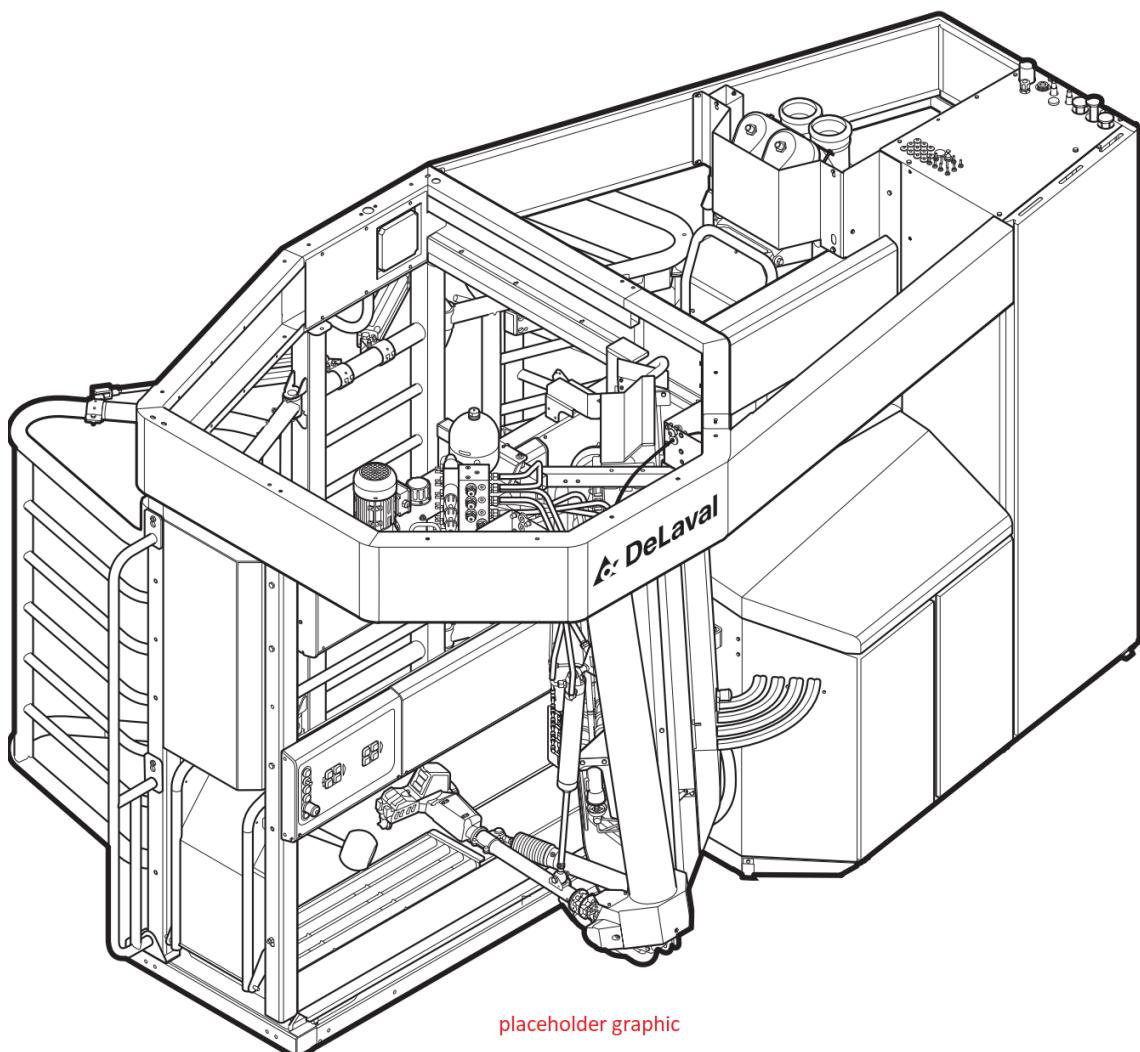


# DeLaval milking automation system MA200

## Instruction Book





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# 1 Safety precautions

## 1.1 Foreword

The safety and operating instructions must be observed by any person involved with the use or operation of this equipment.

Under no circumstances must the equipment be used if it is damaged or if the operation of the equipment is not completely understood.

## 1.2 Disclaimer

The information, instructions and parts listed are applicable and current on the date when issued. DeLaval reserves the right to make changes without notice.

## 1.3 Definitions of persons

<b>Authorised electrician</b>	A person with an education and a practical experience in performing electrical work and installations; considered as a skilled person in his/her area of work.	<b>Instructed person</b>	A person who has received instruction and training or is supervised by a skilled person, thereby able to perceive risks and to avoid dangers that, for example, electricity and moving parts can create.
<b>Ordinary person</b>	A person who is neither a skilled person nor an instructed person. Ordinary persons include not only users of the equipment, but all persons who may have access to the equipment. Children are not considered as ordinary persons.	<b>Skilled person</b>	A person who is capable of making correct judgments on tasks to be performed on the equipment. First and foremost, this means recognising possible hazards on the basis of professional training, experience and knowledge of the equipment.

Authorised service personnel are skilled persons who work with DeLaval technology.

## 1.4 Definitions of admonishments

Admonishments are safety related warning messages.

Admonishments provide important information intended to prevent incorrect or hazardous use of equipment, machinery or software, and support risk assessment.

The following list defines the different types of admonishments used in DeLaval documentation:



**Warning**

Refers to imminent, severe or limited risk. Failure to comply with instruction may result in a serious injury.



**Mandatory**

Refers to an action or behaviour which is essential to safe and successful use of the equipment.

**Prohibited**

Refers to an action or behaviour which is incompatible to safe and successful use of the equipment.

**Note!**

Is intended to draw attention to specific points of importance in the text and advice to prevent equipment damage.



This symbol signals risk of injury.



This symbol signals risk of electric shock.

## 1.5 Safety regulations

### 1.5.1 Safety regulations - General

**WARNING!**

Risk of electric shock!

Always disconnect the main power supply and lock the main switch in off position, before performing any installation, inspection, adjustment, maintenance, or service on the equipment.

**WARNING!**

Electric shock hazard

Disconnect the main power supply and use appropriate lockout-tagout procedures before any installation, inspection, adjustment, or maintenance on the equipment is performed.

**WARNING!**

Electric shock hazard

The electrical installation or any other work on electrical equipment must be performed by skilled personnel. The work must be performed in accordance with provided wiring diagrams and must comply with national electrical safety and EMC regulations.

**WARNING!**

Risk of electric shock

Do not spray water on electrical components even when they are switched off or disconnected. Water on electrical components can cause an electric shock, and could destroy the equipment.

**WARNING!**

Keep safety signs legible.

Read all the safety signs on the machine and in this manual. Replace any lost or damaged signs. Keep safety signs clean and legible at all times.

**PROHIBITED!**

Do not use inadequate parts or consumables

Using products that do not meet the specified requirements, such as spare parts or consumables, may result in damage or injury and may void or limit the warranty.

## 1.5.2 Safety regulations - Operating the equipment

**PROHIBITED!**

It is prohibited to operate, service, inspect, or otherwise handle this equipment until the user has read the manual and has been properly trained in the intended use of the equipment.

**PROHIBITED!**

Read the instructions carefully before using the equipment. Contact a DeLaval representative if the instructions are not understood. Compliance with these instructions ensures the correct and safe use of the equipment. Keep the instructions for future reference.

## 1.5.3 Safety regulations during service of the infrastructure box and the milking automation devices

**WARNING!**

Risk of electric shock!

Always disconnect the main power supply and lock the main switch in off position, before performing any installation, inspection, adjustment, maintenance, or service on the equipment.

**WARNING!**

Electric shock hazard

The electrical installation or any other work on electrical equipment must be performed by skilled personnel. The work must be performed in accordance with provided wiring diagrams and must comply with national electrical safety and EMC regulations.

**WARNING!**

Risk of injury

The installation, deinstallation and/or service of the equipment must be carried out by an authorised installer/service technician.

## 1.6 Safety labels on the equipment

### 1.6.1 Safety labels on infrastructure box

The safety labels must be placed visible on all locations where a safety hazard exists according to illustration [Figure 1: Safety labels on the infrastructure box](#).

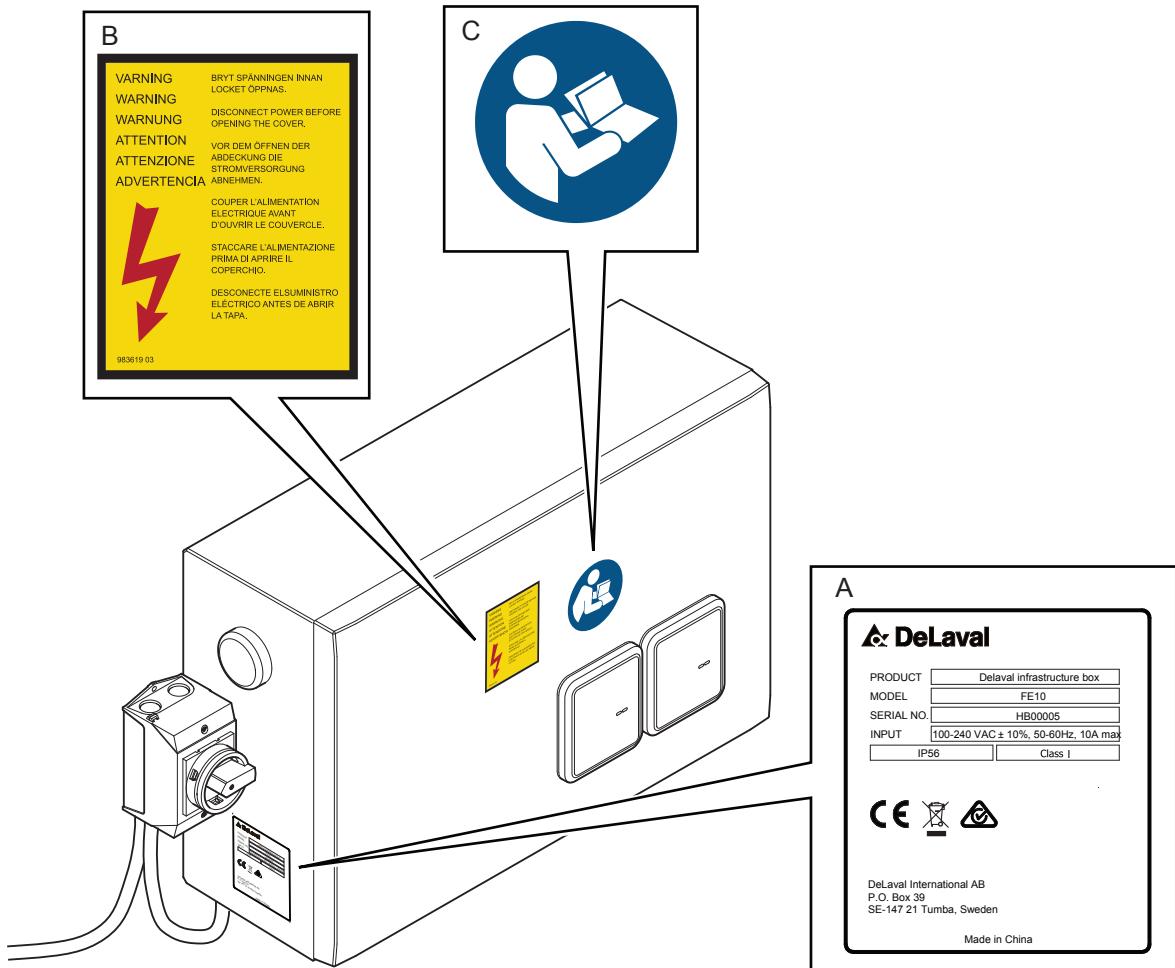


Fig. 1: Safety labels on the infrastructure box.

Position	Label name	Label message
A	Type plate	See <a href="#">Type plate on the infrastructure box</a> .
B	Electrical hazard	Disconnect the power supply before opening the cover.
C	Read manual	Read the instructions carefully before using the equipment. Failure to follow operating instructions could result in injury or damage to equipment.

## 1.7 Safety devices

This system is designed to be safe to operate. The infrastructure box main switch is installed for personal safety and must not be modified, removed, or disconnected.

Any modification to the original design of the equipment may compromise the personal safety. Consequently it may also void or limit the warranty.

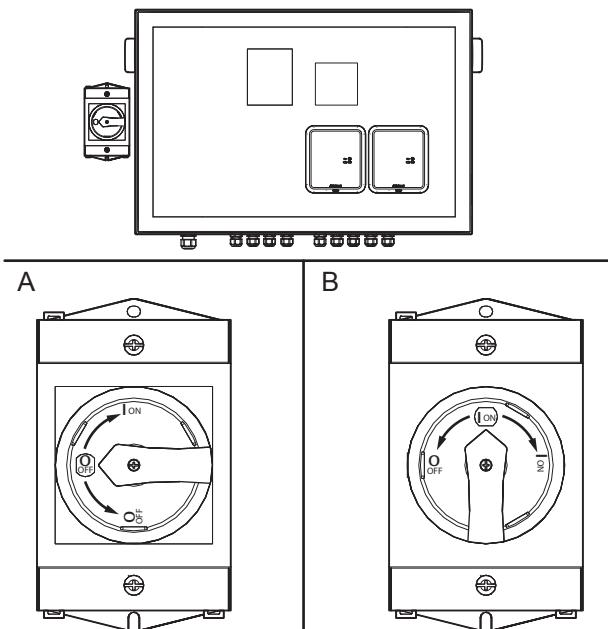
**Note!**

All safety devices in the system must be checked by a DeLaval representative before the system is signed over to the customer.

### 1.7.1 Operating the main switch of the infrastructure box

The main switch of the infrastructure box turns ON or OFF the electricity to the infrastructure box and to the milking automation devices.

1. Turn the main switch to OFF (A) to turn the electricity OFF.



**Fig. 2:** Operating the main switch of the infrastructure box.

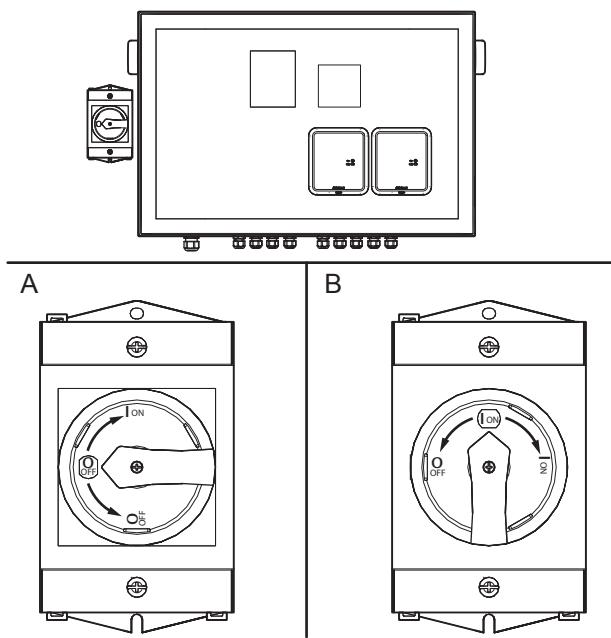
2. Turn the main switch to ON (B) to turn the electricity ON.



### 1.7.2 Operating the main switch

The main switch of the infrastructure box turns ON or OFF the electricity to the infrastructure box and to the milking automation devices.

1. Turn the main switch to OFF (A) to turn the electricity OFF.



**Fig. 3:** Operating the main switch.

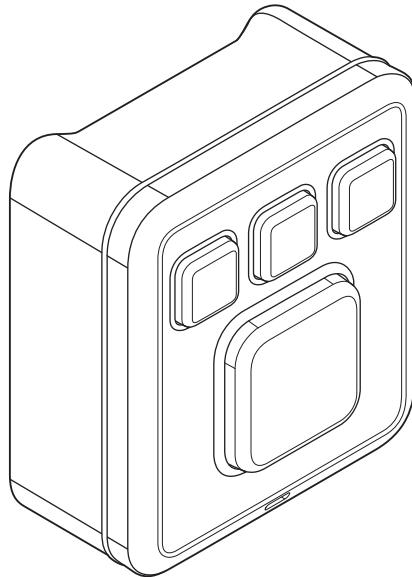
2. Turn the main switch to ON (B) to turn the electricity ON.

## 2 General description

### 2.1 DeLaval milking automation MA architecture - for rotaries

#### 2.1.1 Components in the Milking automation system

##### 2.1.1.1 Description of the button module (BM)



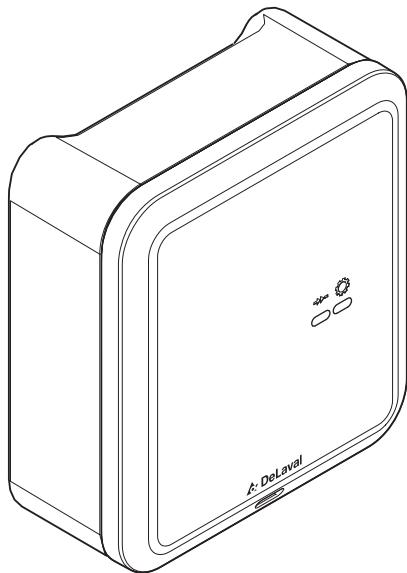
**Fig. 4:** Button module (BM).

One button module is needed for each bail or stall. By pressing the buttons on the button module, user commands are sent through the Lin-bus to the IO module. The milking application status is displayed on the LED indicators around each button.

The large button controls all basic milking and cleaning operations. Four coloured LED segments on each side of the large button communicate the status of the current operation. The status LED inside the right segment of the large button indicates communication issues with the system controller and the flow sensor.

If used, each small button controls a dedicated function, such as **sort once** or **forced vacuum**. Around each button is a coloured LED that indicates the current status.

### 2.1.1.2 Description of the IO module (IOM)

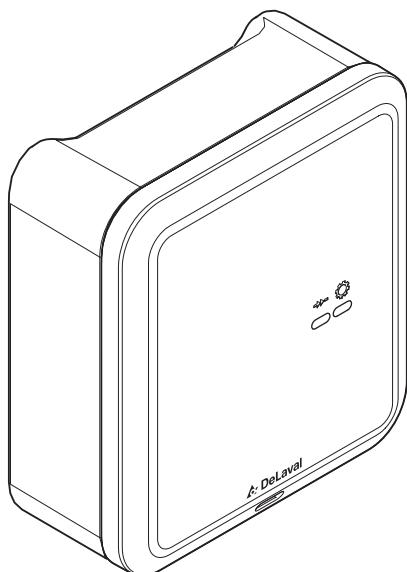


**Fig. 5:** IO module (IOM).

The IO module is an input/output module, receives user commands from the button module (BM) through the Lin-bus or the comfort start (CS) functionality. From these commands the IO module controls the milking and cleaning processes, and interacts with the flow sensor, the control valves, and the regulator block. One IO module is needed for each bail or stall.

The IO module is connected to a CCM through the Lin-bus. Two LEDs on the IO module indicate the current status.

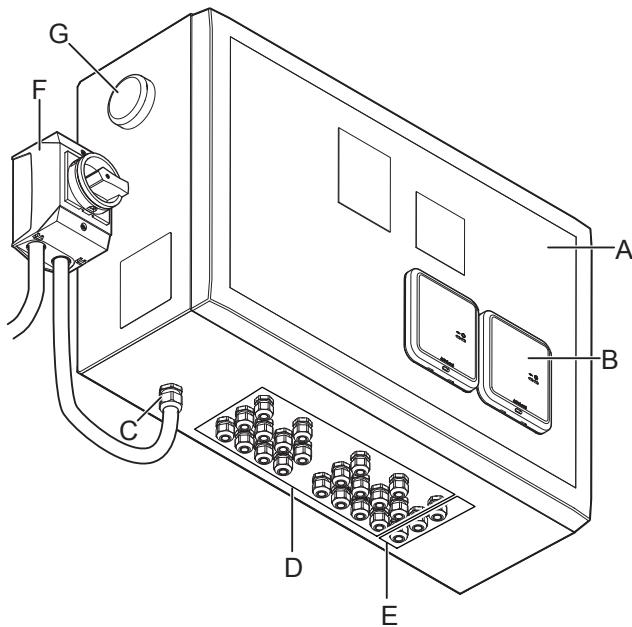
### 2.1.1.3 Description of the CCM



**Fig. 6:** CCM.

The CCM, short for control and communication module, routes data between the connected devices on the Lin-bus and the Ethernet devices, such as the system controller and the rotary controller. Two LEDs on the CCM indicate the current status.

