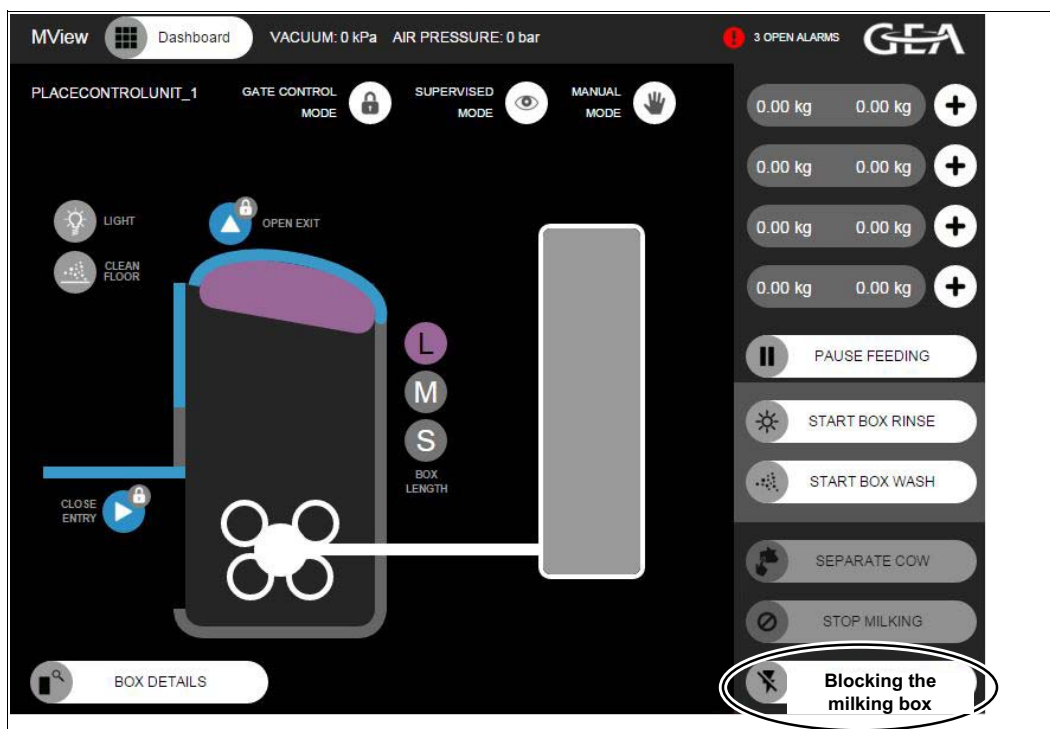
A feed type can be calibrated for one or all milking boxes.



Note!

Only use the feed concentrate conveyor with feed concentrate pellets. Other forms of feed are not suitable.

Blocking the milking box

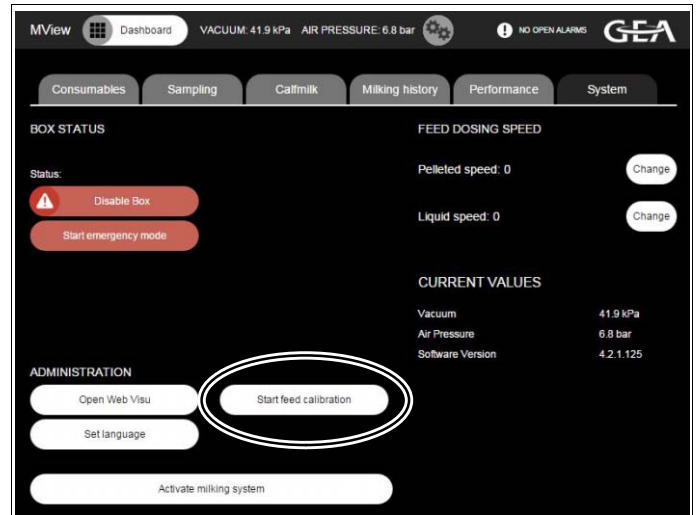


Note!

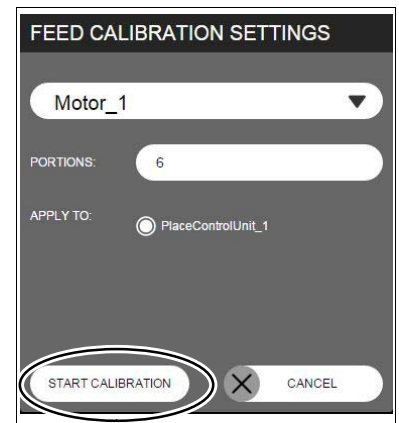
It is absolutely essential that the feed trough is empty before starting to calibrate the feed!

Calibrate feed type

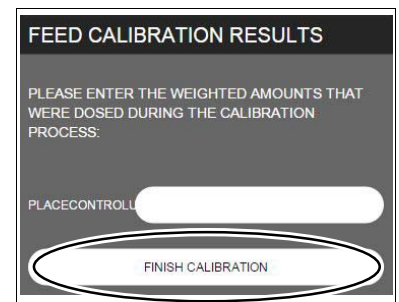
- Start the feed type calibration



- Select the feed type and box
- Start calibrating.



- Weigh the dispensed feed.
- Enter the feed quantity.
- Stop calibrating.



Notes!

An alarm message might appear on the alarm list.
Code: 4019 - 4022

What to do after an alarm message (4019 - 4022)

The feed quantity entered is too small for the calibration.

- Reduce delivery speed



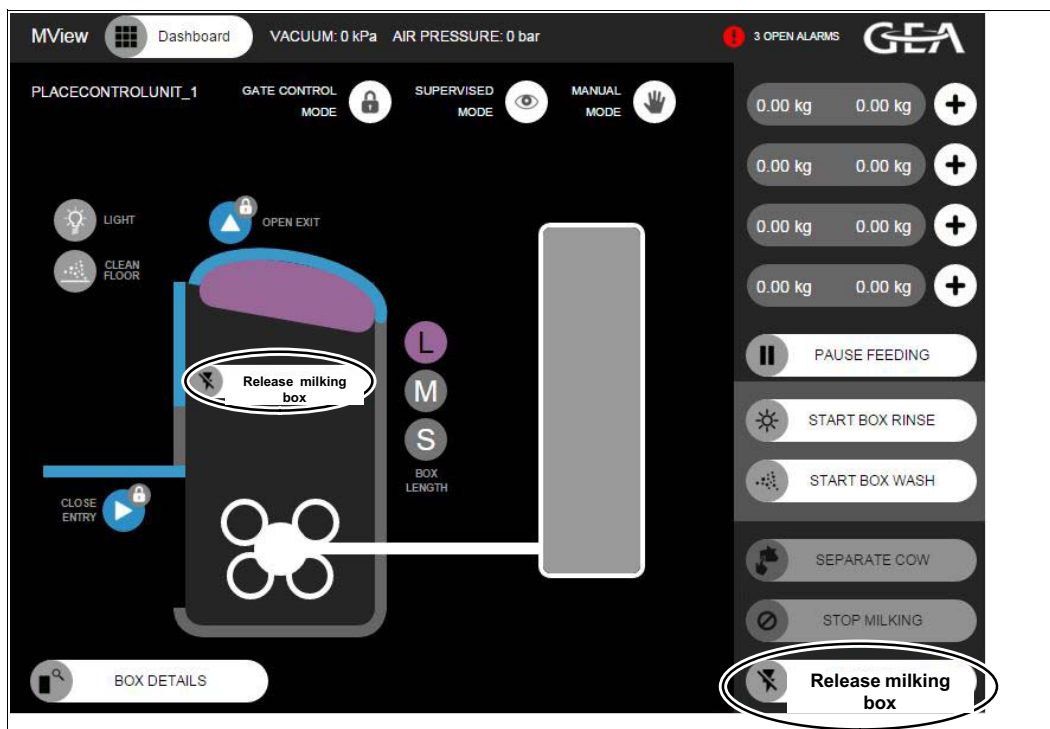
Notes!

Can only be entered on the system computer!

- Recalibrate feed type

Repeat the procedure until calibration ends without an alarm message being given.

Release milking box



4.16.2 Feeding - filling the storage container

The downpipe leads into a pipe which serves as the storage tank.

Example:
Feed concentrate dispensers



Attention!

Compression caused by feed falling down may block the operation of the feed dispenser.

Close all shut-off valves before filling a completely empty storage container.

4.16.3 Optimizing feeding

Feeding can be specifically adjusted to special requirements on the system computer with DPSetup.

Continuing feeding after milking has ended

Feeding can be continued after milking has ended.

**Note!**

The animal stays in the box for longer when this function is enabled.

- Change the setting



For more details see the following Chapter:
Enter basic settings 100/100/057

Feeding manual cows

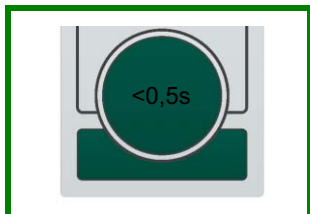
The possibility of a feeding manual cow in the milking box can be restricted.



For more details see the following Chapter:
Enter basic settings 100/100/059

Setting		Effect
0	Never (Default setting)	No feeding
1	only when the animal has been milked	Feeding started: manually
2	always	Feeding started: automatically

Operation (feeding started: manually)



4.17 Herd management with the herd management PC and DairyPlan

The DairyPlan herd management program is installed on an external PC.

A permanent connection between the computers is set up to organize herd management of the milking system with DairyPlan.

4.17.1 Updating data



For information on operation and settings, please refer to the instructions:

7160-90 . . -530 DairyManagementSystem

7160-90 . . -539 DairyManagementSystem

Deleting an animal data record



Setup in the DP menu under:
"DPMenue: Cow / Sire-> Delete"



Attention!

Deleting an animal record with first making it "inactive" may cause synchronization problems!

Always delete animal records as described!

1. Make the animal "inactive"

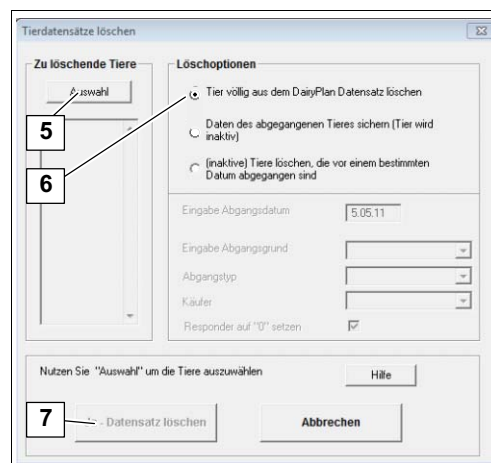
- Call up animal record (1)
- Select "Animal is becoming inactive" (2)
- Enter departure date (3)
- Click the button (4)
 - The system computer will automatically delete inactive animals that have not visited the milking system for more than 7 days after the departure date.

Data records can be re-established within 7 days without losing any information.

2. Delete animal

The animal record can be definitively deleted on the herd management PC at the earliest one day after the departure date.

- Call up animal record (5)
- Select "Delete completely" (6)
- Delete record (7)
 - The record is irrevocably deleted!



Note!

Responder, rescounter or neckband numbers can be used again.
See section on: Reassigning an animal ID

Changing an animal ID

1. Make the animal "inactive"



See section:
Deleting an animal data record

2. Changing an animal ID

- The inactive animal's number can be changed on the herd management PC at the earliest one day after the departure date.



Setup in the DP menu under:
"DPMenue: Cow / Sire"

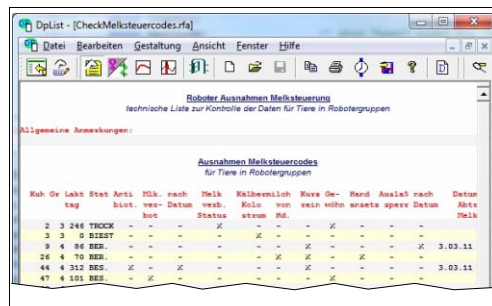
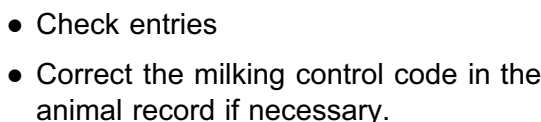
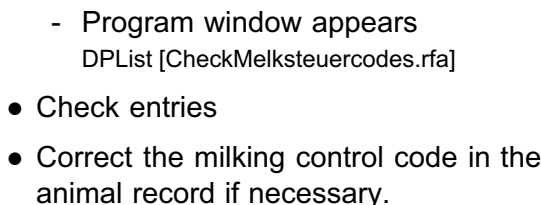
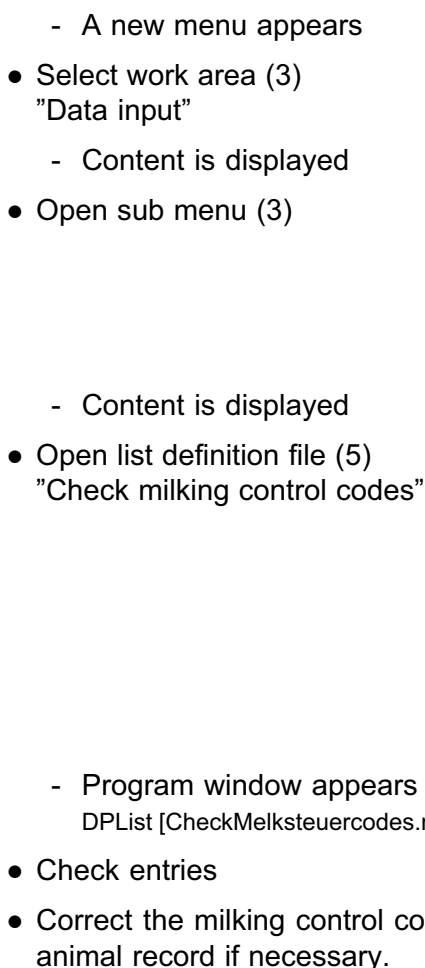
3. Reassigning animal ID

The IDs of deleted animals can be reassigned
And another animal managed under the same ID.

Milking control codes should be checked on the system computer and herd management PC every week, as described.

