

Lely Vector MFR M2 Next

Automatic Feeding System



Operator Manual

en-US - English Original

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Lely Industries N.V.
Cornelis van der Lelylaan 1
3147 PB Maassluis
the Netherlands
Phone: +31 (0)88 1228221
Fax: +31 (0)88 1228222
Website: www.Lely.com

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2026/02	B	2, 3, 4, 5, 7 and 8	Changed: <ul style="list-style-type: none"> • Manual contents • 2.4.1.11 Software controlled protection • 2.4.2.2 Emergency stop button • 3.1 Specification Vector • 4.1.15.2 MFR software • 4.1.15.6 Automatic barn (door) control software • 4.1.7 Feed grabber (FG F2) • 5.13.3 Manually dose feed from the MFR • 7.4 Restart the safety device of the MFR • 7.10 Test the automatic barn door • 8.1.5 Signal lights and console Added: <ul style="list-style-type: none"> • 5.14 Enable the skirt or counter knife
2025/03	A		Initial release

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Preface

Manual contents

This manual contains the technical information, operating instructions, maintenance procedures and the troubleshooting information necessary to operate the machine/system.

The information in this manual is for operators.



Study and understand this information thoroughly before you operate the machine/system. Failure to do so could result in damage to equipment or personal injury (see Signal Icons on page 2-1). Please consult Lely if you do not understand the information in this manual, or if you need additional information. Store this manual in a safe place for future reference.

All information in this manual has been compiled with care. Lely shall not be liable for errors or faults in this manual. The recommendations are meant to serve as guidelines. All instructions, pictures and specifications in this manual are based on the latest information that was available at the time of publication. Your machine/system may comprise improvements, features or options that are not covered in this manual.

Applicability

The table below shows the type numbers of the parts of the Vector for which this manual is applicable.

Model	Type number
Mixing and feeding robot (MFR M2 Next)	5.2011.0060.0
Feed grabber (FG F2)	5.3004.0000.1
Bridge crane (BC B2)	5.2013.1110.1
Bridge crane (BC B1)	5.2013.0210.1
Fixed rail (single)	5.2013.0800.1
Power distribution box (PDB) 3 PhN 400/230 VAC	5.2011.0532.0
Power distribution box (PDB) 2 Ph 240 VAC SP	5.2011.1174.0
Additives control box	5.2011.0608.0
External concentrates box	5.2011.0534.0
Power supply unit (PSU)	5.2011.4500.0
Secondary power supply unit (Secondary PSU)	5.2011.4570.0

This document is applicable for software version 3.0 or higher.

Abbreviations

Name	Abbreviation
Bidirectional converter	BiDiCo
Inertial measurement unit	IMU
Lely device network	LDN
Load cell interface box	LCIB
Lely service organisation	LSO
Mixing and feeding robot	MFR
Obstacle detection sensor	ODS
Printed circuit board	PCB
Power distribution box	PDB
Power supply unit	PSU
Vehicle input/output box	VIOB
Web user interface	WebUI

Standard Torque Loading of Parts

All the nuts, bolts and screws used on the machine are torque tightened to standard torque loadings applicable to the construction materials used.

If a part has a non-standard torque loading, it is specified in the applicable part of the manual.

Registration Vector system

A type and serial number plate is attached to the following parts of the Vector:

- Power distribution box: outside the power distribution box, above the power switch.
- Mixing and feeding robot: on the center of the rear frame above the battery tray.
- Power supply unit: outside the power supply unit, underneath the power switch.
- Feed grabber: on the frame above the control box.
- Bridge crane: on the wheel frame.
- Single fixed rail: on the frame.
- Additives dispenser (frequency pulse): inside the control box.
- Control box external concentrates (frequency weight): inside the control box.
- Control box automatic door: inside the control box.

Always include the type and serial number of the part of the Vector system, when you contact your local Lely service provider or order spare parts.

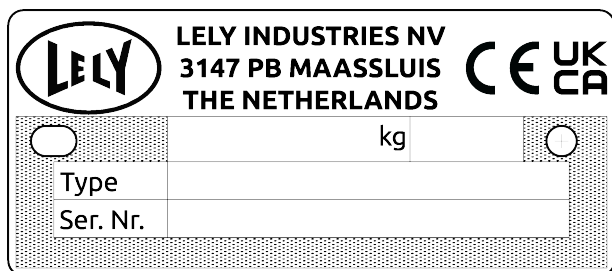


Figure 1. Example type and serial number

The decal in the power distribution box and power supply units are different from the other machines in the Vector system, it shows:

- A serial number that starts with the revision letter (or “-” in case of the first version), year, week number and following number. These numbers are made by the manufacturer. Lely has a different serial numbering.
- Numbers deviate from the numbers on the order form. The number on this decal must be recorded on the handover declaration. Please make sure you do not use the number from the order form.

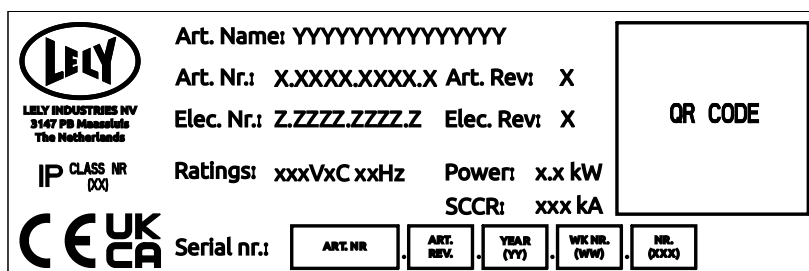


Figure 2. Decal on the PDB and the PSU

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Personnel Requirements



Risk of accident from insufficiently qualified personnel.
Unqualified personnel working on or in the danger zone of the machine can be the cause of serious injuries and considerable damage to material.

- **All activities must only be carried out by qualified personnel.**
- **Keep unqualified personnel away from the working area and danger zones of the machine.**
- **Only persons who can be expected to carry out their job reliably are authorized as personnel. Persons whose reactions are impaired, e.g. by drugs, alcohol medications are not authorized to work with the machine.**

Maintenance Authorization



***Risk of accident from uncertified technicians.
Uncertified technicians doing maintenance on the machine can be the cause of serious injuries and considerable damage to material.
Only technicians certified by Lely Industries are authorized to do maintenance on the machine, except for the maintenance done by the operator as indicated in the operator manual. If people who are not certified by Lely Industries do maintenance on the machine, the warranty on the machine becomes invalid.***

Technician Training

All the technicians certified by Lely Industries have completed an approved training program, and passed written and practical examinations during and at the end of the training program. The training is given by Lely International or a specialist from the LSO and includes troubleshooting and corrective maintenance of the machine.

During training, a trainee is permitted to work for up to a maximum of six months under close supervision of a certified technician. A trainee can do work on the machine only in the presence of a certified technician.

Contact Number Local Service Provider

We suggest you write the telephone number and email address of your local service provider contact in the table below. This makes sure you can easily find the information.

Telephone number	
email address	

Left, Right, Rear and Front

The positions left, right, rear and front in this manual refer to either:

- The machine, as seen in the driving direction.
- The particular component, as seen when standing in front of it.



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1 Lely Vector

1.1 Lely Vector

The Vector system is an automatic feeding system that:

- Collects roughage from the feed kitchen where the feed is stored.
- Doses feed concentrates and additives.
- Mixes the feed.
- Transport this mixture to a location with animals.
- Doses the feed along the feed fence.
- Pushes the feed towards the fence.
- Scans the feed height along the fence.

The Vector system has specific rations for each location with animals and operates continuously, 24/7, throughout the entire year.

The Vector system can incorporate one or multiple mixing and feeding robots that mix, transport and distribute feed. The system has several options:

- Feed grabber for roughage collection.
- A bridge crane system for the feed grabber.
- Additive dispenser(s) operating on frequency pulses.
- Feed concentrate auger(s) operating on frequency weight.
- (Tower) silo(s) for concentrates or roughage.
- Safety fence.
- Automatic control for barn doors.
- Access door control to the feed kitchen.
- Kitchen fill door control.

The Vector system has multiple operator interfaces:

- Lely Control Plus app which is used to control the MFR and the barn door.
- Lely Control app which is used to control the power distribution box (feed controller), feed grabber and bridge crane.
- The webUI which is used to control the power distribution box (feed controller) on your PC.
- The Horizon farm management software to manage the herd and to manage and control the feeding system and all connected devices on your PC.

1.2 Intended use

NOTICE

Only use the Vector system for its intended purpose.