#### 2.1.1.4 Description of the infrastructure box



**Fig. 7:** Example of infrastructure box FE10 / F10.

<b>A</b>	Infrastructure box	<b>E</b>	Cable glands for Ethernet cables
<b>B</b>	CCM	<b>F</b>	Main switch of infrastructure box
<b>C</b>	Main power supply	<b>G</b>	Ventilating membrane
<b>D</b>	Cable glands for Lin-bus cables		

The infrastructure box (IB) is acting as the power supply to the milking automation system and as the communication bridge to the system controller. The infrastructure box contains power supply units, CCMs, a network switch, and connection terminals for Lin-bus cables and power supply cables.

The infrastructure box is designed for IT power distribution system with phase to phase voltage 230 V.

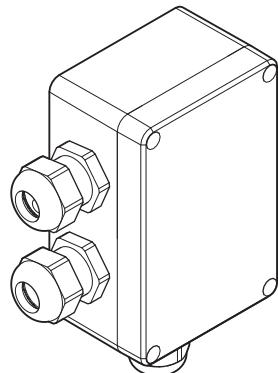
The infrastructure box is available in different configurations, depending on the size of the parlour.

#### 2.1.1.5 Description of the wireless antennas

In rotary parlours, wireless antennas are used for transferring data between the milking automation system and the office. One wireless antenna is connected to the milking automation system through an Ethernet switch. The other wireless antenna is connected to the Ethernet switch in the office.

See the user manual of the wireless antenna for product details and technical data.

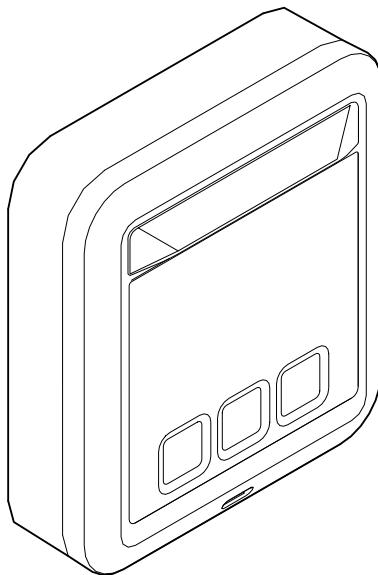
### 2.1.1.6 Description of the junction box on the automation panels



**Fig. 8:** Junction box.

In rotary parlours, the junction box on the automation panels is a connection terminal between the IO module, the button module (BM), the CCM, and optional equipment such as comfort start (CS) and air wash (AW).

### 2.1.1.7 Description of the display module DM223



**Fig. 9:** Display module DM223.

DM223 is a new generation display module. It is an extension for the existing MA system offering a visual user interface for presenting ongoing activities like cow identification, progress bar, expected milking time, status flags and reminder icons. In addition, it was also equipped with an LED indicator that communicates through a colour code, in a manner similar to BM213.

DM223 will display, in real time, the milking progress and the collected amount of milk at the end of milking. It will display a low yield alarm, reminder codes or other alarms, if they occur. Basic cow data can also be checked, like days in milk, days since last insemination, lactation number.

## 2.1.2 Overview of the milking automation system - for rotaries

The milking automation MA200 (MA) is controlling the milking process in the bail or stall and transfers the data to the system controller (SC).

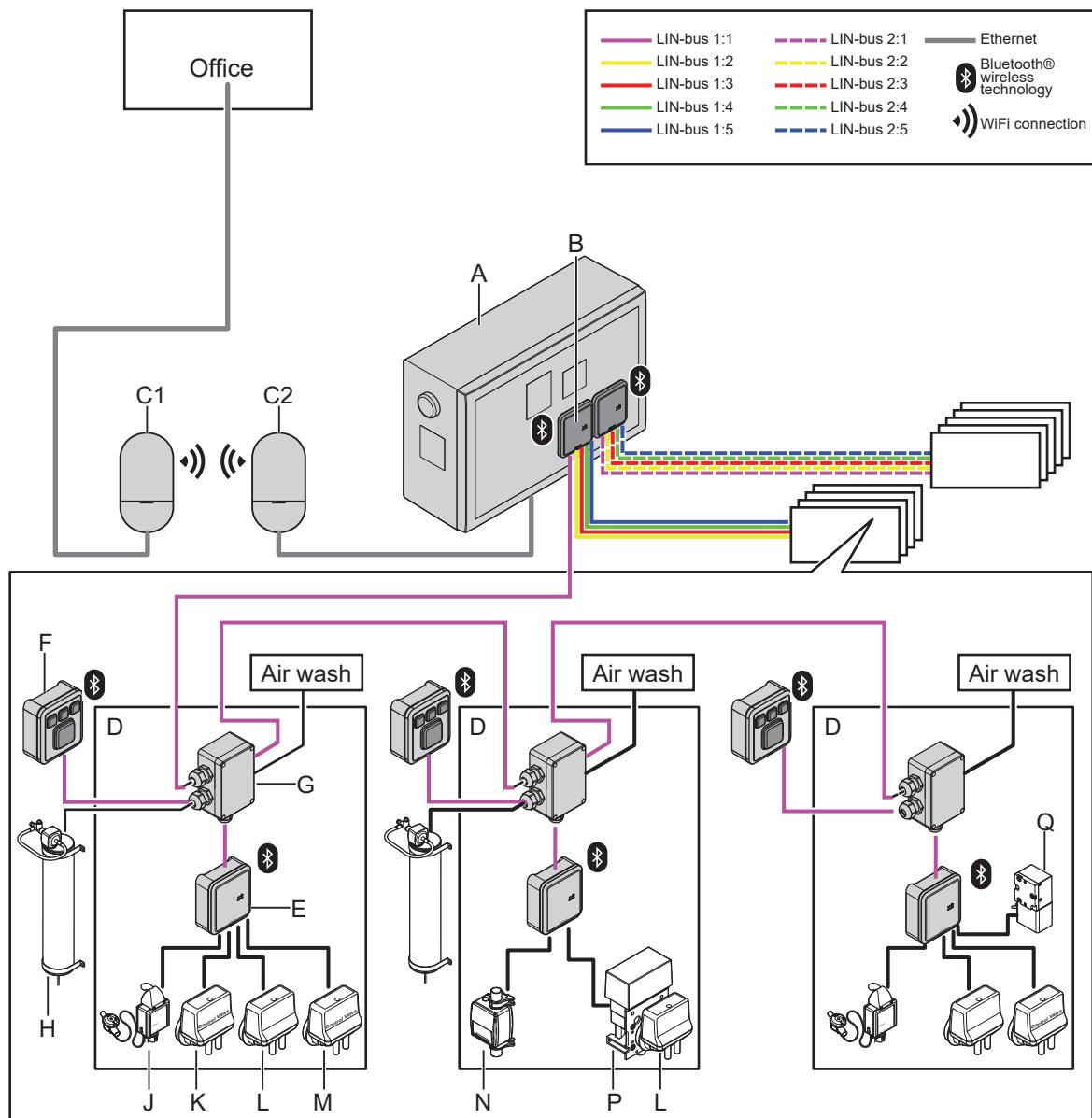


Fig. 10: Milking automation system.

<b>A</b>	Infrastructure box	<b>H</b>	Comfort start functionality
<b>B</b>	CCM	<b>J</b>	Milk meter
<b>C1</b>	Wireless antenna A	<b>K</b>	Control valve
<b>C2</b>	Wireless antenna B	<b>L</b>	Pulsator
<b>D</b>	Automation panel examples	<b>M</b>	Control valve
<b>E</b>	IO module	<b>N</b>	Flow indicator
<b>F</b>	Button module	<b>P</b>	Regulator block

**G** Junction box

**Q** MAC-valve for air retraction

The milking automation system consists of modules with different functionalities connected to each other through a local interconnection network (LIN) bus. Up to three IO modules (E) are connected on the same Lin-bus. The IO module controls the milking process in one bail or stall. Users can interact with the system from the button module (F) which is connected to the IO module.

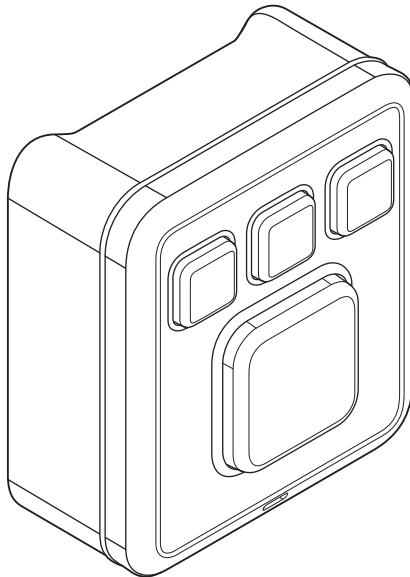
For communication with the system controller and the rotary controller, each IO module is connected through the Lin-bus to a CCM (B). Each CCM handles up to five Lin-buses.

For the MA200 Quick Guide, see: [Quick Guide](#).

## 2.2 DeLaval milking automation MA architecture - for parlours

### 2.2.1 Components in the Milking automation system - for parlours

#### 2.2.1.1 Description of the button module (BM)



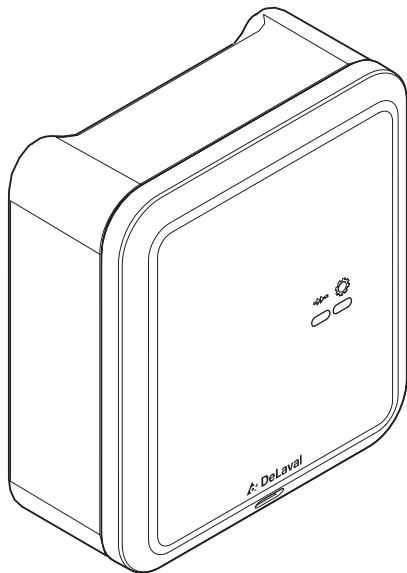
**Fig. 11:** Button module (BM).

One button module is needed for each bail or stall. By pressing the buttons on the button module, user commands are sent through the Lin-bus to the IO module. The milking application status is displayed on the LED indicators around each button.

The large button controls all basic milking and cleaning operations. Four coloured LED segments on each side of the large button communicate the status of the current operation. The status LED inside the right segment of the large button indicates communication issues with the system controller and the flow sensor.

If used, each small button controls a dedicated function, such as **sort once** or **forced vacuum**. Around each button is a coloured LED that indicates the current status.

### 2.2.1.2 Description of the IO module (IOM)

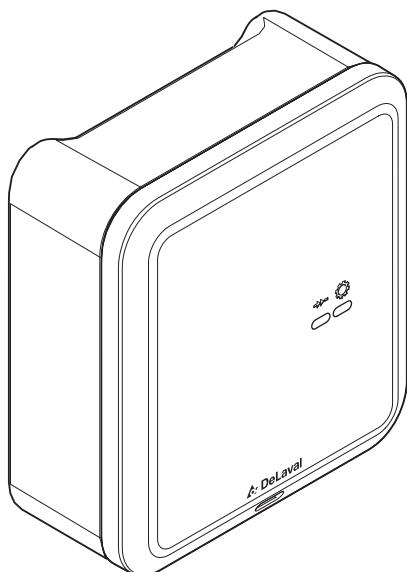


**Fig. 12:** IO module (IOM).

The IO module is an input/output module, receives user commands from the button module (BM) through the Lin-bus or the comfort start (CS) functionality. From these commands the IO module controls the milking and cleaning processes, and interacts with the flow sensor, the control valves, and the regulator block. One IO module is needed for each bail or stall.

The IO module is connected to a CCM through the Lin-bus. Two LEDs on the IO module indicate the current status.

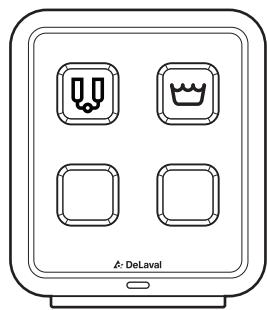
### 2.2.1.3 Description of the CCM



**Fig. 13:** CCM.

The CCM, short for control and communication module, routes data between the connected devices on the Lin-bus and the Ethernet devices, such as the system controller and the rotary controller. Two LEDs on the CCM indicate the current status.

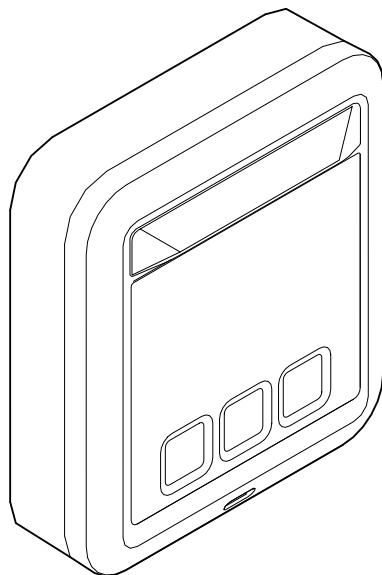
#### 2.2.1.4 Description of the button module BM204 (Parlour State Controller)



**Fig. 14:** Button module BM204.

B204, also called the **Parlour State Controller**, is a user interface for switching the system between milking and cleaning. For switching to **Cleaning Mode**, press the top-right button on the **Parlour State Control** (>1s) or use the IDD if available. The button indicator light must stay solid cyan. All MA modules are set into **Cleaning Mode**.

#### 2.2.1.5 Description of the display module DM223

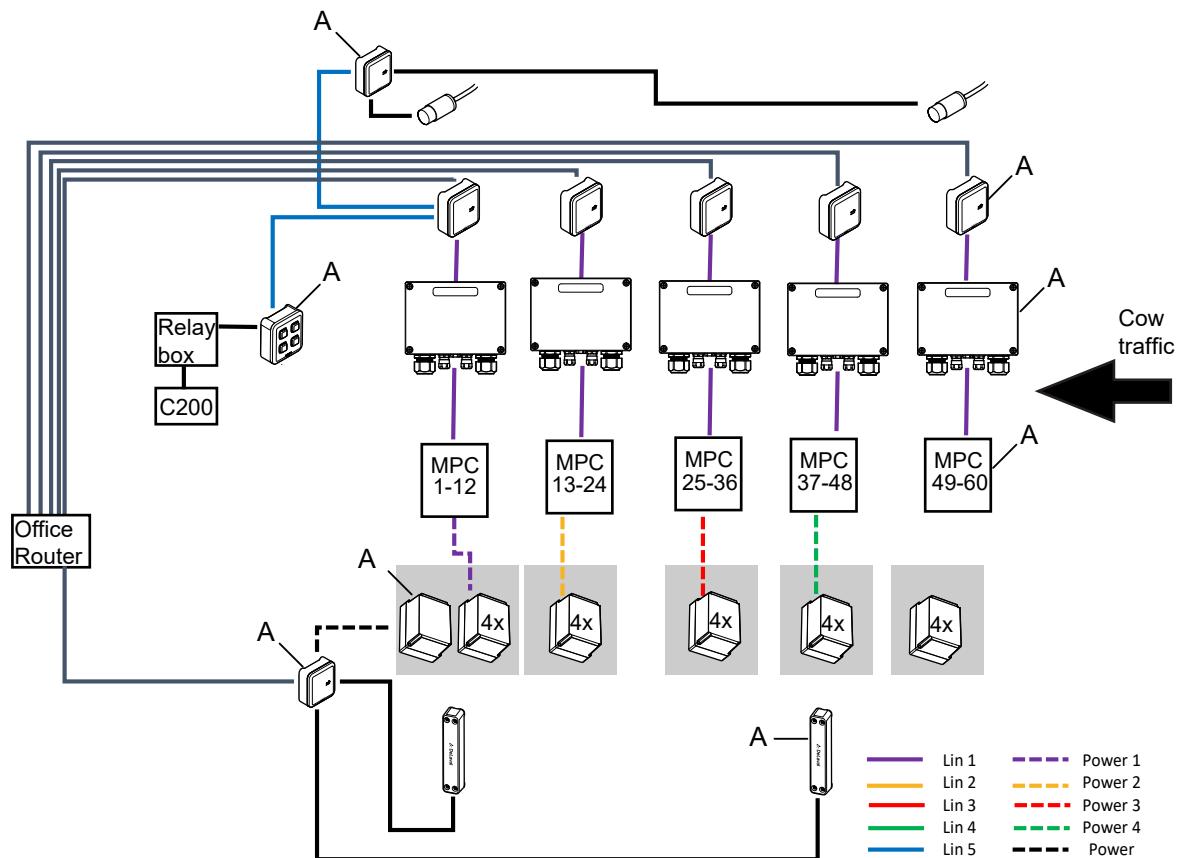


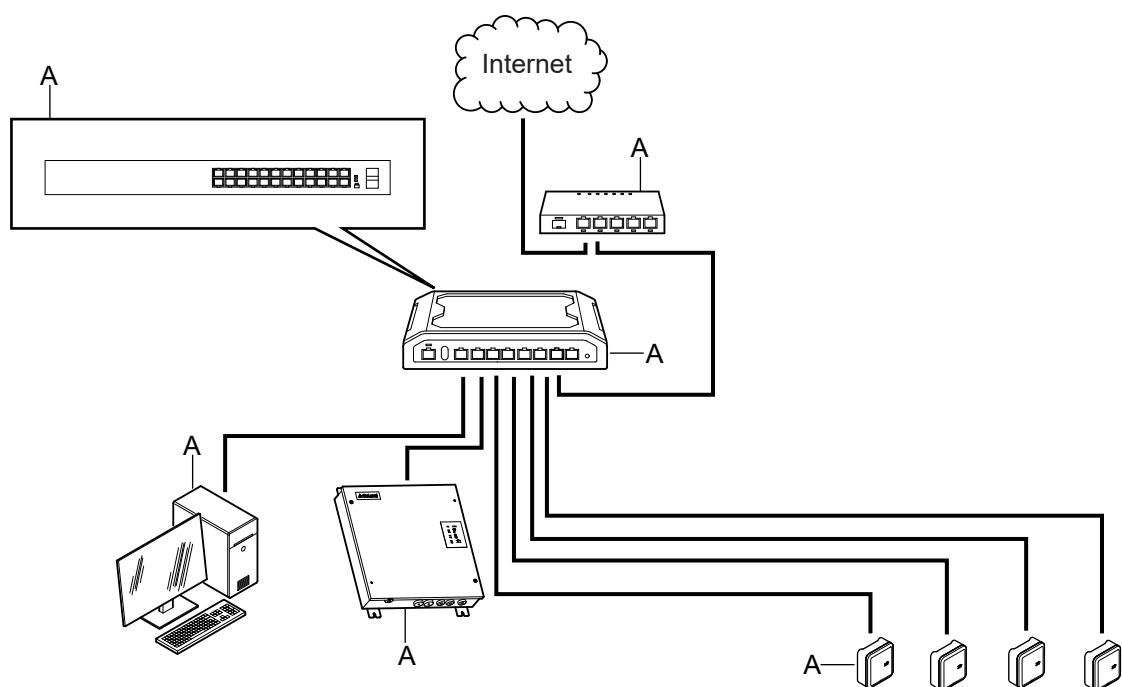
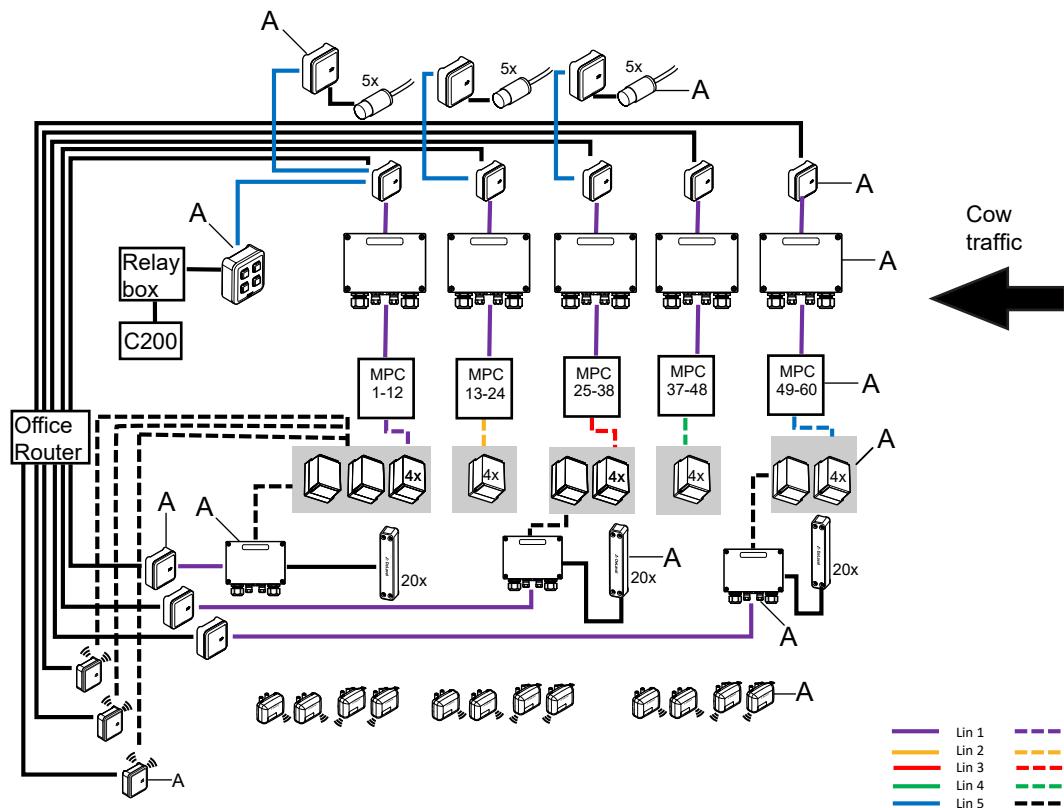
**Fig. 15:** Display module DM223.