- After an automatic security check a warning appears on the herd management PC screen
- When the data connection has been re-established if data were processed when there was no connection.

- Open selection menu (1)
- Select menu



4.17.2 Back-up



Attention!

Loss of the whole data base.

Data records on the computer hard disk or on the back-up media can get damaged and become unreadable.

So save the data on different data carriers. It is best to backup the data every day!



For further information see manual

7160-90 . . . -539 DairyManagementSystem

4.18 Restarting milking after a power failure

Milking must be started again if it has been interrupted because of a power failure or similar event.



For further information, please refer to section:

Temporary decommissioning

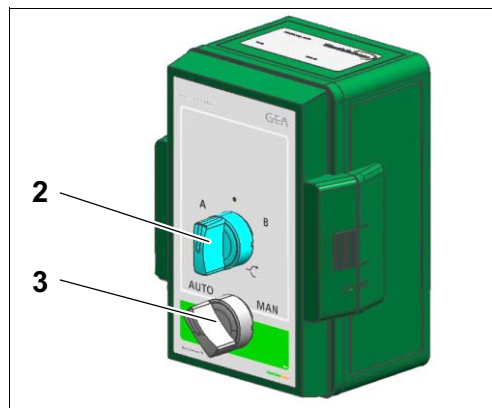
4.19 Animal segregation

Control unit

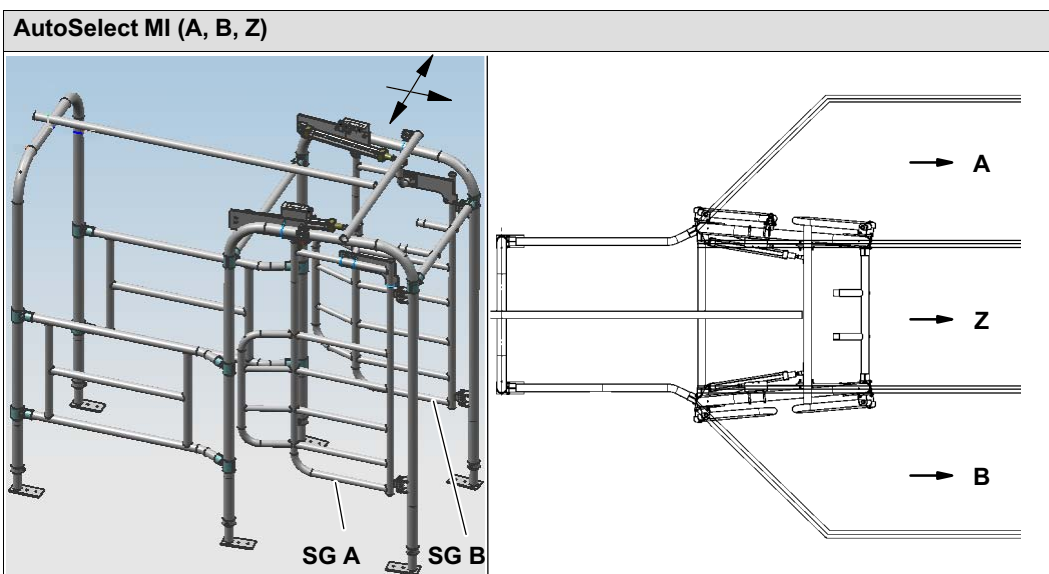
- 2 Push-button for segregation gate control

Selection of the segregation gate to be controlled

- 3 Switch for automatic/manual operation



Segregation passageways



4.19.1 Operating



Danger!

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



Automatic mode

In automatic mode, no manual intervention is necessary.



Note!

Switch "2" must be in the central position in automatic mode.

Manual mode

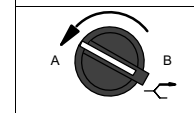
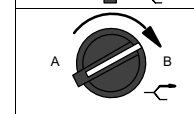
Switch on manual mode

- Move the switch (3 - MAN)
 - Segregation gates close
- Display (Single):
Manual mode = 14



Open/close segregation gate

- Switch in centre position - Segregation gates closed.
- Move the switch (2)
 - Segregation gate opens (SG B)
 - Segregation gate closes (SG A)
- Move the switch (2)
 - Segregation gate opens (SG A)
 - Segregation gate closes (SG B)



Switch on automatic mode

- Move the switch (3 - AUTO)
 - Segregation gates close



Specify selection flag

Animals to be segregated must be allocated a selection flag.

The selection flag is assigned using the milking control unit or DairyPlan.

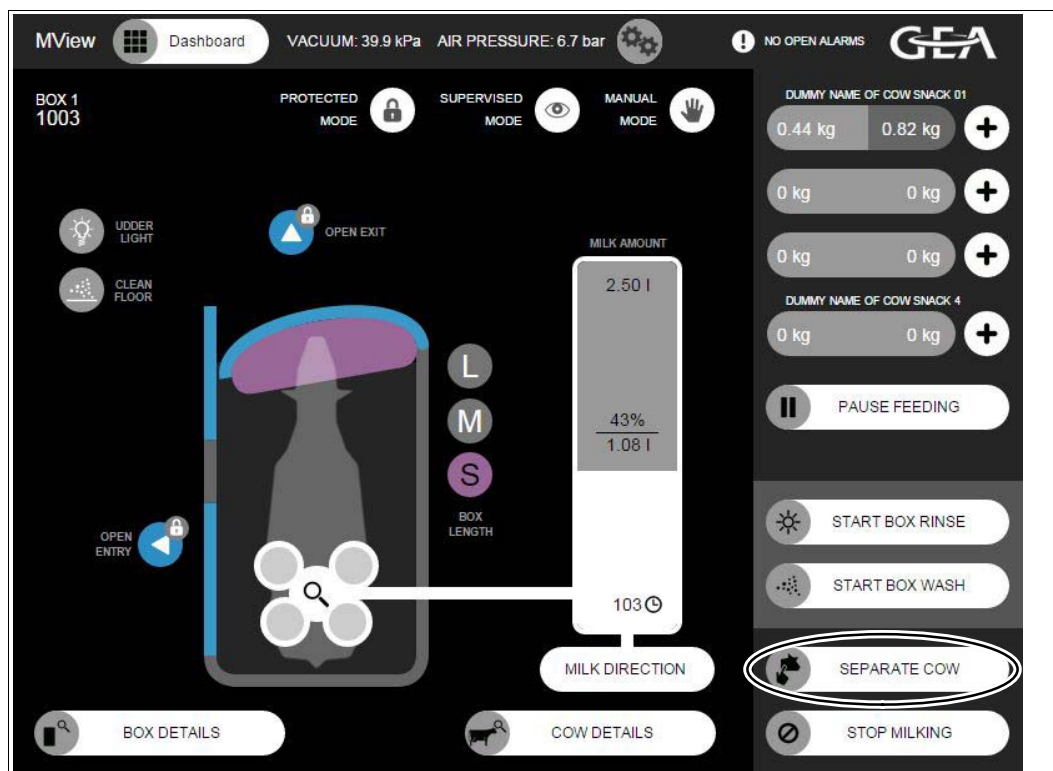
DairyPlan



DPSingle: Details->Process Control



Additional sections:
Commissioning



5 Operating faults

If necessary, please contact your nearest authorized technical dealer.

5.1 Special personnel qualification required for troubleshooting

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

- Participation in corresponding product training is necessary.



See also the section on "Personnel qualification".

5.2 Safety Instructions for Troubleshooting

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

- 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.
- Secure the range of action for any moving parts.



Also read the chapter on "Safety".

Entry into danger areas



Danger!

The danger area may only be entered if the installation has been switched to "Maintenance" mode at the key switch on the control cabinet.

"Automatic" Mode"	"Maintenance" mode

In "Maintenance" mode all the gates operate with greatly reduced pressure in order to avoid crushing injuries.

- Turn the key switch to the right to the "Service" position.
- Withdraw the key.



Particular hazards during 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.
- Compressed air/gases/vapours/... discharged can cause serious physical injury.
- Contact with cleaning agents may cause caustic burns.
- Unsecured manual operation means a higher risk of injury due to crushing/shearing/being pulled in/...
- Electrostatic processes may damage electronic components.

**Attention!**

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

- There are special risks from direct contact with the animal (crushing, risk of kicking or knocking).

5.3 Fault messages and troubleshooting help



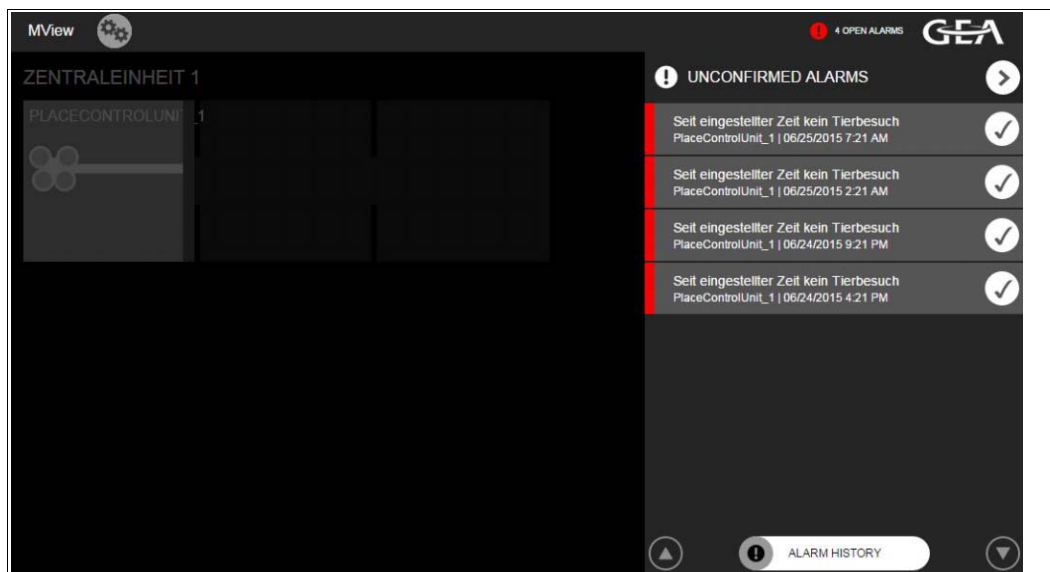
For further information, see the following manual:

7820-90...-005 DairyProQ Automatic milking system - milking place module

**Note!**

If a code appears that has not been listed, please contact your authorized technical dealer.

5.4 Alarms



Alarm list

The controller records irregularities in the milking system with corresponding alarm messages in the alarm list.



Attention!

The alarm list should be checked several times a day and causes removed if necessary.

5.4.1 Checking the alarm list

Safety instructions for repairing faults

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

- First of all make sure that the Doors to the milking boxes and the application robot cannot accidentally start moving again.
- Ensure that safe disconnection can be carried out by a second person at any time.
- Secure the range of action for any moving parts.



Also read the chapter on "Safety".

Particular hazards during 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.
- Contact with cleaning agents may cause caustic burns.
- There are special risks from direct contact with the animal (crushing, risk of kicking or knocking).

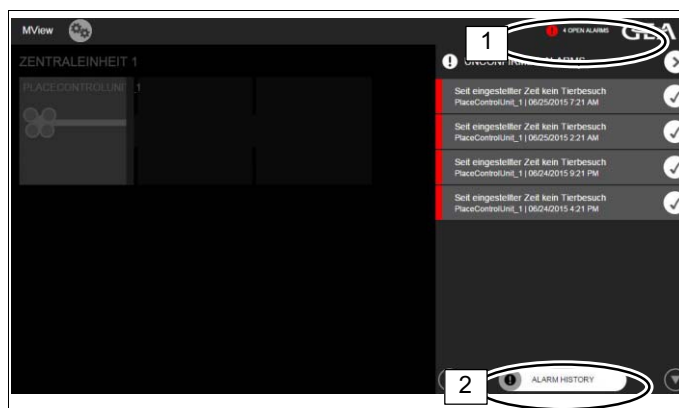
Working with alarms

Alarms that occur are displayed in a pop-up window

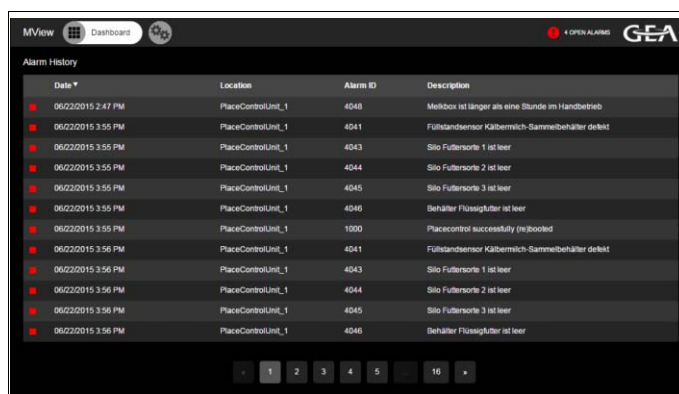
- Confirm:
 - Alarm is now only shown in the alarm history
- Dismiss:
 - Alarm is shown in the list of unconfirmed alarms



- Display of unconfirmed alarms (1)
- Display of all alarms (2)

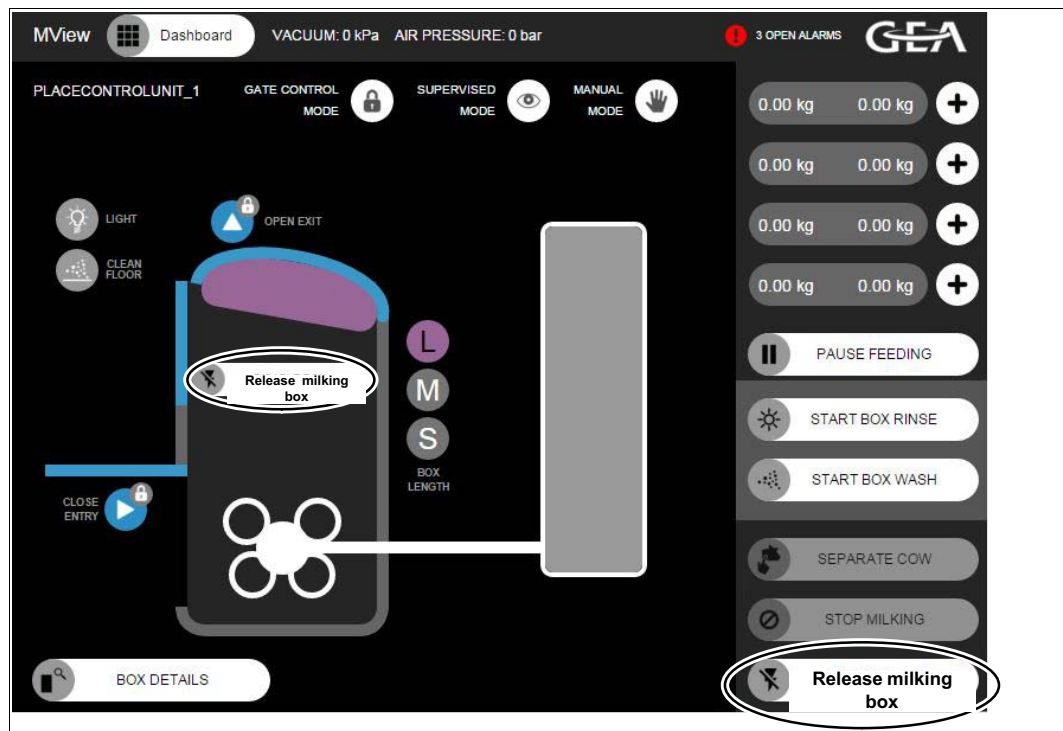


- Overview of all alarms



5.4.2 Release milking box

If a milking box has been locked automatically it must be released in order to continue milking.