The Vector system is designed to be used as an automated feeding system for milking cows and beef cattle.

The Vector system is exclusively built to collect, mix and distribute roughage like silage, hay and grain crops. Other feed types including concentrates, additives, wet mixtures, vegetables and potatoes may be added and mixed in small quantities.

The feed grabber is built to collect loose roughage from blocks and round bales.

The mixing and feeding robot is built to mix and distribute feed in a barn along a feed fence.

Using the system beyond the intended use described above would not be considered proper use. The manufacturer is not liable for damage resulting from improper use; the operator alone bears the risk.

Intended use also implies that the instructions and rules prescribed by the manufacturer are observed.

2 Safety

2.1 Signal Icons

Note the use of the signal words DANGER, WARNING and CAUTION with the safety messages. The signal word for each message uses the following guidelines:



Danger
Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Warning
Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



Caution
Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



Notice
Is used to address practices not related to physical injury e.g. property damage.



Tip
Indicates information that may help the reader, but not hazard related.

2.2 Safety instructions

NOTICE

Contact your nearest Lely service provider if you have any questions concerning the safety instructions.

YOU are responsible for the SAFE operation and maintenance of your machine/system. YOU must make sure that you and anyone else who is going to operate, maintain or work in the vicinity of the machine/system knows all the related SAFETY information in this manual.

YOU are the key to safety. Good safety practices protect you and the people around you. Make these practices a working part of your safety program. Make sure that EVERYONE who operates, maintains or works near the machine/system obeys the safety precautions. Do not risk injury or death by ignoring good safety practices.

- Owners must train operators before they operate the machine/system. This training must be repeated at least annually.
- The operator must read, understand and obey all safety and operating instructions in the manual.
- A person who has not read and understood all safety and operating instructions is not permitted to operate the machine/system.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment and persons.
- Only use approved spare parts and make sure that they are only installed by authorized technicians.

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WARNING

The hazards in the operating zone, danger zone and work area pose a risk of fatal injury to unauthorized persons. Unauthorized persons who do not satisfy the requirements described herein are not aware of the hazards in the operating zone, danger zone and work area. Unauthorized persons are therefore at risk of serious or fatal injury.

- ***Keep unauthorized persons away from the operating zone, danger zone and work area.***
 - ***If in doubt, approach unauthorized persons and ask them to leave the operating zone, danger zone and work area.***
 - ***Stop work as long as unauthorized persons are within the operating zone, danger zone and work area.***
-

2.2.1 Vector system safety instructions

General safety

- Read and understand this manual and all safety signs before you operate, maintain or adjust any parts of the Vector system.

- Only trained persons are permitted to operate the Vector system or parts of the Vector system.
- Only a Lely trained technician is allowed to do maintenance tasks on the Vector system that are not described in this manual.
- The operator is only allowed to do maintenance tasks on the Vector system that are described in this manual.
- Review safety related items with all machine operators frequently (annually).
- Keep unauthorized persons, especially small children away from the feeding system at all times.
- Keep hands, feet, hair and clothing away from all moving parts due to crushing.
- Make sure all covers are installed before you operate the Vector system.
- Make sure that the danger and caution signs are clearly visible. Clean them when they are dirty and replace them when they are damaged (see Safety decals in and near the feed kitchen and barn on page 2-13).
- Make sure the safety lights and signals meet the local regulations.
- Wear the correct protective clothing and equipment.
- When a part of the machines in the Vector system is broken or missing, take the system out of operation. Make sure the part is repaired before you put the system into operation again.
- Let an authorized person yearly inspect and approve the Vector system for hoisting.
- A first-aid kit must be available in or near the barn where the mixing and feeding robot operates. Store in a highly visible place.
- Know the emergency medical center number for your area.

Electrical safety

- Only an authorized electrician is permitted to install the electrical power supply for the Vector system.
- Electrical maintenance is only permitted by a certified Lely technician. Do not perform any maintenance on the electrical system.
- Keep away from areas with high voltage.
- Make sure the electrical power supply and grounding meet local rules and regulations.
- Have grounding connections regularly checked.
- Prevent damage by vermin.
- Have damaged electrical lines, conduits, switches and components immediately replaced by a Lely technician.
- Do NOT pull live electrical lines and power cables across the floor.
- Do NOT use a high pressure cleaner to clean the machines in the Vector system. Keep covers and doors closed while cleaning them.
- Always disconnect and isolate the electrical power before you start to clean or do maintenance.
- Always wait 15 minutes before opening the electrical cabinets, power distribution box and power supply unit(s) so that all residual current has left.
- Always disconnect the mixing and feeding robot from the charge pole before you clean or do maintenance on it.

2.2.2 Mixing and feeding robot safety instructions

Operating safety

- Only trained persons are permitted to operate the mixing and feeding robot.
- Keep hands, feet, hair and clothing away from all moving parts due to crushing.
- Install all protective doors, covers and guards before you operate the mixing and feeding robot.
- Only manually operate the mixing and feeding robot in an area with a slope less than 8% inclination.
- Only operate the mixing and feeding robot in a marked track.
- Do NOT climb on the mixing and feeding robot to inspect the mixing process. The mixing process can be checked by positioning a mirror in the loading zone above the mixing bin, or when you use the Vector step ladder.
- When the buzzer, safety light and/or the head- or taillights are malfunctioning, stop operation immediately and make sure they are repaired before you resume the operation of the mixing and feeding robot.
- The fastest mode of the mixing auger gives a noise level of 72 dB.
- Never have the mixing bin loaded with more than 800 kg (1763.7 lb), this causes a longer braking distance and wear on the wheels and other parts.
- Never stand on the safety bumper or restrict the movement of the bumper in anyway.
- Never touch the bumper when the mixing and feeding robot, with an electric bumper protection, is in operation to avoid an electric shock.
- Keep the mixing and feeding robot routes clear from obstacles, snow, ice and as clean as possible.
- Keep kids and unauthorised persons away from the marked track of the mixing and feeding robot.





Maintenance safety

- Do NOT enter the mixing bin and keep hands and feet clear, as the mixing auger knives are very sharp. Only trained Lely technicians are permitted to enter the mixing bin.
- Only Lely trained technicians are permitted to do corrective maintenance on the mixing and feeding robot.
- Always disconnect the mixing and feeding robot from the charge pole before you clean or do maintenance on it.
- Metal parts on the magnets can be sharp, always wear protective gloves when you clean the magnets.
- Do NOT work near the magnets if you have a cardiac pacemaker or other implant that can be impaired by magnetic fields.
- Only activate the service key on level locations. The mixing and feeding robot may roll away uncontrolled because the mechanical brakes are not enforced.
- Drive the mixing and feeding robot to a level location, take it out of operation and disconnect the electrical power supply to the motors and actuators with the service key before doing maintenance or cleaning it (see Turn and remove the service key to switch off the power to the motors and actuators on page 5-16). If work is done under the skirt and/or at electrical components, switch OFF the high voltage switch (see Switch OFF the power to the MFR with the high voltage switch on page 5-17).
- Always do maintenance on the mixing and feeding robot at a clean, dry and level location without weather influences.
- Do NOT tamper with the safety system, this is strictly forbidden.
- Keep tools and metal parts away from the VIOB and batteries to prevent a short circuit.

- Do NOT touch the motors until they are cooled down.
- Do NOT use a high pressure cleaner when you clean the mixing and feeding robot. Keep covers and doors closed while cleaning the robot.
- Only use water and optionally mild soap to clean the exterior of the mixing and feeding robot. Do NOT use aggressive cleaning agents.
- Do NOT tow, push or lift the mixing and feeding robot under any circumstances. In case of a malfunctioning or a non-operational mixing and feeding robot, contact your local Lely service provider for support.
- Make sure all covers are installed correctly when maintenance work is completed.

2.2.3 Cut resistant clothing

The cut resistant clothing must comply with the standards in the table below.

Symbol	Applies to	Information about level of protection, class and design
 EN 388	Gloves EN 388-5:2016	Cut resistant gloves according to EN 388 level 5 (or ANSI 105 level A7) Level 5 indicates the glove provides the highest level of cut resistance.
 EN 388	Sleeves EN 388-5:2016	Cut resistant sleeves according to EN 388 level 5 (or ANSI 105 level A7) Level 5 indicates the sleeve provides the highest level of cut resistance.
 EN 381	Trousers EN 381-5:1995 Overall EN 381-5:1995	Chainsaw trousers according to EN 381-5: <ul style="list-style-type: none"> • All classes are sufficient, class 0 (16 m/s) to 3 (28 m/s). • Type C is mandatory, this type has protection all around.
 EN 381	Jacket EN 381-11:2002	Chainsaw jacket according to EN 381-11 preferably with belly protection.