DM223 is a new generation display module. It is an extension for the existing MA system offering a visual user interface for presenting ongoing activities like cow identification, progress bar, expected milking time, status flags and reminder icons. In addition, it was also equipped with an LED indicator that communicates through a colour code, in a manner similar to BM213.

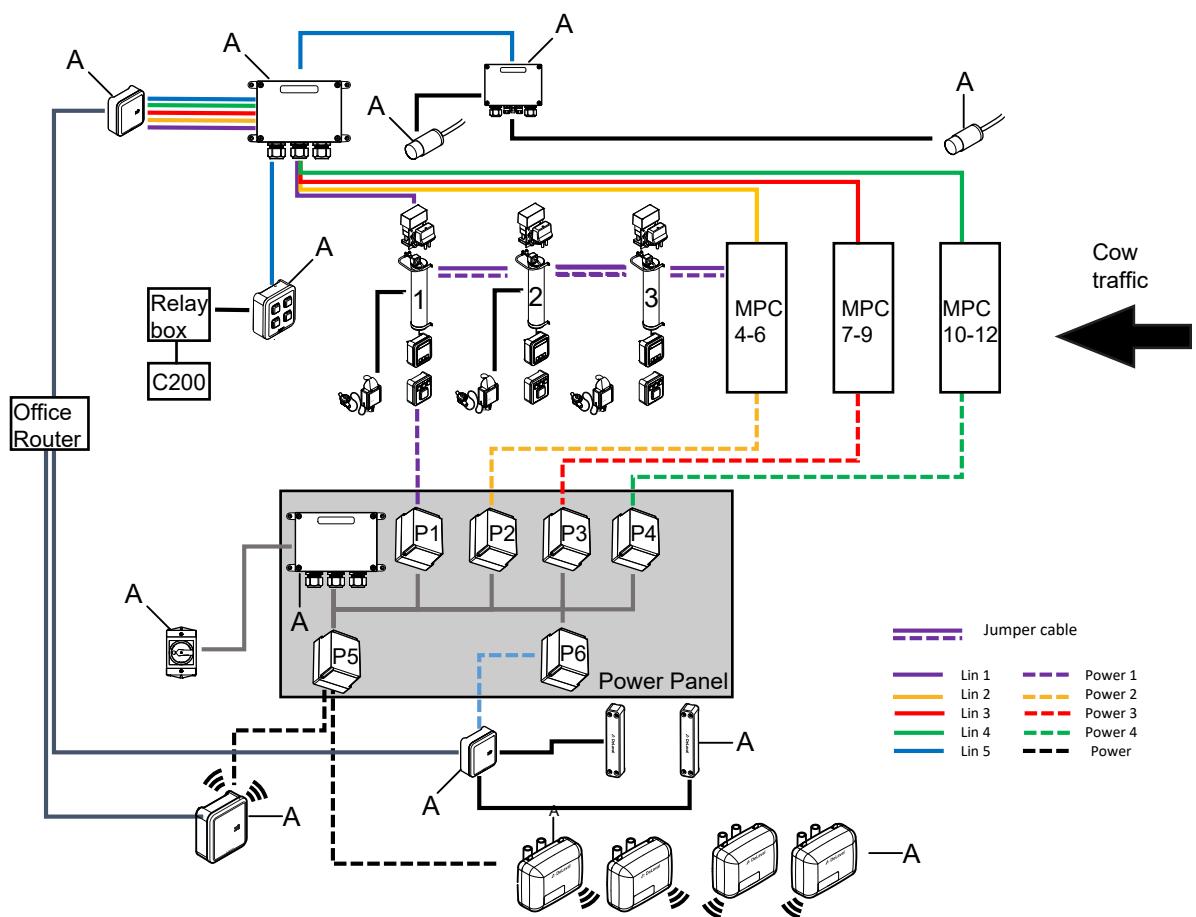
DM223 will display, in real time, the milking progress and the collected amount of milk at the end of milking. It will display a low yield alarm, reminder codes or other alarms, if they occur. Basic cow data can also be checked, like days in milk, days since last insemination, lactation number.

## 2.2.2 Overview of the milking automation system - for parlours

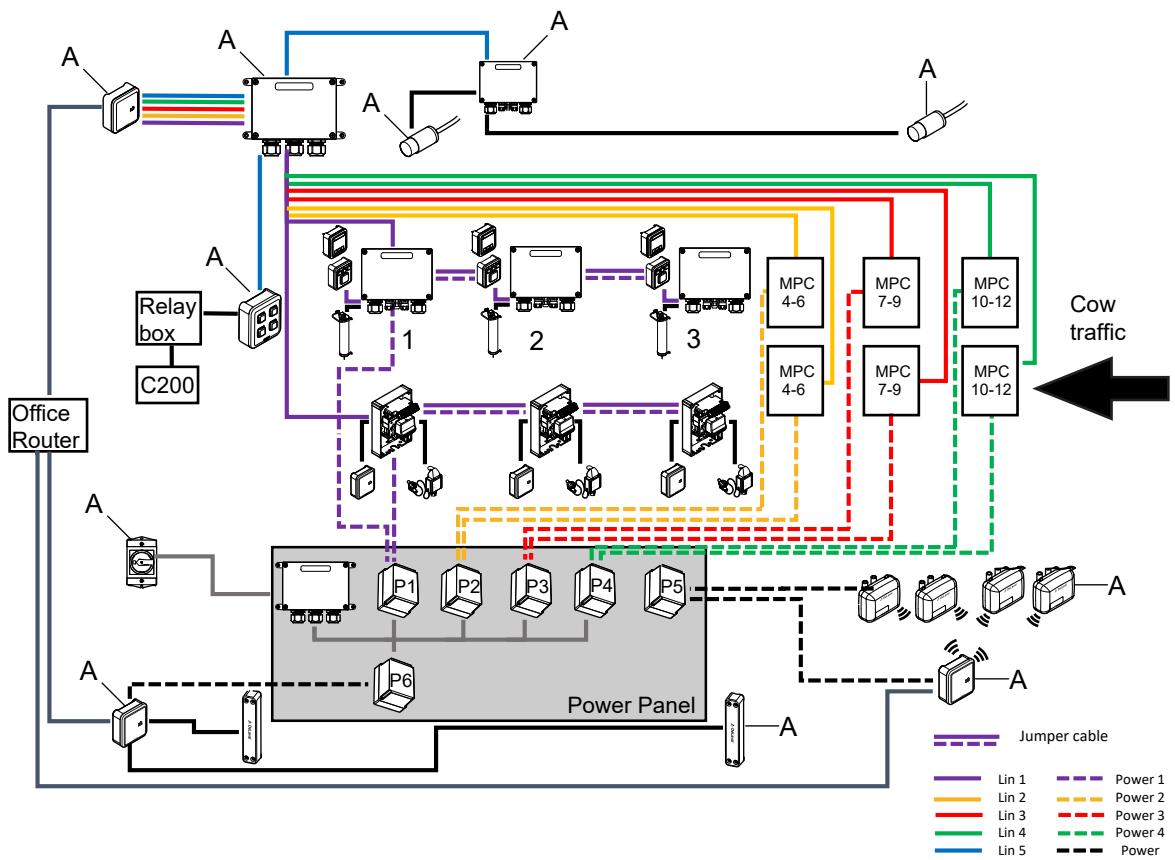




## 2.2.2.1 High-High setup



## 2.2.2.2 High-Low setup



## 3 Operation

### 3.1 Important notes

#### PROHIBITED!

It is prohibited to operate, service, inspect, or otherwise handle this equipment until the user has read the manual and has been properly trained in the intended use of the equipment.

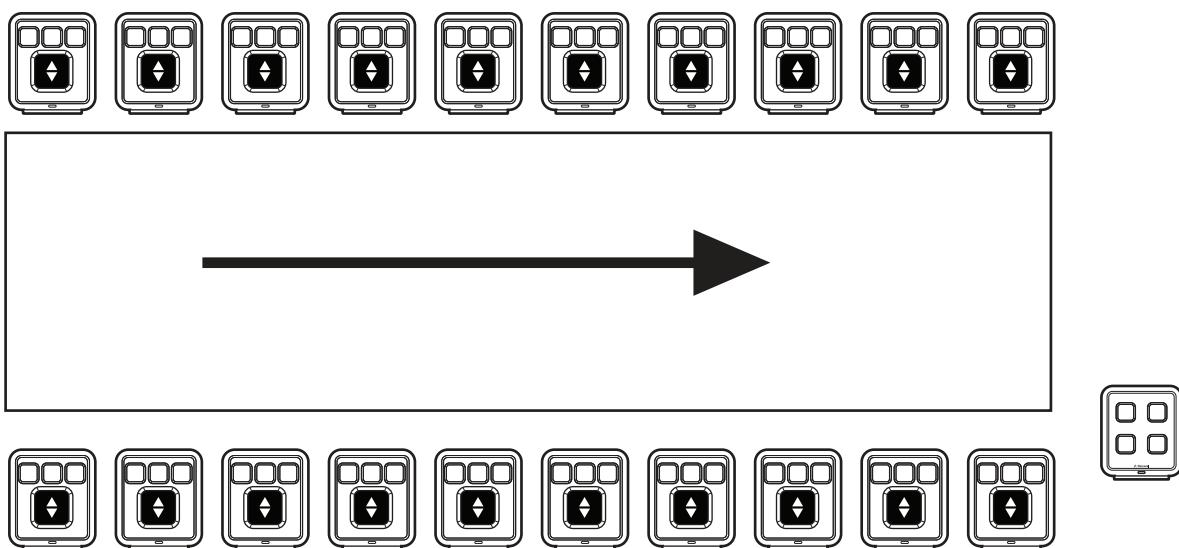
#### Note!

Handle animals quietly and calmly as they enter the holding area. Avoid entering the holding area after the animals are loaded.

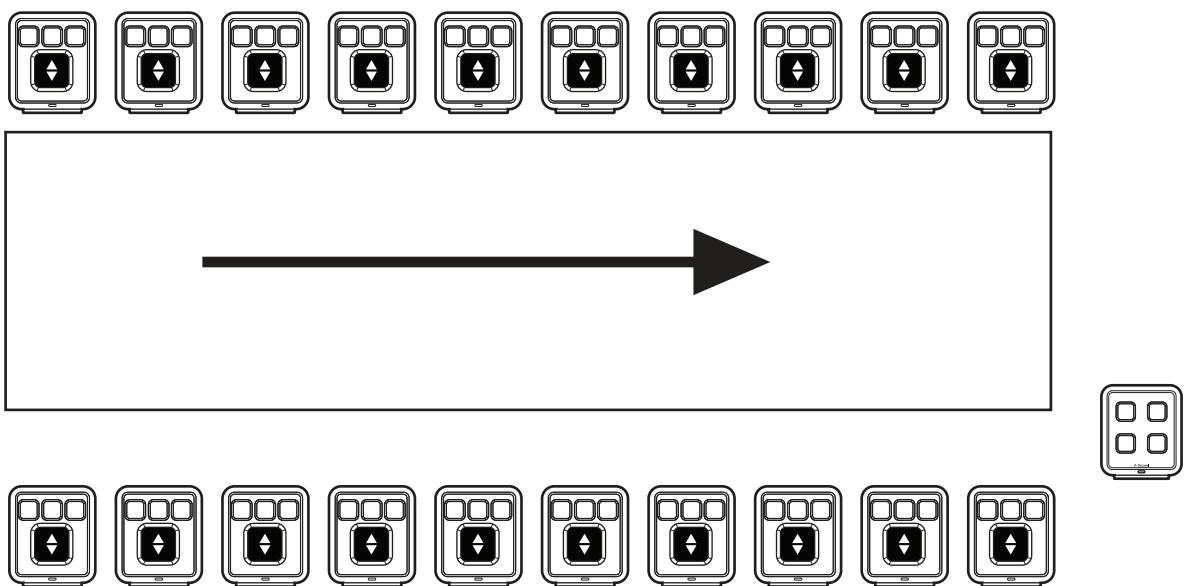
The cleaning unit examples in this chapter refer to DeLaval cleaning unit C125, DeLaval cleaning unit C200, and KOM PLUS.

The crowd gate examples in this chapter refer to DeLaval cow mover herdsman HRS and Usher™ crowd gate HRS.

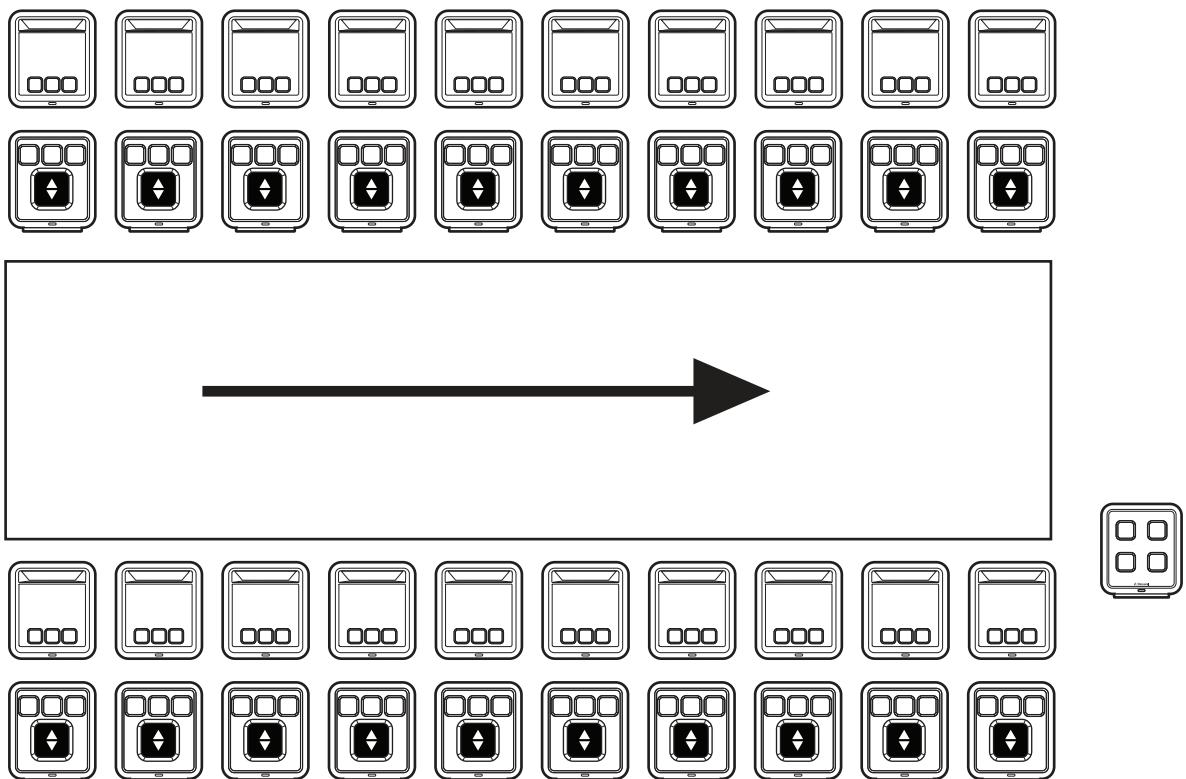
For detailed information about all products mentioned in this chapter, see the Instruction book for a specific product.



**Fig. 16:** A parlour with MA100 and Parlour State Control.



**Fig. 17:** A parlour with MA200 and Parlour State Control.



**Fig. 18:** A parlour with MA500 and Parlour State Control.

**Note!**

This chapter only describes the use of the MA200 system. For a complete system operation, follow also the instructions for the milking parlour and other equipment installed in the parlour.

## 3.2 Handling sick or treated animals

DeLaval recommends physically separating sick or treated cows and milking these cows in a separate group at the end of the milking session, directly before the system cleaning. This milk should not be mixed with the milk from healthy cows.

To prevent sick animal from accidentally being milked with healthy cows, a visual mark (a spray or a leg band) must be applied on animals (in addition to the herd management alarm). The marking helps recognizing animals that must not be milked or with milk to be diverted.

## 3.3 Explanation of ID-system and IDD

A separate identification system (ID-system) identifies the animals in a milking parlour. Each animal has a transponder which the ID-system reads with an antenna.

An interactive data display (IDD) is a computer touch screen that can be used in milking parlours, allowing the user to view information and monitor the status of milking points in the system.

## 3.4 Operating the system during a milking session - for rotaries

**Note!**

This chapter refers to functions on the small buttons (ID button, Second rotation button, High force vacuum button and Sort button). These are not always available depending on the button module configuration.

If the communication to the herd management system is lost, it is still possible to perform a milking session. See [Milking in fail-safe mode](#).

### 3.4.1 Milking the animal - for rotaries

Ensure there is no problem with the identification of the animal and the cluster attachment is enabled.

**Note!**

If the option **Allow milking of unidentified animals** is activated in DelPro software, no herd management alarm is shown on the button module.

**Note!**

If the option **Allow milking of unidentified animals** is activated in DelPro software, all cows are allowed to be milked with or without transponder and no herd management alarm appears on the button module. However, as long as the cow is unidentified comfort start is deactivated and the large button on the button module must be pressed to release the cluster. If the cow is identified after cluster attach and the cow has a **Do not milk** or **Dump milk** flag set, the cluster is immediately retracted.

1.  If part of the routine, predip the teats.

**MANDATORY!**

Read and abide by all Material Safety Data Sheets (MSDS), labels, instructions, warnings, and health hazard information provided by the chemical manufacturer.

2.  Premilk (strip) 2-3 milk jets from each teat of all animals in the territory to check for flocculation (clots), colour changes, or other inconsistencies.

**Note!**

Always keep abnormal milk separated. Examine the udder and if needed, take a sample for analysis, in for example the DeLaval cell counter DCC.

3.  Clean the teats of the animal and stimulate the udder.

**Note!**

Make sure to remove all dirt and predip (if used). If wiping the teat ends, turn the towel to use the clean side of the towel on the teat end. Always use a clean towel for each animal, and wipe nothing but the animal with the towel.

4. Verify that the animals are identified.

**Note!**

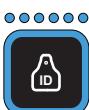
The animal ID can be manual adjusted using the IDD (if IDD is available).

**Note!**

For an animal without a transponder all milk yield data will be lost.

→ The cows are identified when they enter the rotary parlour. The cow number is shown on the rotary controller and on the IDD. The ID may then be changed.

If present, the optional animal identification button indicator is solid cyan if the animal identification is verified.



If the optional animal identification button indicator is flashing rapidly cyan an animal ID is an unknown ID. If the button indicator is flashing slowly in cyan, the animal ID is not verified (verification system needs to be installed).



If the optional animal identification button indicator is off, no animal ID was detected (empty place).

- Check if a herd management alarm active, see table Herd management alarms.

**Table 1: Herd management alarms**

Indication	Description
	<p>If the large button indicator is solid red, the <b>Do not milk</b> flag is set for the specific animal and the button module is blocked for start milking.</p> <p>If the animal is incorrectly flagged, see <a href="#">Overriding a herd management alarm</a>.</p>
	<p>If the large button indicator is rapid flashing red, the <b>Dump milk</b> flag is set for the specific animal and the button module is blocked for start milking.</p> <p>If the animal is incorrectly flagged, see <a href="#">Overriding a herd management alarm</a> and <a href="#">Milking a sick or treated animal into a bucket</a>.</p>
	<p>If the <b>second rotation</b> indicator light is solid yellow, the animal has voluntarily remained on the platform for an additional rotation.</p> <p>The large button indicator is solid red since <b>second rotation</b> indicator triggers a <b>Do not milk</b> flag. See the description for <b>Do not milk</b> alarm.</p>

- Visually inspect the teats.



**Note!**

Do not milk infected teats.