5.4.3 Alarms



Notes!

- Assistance should always be provided by the authorized technical dealer.
If the operator is authorized to provide assistance, this will be indicated.
- The table only shows a selection of alarm messages.
Please contact the authorized technical dealer if an alarm message appears which is not described in the table.
- The text of the message shown on the system computer may differ from the text shown in the table.

code	Message	Possible Cause	Remedy (by)
4000	No automatic operation for one hour	System mode is switched off	Switch on system operation (operator)
4001	Milking box entrance door cannot be opened (guided exit only)	Animal standing in the passageway	Drive the animal out of the passageway.
4002	Milking box entrance door does not open	<ul style="list-style-type: none"> • Door blocked • Defective limit switch 	<ul style="list-style-type: none"> • Check compressed air • Contact the technical dealer
4003	Not visited by any animal since the set time		
4004	Milking box entrance door does not close	<ul style="list-style-type: none"> • Door blocked • Defective limit switch 	<ul style="list-style-type: none"> • Check compressed air • Contact the technical dealer
4005	Milking box exit door cannot be opened (guided exit only)	Animal standing in the passageway	Drive the animal out of the passageway.
4006	Milking box exit door does not open	<ul style="list-style-type: none"> • Door blocked • Defective limit switch 	<ul style="list-style-type: none"> • Check compressed air • Contact the technical dealer
4007	Animal does not leave the milking box	Cow driver switched off or faulty	<ul style="list-style-type: none"> • Take animal out of the milking box • Switch on cow driver
4008	Milking box exit door does not close	<ul style="list-style-type: none"> • Door blocked • Defective limit switch 	<ul style="list-style-type: none"> • Check compressed air • Contact the technical dealer
4009	Milking box has been blocked for more than one hour		Release milking box
4010	Entrance door repeatedly could not be closed Box blocked	<ul style="list-style-type: none"> • Door blocked • Defective limit switch 	<ul style="list-style-type: none"> • Release milking box
4011	Exit door repeatedly could not be closed Box blocked	<ul style="list-style-type: none"> • Door blocked • Defective limit switch 	<ul style="list-style-type: none"> • Release milking box
4012	Box has been locked automatically		<ul style="list-style-type: none"> • Check application arm • Release milking box
4013	An exit block has been set for the animal in the box	Exit block set for animal	<ul style="list-style-type: none"> • Release animal

Operating faults

Alarms

code	Message	Possible Cause	Remedy (by)
4014	Several incomplete milkings in succession	Teat liner connection released	<ul style="list-style-type: none"> • Check milk arm • Release milking box
4015	Entrance door end position sensor faulty		
4016	Exit door end position sensor faulty		
4018	Milking box has been in emergency mode for more than one hour		
4019	Feed calibration quantity 1 too small, will be increased automatically	The dispensing speed cannot be maintained with the set feed calibration quantity; feed calibration quantity is increased automatically	Increase the feed calibration quantity automatically or reduce the dispensing speed
4020	Feed calibration quantity 2 too small, will be increased automatically	The dispensing speed cannot be maintained with the set feed calibration quantity; feed calibration quantity was increased automatically	Increase the feed calibration quantity or reduce the dispensing speed
4021	Feed calibration quantity 3 too small, will be increased automatically	The dispensing speed cannot be maintained with the set feed calibration quantity; feed calibration quantity was increased automatically	Increase the feed calibration quantity or reduce the dispensing speed
4022	Feed calibration quantity 4 too small, will be increased automatically	The dispensing speed cannot be maintained with the set feed calibration quantity; feed calibration quantity was increased automatically	Increase the feed calibration quantity or reduce the dispensing speed
4023	Collecting tank for tank milk overfull	<ul style="list-style-type: none"> • Severe build-up of foam • Defective level sensor • Milk pump frequency converter failed 	<ul style="list-style-type: none"> • No remedy needed • Contact the technical dealer
4024	Collecting tank for calf milk overfull	<ul style="list-style-type: none"> • Severe build-up of foam • Defective level sensor • Failed milk pump 	<ul style="list-style-type: none"> • No remedy needed • Contact the technical dealer
4025	Sampling not confirmed for milking	Information	
4026	Animal without a responder in the box		
4027	Both light scanners incorrectly adjusted or animal identified outside the box		Test light scanners
4028	The "Cow detection rear" light scanner is incorrectly set		

code	Message	Possible Cause	Remedy (by)
4029	The "Cow detection front" light scanner is incorrectly set		
4031	Emergency off actuated	<ul style="list-style-type: none"> • Emergency stop circuit active • Broken cable 	<ul style="list-style-type: none"> • Resetting the emergency stop circuit • Change cable
4032	Supply unit cannot be reached		Milk in emergency mode until the fault is remedied
4033	Herd management computer cannot be reached		Milk in emergency mode until the fault is remedied
4034	Trough door blocked		
4035	Trough door index sensor faulty		
4036	Supply unit shaft drives failure		
4037	Milk pump runs dry		
4038	VFD tank milk pump fault		
4039	VFD calf milk pump fault		
4040	Level sensor at tank milk collecting tank faulty		
4041	Calf milk collecting tank level sensor faulty		
4042	Trough door end position sensor faulty		
4043	No feed 1 available	Feed type 1 silo empty	Fill with feed
4044	No feed 2 available	Feed type 2 silo empty	Fill with feed
4045	No feed 3 available	Feed type 3 silo empty	Fill with feed
4046	Liquid feed tank empty		Fill tank
4047	Feed calibration starts automatically as soon as the milking box is free		
4048	Milking box has been in manual mode for more than one hour	Information	No remedy needed
4049	Milking box has been in monitored milking for more than one hour		
4050	Milking box longer than a quarter of an hour in protected mode		
4051	Cleaning cannot be started because the milking box is in protected mode		Switch off protected mode
4052			
4053			
4054			

Operating faults

Alarms

code	Message	Possible Cause	Remedy (by)
6001	Milk pressure line to the milk cooling tank not released	<ul style="list-style-type: none"> • Milk cooling tank is being emptied or cleaned • Compressed air supply failed 	Re-establish compressed air supply
6002	Test vacuum supply	<ul style="list-style-type: none"> • Actual value deviates too much from set value • Check sensor • Check vacuum supply 	Check vacuum supply
6003	Vacuum supply failed	Vacuum supply failed	Check vacuum supply
6006	Compressed air pressure drop or failure	<ul style="list-style-type: none"> • Compressed air line or valves defective • Compressor failed • Sensor faulty 	<ul style="list-style-type: none"> • Check compressed air line, connections and valves for leaks • Check the compressor (read off the pressure gauge)
6011	Tank valve not switching towards the tank	<ul style="list-style-type: none"> • Tank valve faulty or not supplied with compressed air • Tank valve sensor faulty or not connected 	<ul style="list-style-type: none"> • Check tank valve and sensors • Check compressed air
6012	Tank valve does not switch towards rinsing line	<ul style="list-style-type: none"> • Tank valve faulty or not supplied with compressed air • Tank valve sensor faulty or not connected 	<ul style="list-style-type: none"> • Check tank valve and sensors • Check compressed air
6013	Water flowing although not requested	Leak	<ul style="list-style-type: none"> • Repair leak • Replace defective parts
6015	Time-out error while filling: cleaning tank	<ul style="list-style-type: none"> • Water supply interrupted • Drain valve is open • Level sensor defective or dead 	<ul style="list-style-type: none"> • Check the water supply • Check level sensors • Replace defective parts
6017	System cleaning not started because of a locked box	Box blocked	<ul style="list-style-type: none"> • Put box back into automatic mode • Rectify any faults first
6018	System clean started	Cleaning has started	No remedy needed
6022	Main milk tank drained	Info	No remedy needed
6023	Milk tank alarm!	<ul style="list-style-type: none"> • Milk tank full • Milk tank out of operation or faulty 	<ul style="list-style-type: none"> • Empty the milk tank • Milk tank: repair the fault and reset the alarm
6024	Vacuum pump alarm	Vacuum pump outlet alarm activated	<ul style="list-style-type: none"> • Repair fault • Reset alarm
6025	Milking vacuum (vacuum pump) failed	<ul style="list-style-type: none"> • Power supply failure • Pump defective • Vacuum sensor defective 	<ul style="list-style-type: none"> • Check the power supply to the pump, switch on if necessary • Check vacuum pump • Replace defective parts
6026	Hot water supply faulty		
6027	Cold water supply faulty		
6028	Milk filter needs replacing		
6029	Milk filter replaced		

code	Message	Possible Cause	Remedy (by)
6030	System cleaning outside the limit values → check the cleaning record		
6031	Box cleaning outside the limit values → check the cleaning record		
6032	Automatic system cleaning is ignored because of a manual system cleaning in the last 4 hours		
6033	Incomplete system cleaning	System cleaning was cancelled	Repeat system cleaning
6034	Cleaning tank not emptied during pre-rinse/post rinse	Drain valve or water inlet valve faulty	Check sensors and valves
6035	Cleaning tank not emptied during main cleaning	Foam formation in cleaning tank	Repeat cleaning
6036	Velos components were replaced		

5.5 Opening the control cabinet without switching off the milking system



Danger!

The function described below is intended for specialist personnel only.

Opening the control cabinet without switching off the milking system

Position for opening the control cabinet without switching off the milking system.

This function is only intended for specialist personnel if investigating a fault during operation is possible.

In all other cases, only open the control cabinet when the milking system is switched off.



5.6 Frequency converter parameters

5.6.1 Programming tool for frequency converter



Attention!

Parameters may only be changed by authorized technical personnel and only in consultation with GEA FARM TECHNOLOGIES GMBH.
Incorrect settings may cause damage to the system and loss of warranty!

A programming device is necessary for changing frequency converter parameters.

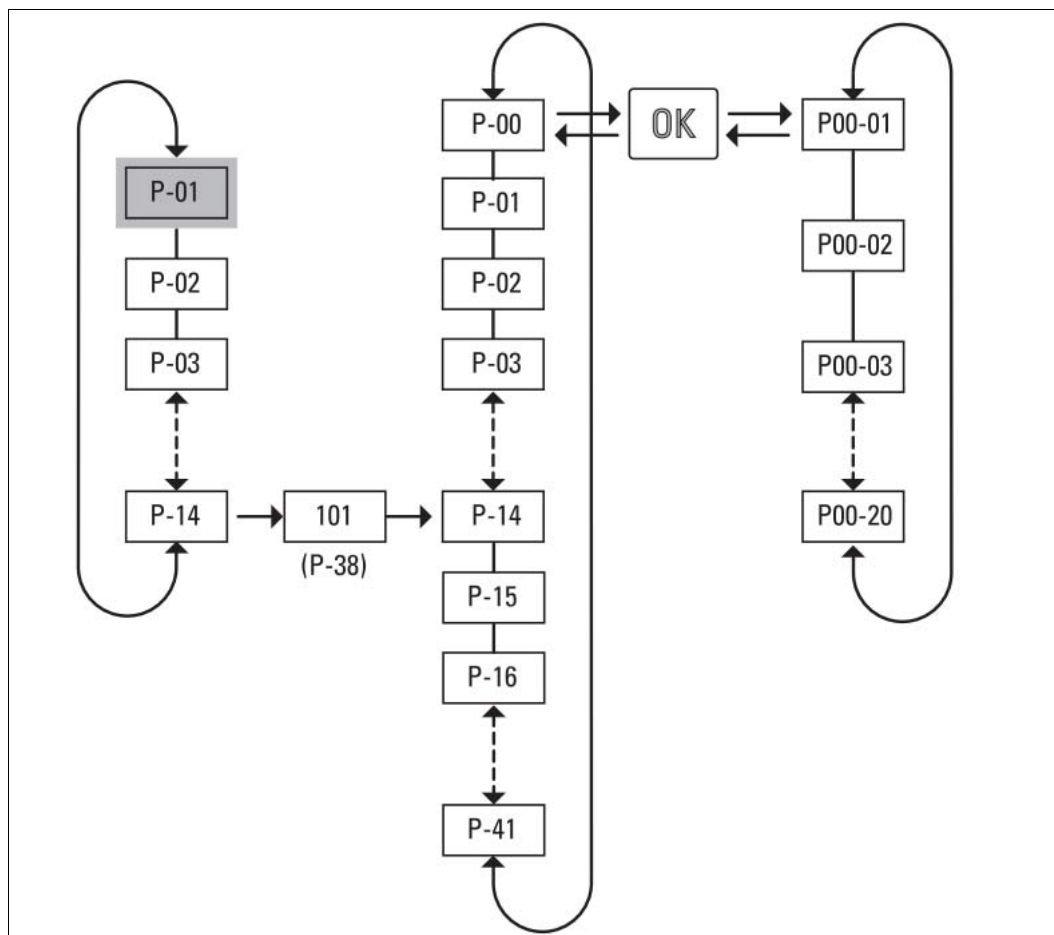
Part no.:

- 0005-8001-230



Programming the parameters

Menu structure



Changing parameters

- Connect the programming tool to the frequency converter with the cable supplied.
- Press and hold the "OK" key for 2 seconds.
- Select the desired parameter with the arrow keys.
- Call up the parameter with the "OK" button.
- Change the setting with the arrow keys.
- Save the changed parameter with the "OK" key.
- To leave programming mode, press and hold the "OK" key again for 2 seconds



Note!