2.2.4 Bridge crane, fixed rail and feed grabber safety instructions

Operating safety

- Only trained persons are permitted to operate the bridge crane, fixed rail and feed grabber.
- Keep hands, feet, hair and clothing away from all moving parts due to crushing.
- Install all protective covers before you operate the bridge crane, fixed rail and feed grabber.



- Do NOT enter the operating area of the bridge crane, fixed rail and feed grabber when the system is not in kitchen fill mode.
- Do NOT bypass / tamper with the safety systems in any way.
- Do NOT block the bridge crane, fixed rail or feed grabber. It can move with sufficient force and can cause injury.
- Do NOT climb the bridge crane or fixed rail.

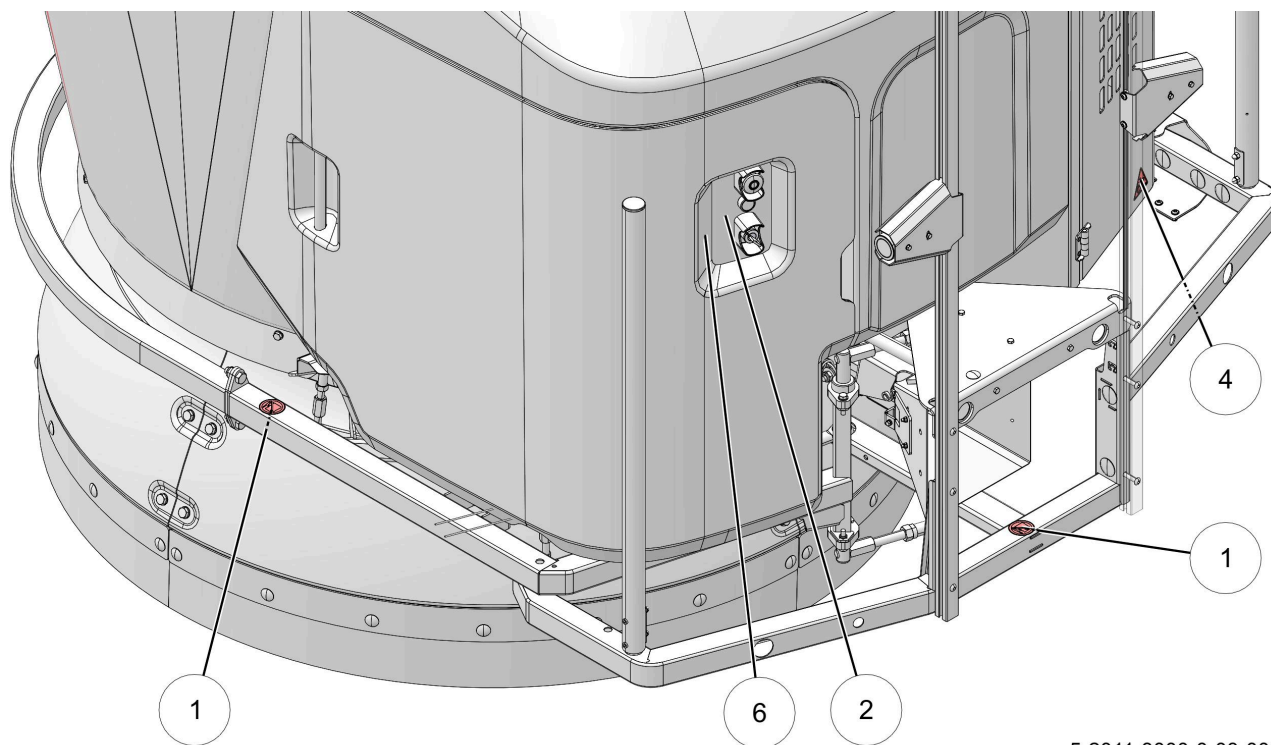
Maintenance safety

- Only Lely trained technicians are permitted to do corrective maintenance on the bridge crane, fixed rail or feed grabber.
- Have the bridge crane or fixed rail inspected annually.
- Do NOT touch the motors until they are cooled down.
- Use the Vector step ladder or an aerial work platform to do maintenance on the bridge crane, fixed rail or feed grabber.
- Visually inspect the Vector step ladder annually if it is still suitable for proper use. If not, replace the step ladder.
- Do NOT use the lattice girder as a support for a step ladder. It is only permitted for inspection purposes.
- Do NOT use a high pressure cleaner when you clean the bridge crane, fixed rail or feed grabber. Keep covers closed while cleaning.
- Do NOT spout water on the body of the feed grabber and the control boxes of the bridge crane. Use a wet brush to clean it.
- Make sure all covers are installed when maintenance work is completed.

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2.3 Safety decals

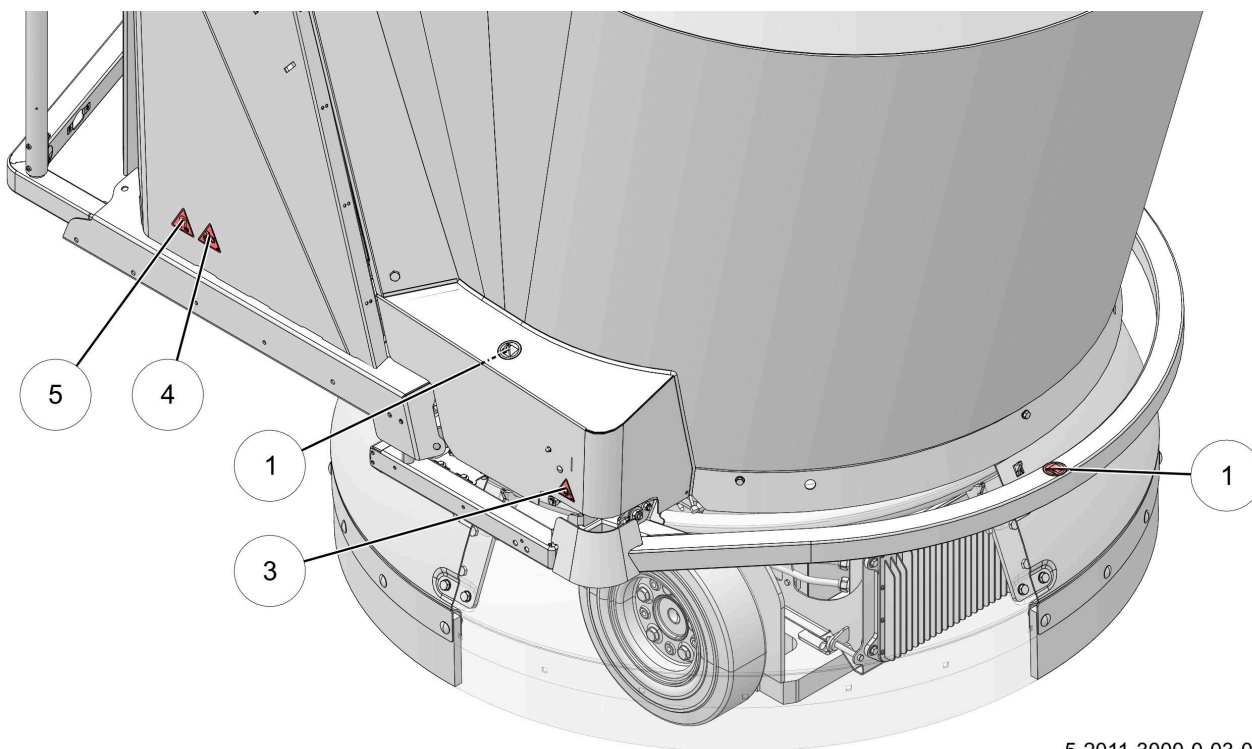
2.3.1 Safety decals on the MFR



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Figure 3. Location of the safety decals





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Figure 4. Location of the safety decals