7. Press the large button to release the cluster.



**Note!**

With comfort start there is no need to push the button, vacuum is applied to the cluster when it is lifted. However, this is not the case if the **Do not milk** or **Dump milk** flags are active.

**Note!**

If the animal is incorrectly blocked for milking, see [Overriding a herd management alarm](#).

8. Attach the cluster to the udder of the cow.



**Note!**

Avoid that air enters the cluster before the actual attachment.

**Note!**

If needed, disable automatic retraction of the cluster by pressing the large button again to activate manual mode or Semi automatic milking.

→ The large button indicator light flashes slowly in white until the milk flow is above the low flow limit.



When the milk flow is above the low flow limit, the large button indicator light turns into a solid white.



When the flow is below the take-off limit, the large button indicator light flashes rapidly in white until the cluster is retracted.



The large button indicator light turns to solid green at normal take-off.



If the large button indicator light is flashing rapidly yellow, the expected milk yield or the expected flow within the minimum milking time limit is not reached (by default 90 seconds after cluster release). Check if a reattach is needed, see [Reattaching a cluster - for rotaries](#).



The cluster can be taken off automatically either:

- after normal milking based on flow, or
- if milking time exceeds the maximum milking time (if activated) based on farm setting, or
- at milking alarm, based on farm setting

9.



If the animal has a high milk flow already at the start of the milking, press the **Force vacuum** button to activate a high vacuum level immediately if the system has two vacuum levels - Flow Adjusted Stimulation (FAS).

**Note!**

The activation can be triggered either manually or automatically.



The indicator light turns into a steady cyan indicating that the high forced vacuum function is active. The activation can be triggered either manually or automatically.

10.



Check for any alarms during milking. A number of milking alarms share the same indication on the button module, see table below.

**Note!**

If the large button indicator is solid yellow, a general milking alarm is active. The general milking alarms are specific to the settings made on the farm. The general alarm can be a reminder for the specific animal, to check something, give a treatment, or do a manual attach, and so on.

**Note!**

Further information regarding the condition of the milking alarm is available on the IDD.

**Note!**

Cluster take-off can be implemented immediately on detection of a milking alarm according to farm settings, unless manual milking is active.

**Note!**

Cluster attachment can be blocked after cluster take-off on detection of a general milking alarm, according to farm settings.

**Note!**

On rotaries using retention bars, when a milking alarm is detected, the retention bar will lower immediately on detection or at the confirmed point according to farm settings (if installed).

**Table 2:**

General milking alarms	<a href="#">» Continue next page</a>
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**General milking alarms**

Air leakage detection.

Occurs due to liner slip or other leakage on teat cups.

Identify and fix the air leakage, see [Reattaching a cluster - for rotaries](#).

**Note!**

The alarm clears when the air leakage stops, at cluster take-off, or from the IDD, whichever occur first.

Kick-off detection.

Occurs when the animal has physically kicked-off and removed the clusters while milking.

Consider reattaching, see [Reattaching a cluster - for rotaries](#).

**Note!**

The alarm clears when the air leakage stops, at cluster take-off, or from the IDD, whichever occur first.

Premature take-off.

Occurs when, after take-off, the minimum milking time limit, according to farm settings, is not reached.

Consider reattaching, see [Reattaching a cluster - for rotaries](#).

**Note!**

The alarm clears when the air leakage stops, at cluster take-off, or from the IDD, whichever occur first.

Blocked air bleed detection.

Occurs when blockage of the airbleed in the cluster is detected and the milk is not evacuated from the cluster properly.

Clean the hole to unblock and consider reattaching, see [Reattaching a cluster - for rotaries](#).

**Note!**

The alarm clears when the air bleed is unblocked, at cluster take-off, or from the IDD, whichever occur first.

» Continue next page

**General milking alarms**

Only in combination with milk meter MM27BC2:

Blood detection.

Occurs when the average blood concentration in the milk during this milking exceeds a threshold set by the user.

If the cluster is retracted due to a blood alarm it is not recommended to reattach the cluster as the blood detected is not always visible in the milk. Consider milking in a bucket.

**Note!**

The alarm clears when the cluster is released (reattached) or dropped, or from the IDD, whichever occur first.

Only in combination with milk meter MM27BC2:

Milk conductivity alarm.

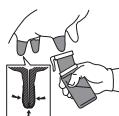
Occurs when the relative deviation between average conductivity during ongoing milking and the expected conductivity for the cow exceeds a set threshold (the expected Conductivity is based on a 7 days average conductivity).

Follow the farm's conductivity management instructions.

**Note!**

The alarm clears when conductivity levels return to normal, the cluster is released (reattached) or dropped, or from the IDD, whichever occur first.

11.



If part of the routine, post-dip or spray the teats of the animals with a suitable solution after take-off.

**MANDATORY!**

Read and abide by all Material Safety Data Sheets (MSDS), labels, instructions, warnings, and health hazard information provided by the chemical manufacturer.

**Note!**

The post-dip or spray should fully cover the teat and the teat end.

## 3.5 Operating the system during a milking session

### 3.5.1 Milking in automatic mode

Ensure there is no problem with the identification of the animal and the cluster attachment is enabled.

**Note!**

If the option **Allow milking of unidentified animals** is activated in DelPro software, no herd management alarm is shown on the button module.

**Note!**

If the option **Allow milking of unidentified animals** is activated in DelPro software, all cows are allowed to be milked with or without transponder and no herd management alarm appears on the button module. However, as long as the cow is unidentified comfort start is deactivated and the large button on the button module must be pressed to release the cluster. If the cow is identified after cluster attach and the cow has a **Do not milk** or **Dump milk** flag set, the cluster is immediately retracted.

For best efficiency, start the first step in the milking routine as soon as the first animal is in position in the stall.

**Note!**

For animals from whom the milk must be separated, follow the instructions in [Milking a sick or treated animal into a bucket](#).

1.  Wash hands before starting milking.

**Note!**

Clean hands prevent contamination of teats.

2.  Put on clean milking gloves.

**Note!**

Disposable gloves prevent the teats from potential bacteria and soil lodged in the small cracks of the hands. Replace torn or ripped gloves immediately.

3.  Press the **Neck rail index forward** button to better position the animals in the gang for preparation and milking.

4.  If part of the routine, predip the teats of all animals in the area of a milker's responsibility (the territory).

**Note!**

Leave the pre-treatment solution on the teats for at least 30 seconds.

**MANDATORY!**

Read and abide by all Material Safety Data Sheets (MSDS), labels, instructions, warnings, and health hazard information provided by the chemical manufacturer.

5.  Premilk (strip) 2-3 milk jets from each teat of all animals in the territory to check for flocculation (clots), colour changes, or other inconsistencies.

**Note!**

Always keep abnormal milk separated. Examine the udder and if needed, take a sample for analysis, in for example the DeLaval cell counter DCC.

6.  Clean the teats and stimulate the udder of all animals in the territory.

**Note!**

Make sure to remove all dirt and predip (if used). If wiping the teat ends, turn the towel to use the clean side of the towel on the teat end. Always use a clean towel for each animal, and wipe nothing but the animal with the towel.

**Note!**

The cluster should be attached to the udder within 45 to 120 seconds after the pre-treatment started, for a fast and gentle milk extraction. The recommendation is 60 seconds, but this varies during the animal's lactation cycle and milking frequency.

7.  When the parlour side is full, press the **Entrance gate close** button to close the entrance gate.

8. Verify that the animals are identified.

**Note!**

The animal ID can be manual adjusted using the IDD (if IDD is available).

**Note!**

For an animal without a transponder all milk yield data will be lost.

→ The cows are identified when they enter the parlour. The cow number is shown on the IDD. The ID may then be changed.



If present, the optional animal identification button indicator is solid cyan if the animal identification is verified.



If the optional animal identification button indicator is flashing rapidly cyan an animal ID is an unknown ID. If the button indicator is flashing slowly in cyan, the animal ID is not verified (verification system needs to be installed).



If the optional animal identification button indicator is off, no animal ID was detected (empty place).

- Check if a herd management alarm active, see table Herd management alarms.

**Table 3: IDD icons and BM indicators**

Indication	Description
 Solid red	<p><b>Do not milk flag.</b></p> <p>This flag is usually used on animals during the post calving and dry-off period or when antibiotic treatment is applied.</p> <p>If the animal is incorrectly flagged, it is possible to override a blocking if the setting to allow an override is activated in DelPro software. See <a href="#">Overriding a herd management alarm</a>.</p>
 Red flashing rapidly	<p><b>Dump milk flag.</b></p> <p>The milking point is blocked for start milking (for the specific animal).</p> <p>It is possible to override a blocking if the setting to allow an override is activated in DelPro software. See <a href="#">Overriding a herd management alarm</a>.</p>
 Solid red in Upper, left, and right segments – Solid yellow in upper segment	<p><b>Dump milk for Blood detection</b></p> <p>Occurs after cluster attachment so that the milk can be assessed before entering the milk line. It is possible to override a blocking if the setting to allow an override is activated in DelPro software.</p>
 Solid cyan	<p><b>Separate animal</b> has been activated</p>

» Continue next page

Indication	Description
	<p><b>General Milking alarm</b></p> <p>These alarms are specific to the settings made on the farm. The general alarm can be a reminder for the specific animal, to check something, give a treatment, or do a manual attach, and so on.</p>

10. Visually inspect the teats.



**Note!**

Dump milk from an animal with infectious teats and animals under antibiotic treatment.

11. Press the large button to release the cluster.



**Note!**

With comfort start there is no need to push the button, vacuum is applied to the cluster when it is lifted. However, this is not the case if the **Do not milk** or **Dump milk** flags are active.

**Note!**

If the animal is incorrectly blocked for milking, see the [Overriding a herd management alarm](#) chapter.

12. Attach the cluster to the udder of the cow.



**Note!**

Avoid that air enters the cluster before the actual attachment.

**Note!**

If needed, disable automatic retraction of the cluster by pressing the large button again to activate manual mode or Semi automatic milking.



The large button indicator light flashes slowly in white until the milk flow is above the low flow limit.



When the milk flow is above the low flow limit, the large button indicator light turns into a solid white.



When the flow is below the take-off limit, the large button indicator light flashes rapidly in white until the cluster is retracted.



The large button indicator light turns to solid green at normal take-off.



If the large button indicator light is flashing rapidly in yellow, the expected milk yield or the expected flow within the minimum milking time limit is not reached (by default 90 seconds after cluster release). Check if a reattach is needed, see the [Reattaching a cluster](#) (for parlours) and [Reattaching a cluster - for rotaries](#) chapter(s).



The cluster can be taken off automatically either:

- after normal milking based on flow, or
- if milking time exceeds the maximum milking time (if activated) based on farm setting, or
- at milking alarm, based on farm setting

13.



If the animal has a high milk flow already at the start of the milking, press the **Force vacuum** button to activate a high vacuum level immediately if the system has more than one vacuum level.

**Note!**

The activation can be triggered either manually or automatically.



The indicator light turns into a solid cyan indicating that the high forced vacuum function is active. The activation can be triggered either manually or automatically.

14.



Check for any alarms during milking. A number of milking alarms share the same indication on the button module, see table below.

**Note!**

If the large button indicator is solid yellow, a general milking alarm is active. The general milking alarms are specific to the settings made on the farm. The general alarm can be a reminder for the specific animal, to check something, give a treatment, or do a manual attach, and so on.

**Note!**

Further information regarding the condition of the milking alarm is available on the IDD.

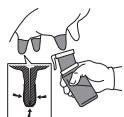
**Note!**

Cluster take-off can be implemented immediately on detection of a milking alarm according to farm settings, unless manual milking is active.

**Note!**

Cluster attachment can be blocked after cluster take-off on detection of a general milking alarm, according to farm settings.

15.



If part of the routine, post-dip or spray the teats of the animals with a suitable solution after take-off.

**MANDATORY!**

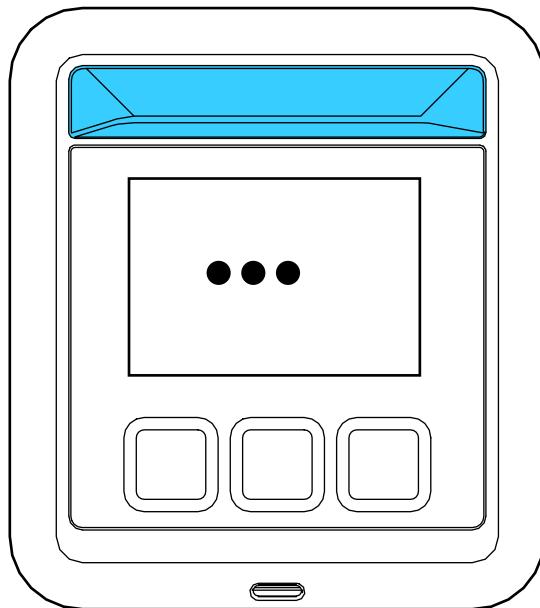
Read and abide by all Material Safety Data Sheets (MSDS), labels, instructions, warnings, and health hazard information provided by the chemical manufacturer.

**Note!**

The post-dip or spray should fully cover the teat and the teat end.

### 3.6 Handling specific MA500 functions

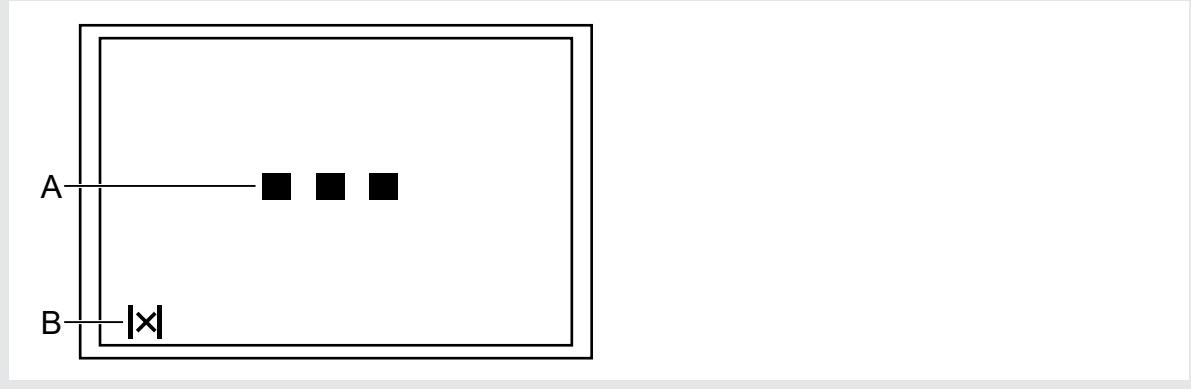
1. After the start of the milking session the display module shows three dots and lights up in a constant blue light, as shown in illustration **Start up screen**. This indicates the **Ready to operate** state and no cow ID.



**Fig. 19:** Start up screen.

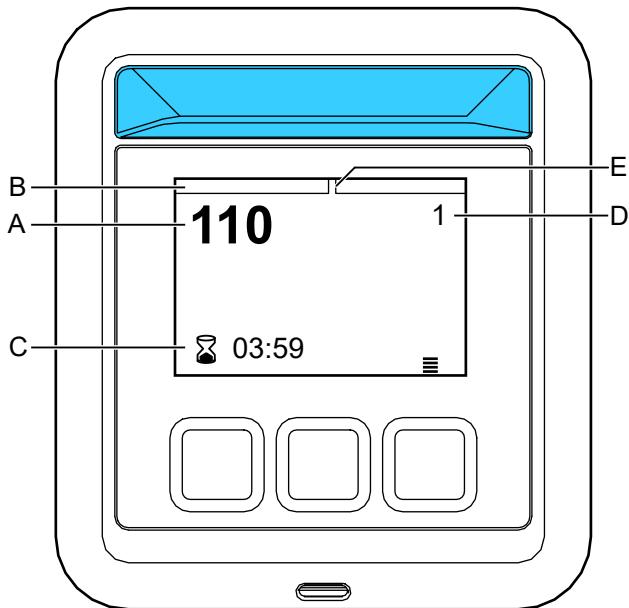
**Note!**

If there is a manual action needed, for instance a confirmation of the empty place, it is done by pressing the left button, as indicated on the screen, see illustration **Empty place correction**.



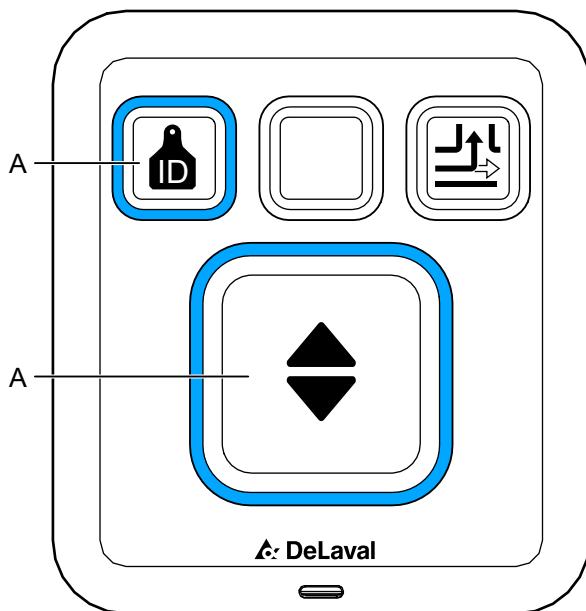
**Fig. 20:** Empty place correction.

2. When the cow ID is sent to the milking place, the animal number can be seen (A), as well as the yield progress bar (B) with the expected yield level (E), the expected milking duration (C) and the group number (D), see illustration **Milking start**.

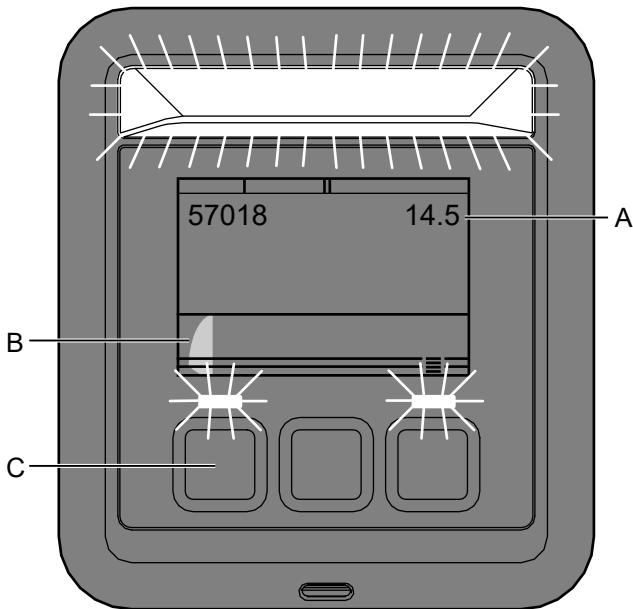


**Fig. 21:** Milking start.

At the same time on the BM215 the ID button (A) can be seen blinking if the ID is not verified yet. After the verification it becomes stable.

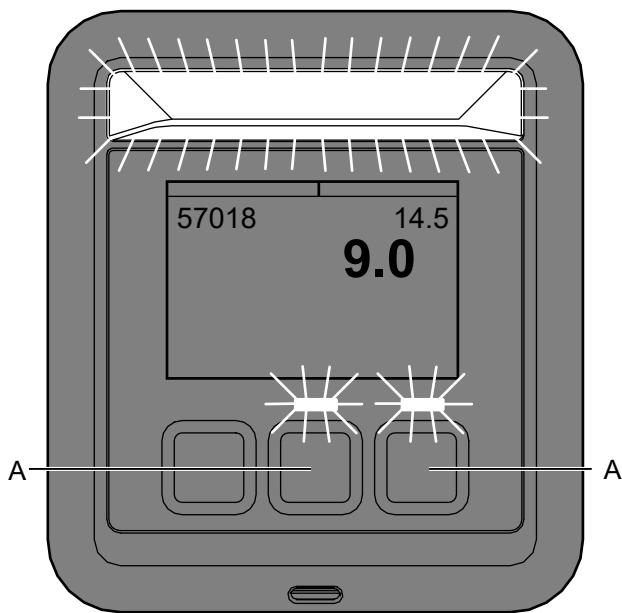


3. After pressing the cluster release button (B), the LED light above the DDM 223 screen turns white and starts flashing, informing about the pre-milking phase. The screen changes and displays the expected yield (A) and the real time milk graph (B), see illustration **Milking in progress**.



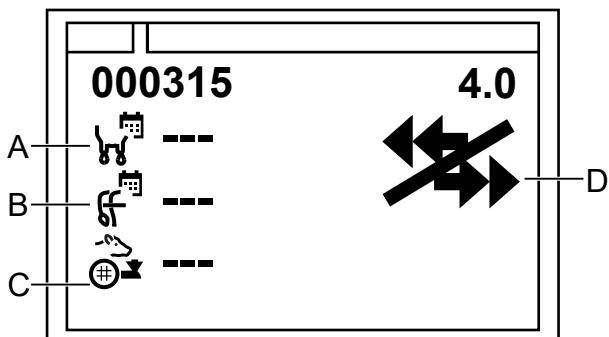
**Fig. 22:** Milking in progress.