The "I" and "O" buttons switch the frequency converter on and off manually.

They are not needed for programming.

5.6.2 Parameter list

Version for Europe (DE1 FS 1 230 V 0,75 kW)

The frequency converter parameters are set as follows, deviating from the factory setting:

ID	Value	Description
P-01	3000 rpm	f-max
P-02	0 rpm	f-min
P-03	3,0 s	t-acc
P-04	1,0 s	t-dec
P-05	1: Ramping	Stop Mode
P-06	1: Activated	Energy Optimizer
P-07	230 V	Motor Nom Voltage
P-08	2,6 A	Motor Nom Current
P-09	50 Hz	Motor Nom Frequency
P-10	2840 rpm	Motor Nom Speed
P-11	0,0 %	V-Boost
P-12	0: Terminals	ProcessDataAccess
P-13	0:00:00 No Fault (no-Flt) 0:00:00 No Fault (no-Flt) 0:00:00 No Fault (no-Flt) 0:00:00 No Fault (no-Flt)	Last Fault
P-14	101	Password

ID	Value	Description
P-15	2: FWD/REV/FF2^0/FF2^1	DI Config Select
P-16	0: 0-10V	AI1 Signal Range
P-17	1,000	AI1 Gain
P-18	0: 0V=min frequency / 10V=max frequency	AI1 Invert
P-19	0: High=ok / Low=Fault	DI3 Logic
P-20	2100 rpm	f-Fix1
P-21	2400 rpm	f-Fix2
P-22	2700 rpm	f-Fix3
P-23	3000 rpm	f-Fix4
P-24	0: Start at min speed	Digital Reference Reset Mode
P-25	0: OFF	DCBrake
P-26	0,0 s	t-DCBrake@Stop
P-27	0,0 %	DCBrake Voltage
P-28	0 Hz	f-DCBrake@Stop
P-29	3: 16 kHz	Switching Frequency
P-30	1: Auto-0	Start Mode
P-31	0: OV Controller Enabled	OvervoltageControl
P-32	0: Enabled	AutoThermalManagement
P-33	0: Thermal memory enabled	SwitchRemanentStorage
P-34	1	PDP-Address
P-35	4: 115.2 kBit/s	RS485-0 Baudrate
P-36	0: No action	Modbus RTU0 COM Timeout
P-37	0: No action	Parameter Set
P-38	101	Password Level2
P-39	0: All parameters can be changed	Parameter Lock
P-40	0: No reaction, continue work	Action@Communication Loss
P-41	0: Parameters are locked	ParameterAccess

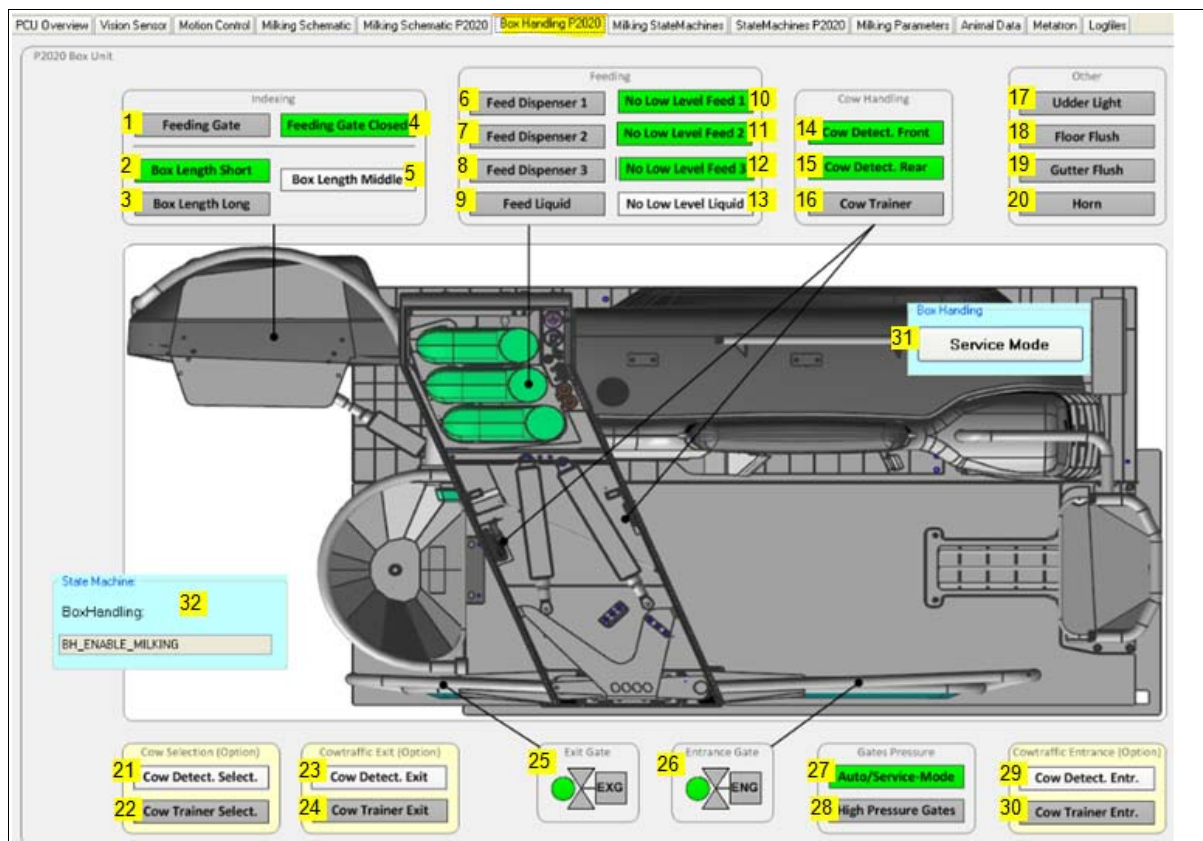
5.7 Process visualization

5.7.1 Milking box



For further information, see the following manual:
7820-90..-005 Automatic milking system DairyProQ - Milking place module

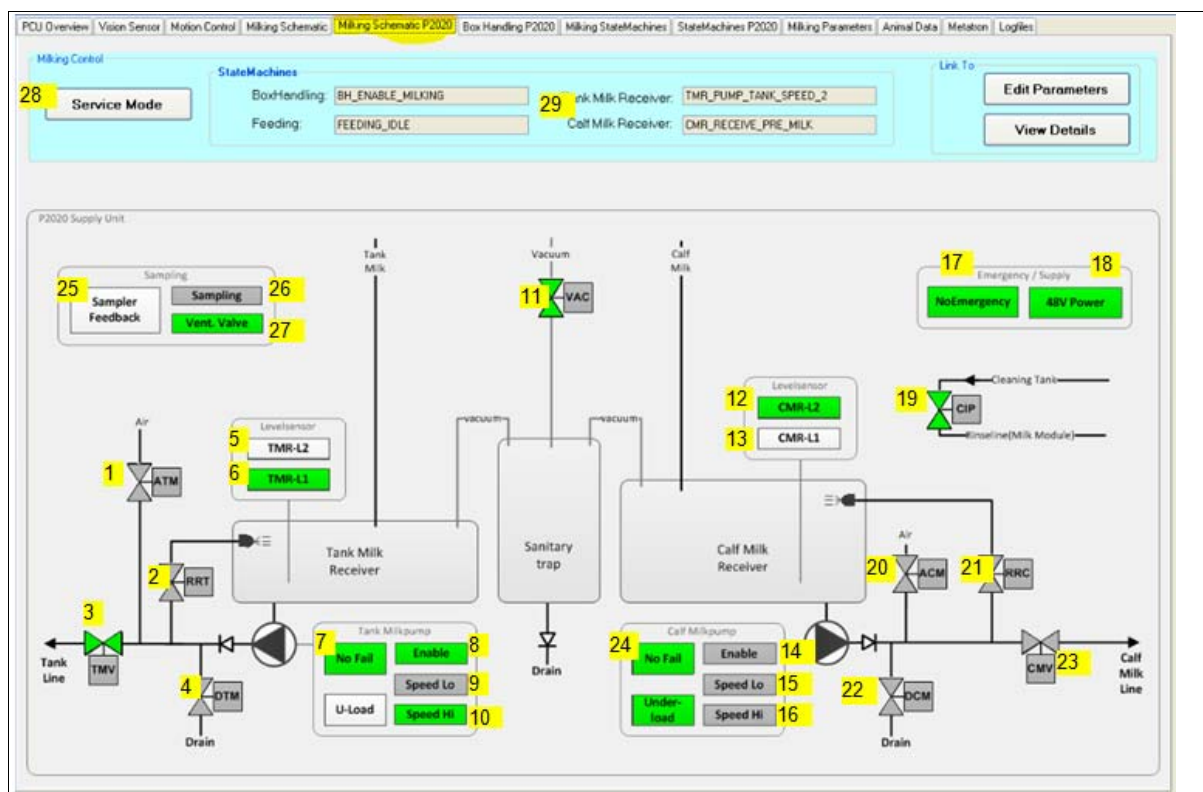
View Box Handling



	Milking box signals	Wiring systems		
		Designation	Input / Output	Sensor / valve
1	Trough door output signal	Feeding Gate (GT-XV-304)	-19A13 DO 10	-27Y2
2	Change box length to short output signal	Index Box length short (GT-XV-303)	-19A13 DO 08	-26Y8
3	Change box length to long output signal	Index Box length long (GT-XV-303)	-19A13 DO 09	-27Y1
4	Trough door closed input signal	Feeding Gate Closed (GT-XV-303)	-19A7 DI 04	-22B4
5	Change box length to middle input signal	Index Box length middle position (GT-XV-303)	-19A7 DI 03	-22B3
6	Feed dispenser type 1 feed output signal	Feed Dispenser 1 (FD-QC-601)	-19A17 DO 01	-14U1
7	Feed dispenser type 2 feed output signal	Feed Dispenser 2 (FD-QC-602)	-19A17 DO 02	-14U2
8	Feed dispenser type 3 feed output signal	Feed Dispenser 3 (FD-QC-603)	-19A17 DO 03	-15U1
9	Feed dispenser liquid feed output signal	Feed Liquid (FD-QC-604)	-19A17 DO 04	-15U2
10	Feed type 1 available input signal	No Low level Feed 1 (FD-LT-601)	-19A7 DI 10	-23B2

11	Feed type 2 available input signal	No Low level Feed 2 (FD-LT-602)	-19A7 DI 11	-23B3
12	Feed type 3 available input signal	No Low level Feed 3 (FD-LT-603)	-19A7 DI 12	-23B4
13	Liquid feed available input signal	No Low level Feed 4 (FD-LT-604)	-19A7 DI 13	-23B5
14	Front light scanner input signal (cow - front)	Cow detection Box Front (GT-NS-301)	-19A4 DI 16	-21B8
15	Rear light scanner input signal (cow - middle)	Cow detection Box Rear	-19A7 DI 08	-22B8
16	Cow trainer output signal	Cow Trainer Box (GT-XV-306)	-19A13 DO11	-32A1
17	Udder lighting output signal	Udder light (GT-OS-100)	-19A15 DO 03	-28H3
18	Floor cleaning output signal	Floor flush (GT-XV-302)	-19A13 DO16	-27Y8
19	Rear barrier cleaning output signal	Gutter Flush (GT-XV-305)	-19A17 DO 09	-31Y1
20	Horn output signal (optional)	Horn (Option) (GT-YY-100)	-19A13 DO 13	-27Y5
21	Selection light scanner input signal (for optional cow trainer selection - Guided Exit)	Cow detection selection (Option) (GT-NS-311)	-19A7 DI 02	-22B2
22	Cow trainer selection output signal (option)	Cow Trainer Selection (Option) (GT-XV-307)	-19A13 DO 12	
23	Exit door light scanner input signal (for optional cow trainer in passageway - Guided Exit)	Cow detection Exit (Option) (GT-NS-302)	-19A7 DI 01	-22B1
24	Cow trainer exit door passageway output signal (option)	Cow Trainer Exit (Option) (GT-XV-309)	-19A13 DO 15	
25	Exit door output signal	Exit Gate (GT-XV-301)	-19A13 DO 06	-26Y6
26	Entrance door output signal	Entrance Gate (GT-XV-300)	-19A13 DO 05	-26Y5
27	Pressure reduction toggle switch input signal (service/auto)	Service Automatic mode	-19A4 DI 12	-13S5
28	Doors pressure reduction output signal	Low/High Pressure Gates	-19A15 DO 01	-13Y2
29	Exit door light scanner input signal (for optional cow trainer in passageway - Guided Exit)	Cow detection Entrance (Option) (GT-NS-300)	-19A4 DI 15	-21B7
30	Cow trainer entrance door passageway output signal (option)	Cow Trainer Entrance (Option) (GT-XV-308)	-19A13 DO 14	
31	If service mode is activated, manual outputs can be actuated. This mode is useful during commissioning or troubleshooting. Note: This mode cannot be activated if the milking box is in the middle of a milking or cleaning process.			
32	Detailed information on current process step			