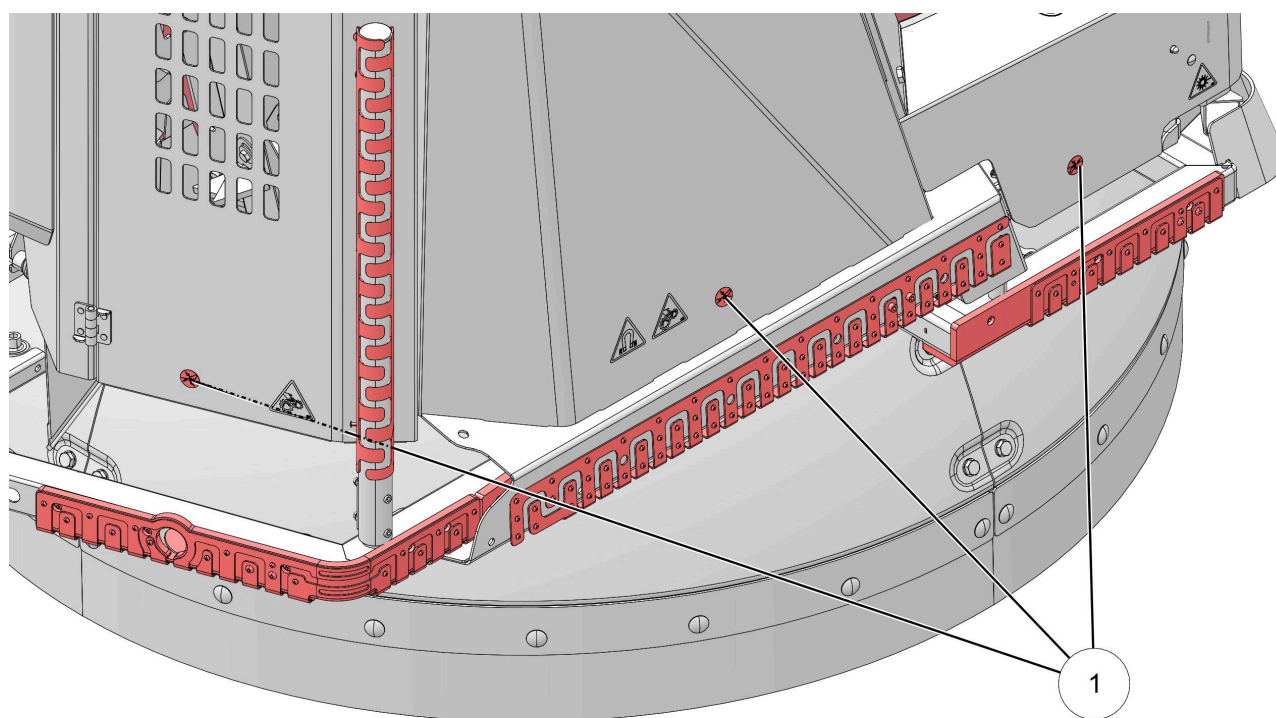
Key	Decal	Explanation
1		Caution: Do not climb / Keep off bumper Risk of serious injury and product damage. Do not climb in, or on the vehicle and keep off the bumper.
2		Caution: Electrocution hazard Risk of electrocution. Switch off the power before doing maintenance, adjustment or repair.
3		Caution: Laser light hazard Risk of being blinded. Do not stare into the beam.
4		Danger: Rotating parts Danger of being entangled by rotating parts. Keep hands, loose clothing and long hair away from moving parts during operation of the Mixing and Feeding Robot

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Key	Decal	Explanation
5		Warning: Magnetic fields Do not work near the magnets if you have a cardiac pacemaker or other implant that can be impaired by magnetic fields.
6		Caution: Read manual Failure to follow operation instructions could result in death or serious injury. Read the manual.

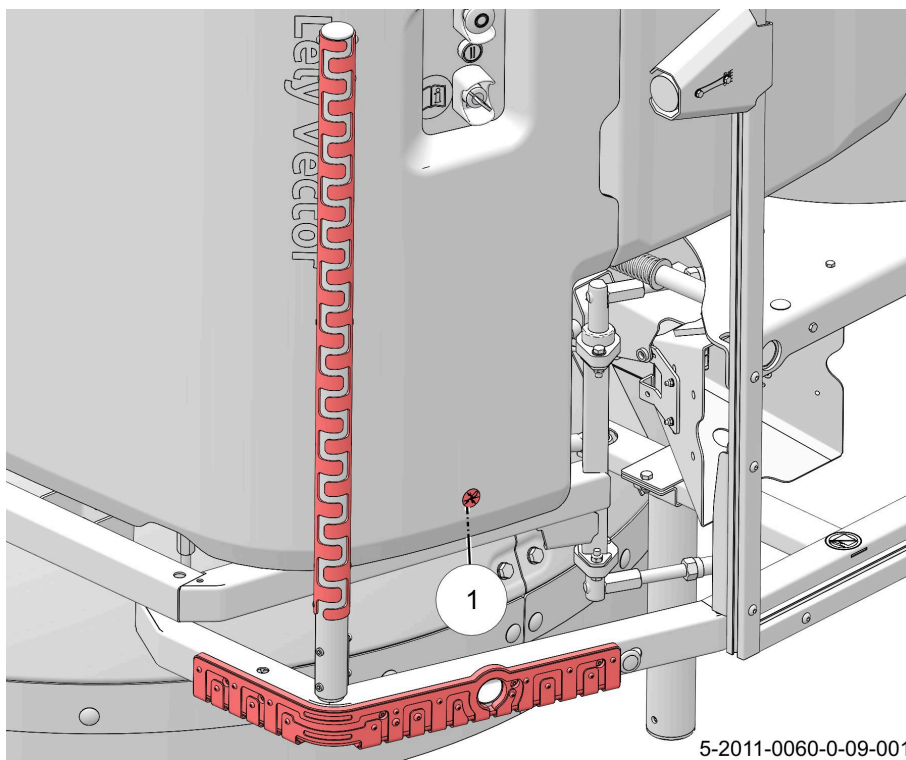
2.3.2 Safety decals for electronic bumper protection on the MFR (optional)

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5-2011-3000-0-03-005

Figure 5. Location of the electronic bumper protection decals

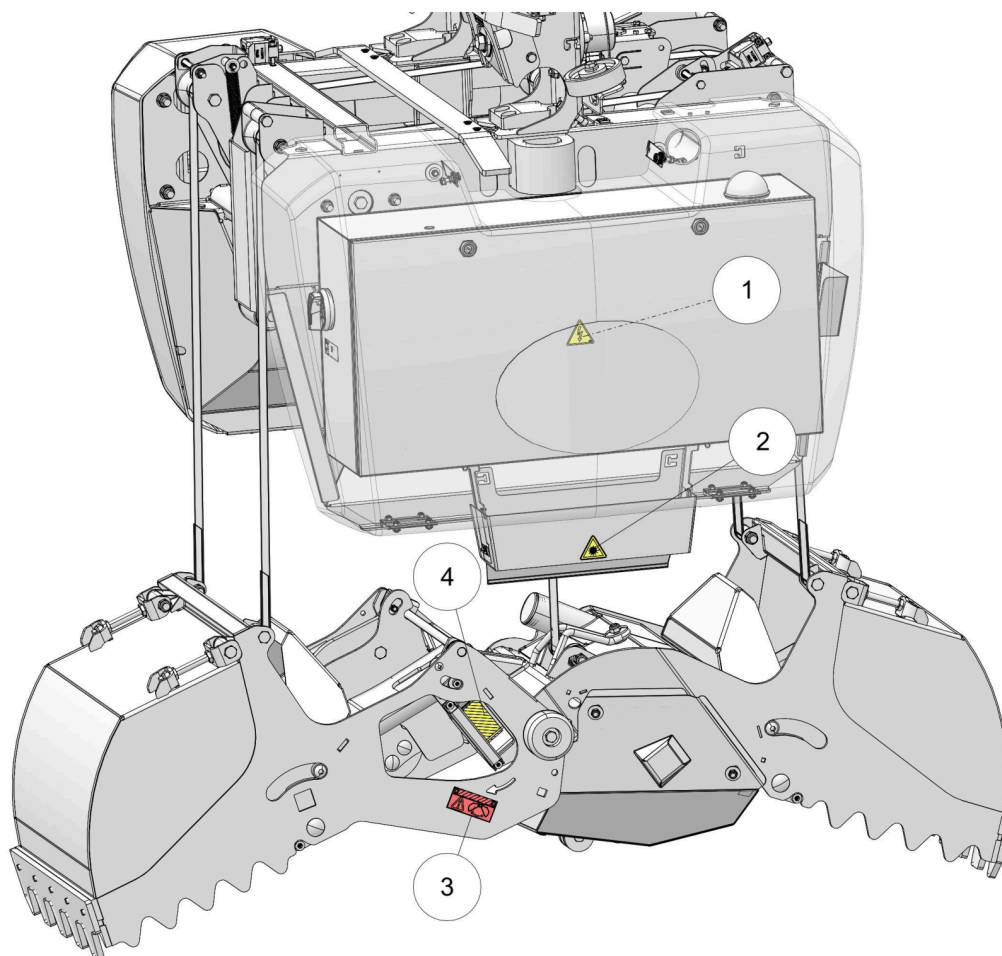


5-2011-0060-0-09-001

Figure 6. Location of the electronic bumper protection decals

Key	Decal	Explanation
1		<p>Caution: Electric shock</p> <p>Risk of a high voltage electric shock.</p> <p>Keep away from the shock strips on the bumper.</p>



2.3.3 Safety Decals on the Feed Grabber



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5-3004-manual1-01-001

Figure 7. Locations of decals on the Feed Grabber

Key	Decal	Explanation
1		Caution: Electrocution hazard Risk of electrocution. Switch off the power before doing maintenance, adjustment or repair.
2		Caution: Laser light hazard Risk of being blinded. Do not stare into the beam.