4. After pressing the left button (C) (fig), the screen changes to show the actual yield in digits, see illustration **Current yield**. To go back, press the button (A) or wait a few seconds.



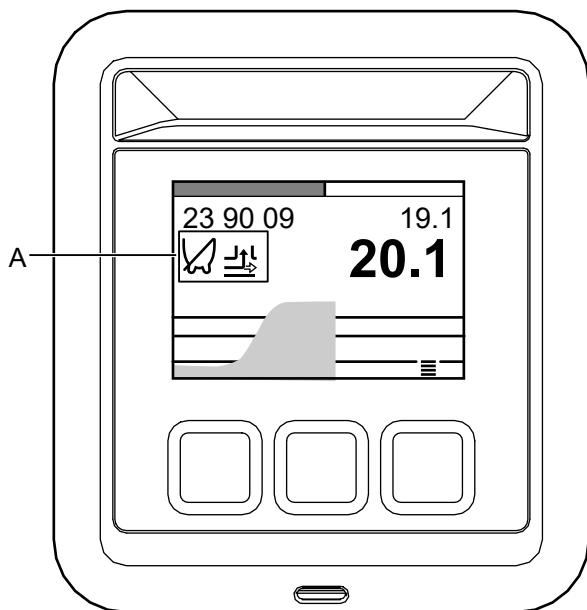
5. By pressing the menu button (B in **Current yield**), enter the animal info section (**Animal data**) where the following cow data can be seen:

- days in milk (A)
- days since last insemination (B)
- lactation number (C)
- communication error (D) in case of a communication issue



**Fig. 23:** Animal data.

6. In case there is a remind code or a flag on the animal, it will be shown on the screen in section A during the milking, see illustration **Remind codes and flags**.

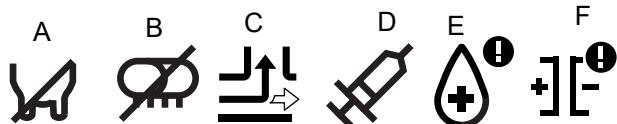


**Fig. 24:** Remind codes and flags.

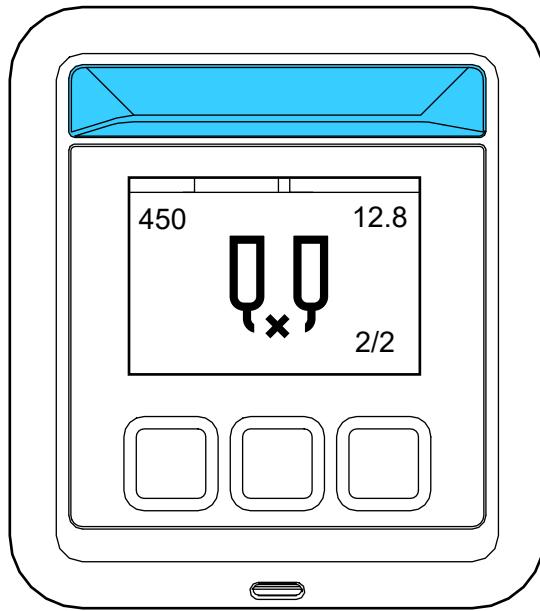
Up to 9 different remind codes can be bundled up, they appear in section A as markers:



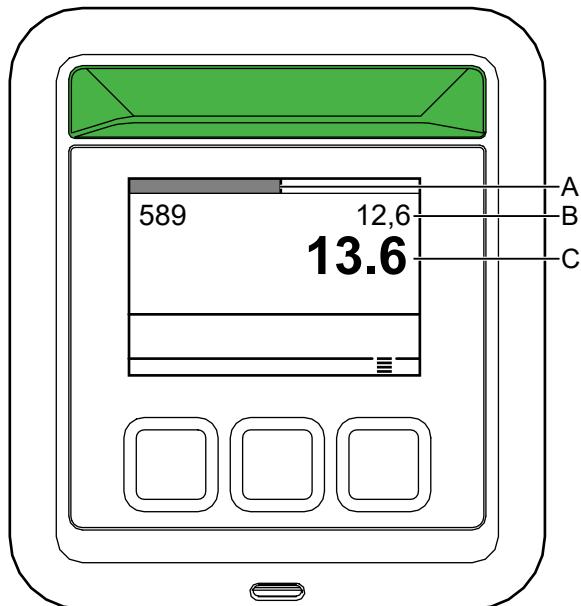
The following flags can be handled:



7. In case there is an alarm during milking it will be displayed on the full screen, see illustration **Alarm: Blocked air bleed**. Blocked air bleed (full list available at the end of this chapter).

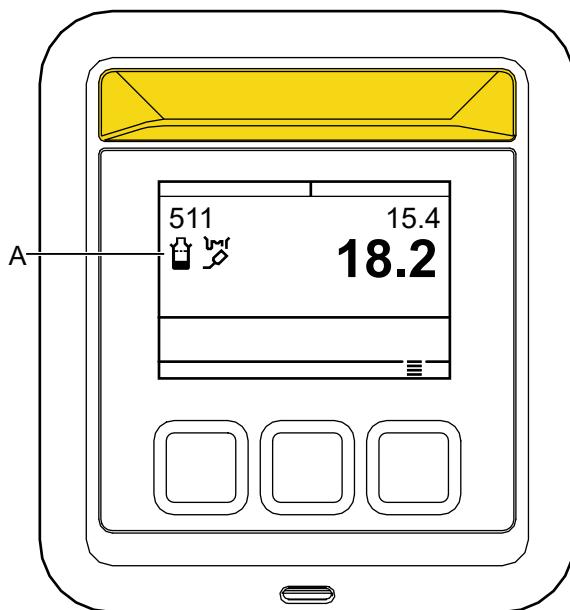


- When the cow is correctly milked and the expected yield threshold (A in illustration **Correct milking end**) is reached, the LED turns green and the cluster is automatically removed (if auto-take-off is installed). On the screen you can see the expected yield value (B in illustration **Correct milking end**) and the actual yield (C in illustration **Correct milking end**).



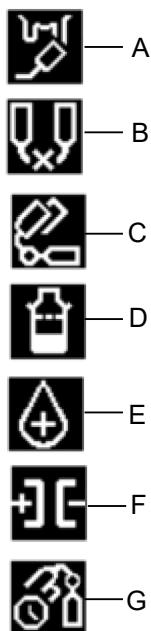
**Fig. 25:** Correct milking end.

- If there is an issue after milking, the LED turns to yellow and starts blinking, informing about a problem that can be observed with the alarm icons (A in illustration **Low yield and slip alarm**).



**Fig. 26:** Low yield and slip alarm.

Possible alarm icons are:



**Fig. 27:** Available alarm icons.

## 3.7 Handling specific MA200 functions

### 3.7.1 Milking in automatic mode

Ensure there is no problem with the identification of the animal and the cluster attachment is enabled.

**Note!**

If the option **Allow milking of unidentified animals** is activated in DelPro software, no herd management alarm is shown on the button module.

**Note!**

If the option **Allow milking of unidentified animals** is activated in DelPro software, all cows are allowed to be milked with or without transponder and no herd management alarm appears on the button module. However, as long as the cow is unidentified comfort start is deactivated and the large button on the button module must be pressed to release the cluster. If the cow is identified after cluster attach and the cow has a **Do not milk** or **Dump milk** flag set, the cluster is immediately retracted.

For best efficiency, start the first step in the milking routine as soon as the first animal is in position in the stall.

**Note!**

For animals from which the milk must be separated, follow the instructions in [Milking a sick or treated animal into a bucket](#).

1.  Wash hands before starting milking.

**Note!**

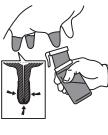
Clean hands prevent contamination of teats.

2.  Put on clean milking gloves.

**Note!**

Disposable gloves prevent the teats from potential bacteria and soil lodged in the small cracks of the hands. Replace torn or ripped gloves immediately.

3.  Press the **Neck rail index back** button to better position the animals in the gang for preparation and milking.

4.  If part of the routine, predip the teats of all animals in the area of a milker's responsibility (the territory).

**Note!**

Leave the pre-treatment solution on the teats for at least 30 seconds.

**MANDATORY!**

Read and abide by all Material Safety Data Sheets (MSDS), labels, instructions, warnings, and health hazard information provided by the chemical manufacturer.

5.  Premilk (strip) 2-3 milk jets from each teat of all animals in the territory to check for flocculation (clots), colour changes, or other inconsistencies.

**Note!**

Always keep abnormal milk separated. Examine the udder and if needed, take a sample for analysis, in for example the DeLaval cell counter DCC.

6.  Clean the teats and stimulate the udder of all animals in the territory.

**Note!**

Make sure to remove all dirt and predip (if used). If wiping the teat ends, turn the towel to use the clean side of the towel on the teat end. Always use a clean towel for each animal, and wipe nothing but the animal with the towel.

**Note!**

The cluster should be attached to the udder within 45 to 120 seconds after the pre-treatment started, for a fast and gentle milk extraction. The recommendation is 60 seconds, but this varies during the animal's lactation cycle and milking frequency.

7.  When the parlour side is full, press the **Entrance gate close** button to close the entrance gate.

8. Verify that the animals are identified.

**Note!**

The animal ID can be manually adjusted using the IDD or the CorrectID App.

**Note!**

For an animal without a transponder all milk yield data will be lost.

→ The cows are identified when they enter the parlour. The cow number is shown on the IDD. The ID may then be changed.

The ID button indicator is solid cyan if the animal identification is verified.





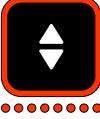
If the ID button indicator is flashing rapidly cyan, an animal ID is an unknown ID. If the button indicator is flashing slowly in cyan, the animal ID is not verified (verification system needs to be installed).



If the ID button indicator is off, no animal ID was detected (empty place).

- Check if a herd management alarm is active, see table Herd management alarms.

**Table 4: IDD icons and BM indicators**

Indication	Description
 Solid red	<p><b>Do not milk flag.</b></p> <p>This flag is usually used on animals during the post calving and dry-off period or when antibiotic treatment is applied.</p> <p>If the animal is incorrectly flagged, it is possible to override a blocking if the setting to allow an override is activated in DelPro software. See <a href="#">Overriding a herd management alarm</a>.</p>
 Red flashing rapidly	<p><b>Dump milk flag.</b></p> <p>The milking point is blocked for start milking (for the specific animal).</p> <p>It is possible to override a blocking if the setting to allow an override is activated in DelPro software. See <a href="#">Overriding a herd management alarm</a>.</p>
 Solid red in Upper, left, and right segments – Solid yellow in upper segment	<p><b>Dump milk for Blood detection</b></p> <p>Occurs after cluster attachment so that the milk can be assessed before entering the milk line. It is possible to override a blocking if the setting to allow an override is activated in DelPro software.</p>

» Continue next page

Indication	Description
	<b>Separate animal</b> has been activated Solid cyan
	<b>General Milking alarm</b> These alarms are specific to the settings made on the farm. The general alarm can be a reminder for the specific animal, to check something, give a treatment, or do a manual attach, and so on.

10. Visually inspect the teats.



**Note!**

Dump milk from an animal with infectious teats and animals under antibiotic treatment.

11. Press the large button to release the cluster.



**Note!**

With comfort start there is no need to push the button, vacuum is applied to the cluster when it is lifted. However, this is not the case if the **Do not milk** or **Dump milk** flags are active.

**Note!**

If the animal is incorrectly blocked for milking, see the [Overriding a herd management alarm](#) chapter.

12.  Attach the cluster to the udder of al pre-treated animals, and properly align the cluster position for good udder health.

**Note!**

Avoid that air enters the cluster before the actual attachment.

**Note!**

If needed, disable automatic retraction of the cluster by pressing the large button again to activate manual mode or Semi automatic milking.

→  The large button indicator light flashes slowly in white until the milk flow is above the low flow limit (pre-milking phase/post-milking phase).



When the milk flow is above the low flow limit, the large button indicator light turns into a solid white (post-milking phase).



When the flow is below the take-off limit, the large button indicator light flashes rapidly in white until the cluster is retracted.



The large button indicator light turns to solid green at normal take-off.



If the large button indicator light is flashing rapidly in yellow, the expected milk yield or the expected flow within the minimum milking time limit is not reached (by default 90 seconds after cluster release). Check if a reattach is needed, see the [Reattaching a cluster](#) chapter.

The cluster can be taken off automatically either:

- after normal milking based on flow, or
- if milking time exceeds the maximum milking time (if activated) based on farm setting, or
- at milking alarm, based on farm setting

13.



If the animal has a high milk flow already at the start of the milking, press the **Force vacuum** button to activate a high vacuum level immediately if the system has more than one vacuum level.

**Note!**

The activation can be triggered either manually or automatically.

→  The indicator light turns into a solid cyan indicating that the high forced vacuum function is active. The activation can be triggered either manually or automatically.

14.



Check for any alarms during milking. A number of milking alarms share the same indication on the button module, see table below.

**Note!**

If the large button indicator is solid yellow, a general milking alarm is active. The general milking alarms are specific to the settings made on the farm. The general alarm can be a reminder for the specific animal, to check something, give a treatment, or do a manual attach, and so on.

**Note!**

Further information regarding the condition of the milking alarm is available on the IDD.

**Note!**

Cluster take-off can be implemented immediately on detection of a milking alarm according to farm settings, unless manual milking is active.

**Note!**

Cluster attachment can be blocked after cluster take-off on detection of a general milking alarm, according to farm settings.

15.



If part of the routine, post-dip or spray the teats of the animals with a suitable solution after take-off.

**MANDATORY!**

Read and abide by all Material Safety Data Sheets (MSDS), labels, instructions, warnings, and health hazard information provided by the chemical manufacturer.

**Note!**

The post-dip or spray should fully cover the teat and the teat end.

### 3.7.2 Milking in manual mode

Sometimes it is better to milk in manual mode. For example, if an animal has a very low milk flow at start and there is a risk that the pre-milking time-out will occur before the milk flow is above the low flow limit which results in a premature take-off. The mode can be shifted back to automatic when the milk flow has increased, to activate automatic retraction after milking.

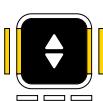
**Note!**

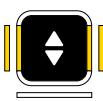
Manual milking requires extra attention since the cluster is not retracted automatically. Retract the cluster in due time to avoid over-milking the animal. Based on farm setting either the **Manual mode** function or **Semi-automatic mode** function will be activated.

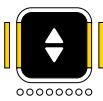
1.

Press the large button to shift to automatic mode from manual mode.



→  The indicator is solid yellow on the left and right segments while the top and bottom are white slow flashing until the milk flow is below the low flow limit.

→  The indicator is solid yellow on the left and right segments while the top and bottom are white solid when the milk flow is above the low flow limit.

→  The indicator is solid yellow on the left and right segments while the top and bottom are white rapid flashing when the milk flow has reached the low flow limit.

2.  When the milk flow has increased above the low flow limit, press the large button again to shift back to automatic mode to activate automatic retraction after milking.

### 3.7.3 Milking in Semi-automatic mode

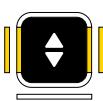
Sometimes it is better to milk in Semi-automatic mode. For example, if an animal has a very low milk flow at start and there is a risk that the pre-milking time-out will occur before the milk flow is above the low flow limit which results in a premature take-off. The mode will automatically shift back to Automatic milking mode when the milk flow has reached a set flow level. Or after a set time. The mode can also be shifted back to automatic by a button push, to activate automatic retraction after milking.

**Note!**

Based on farm setting either the **Manual mode** function or **Semi-automatic mode** function will be activated.

1.  Press the large button to shift to Semi-automatic milking mode from manual mode.

→  The indicator is solid yellow on the left and right segments while the top and bottom are white slow flashing until the milk flow is above the low flow limit.

→  The indicator is solid yellow on the left and right segments while the top and bottom are white solid when the milk flow is above the low flow limit.

When the milk flow is above the low flow limit, the large button indicator light turns into a solid white.



When the flow is below the take-off limit, the large button indicator light flashes rapidly in white until the cluster is retracted.



The large button indicator light turns to solid green at normal take-off.



If the large button indicator light is flashing rapidly yellow, the expected milk yield or the expected flow within the minimum milking time limit is not reached (by default 90 seconds after cluster release). Check if a reattach is needed, see the **Reattaching the cluster** chapter(s).

2. If wanted, press the large button again to shift back to automatic mode to activate automatic retraction after milking.



### 3.7.4 Overriding a herd management alarm



**Fig. 28:** The **Do not milk** flag

If the large button indicator is solid red, the **Do not milk** flag is set for the specific animal and the button module is blocked for start milking. This flag is usually used on animals during the post calving and dry-off period or when antibiotic treatment is applied.



**Fig. 29:** The **Dump milk** flag

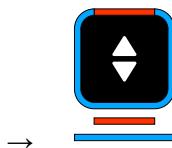
If the large button indicator is rapid flashing red, the **Dump milk** flag is set for the specific animal and the button module is blocked for start milking. This flag is usually set on animals with colostrum milk or animals under treatment.

If the settings in DelPro software allows, it is possible to override a blocking for an animal that is incorrectly flagged.

1. If the animal has colostrum milk or is under treatment, see [Milking a sick or treated animal into a bucket](#).
2. If the animal is incorrectly blocked for milking, press and hold the large button until the blocking is released.

#### Note!

Do not override an animal which is correctly blocked for milking.



→ When an override is released, the top segment turns to solid red while the rest segments are solid cyan.

3.  Attach the cluster to the udder of the cow.

**Note!**

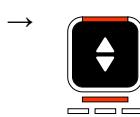
With Flow Adjusted Stimulation (FAS) milking mode the vacuum level can be forced to a high level immediately by pressing high forced vacuum button after attaching the cluster.

**Note!**

If needed, disable automatic retraction of the cluster by pressing the large button again to activate manual mode.

**Note!**

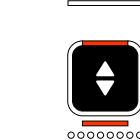
After overriding a herd management alarm, a reminder is indicated on the large button indicator and remains active until the animal exit the rotary. However, the override reminder disappears while manual milking is active.



→ The large button indicator light has the top segment solid red and the other segments flash slowly in white until the milk flow is above the low flow limit.



When the milk flow is above the low flow limit, the large button indicator light turns into a solid white and the top segment is solid red.



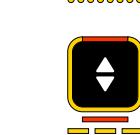
When the flow is below the take-off limit, the large button indicator light is flashing rapidly white and the top segment is solid red until the cluster is retracted.



The large button indicator light turns to solid green at normal take-off. The top segment is solid red still indicating the override.



If the large button indicator light is flashing rapidly yellow, the milk yield is below the expected level. The top segment is solid red still indicating the override. Check if a reattach is needed, see [Reattaching a cluster - for rotaries](#).



If the large button indicator light, despite flashing rate, turns to yellow, it means that a milking alarm has been detected. The top segment is solid red still indicating the override. Check if a reattach is needed, see [Reattaching a cluster - for rotaries](#).

### 3.7.5 Taking off a cluster manually

If a cluster is attached to the udder of an animal and needs to be manually detached, do the following.

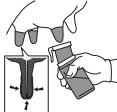
1. Press and hold the large button to take off the cluster manually.  
→ The milking ends (vacuum and pulsation stops) and the cluster is retracted.

If there is no active milking alarm, the indicator turns to solid green.



If the large button indicator light, despite flashing rate, turns to yellow, it means that a milking alarm has been detected.



2.  If part of the routine, post-dip or spray the teats of the animals with a suitable solution after take-off.

#### MANDATORY!

Read and abide by all Material Safety Data Sheets (MSDS), labels, instructions, warnings, and health hazard information provided by the chemical manufacturer.

#### Note!

The post-dip or spray should fully cover the teat and the teat end.

### 3.7.6 Reattaching a cluster - for rotaries

#### Note!

Always check the udder to see if the animal is milked out or if a reattach is necessary.

#### Note!

When reattaching a cluster to an animal; according to farm settings, different parameters will be applied.

#### Note!

If a cluster must be reattached near the exit of a rotary parlour without retention bar it is necessary to stop the platform rotation, reattach the cluster, and manually position a chain behind the animal for a second rotation.

1. Press the large button to release the cluster.

#### Note!

With comfort start there is no need to push the button, vacuum is applied to the cluster when it is lifted.

**Note!**

If the animal is incorrectly blocked for milking, see [Overriding a herd management alarm](#).