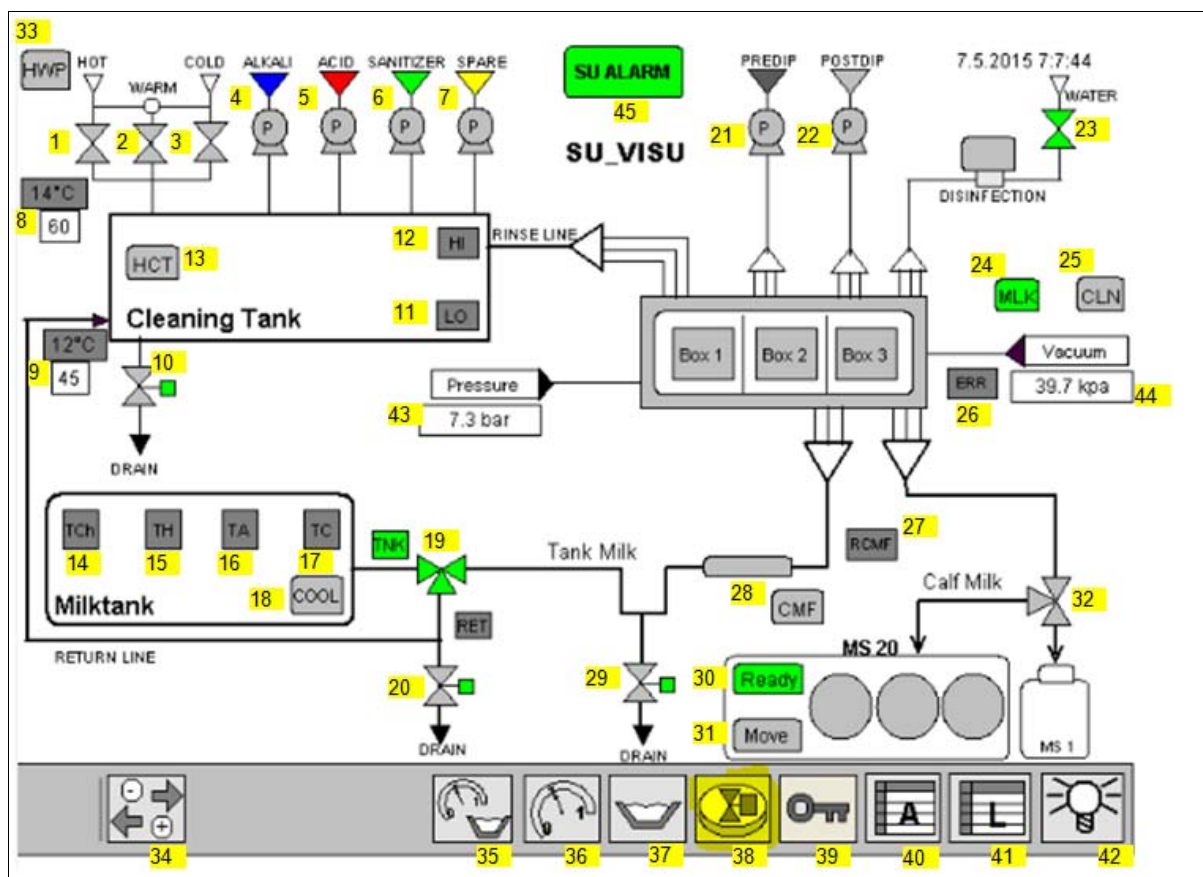
View Milking Schematic



	Milking box signals	Wiring systems		
		Designation	Input / Output	Sensor / valve
1	Tank milk line blowdown output signal	Air Chase Tank Milkline (ML-XV-106)	-19A15 DO 09	-29Y1
2	Tank milk receiver backflush output signal	Rinse Return Tank Milk Receiver (ML-XV-104)	-19A15 DO 07	-28Y7
3	Tank milk line valve output signal	Tank Milk Valve (ML-XV-104)	-19A15 DO 06	-28Y6
4	Tank milk line drain output signal	Drain Tank Milkline at Box (ML-XV-108)	-19A15 DO 11	-29Y3
5	Tank milk receiver top filling level input signal Note: Top filling level not reached -> this field is green -> input signal actuation is ON	Upper Level Tank Milk Receiver (ML-LT-101)	-19A4 DI 07	-20B7
6	Tank milk receiver bottom filling level input signal Note: Bottom filling level reached -> this field is green -> input signal actuation is ON	Low Level Tank Milk Receiver (ML-LT-101)	-19A4 DI 08	-20B7
7	Tank milk delivery pump ready for operation input signal, no fault at frequency converter	FC Failure Tank Milk Pump (ML-P-101)	-19A4 DI 05	-7F2
8	Tank milk delivery pump enable output signal	Enable Tank Milk pump (ML-P-101)	-19A13 DO 01	-7U1
9	Tank milk delivery pump speed 1 output signal	Speed binary 1 Tank Milk pump (ML-P-101)	-19A13 DO 02	-7U1
10	Tank milk delivery pump speed 2 output signal	Speed binary 2 Tank Milk pump (ML-P-101)	-19A13 DO 03	-7U1
11	Vacuum supply to the box	Vacuum To Box	-19A15 DO 04	-28Y4

12	Calf milk receiver top filling level input signal Note: Top filling level not reached -> this field is green -> input signal actuation is ON	Upper Level Calf Milk Receiver (ML-LT-101)	-19A4 DI 09	-21B1
13	Calf milk receiver bottom filling level input signal Note: Bottom filling level reached -> this field is green -> input signal actuation is ON	Low Level Calf Milk Receiver (ML-LT-101)	-19A4 DI 10	-21B1
14	Calf milk delivery pump enable output signal	Enable Calf Milk pump GM (ML-P-102)	-19A17 DO 05	-6U1
15	Calf milk delivery pump speed 1 output signal	Speed binary 1 Calf Milk pump GM (ML-P-102)	-19A17 DO 06	-6U1
16	Calf milk delivery pump speed 2 output signal	Speed binary 2 Calf Milk pump GM (ML-P-102)	-19A17 DO 07	-6U1
17	No emergency stop activated input signal	No Emergency stop (GT-HSS-001)	-19A4 DI 01	-13K1
18	48 V supply input signal	Good Servo Power Supply	-19A4 DI 03	-1G1
19	Output signal from valve between rinsing tank and milking stall module	CIP Valve (-CP-XV-111)	-19A15 DO 15	-29Y7
20	Calf milk line blowdown output signal	Air Chase Calf Milkline (ML-XV-107)	-19A15 DO 10	-29Y2
21	Calf milk receiver backflush output signal	Rinse Return Calf Milk Receiver (CP-XV-115)	-19A15 DO 12	-29Y4
22	Calf milk line drain output signal	Drain Calf Milkline (ML-XV-109)	-19A15 DO 14	-29Y6
23	Calf milk line valve output signal	Calf Milk Valve (ML-XV-105)	-19A15 DO 08	-28Y8
24	Calf milk delivery pump ready for operation input signal, no fault at frequency converter	FC Failure Calf Milk Pump (ML-P-102)	-19A4 DI 06	-6F2
25	Sampling connected input signal	Sampler Feedback (Connected) (AS-YY-100)	-19A4 DI 11	
26	Sampling output signal	ML-AS Sampling (SC) (AS-YY-102)	-19A15 DO 16	
27	Drain valve sampling output signal	Sampling Vent Valve (ML-XV-125)	-19A17 DO 08	-30Y8
28	If service mode is activated, manual outputs can be actuated. This mode is useful during commissioning or troubleshooting. Note: This mode cannot be activated if the milking box is in the middle of a milking or cleaning process.			
29	Detailed information on current process step			

5.7.2 Supply unit



Supply unit signals		Wiring systems		
		Designation	Input / Output	Sensor / valve
1	Hot water feed to mixer container output signal	Hot Water Cleaning Tank (CP-XV-103A)	-6A13 DO 11	-14Y3
2	Hot water feed to mixer container output signal	Warm Water Cleaning Tank (CP-XV-103B)	-6A13 DO 12	-14Y4
3	Cold water feed to mixer container output signal	Cold Water Cleaning Tank (CP-XV-103C)	-6A13 DO 10	-14Y2
4	cleaning agent pump 1 output signal - alkaline	Detergent Pump 1 Alkaline (CP-P-101)	-6A13 DO 13	-14K5
5	Cleaning agent pump 2 - acidic - output signal	Detergent Pump 2 Acid (CP-P-102)	-6A13 DO 14	-14K6
6	Cleaning agent pump 3 output signal - disinfection (for USA)	Detergent Pump 3 Sanitizer (CP-P-103)	-6A13 DO 15	-14K7
7	Cleaning agent pump 4 output signal - reserve (for USA)	Detergent Pump 4 Spare (CP-P-104)	-6A13 DO 16	-14K8
8	Water feed temperature input signal	Temperature Water Supply (CP-TT-101)	-6A2 AI 01	-7R1
9	Feedback temperature input signal	Temperature Return Line (CP-TT-102)	-6A2 AI 02	-7R2
10	Mixer container drain output signal	Drain Cleaning Tank (CP-XV-106D)	-6A15 DO 11	-16Y3
11	Mixer container bottom filling level input signal Note: Bottom filling level reached -> this field is green -> input signal actuation is ON	Low level Cleaning Tank (CP-LT-101)	-6A15 DI 13	-18K2
12	Mixer container top filling level input signal Note: Top filling level reached -> this field is green -> input signal activation is ON	High level Cleaning Tank (CP-LT-103)	-6A15 DI 12	-18K1

13	Mixer container heating output signal	Heating Cleaning Tank (CP-TC-101)	-6A15 DO 14	-16K6
14	Tank change input signal (only required if there are two cooling tanks)	Tank Change (ML-HB-101)	-6A10 DI 05	-11S5
15	Tank haul input signal	Tank Hauler Switch (ML-HB-100)	-6A10 DI 03	-SR1
16	Tank unit alarm input signal	Tank Unit Alarm (ML-MT)	-6A10 DI 02	-KA5
17	Tank unit cleaning input signal	Tank Unit Cleaning (ML-MT)	-6A10 DI 01	-KA6
18	Start cooling output signal	Cooling Start (ML-MT-101)	-6A10 DO 10	J7
19	Tank valve output signal	Milk Tank 1 /Return Line (1/0) (ML-XV-110)	-6A13 DO 02	-13Y2
20	Tank line drain at cooling tank output signal	Drain Tank Milkline at Tank (CP-XV-110D)	-6A13 DO 04	-13Y4
21	Dipping - predip output signal	PreDip Pump (CD-P-101)	-6A13 DO 08	-13K8
22	Dipping - post dip output signal	PostDip Pump (CD-P-102)	-6A13 DO 09	-14K1
23	Disinfectant mixture supply output signal	Disinfection Supply (WS-XV-106)	-6A13 DO 12	-16Y4
24	Milking vacuum signal output signal	VOD Signal Milking (+CU 18K2)	-6A15 DO 02	-15K2
25	Vacuum rinsing signal output signal	VOD Signal Cleaning (+CU 18K1)	-6A15 DO 01	-15K1
26	Vacuum error input signal	VOD Vacuum Error (V-VOD)	-6A7 DI 14	
27	Milk filter switch input signal	Milk Filter Switch (ML-F-100/101/102)	-6A10 DI 14	S1
28	Milk filter output signal	Milkfilter (ML-F-100/101/102)	-6A15 DO 09	
29	Tank line drain output signal (optional drain valve)	Drain Tank line (ML-XV-122)	-6A15 DO 08	-15Y8
30	MS20 ready output signal	MS20 Block (ML-YY-MS20)	-6A15 DO 05	-15Y5
31	MS20 move output signal	MS20 Move (ML-YY-MS20)	-6A15 DO 04	-15Y4
32	MS1 or MS20 output signal	MS1/MS20 (1/0)	-6A15 DO 06	-15Y6
33	Start hot water preparation output signal	Start Hot Water Preparation	-6A15 DO 16	-16K8
43	Compressed air supply pressure sensor input signal	Air Pressure (PA-PIT-101)	-6A4 AI 01	-8B1
44	Vacuum supply pressure sensor input signal	Vacuum Pressure (V-PIT-101)	-6A4 AI 02	-8B2
45	Alarm output signal (for optional alarm modem)	Alarm (+CU18K3)	-6A15 DO 03	-15K3
34	Overview of all inputs and outputs			
35	Cleaning report of current and last box and system cleaning			
36	Consumption overview			
37	Mixer container details view			
38	Supply unit overview			
39	If service mode is activated, manual outputs can be actuated. This mode is useful during commissioning or troubleshooting.			
40	Alarms overview			
41	Parameters overview			
42	Detailed information overview (for service technicians)			

5.8 Milking in emergency mode

If system components fail (e.g. system computer, identification, controllers, ...), milking can be performed in emergency mode.

Emergency mode is also used for testing operation after maintenance.



Attention!

In emergency mode there is no access to animal data and new data are not saved.

- Consequently there is not automatic activity in the milking system (e.g. separating the milk)
- The milk is not taken into account when calculating the next milking authorization.

The milking box doors are operated manually.



Important! Suspected inhibitors



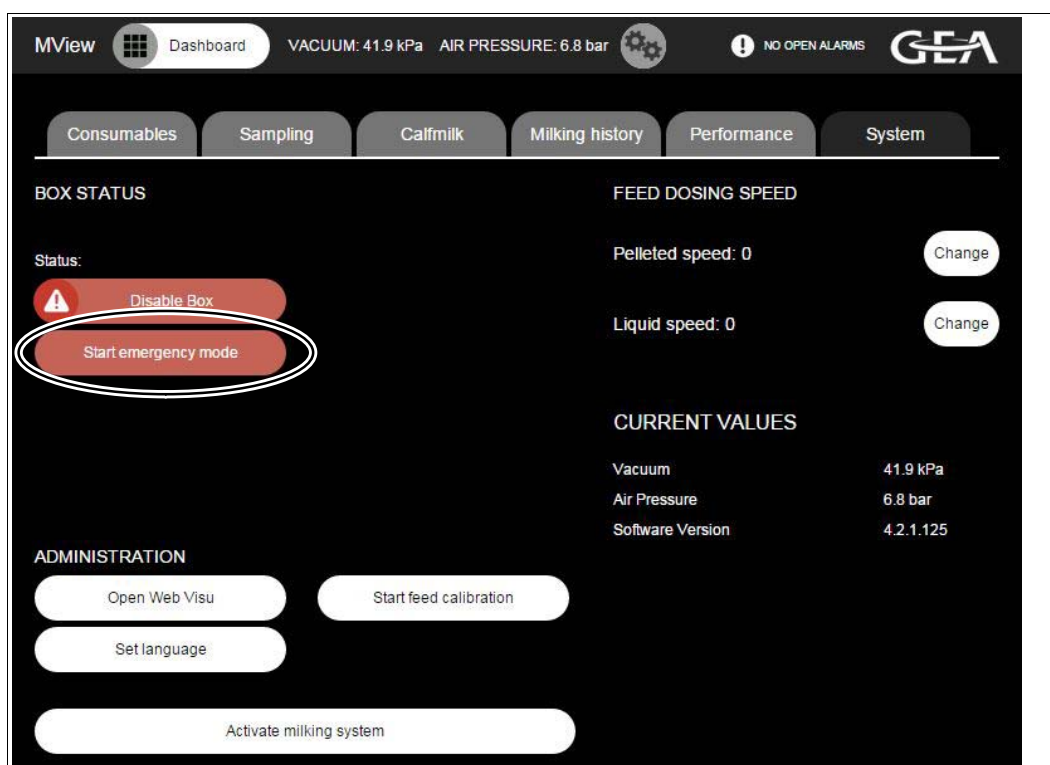
All animals whose milk is subject to a delay time because of treatment must be milked directly before a system clean!