Key	Decal	Explanation
3		Safety handles Safety handle (on both sides of the feed grabber). The decal indicates the function of the safety handle. Pull the handle downwards to release the tension on the feed grabber. Be aware that the feed grabber may open with force. Stand clear of the feed grabber when pulling the handle.
4		Safety handle stripes This decal indicates the position of the safety handles.

2.3.4 Safety decals on the bridge crane or fixed rail





Location	Decal	Explanation
On the lattice girder.		WLL 0.15 T The WLL (work load limit) of the feed grabber 0.15 T (150 kg (330 lb)).
On the I-beam of the bridge crane or a fixed rail. Location of the service point.		WLL 1.5 T The WLL (work load limit) is 1.5 T (1500 kg (3307 lb)). An empty MFR can be lifted at this point for maintenance.

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2.3.5 Safety Decals on the Control Boxes

Location	Decal	Explanation
On every door of a control box connected to 230 V		Caution: Electrocution hazard Risk of electrocution. Switch off the power before doing maintenance, adjustment or repair.

2.3.6 Safety decals in and near the feed kitchen and barn

Location	Decal	Explanation
<p>At doorway passages that the MFR goes through, at the entrance of the barn, at the entrance of the feed alley and at the entrance of the farmyard where the MFR moves.</p>	 <p>5.2011.0866.0.01.003</p>	<p>Caution - Unmanned moving vehicles</p> <p>Only persons who are authorized and have been instructed on all applicable safety instructions are permitted to enter the area. Ignoring this warning can interfere with the proper functioning of the system and may cause injuries.</p>
<p>At the entrance of the feed loading area.</p> <p>For the decals on the narrow alley refer to: Safety decals on a narrow alley (see page 2-14).</p>	 <p>5.2011.0866.0.01.001</p>	<p>Warning - Restricted area</p> <p>Only persons who are authorized and have read and understood all applicable safety instructions are permitted to enter the area. Ignoring this warning may cause severe injuries.</p>
<p>At the entrance of the feed kitchen.</p>	 <p>5.2011.0866.0.01.002</p>	<p>Danger - No Admittance because of unmanned moving vehicles</p> <p>Persons are only permitted to enter the area when all systems are shut down. Ignoring this warning may cause critical injuries or death.</p>
<p>On the knife guard holders near the PDB.</p>		<p>Warning</p> <p>Switch off the MFR with the key and remove the key before you do work on the MFR.</p>

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2.3.7 Safety Decals of the Tower Silo

Location	Decal	Explanation
<p>Near the main switch on every tower silo or other device operated with a Digital Output</p>		<p>Lock instructions tower silo</p> <p>This decal warns the mechanic on the tower silo or other device that it is operated with Digital Output. The mechanic is warned about the fact that the Vector system starts the auger or conveyor belt of the silo. The decal instructs the mechanic to switch the power to the silo off and to lock the switch before doing maintenance.</p>

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2.3.8 Safety decals on a narrow alley

Location	Decal	Explanation
<p>At the entrance of a narrow alley on the route of the MFR</p>		<p>Warning: Narrow alley zone</p> <p>Risk of being trapped.</p> <p>In this zone the clearance around the MFR is less than 50 cm (19.7 in). It is not possible for persons to pass the MFR in this area. When the MFR deploys a sound and light signal, move to the nearest exit away from the MFR. The MFR will wait a time period to allow evacuation before continuing the route in the narrow alley.</p>

2.3.9 Installation of Safety Decals

1. Make sure that the installation surface is clean and dry.
2. Make sure that the temperature of the mounting surface is not less than 5 °C (41 °F).
3. Find the correct position for the decal before you remove the backing paper.
4. Remove a small part of the cover paper.
5. Put the decal in the correct position on the installation surface and carefully push the small part of exposed adhesive surface of the decal onto the installation surface.
6. Slowly remove the cover paper and attach the rest of the decal to the installation surface.
7. Puncture small air pockets in the decal with a pin and use the cover paper to smoothen the decal.

2.3.10 Maintenance of Safety Decals

Safety decals show important and useful information that will help you to safely operate and maintain the machine.

Obey the instructions below to make sure that all the decals stay in the correct position and condition.

- Keep the safety decals clean and legible at all times. Clean the safety decals with soap and water. Do not use mineral spirits, abrasive cleaners or other similar agents that may damage the safety decals.
- Replace safety decals that are missing or that are illegible.
- Safety decals can be purchased from your local Lely service provider.

2.4 Safety devices

2.4.1 MFR

2.4.1.1 Emergency button

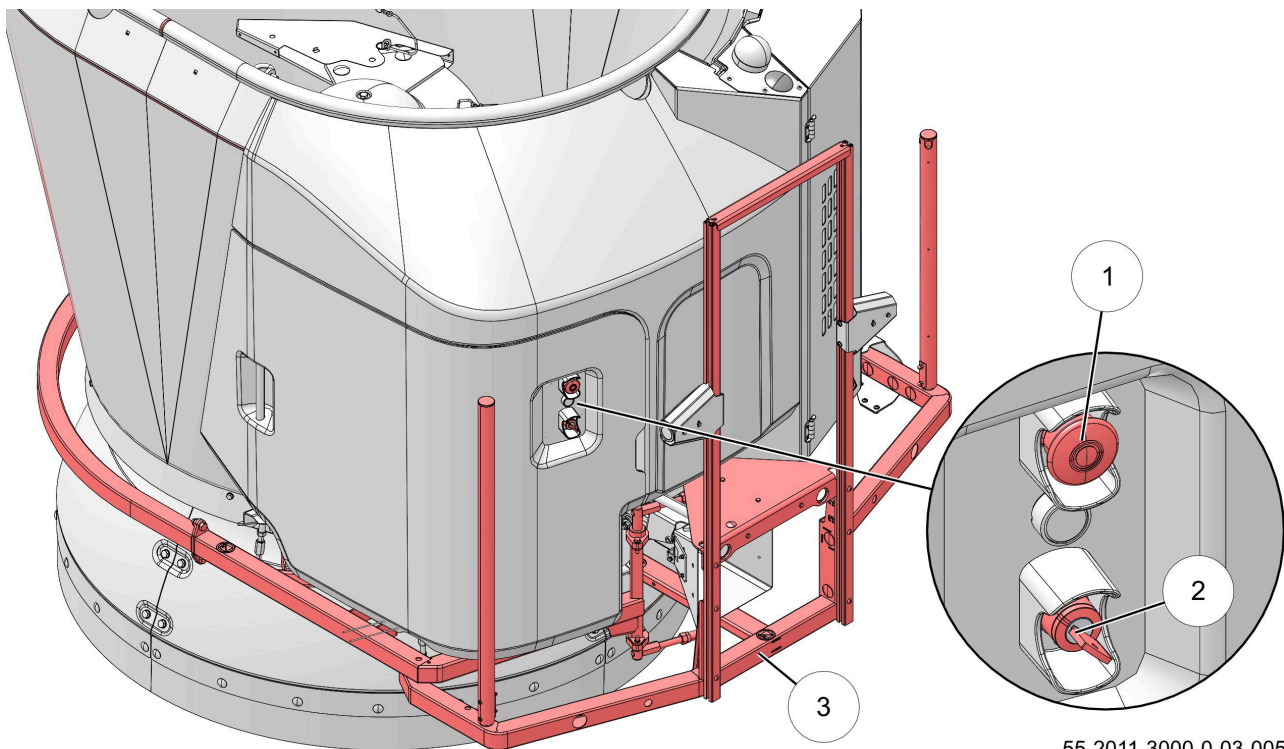
NOTICE

Do NOT tow, push or lift the mixing and feeding robot under any circumstances. In case of a malfunctioning or a non-operational mixing and feeding robot, contact your local Lely service provider for support.