2. Attach the cluster to the udder of the cow.

**Note!**

Avoid that air enters the cluster before the actual attachment.

**Note!**

The 2<sup>nd</sup> pre-milking time, which is active at a reattach, is shorter than the 1<sup>st</sup> pre-milking time.

→ The large button indicator light flashes slowly in white until the milk flow is above the low flow limit.



When the milk flow is above the low flow limit, the large button indicator light turns into a solid white.



When the flow is below the take-off limit, the large button indicator light flashes slowly in white until the cluster is retracted.



The large button indicator light turns to solid green at normal take-off.



If the large button indicator light is flashing rapidly yellow, the expected milk yield or the expected flow within the minimum milking time limit is not reached (by default 90 seconds after cluster release). Check if a reattach is needed.



If the large button indicator light, despite flashing rate, turns to yellow, it means that a milking alarm has been detected. Check if a reattach is needed.



3.



→ If the animal has a high milk flow already at the start of the milking, press the **Force vacuum** button to activate a high vacuum level immediately if the system has two vacuum levels - Flow Adjusted Stimulation (FAS).



The indicator light turns into a steady cyan indicating that the high forced vacuum function is active.

4.  In second rotation (with retention bar), if a cluster must be reattached near the exit of a rotary parlour, press the **second rotation** button to lower the retention bar.
5. In second rotation (without retention bar), stop the platform rotation.
6. Reattach the cluster.
7. Manually position a chain behind the animal for a second rotation.
8. Restart the platform rotation.

### 3.7.7 Reattaching a cluster

**Note!**

Always check the udder to see if the animal is milked out or if a reattach is necessary.

**Note!**

When reattaching a cluster to an animal; according to farm settings, different parameters will be applied.

1. Press the large button to release the cluster.

**Note!**

With comfort start there is no need to push the button, vacuum is applied to the cluster when it is lifted.

**Note!**

If the animal is incorrectly blocked for milking, see [Overriding a herd management alarm](#) chapter.

2.  Attach the cluster to the udder of the animal.

**Note!**

Avoid that air enters the cluster before the actual attachment.

**Note!**

The 2<sup>nd</sup> pre-milking time, which is active at a reattach, is shorter than the 1<sup>st</sup> pre-milking time.

→



The large button indicator light flashes slowly in white until the milk flow is above the low flow limit.

When the milk flow is above the low flow limit, the large button indicator light turns into a solid white.



When the flow is below the take-off limit, the large button indicator light flashes slowly in white until the cluster is retracted.



The large button indicator light turns to solid green at normal take-off.



If the large button indicator light is flashing rapidly yellow, the expected milk yield or the expected flow within the minimum milking time limit is not reached (by default 90 seconds after cluster release). Check if a reattach is needed.



If the large button indicator light, despite flashing rate, turns to yellow, it means that a milking alarm has been detected. Check if a reattach is needed.



3.  If the animal has a high milk flow already at the start of the milking, press the **Force vacuum** button to activate a high vacuum level immediately if the system has two vacuum levels - Flow Adjusted Stimulation (FAS).

→  The indicator light turns into a steady cyan indicating that the high forced vacuum function is active.

### 3.7.8 Manually sorting a cow once to a predefined sorting area from the button module

This section describes how to manually sort an animal from the button module to a predefined area when exiting the parlour after a milking session.

**Note!**

Manually sorting an animal once to a predefined area can also be done from the IDD or rotary controller.

Press the **Sort** button to activate the separate animal.



**Note!**

Pressing **Sort** again cancels the sorting of the animals.

→  The indicator light is steady cyan indicating that the animal will be separated, from the rest of its group, to the predefined sorting area that has been set according to the farm settings.

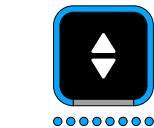
### 3.7.9 Dropping a cluster manually

If the cluster is retracted, the cluster can be manually dropped (without vacuum and pulsation) as follows.

1. In milking mode, press and hold the large button.



→

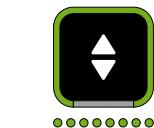


The cluster drops and the lower segment on the button flashes rapidly for 3 seconds.

2. After a normal take-off, press and hold the large button.



→



The cluster drops and the lower segment on the button flashes rapidly for 3 seconds.

3. After a milking alarm, press and hold the large button



→ The cluster drops.

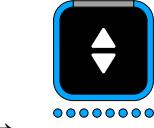
### 3.7.10 Retracting a cluster manually

If the cluster is dropped, the cluster can be manually retracted as follows.

1. In milking mode, press and hold the large button when it is in milking mode.



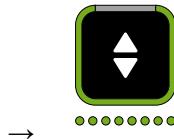
→



The cluster is retracted and the upper segment on the button flashes rapidly for 3 seconds.

2. After a normal take-off, press and hold the large button after a normal take-off.





→ The cluster is retracted and the upper segment on the button flashes rapidly for 3 seconds.

3. After a milking alarm, press and hold the large button after a milking alarm.



→ The cluster is retracted.

### 3.7.11 Forcing milking vacuum level manually

If the animal has a high milk flow already at the start of the milking, it is possible to skip the stimulation vacuum level and force the milking vacuum level immediately.

Press the **Force vacuum** button to activate the milking vacuum level immediately.



→  The indicator light turns into a steady cyan indicating that forced vacuum function is active. The activation can be triggered either manually or automatically.

### 3.7.12 Activating a second rotation manually - for rotaries

The **second rotation** button is used to keep cows in the rotary parlour for a second rotation with retention bar or chain.

The retention bar can be raised or lowered manually as described in below or automatically by the system, based on settings, for example triggered by a low yield indication or blood detection.

1. During manual second rotation, if a cluster must be reattached near the exit of a rotary parlour, press the **second rotation** button to lower the retention bar or to attach the chain.



#### Note!

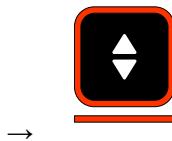
If a retention bar is installed, pressing the **second rotation** again raises the retention bar and the indicator light turns off indicating that the retention bar is raised.



→ The indicator light is steady cyan to indicate that the retention bar is lowered or the chain is in place to keep the animal for a second rotation.

2. If the **second rotation** indicator light is solid yellow, the animal has voluntarily remained on the platform for an additional rotation.





→

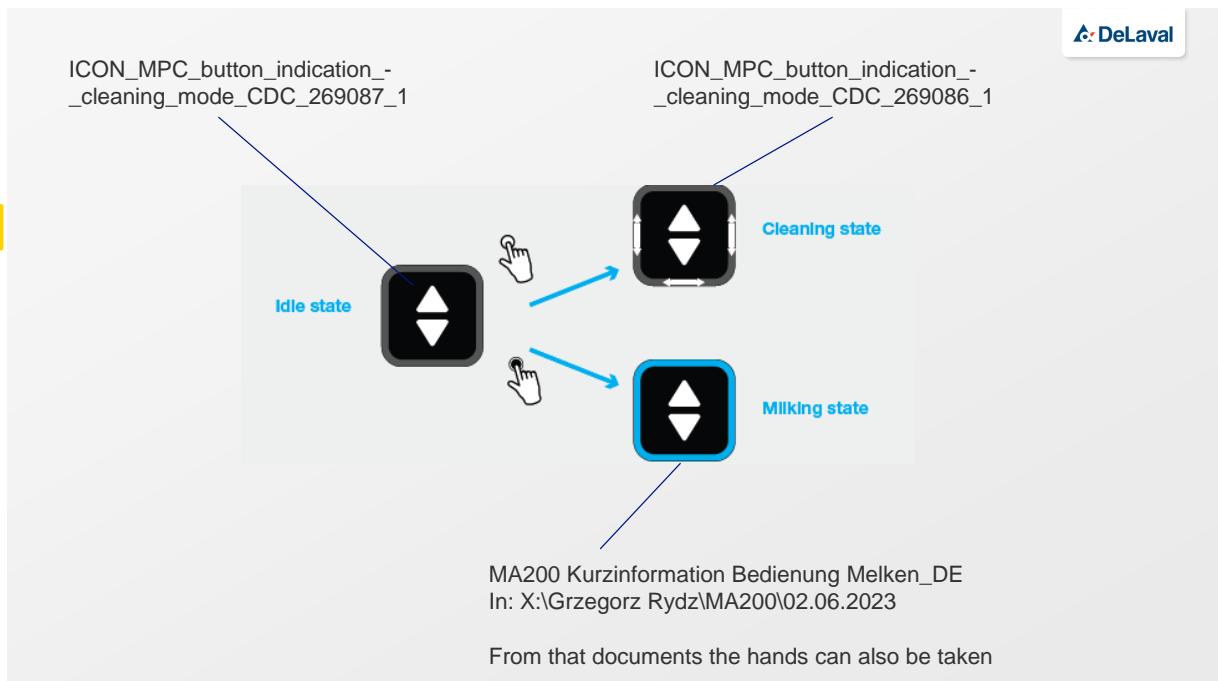
The large button indicator is solid red since **second rotation** indicator triggers a **Do not milk** flag. See the description for **Do not milk** alarm.

### 3.7.13 Setting the system in cleaning/milking mode for rotaries

Setting the system between cleaning/milking can be done with the IDD screen (recommended). In case it is not possible, it might be an MPC (BM213) on a particular bail designated in DelPro for that function.

In order to switch the mode using the MPC, do the following:

- when the MPC is in **Idle mode** or **Cleaning mode**, a short push on the big button will toggle mode between these modes
- a long push (>1s) will enter/exit the milking mode



### 3.7.14 Setting the system in cleaning/milking mode for parlours

Setting the system between cleaning/milking can be done with the IDD screen (recommended). In case the IDD is not installed it might be a Parlour State Controller (BM204) used for that purpose or, in case the cleaning unit is connected to the Parlour State Controller, the switching mode can be done from the Cleaning unit automatically without using the Parlour State Controller buttons.

When the cleaning unit is not connected to the Parlour State Controller, the Parlour State Controller buttons must be used for changing the mode:



Long press (>1second) for changing to **Milking mode**. Second press will disable the **Milking mode**.

Long press (>1second) for changing to **Cleaning mode**. Second press will disable the **Cleaning mode**.

### 3.7.15 Correcting or confirming an animal ID

The small button with the ID ear tag print on the button module indicates the status of the animal identification. The animal ID cannot be corrected on the button module, but on an interactive data display (IDD or a mobile App).

1.  Enter the animal ID on the IDD if an animal is present in the milking point but the indication is off, meaning no animal ID has been detected.

**Note!**

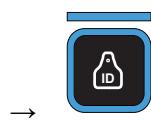
If cow ID is missing, always correct it starting from the lowest MPC number (first MPC with the wrong ID). That will move the rest of the row automatically to correct places (applicable only for parlours).

**Note!**

If the animal is missing a transponder but has a registered ID in DelPro, enter the correct animal ID on the IDD. If possible, separate the animal to a sorting area where a transponder can be placed on the animal.

**Note!**

For an animal without a transponder all milk yield data will be lost.



If the animal ID is verified the indication is solid cyan.

2.  Confirm the animal ID on the IDD if the indication is flashing rapidly cyan, meaning that the animal ID is not registered in DelPro.

**Note!**

Write down a note to register the animals' transponder in DelPro. If needed, separate the animal to a sorting area to read the transponder number.

3.  Confirm the animal ID on the IDD if an animal is present in the milking point but the indication is flashing slowly cyan, meaning that the animal ID has not been verified.

**Note!**

ID verification is an option that might be installed in addition to the entrance ID (for parallel parlours).

### 3.7.16 Milking a sick or treated animal into a bucket

When an animal in the parlour is not supposed to be milked into the regular milk line because it has colostrum milk, is sick, or is treated with penicillin and so on, it can be milked into a milk bucket using a separate cluster.

When the cluster is retracted, proceed as follows:

1. Disconnect the cluster milk tube from the dropper pipe below the platform and connect it to the lid of the milk bucket.
2. Connect a tube from the lid of the milk bucket to the dropper pipe.
3. If the animal is blocked for milking, override the blocking, see the [Overriding a herd management alarm chapter](#).
4. Milk the cow manually according to [Milking in manual mode](#).

**Note!**

Take off the cluster in due time to avoid over-milking the animal.

**Note!**

Avoid over-flowing the bucket, to prevent milk entering the vacuum line.

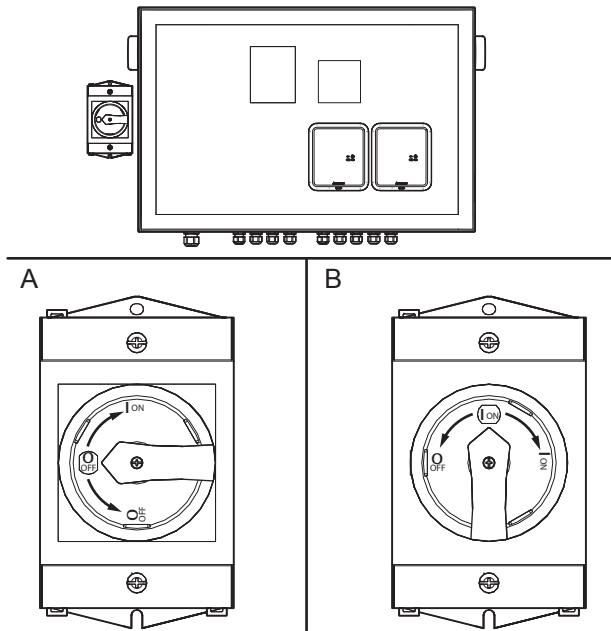
5. Set the appropriated flag **Do not milk** or **Dump milk** from IDD or directly into the DelPro software.

**Note!**

The herd management alarm is active during future milkings for the period set in DelPro software.

## 4 Maintenance

### 4.1 Preparing for maintenance



**Fig. 30:** Operating the infrastructure box main switch.

Turn the main switch or switches to **OFF** (A) of the infrastructure box or boxes.

### 4.2 Maintenance schedule

#### 4.2.1 Cleaning the button module

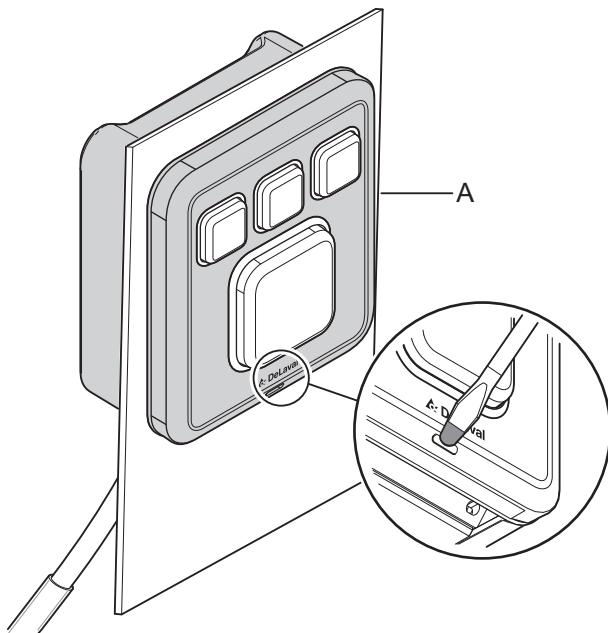
##### **WARNING!**

Electric shock hazard

Disconnect the main power supply and use appropriate lockout-tagout procedures before any installation, inspection, adjustment, or maintenance on the equipment is performed.

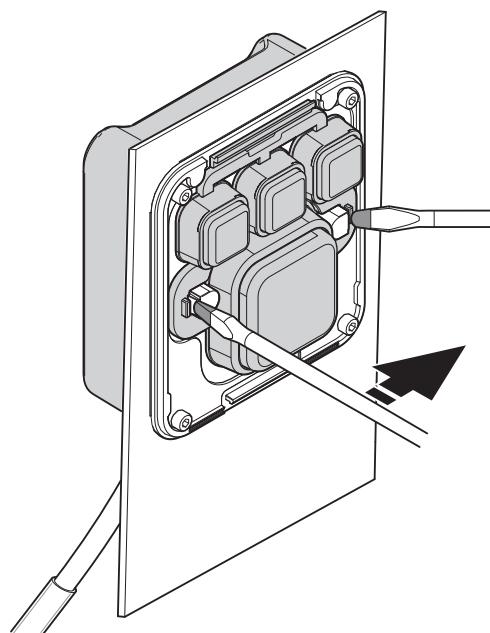
The front cover and button frame is secured to the button module unit with click-locks. Use a flat rubber head tool to carefully click off the parts.

1. Remove the front cover (A).



**Fig. 31:** Removing the front cover from the button module.

2. Detach the button assembly.

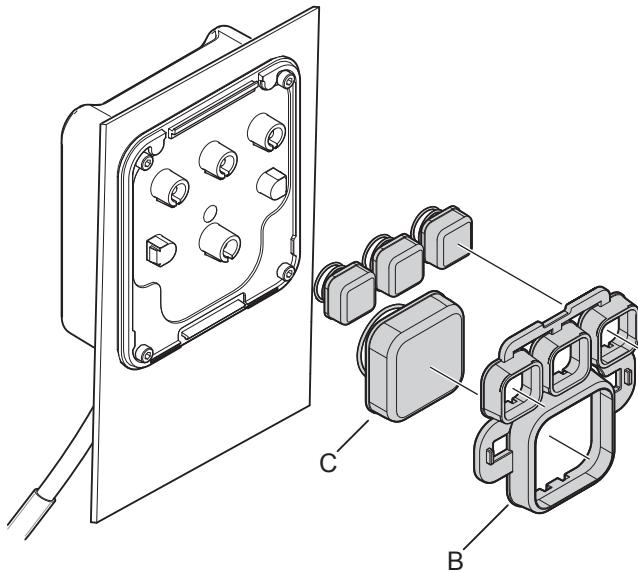


**Fig. 32:** Detaching the button assembly from the main unit.

**Note!**

Do not touch the screw in the back of the buttons as this has a negative impact on the sensor's detection of the button.

3. Remove the buttons (C) from the button frame (B).



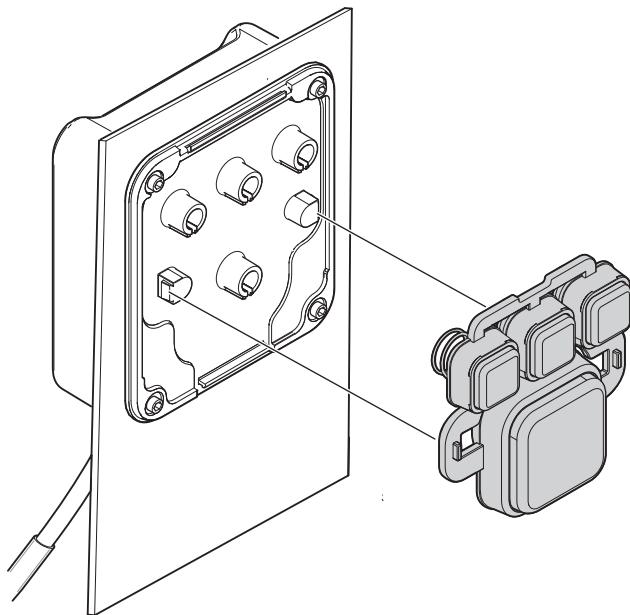
**Fig. 33:** Removing the buttons (C) from the button frame (B).

4. Clean the surfaces of the button module using a sponge and soapy water. Rinse with water. Wipe with sponge.

**Note!**

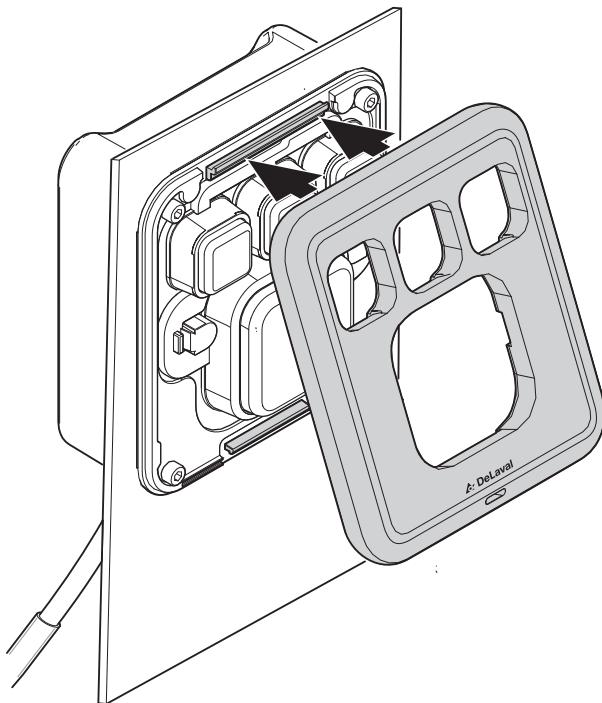
Directing the water jet towards the connections may short circuit the system.