A short clean is not sufficient!



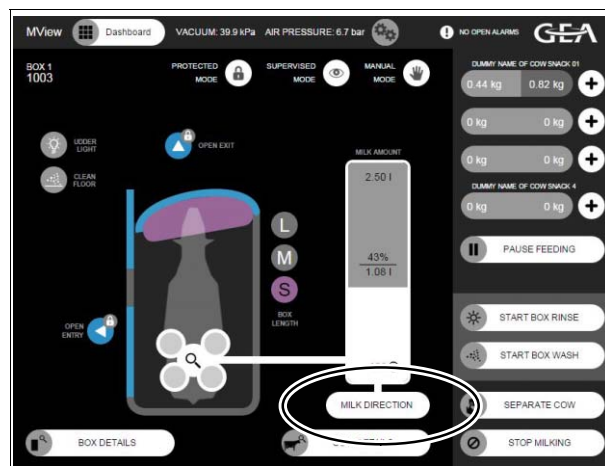
Please make sure to read the following section:
Separating of non-saleable milk

Switch on emergency operation



Milking

- Guide the animal into the milking box.
- Select milk channel.
 - Milk storage tank
 - Separate (drain)
 - Calf milk unit



Note!

Make sure that the milk channel to the milk cooling tank is not blocked.

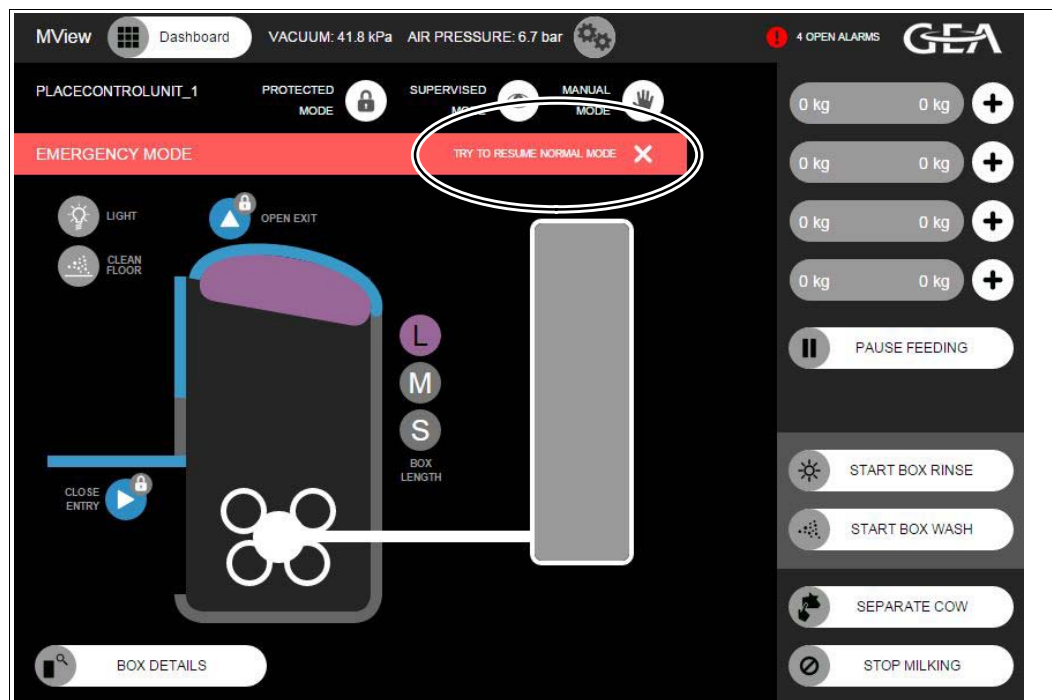
- The following steps are the same as for milking in manual mode.



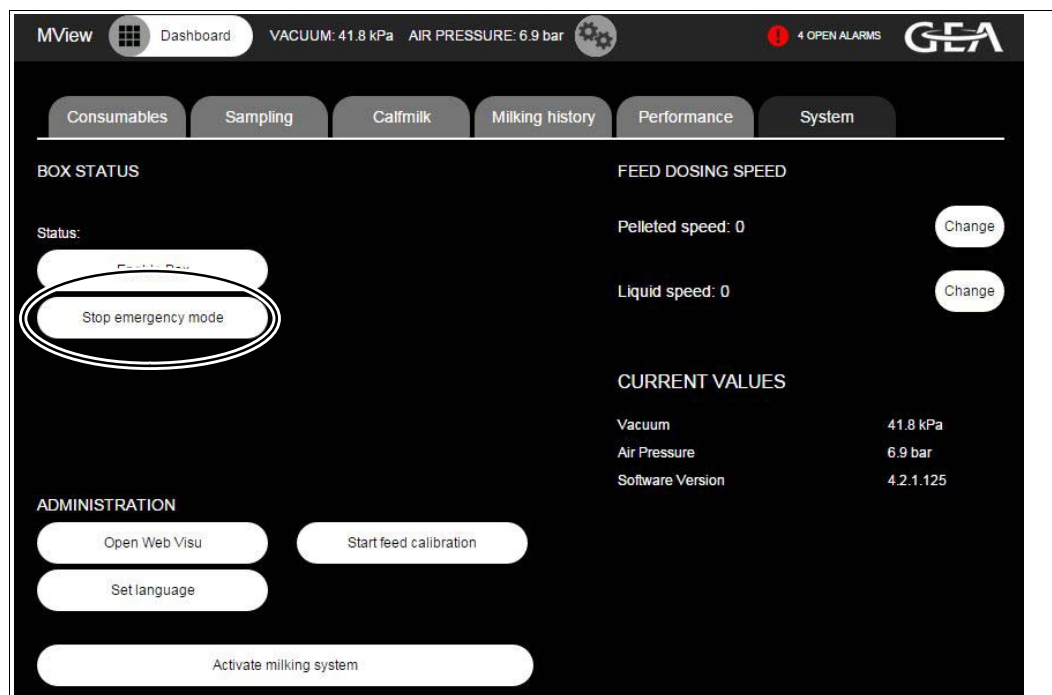
For further information, please refer to section:
Milking in manual mode

- Manual start of milking
 - Manual attaching of cows
 - Automatic milking
 - End of milking
- Milk next animal or switch off emergency mode.

Switch off emergency mode



Emergency operation can also be switched off in system view.



6 Maintenance by the farmer

If necessary, please contact your nearest authorized technical dealer.



Attention!

Regular inspection and maintenance by the user is necessary to ensure optimum operation of the milking system.
Regular servicing must also be performed by Customer Service to ensure safe operation.

6.1 Safety instructions for maintenance

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

- Use the "Lockout/Tagout" procedure when switching off the automatic milking system.



For more information on this subject, please refer to the following section in the Appendix to this manual:
Lockout/Tagout procedure

- 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.
- Also note the special information in this manual for the individual components.
- Only use the operating media specified.
- All warnings and warning signs must be present and legible.
- 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:

- the milking box doors and the application robot are secured against starting again unintentionally.
- The area for the maintenance work and access to the working area should be secured over a wide area and there should not be any unauthorised people in the working area.
- suitable collection vessels are available for all substances that might be harmful to the ground water (oils, coolants, cleaning and disinfecting agents, etc.)

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.
- There is a risk of injury from components/tools... with accessible sharp edges.
- Contact with cleaning agents may cause caustic burns.

On completion of the maintenance work, check that:

- All safety devices are working perfectly again.
- all of the tools, materials and other equipment that were used have been removed from the working area again.
- The working area has been cleaned
(e.g. to remove any fluids or metal chips that have been discharged, ...)
- Operation has been checked after maintenance work has been completed or parts replaced.

6.2 Maintenance requirements

As far as animal health and milking results are concerned, it is extremely important for the milking installation to be inspected and settings checked on a regular basis.

Keep records of checks in a safe place so that they can be inspected at any time.

Always adapt settings and milking equipment to the current herd characteristics (milk yield, udder shape, etc.).

Example:

- Vacuum level:
Is the vacuum level set correctly and is the operating vacuum being displayed correctly by the vacuum gauge? Would it be possible to set the operating vacuum at a lower level (gentler milking)?

Overview of maintenance work

Detailed maintenance steps are described in relevant sections.

Interval	part no.	Description	Action
After every system clean	7038-9926-420 7038-9926-530	Filter sock welded (4x 370 off) sewn (10x 100 Stück)	replace/exchange
2 daily		Animal data <ul style="list-style-type: none"> • Milking interval • Milk production 	check
		System data <ul style="list-style-type: none"> • Alarm list • Washing 	check
		Milking system <ul style="list-style-type: none"> • Spray unit • Milking cups • Milking box 	Clean with a jet of water. Check there are no leaks
		Optical sensor	Clean
1 x a day	7801-2720-010 7801-2720-000	Milking cups left right <ul style="list-style-type: none"> • Orientation • Leak-tightness • Rinsing connector • Air admission 	check and replace if necessary check
		Feed allocation	check delivery
		Canister with dipping agent	Check level and top up if necessary
		Operating vacuum	check
1 x weekly		Vacuum pump <ul style="list-style-type: none"> • Oil level • Vacuum regulator 	check
		Cables	visual inspection
		Cleaning agent canister	check level and replace if necessary
		conductivity sensor	Check
		Database	Backup data on USB stick
		System computer / Screen	Clean
		Functional check, modem	Carry out a test alarm
		Milking equipment <ul style="list-style-type: none"> • Milk meters, etc. 	check they are clean
		Milking cup cleaning	check
every 750 hours of operation	7801-2725-350 7801-2725-220	rubber teat liners (ø24/22/58) (ø27/23/58)	replace/exchange
	7801-1000-020	grease for door cylinder	clean / lubricate piston rod (apply a thin layer of grease)

6.2.1 Replace filter sock

The milking system is fitted with a single or double milk filter

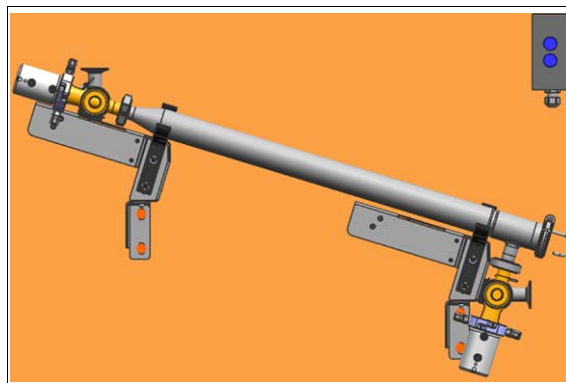
part no.	Description	
7319-0004-000	Filter socks	530x60 (370 Qty.)



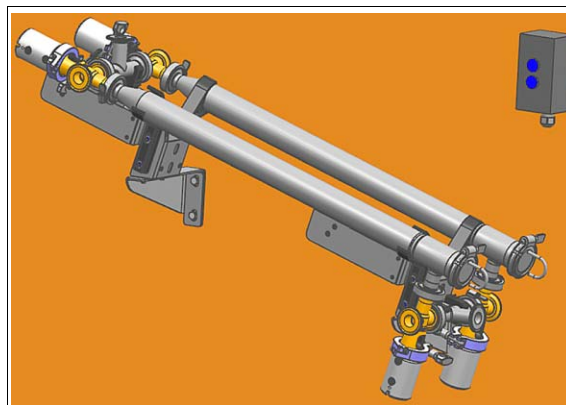
Note!

The filter can be changed during the system clean, after the end of the pre-rinse.

Single milk filter



Double milk filter



Maintenance steps

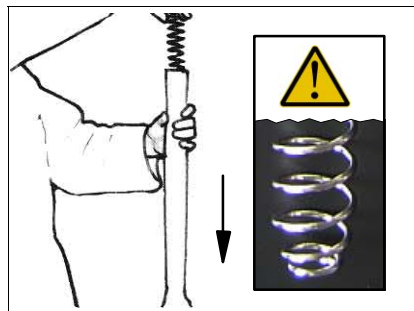


Note!

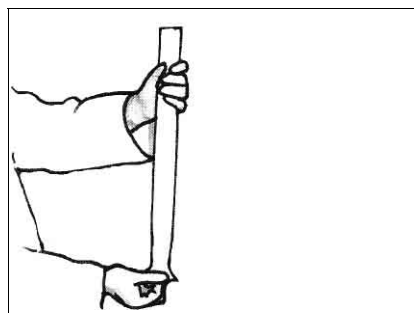
Before starting, make sure that your hands are dry.

- Undo the screws on the pressure filter.
- Take out the filter insert (plug, filter sock, steel spring).
- Remove plug and take the steel spring out of the filter sock.

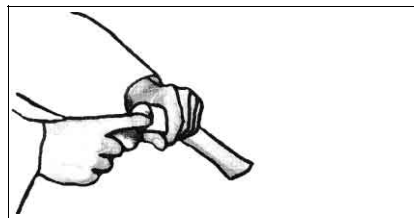
- Wipe the steel spring.
- Insert the steel spring, conical end first, into the filter sock.