An emergency button (1) is installed on the front of the power box. Only use the emergency button in case of an emergency.

When the emergency button is pushed, the Mixing and Feeding Robot (MFR) immediately stops to avert actual or impending hazards. This button affects only the MFR and does not control any other machine in the Vector system.

To release the emergency button, pull it out until you hear a perceivable click. After releasing the button, the MFR will not resume operation automatically. An emergency alarm will be active. You must press the pause button to clear the alarm and accept the generated alarm in the Lely Control Plus app.



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Figure 8. Location of the emergency button, service key and safety bumper

KEY: 1. Emergency button - 2. Service key - 3. Safety bumper with stop function

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2.4.1.2 Service key

A key lock for the service key (2) (see figure 8 on page 2-16) is installed on the front of the power box on the MFR.

When the service key is turned to the OFF position, the MFR immediately stops, cutting power to the motors and actuators. This prevents unexpected start-up of the motors and actuators during maintenance work. Be aware there is still power on the system and the mechanical brakes are not enforced. Always remove the service key and take it with you before performing any maintenance.

Use the service key only on level locations and for the following purposes:

- Inspections.
- Adjustments.

Maintenance beyond this scope must be carried out by Lely-trained personnel.

2.4.1.3 Safety bumper



When the MFR is in operation the bumper could be equipped with an electronic bumper protection (optional) to make sure cows do not block/damage the robot.

The safety bumper (3) (see figure 8 on page 2-16) makes sure the MFR stops when it hits an object that is at least 45 cm (17.7 in) above floor level. In the center of the MFR the bumper is lowered to detect lower objects. Sensors detect the position of the safety bumper, when the bumper hits an object the bumper is pushed out of its original location.

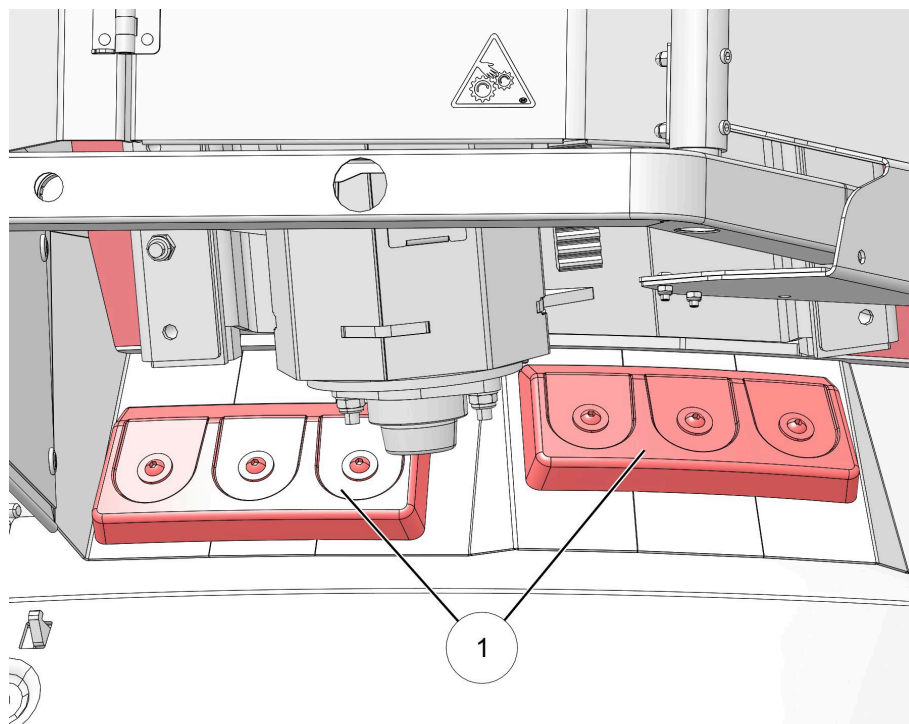
When the MFR stops after the bumper is triggered, the control system stops it. The MFR retries the action up to five times when it moves more than 0.01 m after a bumper hit and release. The system resets the retry count if the MFR moves more than 0.5 m from the previous bumper hit location. The number of retries could be different during ultrasound drive. If the control system fails to stop the MFR in time, the safety system performs a hard bumper stop. The operator must then manually recover the bumper (see Manually recover the safety bumper on page 7-29), press the pause button to clear the alarm and accept the generated alarm in the software.

During bumper recovery, the bumper function is disabled, so new bumper activations will not stop the MFR. Additionally, the MFR's speed and movement are restricted for safety reasons. Recovery ends when the MFR is stationary and the bumper is released. At this point, the hard bumper stop function becomes active again.

2.4.1.4 Magnets

Two sets of three very strong magnets (1) are installed below the feed door. If there is metal in the feed, for example from a broken mower knife, it will stick to the magnets. This reduces the risk of animals eating sharp metal parts.

Make sure to follow the cleaning instructions in this manual and wear the correct protective clothing and do not work near the magnets if you have a cardiac pacemaker or other implants that can be impaired by magnetic fields.



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Figure 9. Location magnets

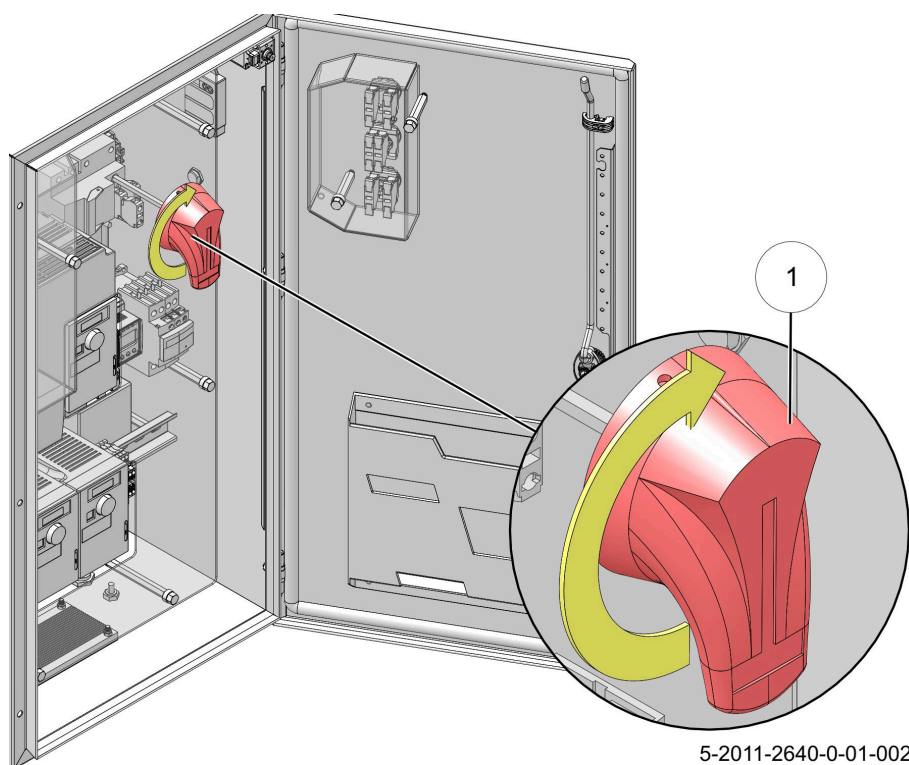
KEY: 1. Magnets

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2.4.1.5 High voltage switch in the power box

The high voltage switch (1) isolates the 340 Vdc from the power converter to the power box and the connection between the grid and the power box. When the switch is set to OFF and the battery indicator D10 on the PCB is OFF:

- All 340 Vdc is cut OFF.
- It is now safe for Lely technicians to do maintenance on all the (high voltage) parts.



5-2011-2640-0-01-002

Figure 10. Location high voltage switch

KEY: 1. High voltage switch

2.4.1.6 Acoustic warning device

An acoustic warning device, positioned on the right side of the power box, alerts the user, animals and surrounding people.