5. Clean the front cover using a sponge and soapy water. Rinse with water. Wipe with sponge.
6. Clean the button frame in a dishwasher or by hand. Rinse with water. Wipe with sponge.
7. Check that all dirt, dust, and residues are removed.
8. Check that the four screws on the button module unit are correctly fastened and that there are no gaps in the sealing.
9. Reinstall the buttons (C) into the button frame (B).
10. Click the button assembly into the click-lock on the main unit.



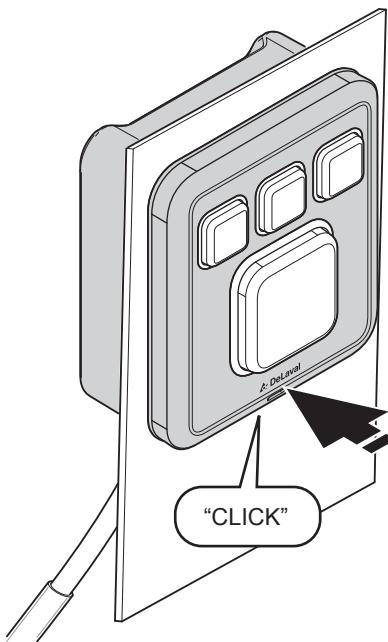
**Fig. 34:** Attaching the button assembly to the main unit.

11. Insert the upper edge of the front cover into the upper edge on the button module.



**Fig. 35:** Attaching the front cover to the button module.

12. Click the lower edge of the front cover into the click-lock.



**Fig. 36:** Click the front cover into position.

**Note!**

If buttons stuck it is good to use a bit of silicon spray.

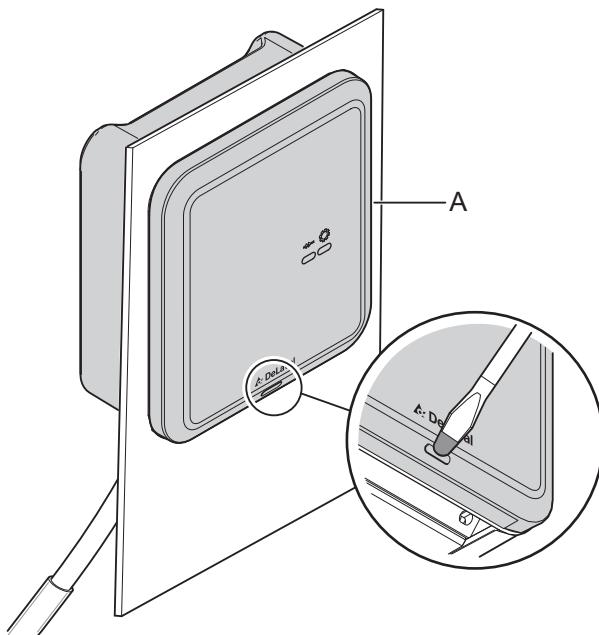
#### 4.2.2 Cleaning the IO modules and the CCMs

**WARNING!**

Electric shock hazard

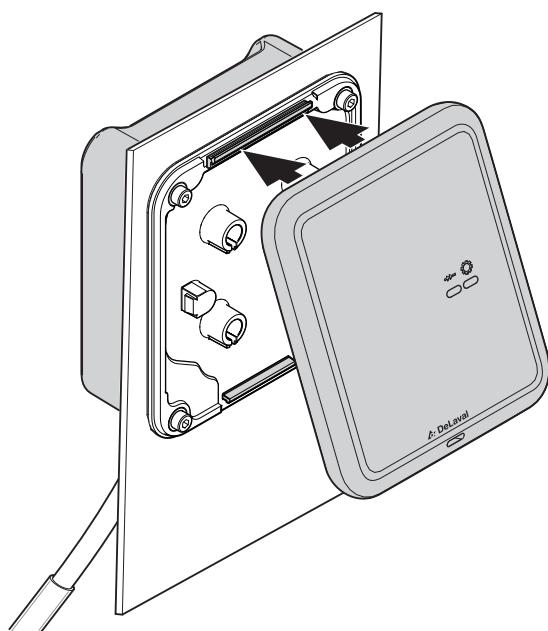
Disconnect the main power supply and use appropriate lockout-tagout procedures before any installation, inspection, adjustment, or maintenance on the equipment is performed.

1. Remove the front cover from the IO module or CCM.



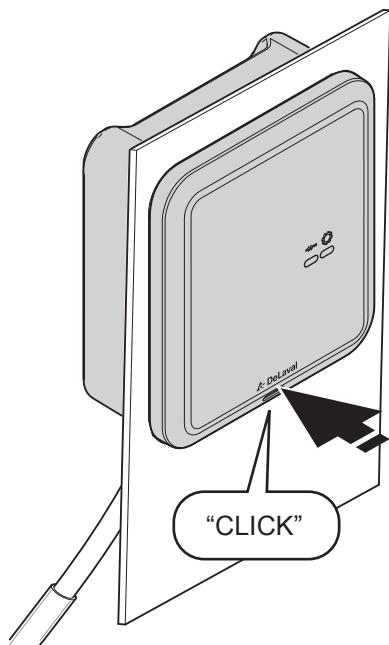
**Fig. 37:** Removing the front cover from the IO module and the CCM.

2. Clean the surfaces of the units using a sponge and soapy water. Rinse with water. Wipe with sponge. Directing the water jet towards the connections may short circuit the system.
3. Clean the front cover using a sponge and soapy water. Rinse with water. Wipe with sponge.
4. Check that all dirt, dust, and residues are removed.
5. Check that the four screws on each unit are correctly fastened and that there are no gaps in the sealing.
6. Insert the upper edge of the front cover into the upper edge on the IO module or CCM.



**Fig. 38:** Attaching the front cover to the IO module or CCM.

7. Click the lower edge of the front cover into the click-lock.



**Fig. 39:** Click the front cover into position.

## 5 Troubleshooting

### 5.1 Procedure when a problem occurs

**Note!**

It is possible to perform milking even if the communication with the herd management system is lost, see [Milking in fail-safe mode](#).

1. Make a note in an error log file on the desktop of the DelPro computer describing the error.

**Note the following:**

- Date (YYYY-MM-DD) and time (HH:MM) when the problem occurred
- What happened (the actual symptoms of the problem)?
- Is the problem reoccurring at a milking point?
- Is the problem with one button module or with several / all?

Example; 2019-05-26 at 08:36 AM: Cow no 126 premature take-off at milking point 3.

**Note!**

This is very important for support personnel who are not present first hand when the problem occurred.

2. If an alarm code is present on the button module, IO module or the CCM, read the information about the alarm and take the necessary action, see [Alarms and status indicators on MA200](#).
3. If no alarm code is present, look through the **Possible problems** section, see [Possible problems with the milking automation](#).
4. If there is a need to contact the service technician, make sure to have as detailed information as possible about the installation.

**Have at least the following information available:**

- DelPro software version
- Photo of the automation panel

**Note!**

A stable internet connection is required to the farm for remote assistance.

### 5.2 Alarms and status indicators on MA200

The milking automation modules have status LED indicators that show status information and alarms. The table below states where the status LED indicators are located on each module.

Module	Status LED indicator location
Button module	One LED on the right segment of the large button and the RGB LED light frames.
IO module	Both LED indicators on the module front.
CCM	Right LED indicator on the module front.

## 5.2.1 Button module (BM) alarms and status indicators

### 5.2.1.1 Large button upper RGB segment is flashing orange on the button module

Large button upper RGB segment is flashing orange on the button module



#### Note!

The indication is only available for software version 6.1.

#### Cause

A mobile device with the **MAtool** running, advertises to the modules that it is ready to pair.

#### Action

- Contact a DeLaval service technician.

### 5.2.1.2 Steady orange (Status indication) on the button module

Steady orange (Status indication) on the button module



#### Note!

The indication is only available for software version 6.1.

#### Cause

Normal application runs with configuration tool connected.

#### Action

- Contact a DeLaval service technician.

### 5.2.1.3 Orange fast flashing (Alarm) on the button module

Orange fast flashing (Alarm) on the button module



#### Cause

The application indicates that the connection to the system controller is lost.

#### Action

- Fail-safe mode is activated, see [Milking in fail-safe mode](#).
- Contact a DeLaval service technician.

#### Cause

The connection to the milk meter or the flow indicator is lost.

#### Action

- Contact a DeLaval service technician.

**5.2.1.4 Orange slow flashing (Alarm) on the button module**

Orange slow flashing (Alarm) on the button module

**Cause**

The connection to the input/output module is lost.

**Action**

- Contact a DeLaval service technician.

**5.2.1.5 Green fast flashing (Alarm) on the button module**

Green fast flashing (Alarm) in the button module

**Cause**

Built-in self-test application run failed.

**Action**

- Contact a DeLaval service technician.

**5.2.1.6 Bright flickering red (Alarm) on the button module**

Bright flickering red (Alarm) on the button module

**Cause**

The launcher application indicates serious unexpected error on the module.

**Action**

- Contact a DeLaval service technician.

**5.2.1.7 Dim steady red (Alarm) on the button module**

Dim steady red (Alarm) on the button module

**Cause**

The feed voltage to the module is equal to or below 18.6 VDC.

**Action**

- Contact a DeLaval service technician.

**5.2.1.8 Bright steady red (Alarm) on the button module**

Bright steady red (Alarm) on the button module

**Cause**

The feed voltage to the module is equal to or above 27.2 VDC.

**Action**

- Contact a DeLaval service technician.

**5.2.1.9 The RGB LED light intensity on the button module is lower than usual****Symptom**

The RGB LED light intensity on the button module is lower than usual.

**Note!**

In normal operation, the RGB LED light intensity lowers during a button push.

**Cause**

The feed voltage to the module is equal to or below 21 VDC.

**Action**

- Contact a DeLaval service technician.

**5.2.1.10 The RGB LEDs on the button module are sometimes glitching****Symptom**

The RGB LEDs on the button module are sometimes glitching.

**Cause**

The feed voltage to the module fluctuates.

**Action**

- Contact a DeLaval service technician.

**5.2.2 IO module (IOM) alarms and status indications****5.2.2.1 Green slow flashing (Status indication) on the IO module**

Green slow flashing (Status indication) on the IO module

**Cause**

The application runs normally.

**Action**

- -

**5.2.2.2 Orange flashing (Status indication) on the IO module or the CCM**

Orange flashing (Status indication) on the IO module or the CCM

**Cause**

A mobile device with the **MAtool** running advertises to the modules that it is ready to pair.

**Action**

- Contact a DeLaval service technician.

**5.2.2.3 Steady orange (Status indication) on the IO module or CCM**

Steady orange (Status indication) on the IO module or CCM

**Cause**

Normal application runs with configuration tool connected.

Launcher application or decompress application runs.

**Action**

- Contact a DeLaval service technician.

**5.2.2.4 Steady green during 3 seconds (Status indication) on the IO module or CCM**

Steady green during 3 seconds (Status indication) on the IO module or CCM

**Cause**

Decompress process ready.

**Action**

- Contact a DeLaval service technician.

**5.2.2.5 Orange fast flashing (Alarm) on the IO module**

Orange fast flashing (Alarm) on the IO module

**Cause**

The application indicates that the connection to the system controller is lost.

**Action**

- Fail-safe mode is activated, see [Milking in fail-safe mode](#).
- Contact a DeLaval service technician.

**Cause**

The connection between the IO module and the button module is lost.

**Action**

- Contact a DeLaval service technician.

**5.2.2.6 Toggling between orange and green flickering every second (Alarm) on both LEDs of the IO module**

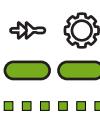
Toggling between orange and green flickering every second (Alarm) on both LEDs of the IO module

**Cause**

The module runs with fallback software due to malfunctioning firmware. The module is only available for pairing with a mobile device with the **MAtool** installed. The module is not available for milking.

**Action**

1. If possible, block the bail or stall for milking.
2. Contact a DeLaval service technician.

**5.2.2.7 Green fast flashing (Alarm) on the IO module or CCM**

Green fast flashing (Alarm) on the IO module or CCM

**Cause**

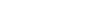
Built-in self-test application run failed.

**Action**

- Contact a DeLaval service technician.

**5.2.2.8 Orange flickering (Alarm) on the IO module**

Orange flickering (Alarm) on the IO module

**Cause**

The launcher application indicates serious unexpected error on the module.

**Action**

- Contact a DeLaval service technician.

**5.2.3 CCM alarms and status indicators****5.2.3.1 Green slow flashing (Status indication) on the right LED of the CCM**

Green slow flashing (Status indication) on the right LED of the CCM. This green indication can also be seen together with an orange and green continuous flickering on the left LED.

For more information see, [Orange and green continuous flickering \(Status indication\) on the left LED of the CCM](#).**Cause**

Normal application runs.

**Action**

- -

**5.2.3.2 Orange and green continuous flickering (Status indication) on the left LED of the CCM**

Orange and green continuous flickering (Status indication) on the left LED of the CCM in combination with a slow green flashing on the LED indication to the right.

**Cause**

The module is connected to the Ethernet and the communication works properly.

**Action**

- -

**5.2.3.3 Orange flashing (Status indication) on the IO module or the CCM**

Orange flashing (Status indication) on the IO module or the CCM

**Cause**

A mobile device with the **MAtool** running advertises to the modules that it is ready to pair.

**Action**

- Contact a DeLaval service technician.

**5.2.3.4 Steady orange (Status indication) on the IO module or CCM**

Steady orange (Status indication) on the IO module or CCM

**Cause**

Normal application runs with configuration tool connected.

Launcher application or decompress application runs.

**Action**

- Contact a DeLaval service technician.

**5.2.3.5 Steady green during 3 seconds (Status indication) on the IO module or CCM**

Steady green during 3 seconds (Status indication) on the IO module or CCM

**Cause**

Decompress process ready.

**Action**

- Contact a DeLaval service technician.

**5.2.3.6 Toggling between orange and green flickering every second (Alarm) on both LEDs of the CCM**

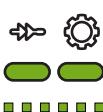
Toggling between orange and green flickering every second (Alarm) on both LEDs of the CCM

**Cause**

The module runs with fallback software due to malfunctioning firmware. The module is only available for pairing with a mobile device with the **MAtool** installed. The module is not available for milking.

**Action**

- Fail-safe mode is activated for the affected bails or stalls, see [Milking in fail-safe mode](#).
- Contact a DeLaval service technician.

**5.2.3.7 Green fast flashing (Alarm) on the IO module or CCM**

Green fast flashing (Alarm) on the IO module or CCM

**Cause**

Built-in self-test application run failed.

**Action**

- Contact a DeLaval service technician.

**5.2.3.8 Steady green (Alarm) on the CCM**

Steady green (Alarm) on the CCM

**Cause**

The CCM is not connected to the Ethernet switch.

**Action**

- Fail-safe mode is activated for the affected bails or stalls, see [Milking in fail-safe mode](#).
- Contact a DeLaval service technician.

## 5.3 Possible problems with the milking automation

The following chapters describe possible problems with the system, what might cause the problem, and suggestions on how the problem might be solved.

Try to isolate the error by studying smaller parts of the system. Find the suitable table below to find out what is causing the problem.

### 5.3.1 The fuses or thermal protection are broken repeatedly in the power supply

**Symptom**

The fuses or thermal protection are broken repeatedly in the power supply.

**Cause**

The cable type used between the power supply to the CCM is incorrect.

**Action**

- Contact a DeLaval service technician.

**Cause**

The cable type between the CCM and the IO module is incorrect.

**Action**

- Contact a DeLaval service technician.

**Cause**

The wiring between the power supply and the CCM and IO module is incorrect.

**Action**

- Contact a DeLaval service technician.

**Cause**

The wiring between the CCM and the IO module is incorrect.

**Action**

- Contact a DeLaval service technician.

**Cause**

The wiring between the button module and the IO module (or junction box) is incorrect.

**Action**

- Contact a DeLaval service technician.

**Cause**

The installer did not follow the power consumption guidelines and connected too many IO modules or/and button modules to one 5 A circuit.

**Action**

- Contact a DeLaval service technician.

### 5.3.2 The clusters are removed too early during milking in one or several milking points

**Symptom**

The clusters are removed too early during milking in one or several milking points.

**Cause**

There is a communication problem between the IO module and the milk meter / flow sensor.

**Action**

- Contact a DeLaval service technician.

### 5.3.3 The clusters are removed too late during milking in one or several milking points

**Symptom**

The clusters are removed too late during milking in one or several milking points.

**Cause**

Incorrectly programmed parameters.

**Action**

- Contact a DeLaval service technician.

### 5.3.4 The clusters are retracted during cleaning in one or several milking points in cleaning mode

**Symptom**

The clusters are retracted during cleaning in one or several milking points in cleaning mode.

**Cause**

There is a problem with timing of the milking / cleaning signals.

**Action**

- Contact a DeLaval service technician.

### 5.3.5 Communication interruption with flow sensor in external rotary

**Symptom**

Communication interruption with flow sensor in external rotary.

**Cause**

A DeLaval teat spray robot TSR is installed which might disturb the button module.

**Action**

- Contact a DeLaval service technician.

### 5.3.6 The button module behaves erratic

**Symptom**

The button module behaves erratic.

**Cause**

The button module is exposed to high temperatures or significant temperature difference repetitively.

**Action**

- Contact a DeLaval service technician.

**Cause**

The button module enclosure is cracked.

**Action**

- Contact a DeLaval service technician.

**Cause**

Dirt is lodged between the button magnet and the chamber of the push button.

**Action**

- Clean the button and chamber.

**Cause**

The magnet is not properly assembled, or magnetic switch in the button module is not level.

**Action**

- Take the push button apart and reassemble it correctly.

**Cause**

A button is broken.

**Action**

- Replace broken parts in the button.

**Cause**

An electrical storm or extreme power surge took place, possibly rearranging the program values in the button module.

**Action**

- Contact a DeLaval service technician.

**Cause**

A Variable Speed Drive (VSD) has been installed incorrectly on the facility, causing excess harmonic current to ground.

**Action**

- Contact a DeLaval service technician.

**Cause**

External high or low voltage equipment on the facility have defective wiring or grounds. Voltage is leaking to ground.

**Action**

- Contact a DeLaval service technician.

### 5.3.7 The large button on the button module flashes when being pressed but no state transition occurs

**Symptom**

The large button on the button module flashes when being pressed but no state transition occurs (for example, the button module does not switch from idle to milking or washing).

**Cause**

Communication error between the button module and the corresponding IO module or an internal error in the button module software.

**Action**

- Contact a DeLaval service technician.

### 5.3.8 The large button on several button modules flash when being pressed but no state transition occurs

**Symptom**

The large button on several button modules connected to the same milking automation network flashes when being pressed but no state transition occurs (for example, the button module does not switch from idle to milking or washing).

**Cause**

Wrongly connected bus cable from the infrastructure box to the affected milking automation network.

**Action**

- Contact a DeLaval service technician.

### 5.3.9 The button module is powered up correctly but no reaction is noted when pressing on one or several buttons on the module

**Symptom**

The button module is powered up correctly but no reaction is noted when pressing on one or several buttons on the module.

**Cause**

The affected buttons are filled with dirt or water.

**Action**

- Remove the buttons and clean them.

**Cause**

One or more screws in the button module is either wrongly tightened or are missing.

**Action**

- Contact a DeLaval service technician.

**Cause**

The button press software in the button module has lost its calibration.

**Action**

- Contact a DeLaval service technician.

### 5.3.10 No reaction when pressing the buttons on one single button module

**Symptom**

No reaction when pressing the buttons on one single button module.

**Cause**

The connections in the button module or in the junction box on the corresponding automation panel are wrong.

**Action**

- Contact a DeLaval service technician.

### 5.3.11 No indications on the IO module LED indicators (and possibly no power to the milk meter)

**Symptom**

No indications on the IO module LED indicators (and possibly no power to the milk meter)

**Cause**

The connections in the IO module or in the junction box on the corresponding automation panel are wrong.

**Action**

- Contact a DeLaval service technician.

### 5.3.12 No reaction when pressing the buttons on any of the three button modules connected together (shorted current to one complete bus/gang)

**Symptom**

No reaction when pressing the buttons on any of the three button modules connected together (shorted current to one complete bus/gang).

**Cause**

Wrong connections in the junction box on one of the corresponding automation panels or between the automation panel group to the infrastructure box.

**Action**

- Contact a DeLaval service technician.

### 5.3.13 No reaction when pressing the buttons on any of the fifteen button modules connected together (no current or shorted current from an infrastructure box)

#### **Symptom**

No reaction when pressing the buttons on any of the fifteen button modules connected together (no current or shorted current from an infrastructure box)

#### **Cause**

The power supply to the infrastructure box is wrongly connected or turned off.