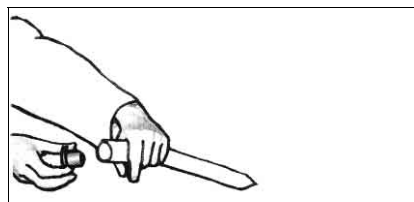
- Press together the end of the filter sock ensuring that the sock is not under any tension.



- Tease the open end of the filter sock inside.



- Press the plug into the steel spring as far as the stop.



- Introduce the whole filter insert into the pressure filter housing and screw closed.

6.2.2 Cleaning the milking system

**Attention!**

Do not use high pressure cleaners.

Never point the water jet directly at the milking box operating units, the application robot on the control units.

Remove dirt in the milking boxes (especially on the spray unit and the teat cups) with a jet of water several times a day, preferably during a system clean.

Pay particular attention to dirt on the spray unit and teat cups.

**Note!**

Drain the milking cups (RDM) when cleaning the cluster (milking rack)

6.2.3 Cleaning the optical sensor / system computer

**Attention!****Note the following when cleaning:**

- Only use a damp (not wet), soft cloth.
- Only use a mild cleaner that does not contain any abrasive or caustic substances (mineral acid, lye, ...).
- Never use a high-pressure cleaner or water jet.



For further information, see the following manual:

7820-90...-005 DairyProQ Automatic milking system - milking place module

6.2.4 Replacing a teat liner / teat cup

**Note!**

Only replace a teat cup if there are functional faults.



For further information, see the following manual:

7820-90...-005 Automatic milking system DairyProQ - Milking place module

6.2.5 Replacing the cleaning agent, disinfectant and dipping agent canister



Warning!

There is a risk of poisoning from chlorine gas!

Poisonous chlorine gas occurs when a chlorinated cleaning agent such as detergent or sanitizer is mixed with an acidic cleaning agent!



Handling detergents correctly:

- Never mix the different cleaning agents together.
- Only use suitable cleaning and disinfecting agents.
- When working with cleaning and disinfecting agents observe the notes on dangers and protective measures (risk of caustic burns)! Follow the manufacturer's instructions.
- Cleaning and disinfecting agents which are not connected properly may lead to caustic burns and the formation of gas.
The blue tube is exclusively for alkaline cleaning agent (e.g. CircoTip AF) and the red tube is exclusively for acidic cleaning agent (e.g. CircoTop SF)
- Keep all drums containing cleaning agent upright and out of the reach of children.
- Use safety goggles and gloves!
Protect eyes and hands when handling cleaners and disinfectants.
- Wear protective clothing.



Recommended cleaning agents

Only use the manufacturer's original cleaners.

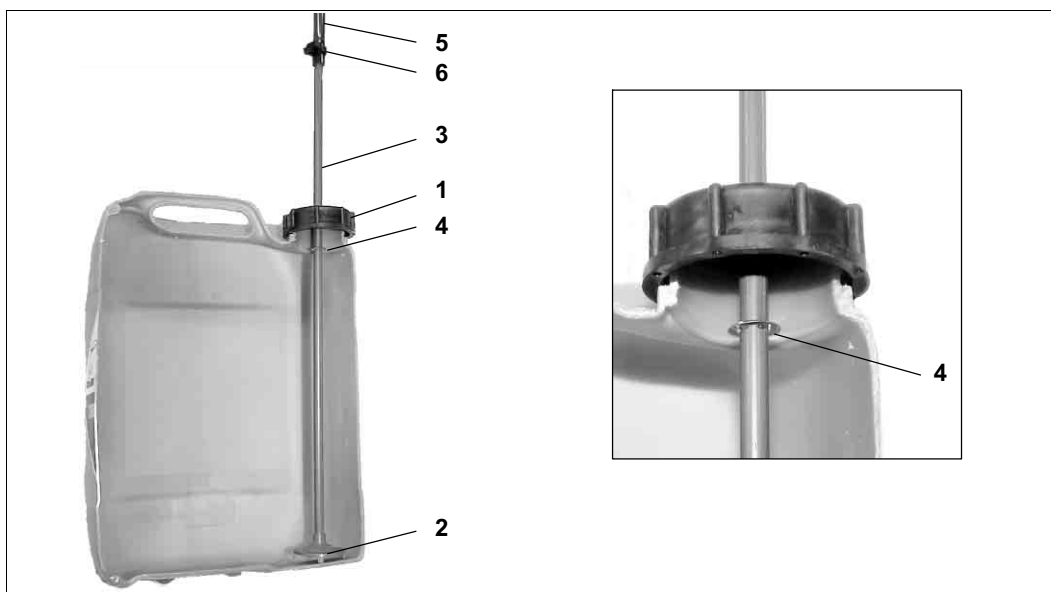
Alkaline cleaning agent	CircoTip AF
Acidic cleaning agent	CircoTop SF

Maintenance steps



Attention!

Only change the cleaning agent canister when there is no system clean running.

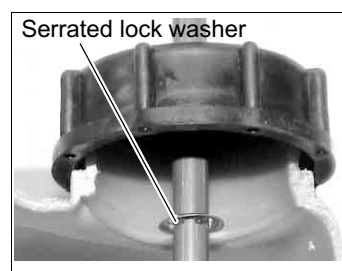


Item	part no.	Description
1	-	Lid
2	7015-2799-010	Filters
3	7015-6486-010	Intake pipe complete
4	0026-2447-300	Serrated lock washer
5	0018-7235-860	Metering tube, red
	0018-7235-870	Metering tube, blue
6	0018-6155-840	Hose clip

- Unscrew the cap (1) from the canister.
- Drill an 8.5 mm hole in the centre of the cap.
- Mount filter (2) on to the intake pipe.
- Pass the free end of the intake pipe through the hole in the cap.
- Lock the intake pipe under the cap with a serrated lock washer.

We reserve the right to modify the construction and design in all cases!

The teeth on the serrated lock washer (4) must point towards the side of the intake tube where the filter is mounted.



- Feed the intake pipe with the filter into the canister holding the cleaning chemical agent and screw the top on tight.



- Push the metering hose (5) onto the free end of the intake pipe and secure using the hose clip (6).

6.3 Eliminating cleaning problems

High germ count

The germ count is an indicator of how clean the milking installation is.

What to do if the germ count is high

- Compare germ counts

Compare current germ counts with the germ counts from past inspections.

- Slowly rising germ counts point to dirty components in the installation.
- Constantly high germ counts indicate inadequate cleaning of the milking system or the milk cooling tank.

- Visually inspect all parts of the installation that carry milk for dirt
- Visually inspect all parts of the installation that carry milk for leaks
- Check the cleaning process

- Check settings for the cleaning procedure.
- Operation of the level sensors and cleaning pumps.
- Check the amount of water.
- Check the seating of the teat cups on the cluster receptacle.

- Take samples with a swab

If the problem persists, the contamination should be localized by examining milk samples.

- After the dual pressure filter
- Drain valve before the milk cooling tank
- In the milk cooling tank



For further information, see the following manual:

7820-90..-005 Automatic milking system DairyProQ - Milking place module

High cell count

The cell count is an indicator of how healthy the herd is.

What to do if the cell count is high

- Functional testing
 - Performance of the vacuum pump (output required: 600 - 700 l/min)
 - Milking cup air inlet (nozzle)
- Check the milking settings.
 - Pulsation ratio / number of pulses
Recommended: 64/36 and 60 pulses/minute.

Vacuum level recommendation	
part no.	rubber
7801-2725-350	42 kPa
7801-2725-220	
	Silicone
7801-2725-100	40 kPa
7801-2725-110	
7801-2725-120	

- Check cleanness of the resting area, teat cups, cluster unit collars and milking boxes.
- Identify problem animals
Cell problems are often caused by individual animals (high cell count but no symptoms of mastitis).
These animals can be identified by collecting samples.
Separate the animal that are identified from the herd, or separate their milk.
- Working with animals that are undergoing treatment
 - There must be a short clean after milking animals that are undergoing treatment.
The relevant animal setting makes sure that the milk is separated.
 - Check absence time
Make sure the absence times are the same for animals undergoing treatment.
As far as possible do not exceed an absence time of 12 hours.
- Vet report
Inform the vet in the case of serious cell problems (several animals with a high cell count).

7 Decommissioning

7.1 Special personnel qualification required for decommissioning

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

- All work on electrical equipment and electrical connection work should only be performed by trained electricians.
- All work on pneumatic equipment should only be performed by technicians trained for this purpose.
- All welding work must only be performed by trained welders.



See also the section on "Personnel qualification".

7.2 Safety instructions for decommissioning

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

- Use the "Lockout/Tagout" procedure when switching off the automatic milking system.



For more information on this subject, please refer to the following section in the Appendix to this manual:
Lockout/Tagout procedure

- 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.



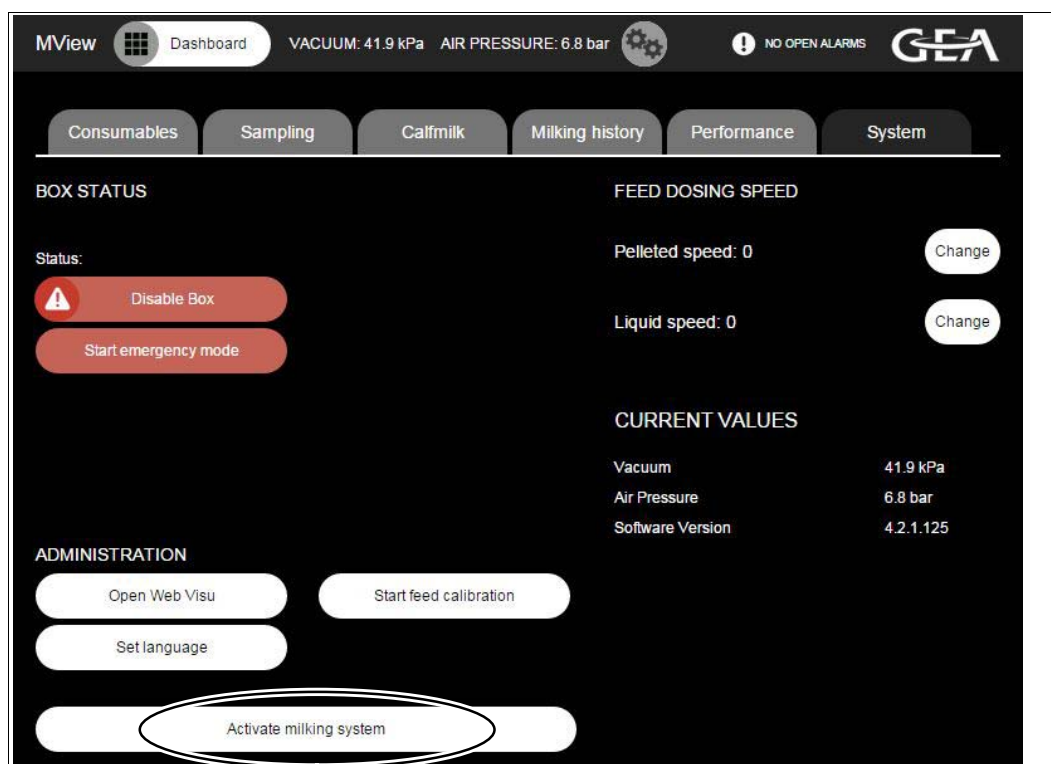
Also read the chapter on "Safety".

Special dangers involved in decommissioning:

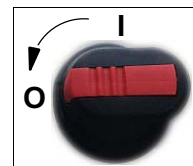
- Leaking lubricants, solvents, preservatives, can cause injury if they come into direct contact with the skin.
- Components which have not been set down correctly may fall off or twist.
- There is a risk of injury from open components / tools / with sharp edges.
- Do not stand beneath a suspended load. A suspended load may fall unexpectedly, which may cause death.
- Using load suspension devices other than those specified here may result in serious injury to people and damage to property.

7.3 Temporary decommissioning

Stopping milking operation



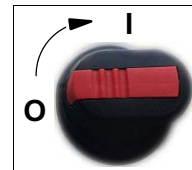
- Switch off the milking box main switch
- Switch off the supply unit main switch



Start milking again

After temporary decommissioning, the milking system must be commissioned again as follows.

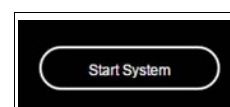
- Switch on the milking box main switch
- Switch on the supply unit main switch



- Press the reset button



- Start system operation in the system program.



- Start box cleaning



Attention!

If the last animal milked was being undergoing edictal treatment, a system clean must be started.

The milking system is ready to use.

7.4 Final decommissioning/disposal

After final decommissioning, handle all components properly and dispose of them in accordance with your valid local rules and regulations on waste disposal. Recycle if possible.



8 Appendix

8.1 Abbreviations


	Explanation
Ø	Diameter
BCU	Milking box switchgear cabinet
SMS	Text message
GMS	Global system for mobile communication
PSU	Power supply switchgear cabinet
RSU	Attachment robot switchgear cabinet
RDM	System program for the automatic milking system
IPC	System computer
HM-PC	Herd management PC
SU	Supply unit
SU-P	Servicing unit


Units	
°	degrees (angles)
°C	Degrees Celsius
s	Second
min	minute
" (in)	inch (= 25.4 mm)
mm	millimeters
cm	centimeters
m	meter
mm ²	Square millimetre
mm ³	Cubic millimetres
g	gram
kg	kilogram
kPa	kilo-pascal
kW	Kilowatt
A	Amp (current)
V	Volt (voltage)
Ω	ohm (resistance)

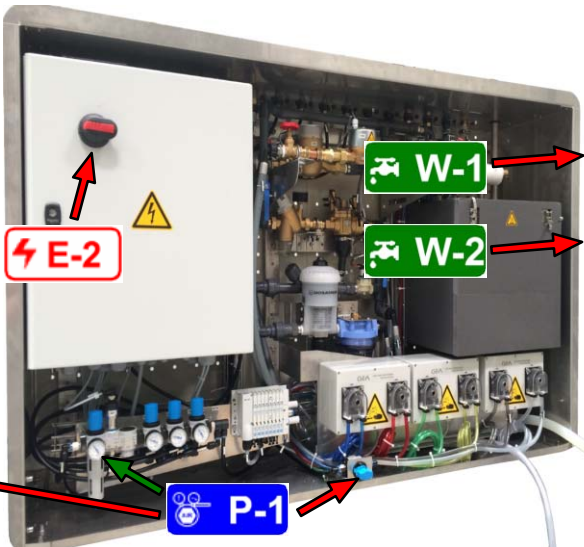
8.2 Lockout/Tagout procedure

  GEA Farm Technologies		ANSI Z244.1 EG 89/655		Developed by GEA	Evaluated by GEA	Modified
How it works: DairyPro Monobox				Equipment: milking box (Monobox) and supply unit		
Location: stall / tank room	Range:	Change: 0	Date: 17-2-2015	Orig. Datum: 5-2-2015		
Isolation points to be cordoned off and marked		We reserve the right to modify the construction and design in all cases! Stopping milking operation before switching off or disconnecting the supply (see the "Temporary decommissioning" section))				

Milking box














Supply unit view

Always stop milking operation before switching off the main breaker!