It produces three types of beeps:

1. A short beep lasting 0.25 seconds.
2. A medium beep lasting 0.5 seconds.
3. A long beep lasting 1 second.

The acoustic warning device is activated in the following situations:

- Two short beeps sound when the Lely Control Plus app connects to the MFR.
- Four short beeps sound every minute when an alarm is active on the MFR. It stays on until the alarm is accepted in the Lely Control Plus app.
- A long beep repeats with a 1.5 second pause while waiting in front of a narrow alley.
- Two medium beeps sound with a 0.5 second pause between them while driving backwards or into a charge pole.
- For 3 seconds two medium beeps sound with a 0.5 second pause between them when the MFR is put into operation. The beeps sound before the MFR starts moving.
- For 3 seconds two medium beeps sound with a 0.5 second pause between them at the start or resume of a route. The beeps sound before the MFR starts moving.

- Two long beeps sound constantly while feed or water is loaded through a digital output. The external dispenser warning needs to be activated in the settings of the MFR in the Lely Control Plus app. This is only required if the machinery powered by the digital output poses a hazard (for example conveyor belts), but for example not when operating a water valve with the digital output.
- Two short beeps sound once feed loading is finished and post-mixing starts.

2.4.1.7 Safety light

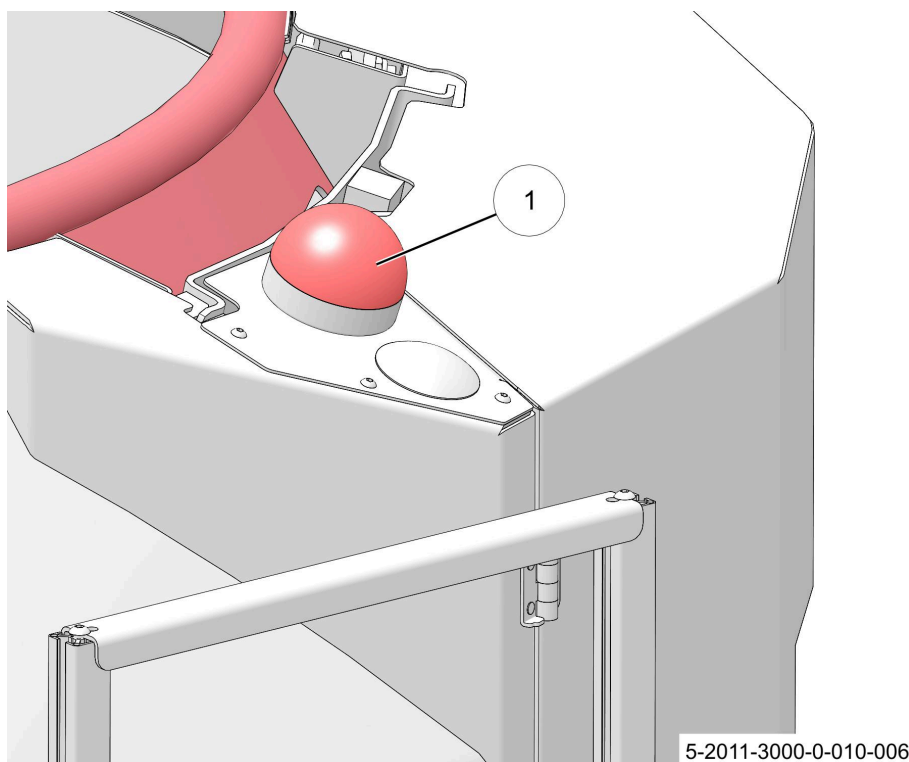


Figure 11. Safety light

KEY: 1. Safety light

A safety light (1), positioned on the top of the MFR, alerts the user and surrounding people.

It uses a flashing amber color at a rate of 60 to 85 flashes per minute.

The safety light is activated in the following situations:

- The safety light flashes for 2 seconds when the Lely Control Plus app connects to the MFR.
- The safety light flashes constantly when there is an alarm on the MFR. It stays on until the alarm is accepted in the Lely Control Plus app.
- The safety light flashes constantly while waiting in front of a narrow alley.
- The safety light flashes constantly while driving through a narrow alley.
- The safety light flashes while driving backwards or into a charge pole.
- The safety light flashes for 3 seconds when the MFR is put into operation. It flashes before the MFR starts moving.

- The safety light flashes for 3 seconds at the start or resume of a route. It flashes before the MFR starts moving.
- The safety light flashes while feed or water is loaded through a digital output. The external dispenser warning needs to be activated in the settings of the MFR in the Lely Control Plus app. This is only required if the machinery powered by the digital output poses a hazard (for example conveyor belts), but for example not when operating a water valve with the digital output.
- The safety light flashes once feed loading is finished and post-mixing starts.

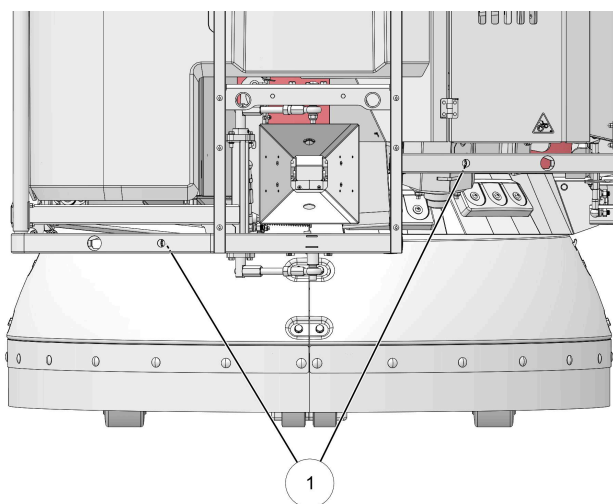
The safety light also activates when the operator initiates one of the following actions in the Lely Control Plus app service menu:

- Start or stop the mixing auger.
- Start or stop the dosing roller.
- Start or stop the drive motors.
- Move dosing roller to closing position in the feed door menu.
- Move the skirt left or right.
- Lift the skirt.
- Move the counter knife **To IN position** or **To OUT position**.

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2.4.1.8 Head- and taillights

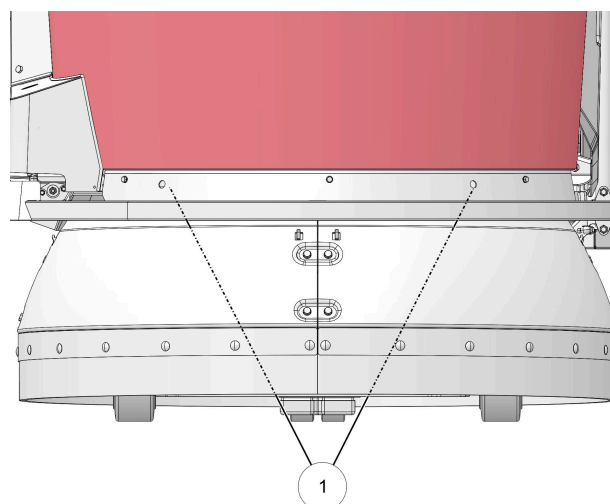
There are four lights on the MFR, two headlights and two taillights.



5-2011-3000-0-07-002

Figure 12. Location headlights

KEY: 1. Headlights



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Figure 13. Location taillights

KEY: 1. Taillights

2.4.1.9 Obstacle detection sensors

NOTICE

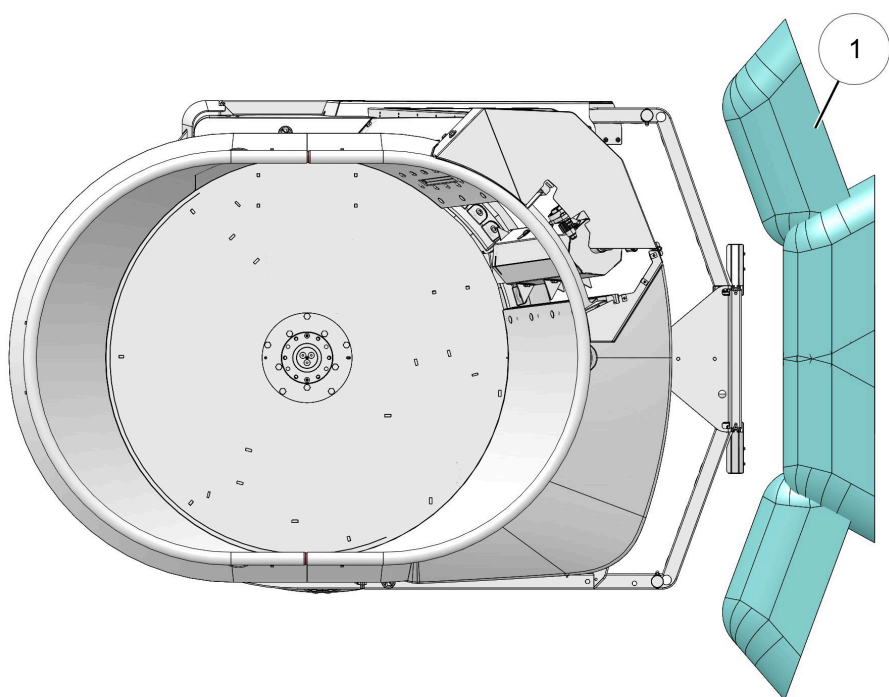
Obstacle detection sensors (ODS) are designed to avoid material damage only! It is not intended as a safety system.