#### **Action**

- Contact a DeLaval service technician.

### 5.3.14 The status LED on the button module is flashing fast

#### **Symptom**

The status LED on the button module is flashing fast.

#### **Cause**

For more information, see [Button module \(BM\) alarms and status indicators](#).

#### **Action**

- For more information, see [Button module \(BM\) alarms and status indicators](#).

### 5.3.15 The button module does not enter main milking phase during simulated milking

#### **Symptom**

The button module does not enter main milking phase during simulated milking.

#### **Cause**

Communication error or configuration error.

#### **Action**

- Contact a DeLaval service technician.

### 5.3.16 The cluster does not retract when it should

#### **Symptom**

The cluster does not retract when it should.

#### **Cause**

The retraction cylinder connection from the automation panel is not correct.

#### **Action**

- Contact a DeLaval service technician.

#### **Cause**

Then pin configuration in the IO module is not performed correctly.

#### **Action**

- Contact a DeLaval service technician.

**Cause**

The valve plate under the retraction cylinder solenoid is missing, is flipped, or is stuck in the solenoid.

**Action**

- Contact a DeLaval service technician.

**Cause**

The vacuum is not connected to the retraction cylinder control valve.

**Action**

- Contact a DeLaval service technician.

**Cause**

The cables from the IO module to the retraction cylinder solenoid are not connected correctly.

**Action**

- Contact a DeLaval service technician.

**Cause**

The retraction cylinder solenoid in the control valve is broken.

**Action**

- Contact a DeLaval service technician.

### 5.3.17 Lifting a retracted cluster while the button module is in milking session mode does not start milking

**Symptom**

Lifting a retracted cluster while the button module is in milking session mode does not start milking.

**Cause**

Communication error or configuration error.

**Action**

- Contact a DeLaval service technician.

**Cause**

The comfort start sensor system is broken or is stuck.

**Action**

- Contact a DeLaval service technician.

### 5.3.18 No vacuum in the clusters, neither in pre-milking phase nor in main milking phase

**Symptom**

No vacuum in the clusters, neither in pre-milking phase nor in main milking phase.

**Cause**

The vacuum is not correctly supplied from the vacuum pump.

**Action**

- Make sure that the pump controller is in milking mode or contact a DeLaval service technician or dealer.

### 5.3.19 No vacuum during the pre-milking or the post-milking phases

#### **Symptom**

No vacuum during the pre-milking or the post-milking phases.

#### **Cause**

The connections between the low vacuum solenoid and the corresponding IO module are wrong, IO module configuration error or problems with the control valve or regulator block.

#### **Action**

- Contact a DeLaval service technician.

### 5.3.20 No vacuum during main milking or forced high phases

#### **Symptom**

No vacuum during main milking or forced high phases.

#### **Cause**

The connections between the low vacuum solenoid and the corresponding IO module are wrong, IO module configuration error or problems with the control valve or regulator block.

#### **Action**

- Contact a DeLaval service technician.

### 5.3.21 The pulsation during milking has wrong rate and/or ratio or makes a strange sound

#### **Symptom**

The pulsation during milking has wrong rate and/or ratio or makes a strange sound.

#### **Cause**

The connections between the pulsator solenoids and the corresponding IO module are wrong, IO module configuration error or problems with the pulsator.

#### **Action**

- Contact a DeLaval service technician.

### 5.3.22 The retention bar is lowered when the button module is in idle mode, but does not lift when a session is activated on the button module

#### **Symptom**

The retention bar is lowered when the button module is in idle mode, but does not lift when a session is activated on the button module.

#### **Cause**

The connections between the retention bar control valve solenoids and the corresponding IO module are wrong, IO module configuration error or problems with the retention bar control valve or regulator block.

#### **Action**

- Contact a DeLaval service technician.

### 5.3.23 The retention bar is lifted when the button module is in idle mode and lowered when a session is activated on the button module

#### Symptom

The retention bar is lifted when the button module is in idle mode and lowered when a session is activated on the button module.

#### Cause

Configuration error.

#### Action

- Contact a DeLaval service technician.

## 5.4 Procedures for exceptional cases

### 5.4.1 Milking in fail-safe mode

#### 5.4.1.1 Available functionality in the fail-safe mode

If the communication between the milking automation system and the herd management system is lost or if the milking automation system network is partially lost, it is still possible to perform milking but with limited functionality on the affected bails or stalls.

#### Note!

The **Do not milk** or **Dump milk** indications are not present on the button module if the communication with the herd management system is lost. Unless the animals have a physical indication (leg band or similar) indicating that they need special treatment, there is a risk of mixing milk from these animals with the milk from healthy animals. For more information, see [Handling sick or treated animals](#) in the **Operation** chapter.

#### The following can be done in fail-safe mode:

- Automatic and manual milking
- Milking a sick or treated cow into a bucket
- Manual take-off
- The automatic retention bar function base on maximum milking time limit (rotaries)
- Cluster drop zone (rotaries)
- Comfort start disable zone (rotaries)

#### The following cannot be done in fail-safe mode:

- No herd management alarms nor indications are available
- No milk yield is collected from the milking session
- Animals cannot be sorted from the button module
- The parlour cannot be set in cleaning state. Each button module (BM) must be set in manual milking before starting a cleaning session

#### 5.4.1.2 Starting a milking session from a button module in fail-safe mode

A fail-safe mode is activated if the communication malfunctions between a set of button modules, IO modules, and the CCM or if the communication with the herd management system is lost.

When the complete system or part of the system is in fail-safe mode, milking can be started from the individual button modules in idle mode or cleaning mode following the procedure below.

1. Remove the cluster from the cluster cleaner.
2. Press and hold the large button on each button module individually from idle mode or cleaning mode.



→ The button module is set to milking mode. The button segments are solid cyan indicating that the button module is ready for start milking.

For more information, see **Preparing for a milking session** in the **Operation** chapter for the parlour.

#### 5.4.1.3 Preparing for a cleaning session from a button module in fail-safe mode

A fail-safe mode is activated if the communication malfunctions between a set of button modules, IO modules, and the CCM or if the communication with the herd management system is lost.

When the complete system or part of the system is in fail-safe mode, it is not possible to activate the cleaning mode in all button modules.

The button modules that are in fail-safe mode can be prepared for a system cleaning following the procedure below.

1. Verify that all clusters are retracted after the end of the milking session.
2. In a rotary parlour, rotate the parlour to the cleaning position.
3. Press the large button on the button module.



→ The cluster is released with vacuum and pulsation.

4. Press the large button again to set the button module in manual mode.
5. Place the cluster in the cluster cleaner.
6. Repeat this at each button module.

##### Note!

When all clusters are placed in the cluster cleaners with the button modules in manual mode, a system cleaning can be started. The button modules must be in manual mode so that the clusters are not retracted during the system cleaning.

For more information, see **Preparing for a cleaning session** in the **Operation** chapter for the parlour.

## 6 Appendix

### 6.1 Quick guide

[MA500 display central view](#)

[MA200 ID information](#)

[MA200 quick reference guide](#)

### 6.2 Article numbers – Infrastructure box configurations

Article number	Description	Number of power supply units	Number of CCMs	Number of switches	Maximum number of milking points to serve
2150009528	Infrastructure box F5	5	1	0	15
2150011432	Infrastructure box F10	10	2	0	30
2150009524	Infrastructure box FE10	10	2	1	30
2150010346	Infrastructure box FE12	12	3	1	36

### 6.3 Technical data

#### 6.3.1 Technical data – button module, IO module, and CCM

Type	Value
Depth	51 mm
Width	107 mm
Height	120 mm
Weight	Approximately 0.5 kg
Input voltage	24 VDC
Output power	5 W
Bluetooth frequency range	2402-2480 MHz
Ambient temperature	+4°C to + 40°C
IP class	IP56
IEC protection class (protection against electric shock)	Class III

#### 6.3.2 Technical data – infrastructure box

Dimensions and weight:

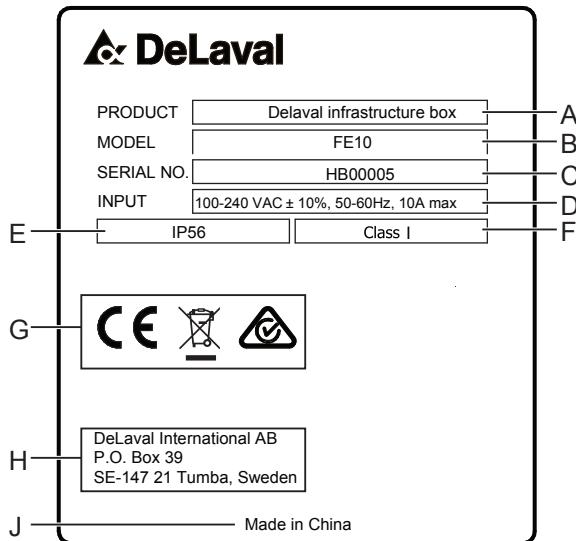
[» Continue next page](#)

Depth	210 mm
Width	600 mm
Height	400 mm
Maximum weight	21.5 kg (FE12)
Environmental conditions:	
Ambient operation temperature	+4°C to + 40°C
IP class	IP56
IEC protection class (protection against electric shock)	Class I
Power supply	
Nominal input voltage	100-240 VAC ± 10%
Nominal input frequency	50-60 Hz
Max. input current	10 A
Power supply unit output	24 VDC 3.8A per power supply unit
Ethernet switch (only in FE10 and FE12):	
Standards	IEEE 802.3af/at, 802.3, 802.3u, 802.3ab, 802.3az, 802.3x, 802.1p
Connectors	Eight 10/100/1000BASE-TX with Power over Ethernet and two 10/100/1000BASE-TX
Transmission distance	Up to 100 m
Transmission speed	Up to 1000 Mbps

## 6.4 Type plate

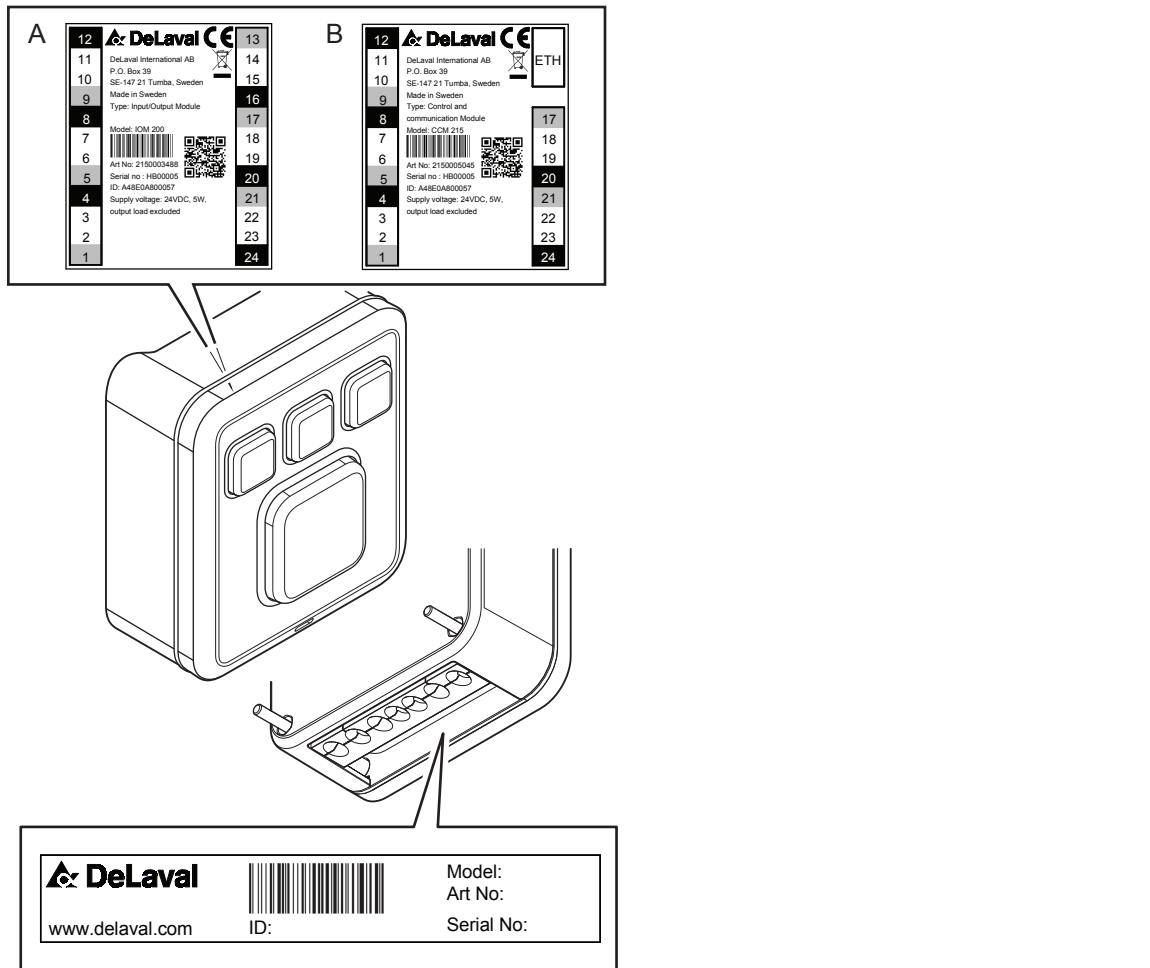
Enter a short description of your concept here (optional).

This is the start of your concept.

**Related topics:****6.4.1 Type plate on the infrastructure box****Fig. 40:** Infrastructure box type plate.

Position	Description
A	Product name
B	Product model
C	Serial number
D	Electrical input rating
E	IP class
F	IEC protection class (protection against electric shock)
G	Compliance markings
H	Manufacturer contact information
J	Country of origin

### 6.4.2 Type plate on milking automation modules

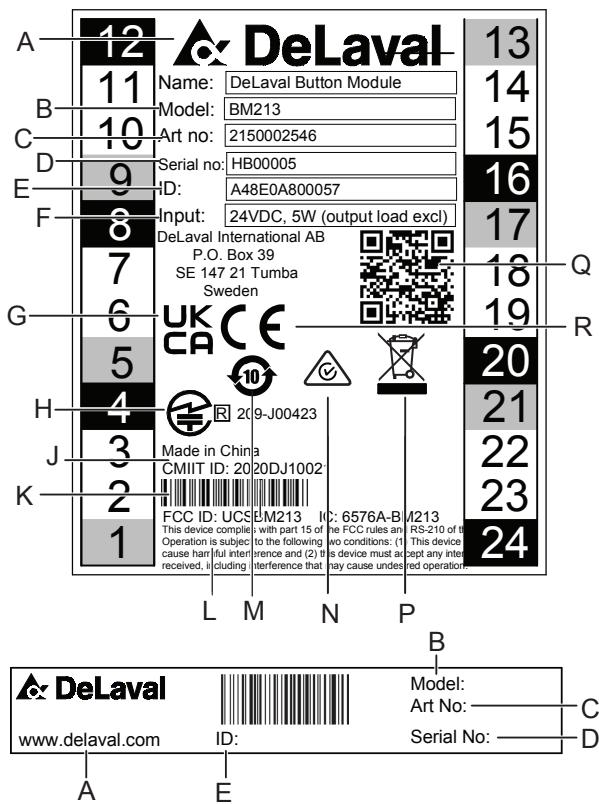


**Fig. 41:** Type plate locations on the modules. The button module is used as an example.

- A** Type plate layout for the button module and the IO module
- B** Type plate layout for the CCM
- C** Small type plate layout for all modules

The type plates on the modules are located at the bottom of the module box and on the potting compound covering the PCB on the inside of the module, see illustration "Type plate locations on the modules". The button module is used as an example. The type plate contains the information shown in illustration "Module type plate".

The field on the type plate are described in the table.



**Fig. 42:** Type plate on button modules and IO modules

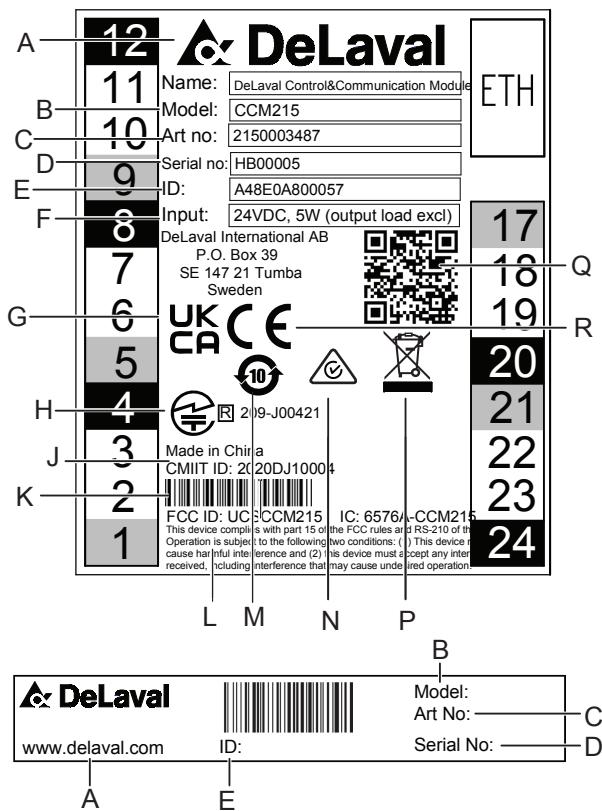


Fig. 43: Type plate on CCMs

Table 5: Type plate information

Legend	Description
A	DeLaval logotype and web address
B	Model
C	Article number
D	Serial number
E	Identity number
F	Input of electric potential difference (V) and power (W)
G	UKCA marking (UK regulatory compliance mark) The UKCA-mark indicates that the module fulfils the UK regulations for products. The declaration by the manufacturer states the directives that are fulfilled.
H	GITEKI mark (Japanese regulatory compliance mark) Japan radio ID
J and K	CMIIT ID (Chinese regulatory authorization number) China radio ID

» Continue next page

Legend	Description
L	US FCC ID (United States regulatory authorization number) IC (Canadian regulatory authorization number) FCC/IC ID plus statement
M	China RoHS (Restriction of Hazardous Substances)
N	RCM symbol (Australia and New Zealand regulatory compliance mark)
P	WEEE symbol (European recycling regulations mark) The Waste Electrical and Electronic Equipment Directive (WEEE Directive)
Q	QR code
R	CE marking (European regulatory compliance mark) The CE-mark indicates that the module fulfils the European regulations for products. The declaration by the manufacturer states the directives that are fulfilled.

## 6.5 Regulatory compliance

For more information on regulatory compliance, see <https://corporate.delaval.com/product-and-material-compliance>.

### 6.5.1 China SRRC Compliance Statement

This equipment contains specified radio equipment that has been certified by State Radio Regulation of China (SRRC) and the tests have been accredited by the Ministry of Industry and Information Technology (MIIT).

Manufacturer	Product number	CMIIT ID	Note
DeLaval	BM204	2020DJ10021	–
DeLaval	BM213	2020DJ10021	–
DeLaval	CCM215	2020DJ10004	The CCM215 can be used as is or mounted in the cover of a DeLaval Infrastructure box F/FE.

### 6.5.2 FCC Statement (Radio directive)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To comply with FCC/IC RF exposure limits for general population / uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from any persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

### 6.5.3 ISED Canada Statement (Radio directive)

This Device complies with Industry Canada License-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

**Note!**

In Canada, customers should always receive an instruction book in both English and French in accordance with local regulations.

### 6.5.4 Japanese Radio Certification

This equipment contains specified radio equipment that has been certified to the Technical Regulation Conformity Certification under the Japanese Radio Law, Ministry of Internal Affairs and Communications (MIC).

Manufacturer	Product number	ACB-MIC	Note
DeLaval	BM204	ACB-MIC000381	–
DeLaval	BM213	ACB-MIC000381	–
DeLaval	CCM215	ACB-MIC000381	The CCM215 can be used as is or mounted in the cover of a DeLaval Infrastructure box F/FE.

## 6.6 Warranty

**Note!**

DeLaval will not take any responsibility for damage resulting from faulty installation, operation, or for improper or inadequate care and maintenance.

**Note!**

DeLaval will not take any responsibility for any damage resulting from frost. The owner/user must take the necessary measurements to prevent the ambient temperature around the equipment from dropping to or below freezing point.

**Note!**

Modification may create risks not covered by the original construction. Do not make any modifications which has not been approved by DeLaval.





DeLaval International AB  
Box 39  
SE-147 21 Tumba  
SWEDEN

[www.delaval.com](http://www.delaval.com)