ID	Source	Unit	Location	Procedures	Check
	electric 230-240V AC	Padlock	Milking box main power switch (+RU)	Switch main switch "OFF". Secure against being switched back on with a padlock	IPC off
	electric 230-240V AC	Padlock	Supply unit main power switch (+SU)	Switch main switch "OFF". Secure against being switched back on with a padlock	N/A
	Pneumatic 6bar / 90PSI	Padlock	Shut-off valve in the middle of the supply unit	Switch main switch "OFF". Secure against being switched back on with a padlock	Check zero pressure status visually
	Hot water 90°C 3bar / 40PSI	Padlock	Shut-off valve on the right of the supply unit	Close shut-off valve. Secure against being switched back on with a padlock and/or put up a warning sign	N/A
	Cold water 3bar / 40PSI	Shut-off valve	Shut-off valve on the right of the supply unit	Close shut-off valve. Put up a warning sign.	N/A
Heat energy 90°C / 194°F			Attention! Wait until the heat has dissipated from the machine and the machine is cool enough to touch components during maintenance. Wear appropriate PPE during the work.		
Electrical energy 230V AC - 240V AC			Attention! Carry out measurements to ensure the electrical energy has been switched off before working on the switchgear cabinet.		

! DANGER

The "Service" switch position does not offer any security against becoming trapped.

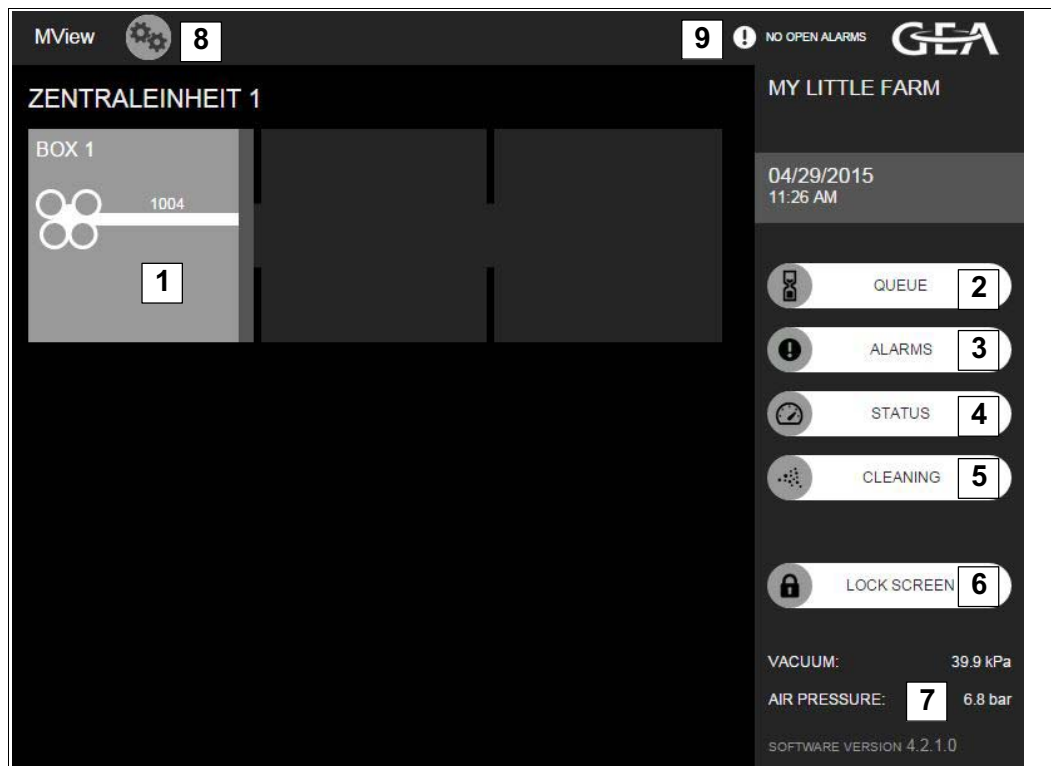
SAFETY IS YOUR RESPONSIBILITY

! DANGER

8.3 Quick guide

System program control unit

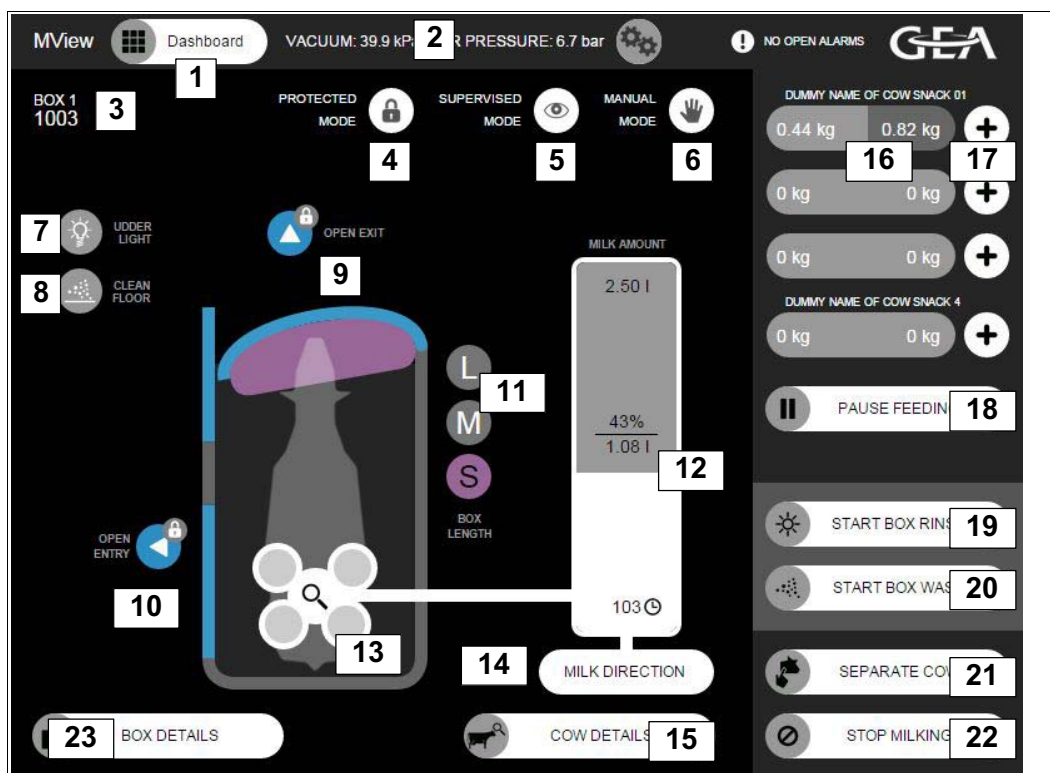
System overview (Dashboard)



Legend:

1	Selects milking box view
2	Animals to be milked view selection
3	Selects alarm view
4	Selects system status view
5	Selects system cleaning view
6	Locks screen briefly to carry out cleaning
7	Vacuum and compressed air supply display
8	Selects settings view (found in every view)
9	Number of unconfirmed alarms (appear in every view)

Milking box view



Legend:

1	Selection of Dashboard (system overview)	13	Individual quarter information display
2	Vacuum and compressed air supply display	14	Display and change milk path
3	Display of current milking box and animal number	15	Selects animal details
4	Switches door control manual mode on/off	16	Display of feed quantity dispensed Display of allocated feed quantity
5	Switches monitored milking on/off	17	Extra feed allocation (+100 g)
6	Switches manual mode on/off	18	Pauses feeding
7	Switches milking box lighting on/off	19	Starts/stops milking box rinsing (clear water)
8	Switches on milking box floor cleaning	20	Starts/stops box cleaning (with cleaning agent)
9	Opens/closes exit doors (only possible in door control mode)	21	Separate current cow
10	Opens/closes entrance doors (only possible in door control mode)	22	End milking and let animal out
11	Display and change box length	23	Selects milking box details
12	Expected milk quantity (top) Actual milk yield (middle) Milking duration (bottom)		

System cleaning view

Legend:

1	Selects dashboard (system overview)
2	Display of last and imminent system cleaning
3	Starts / stops system cleaning
4	Sets box cleaning interval
5	Change the box cleaning interval
6	Sets automatic system cleaning
7	Change the automatic system cleaning settings
8	Box cleanings carried out
9	System cleaning carried out

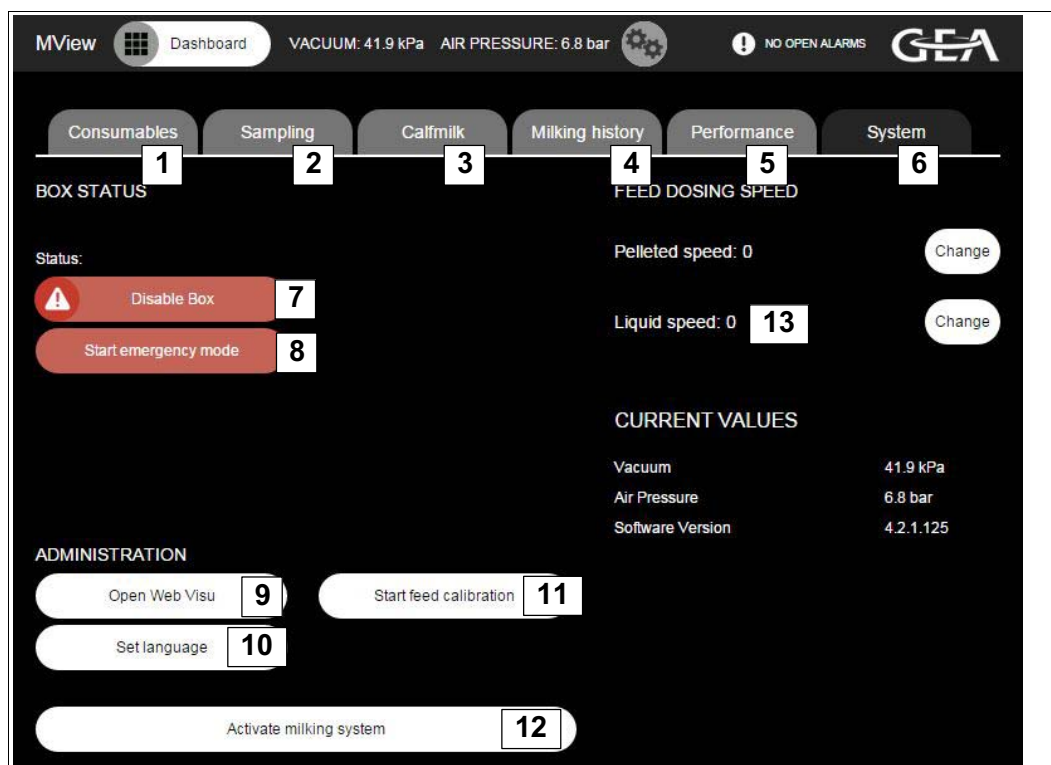
"Animals for milking" view

	Cow number	Time since last complete	Entitlement Milk/Access	Specifies	Destination	# incomplete milkings	Location
1	112	13:29	Yes/No	Blocked	Tank	1	Barn A
	113	13:30	Yes/No	Blocked	Tank	1	Barn A
	114	13:30	Yes/No	Blocked	Tank	1	Barn A
	115	13:30	Yes/No	Blocked	Tank	1	Barn A

Legend:

1	Animal must be milked urgently
2	Number of successive incomplete milkings Note: check with particular care as from 2 animals
3	One-off milking authorization for one animal

Selects system status view



Legend:

1	Selects overview of filling levels in supply canisters
2	Selects sampling overview
3	Selects calf milk overview
4	Selects consumption overview during milking
5	Selects performance parameters overview
6	Selects system overview (selected in the example)
7	Blocks a box for milking
8	Activate/deactivate emergency operation
9	Starts diagnostic overview
10	Select language
11	Start feed calibration
12	Switch off system operation
13	Set feed dispensing speed

8.4 Servicing instructions for the operator

Interval	part no.	Description	Action
After every system clean	7038-9926-420	Filter sock welded (4x 370 off)	replace/exchange
	7038-9926-530	sewn (10x 100 Stück)	
2 daily		Milking system <ul style="list-style-type: none"> • Spray unit • Milking cups 	Clean with a jet of water.
		Optical sensor	Clean
1 x a day-....-....	Spray unit tank (Option)	Check level and top up if necessary
1 x weekly-....-....	Cleaning agent canister	Check level and replace if necessary
		Database	Back up
		Functional check, modem	Carry out a test alarm
every 750 hours of operation	7801-2725-350	rubber teat liners (ø24/22/58)	replace/exchange
	7801-2725-220	(ø27/23/58)	
	0015-0104-060	Support arm cylinder assembly	clean / lubricate piston rod (apply a thin layer of grease)
		Door cylinders	



We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA Group is a global engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX® Europe 600 index.

GEA Farm Technologies GmbH

Siemensstraße 25-27
D-59199 Bönen

 +49 (0) 2383 / 93-70
 +49 (0) 2383 / 93-80

contact@gea.com
www.gea.com