ODS only operate on the route actions where it is activated in the WebUI.

The ODS can detect large objects with a minimum height of 38 cm (15 in), it has a detection range of 38-100 cm, and with a distance of 40 cm (16 in). When an object is detected, the MFR stops immediately.

If the obstacle is still present after six minutes, an alarm is generated: **Obstacle detected**.

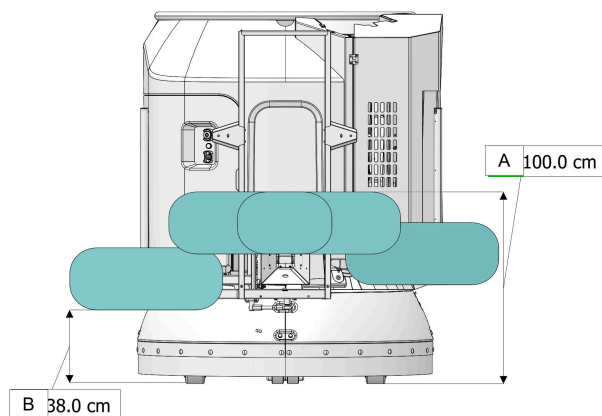
If the obstacle is removed, the MFR will continue its route after a delay of five seconds. The left and right ODS sensors can be controlled independently, for example to ignore cows at the feed fence while detecting a loader or wheelbarrow in the feed alley.



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Figure 14. Top view obstacle detection range

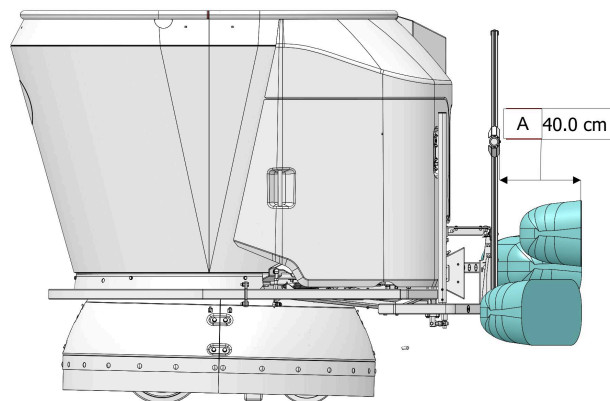
KEY: 1. Detection area



5-2011-3000-0-06-003

Figure 15. Distance obstacle detection front view

KEY:
A: 100 cm (39 in)
B: 38 cm (15 in)



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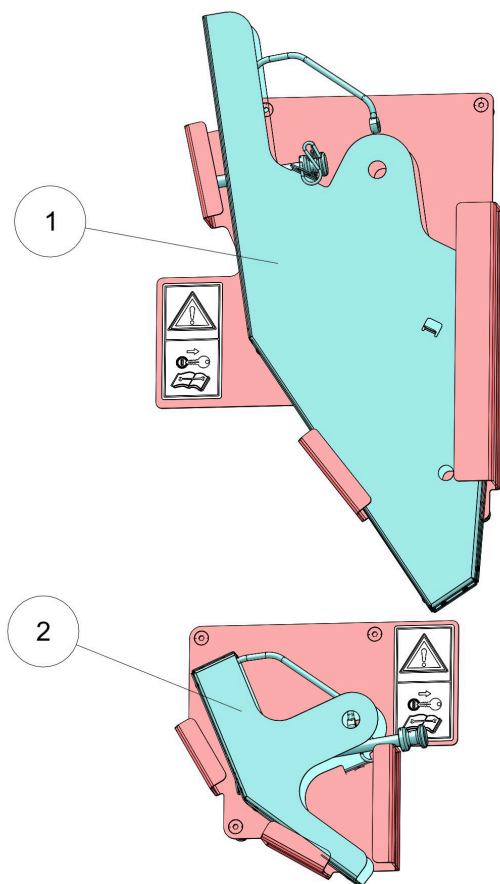
Figure 16. Distance obstacle detection side view

KEY:
A: 40 cm (16 in)

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2.4.1.10 Knife guards

The knife guards (1–2) (see figure 17 on page 2-24) are kept in the holders on the wall near the PDB.



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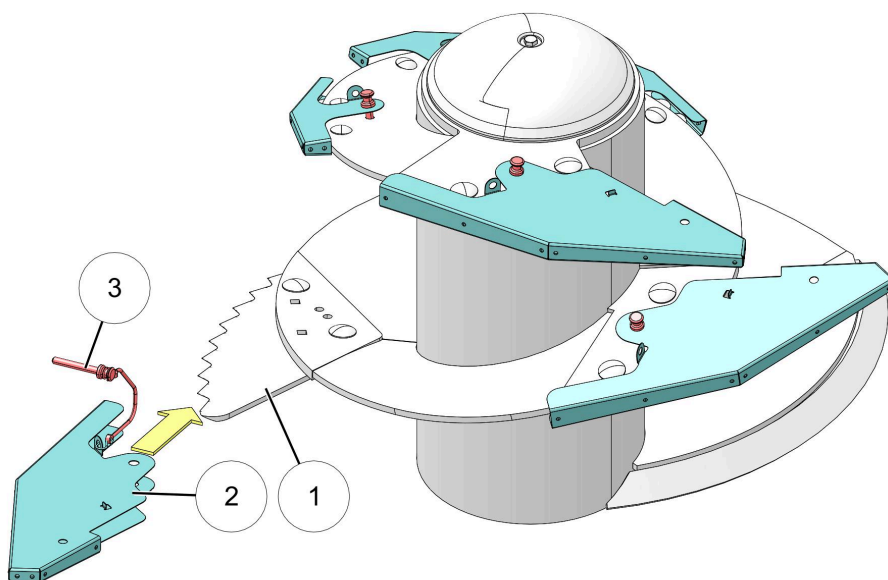
Figure 17. Location knife guards near PDB

KEY: 1. Large knife guard - 2. Small knife guard

DANGER

**Sharp rotating knives.
Risk of severe injury or death.
Never enter the mixing bin and keep hands and feet clear.
Only trained Lely technicians are permitted to enter the
mixing bin.**

During replacement of the mixing auger knives (1) and other work in the mixing bin, the knife guards (2) must be installed on the knives and secured with the locking pins (3) (see figure 18 on page 2-25). Always contact your local Lely service provider to replace the mixing auger knives or for other work in the mixing bin.



5-2011-1650-0-01-001

Figure 18. Knife guards installed on the mixing auger knives

KEY: 1. Mixing auger knife - 2. Knife guard - 3. Locking pin

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2.4.1.11 Software controlled protection

Driving in narrow alleys

In narrow alleys, the minimum clearance is 0.35 m (1.15 ft) on both sides of the MFR, or 0.50 m (1.6 ft) on one side and less on the other. A clearance of 0.35 m (1.15 ft) on only one side is not acceptable. For narrow alleys the **Zone narrow alley** option is set. In this part of the route, the software makes sure that:

- The MFR emits a warning sound, activates light signals, and waits for a set time before it enters the narrow alley. This allows people and animals time to exit the alley.
- The MFR drives with a reduced speed through the narrow alley.
- A safety light signals during driving in the narrow alley.

Driving on slopes

The MFR is able to drive up/down slopes with a maximum inclination of 8%. The MFR has normal driving behaviour at slopes less than 5%. For routes with a 5-8% incline, the driving speed must be reduced in the route program. Please consult Lely if you need assistance.

Safety system

The MFR's safety system, monitored by the safety device, performs internal diagnostics to detect any safety related inputs. If a safety related input is detected, the safety system automatically stops all motors and actuators. When this happens, the MFR's control system raises an alarm to indicate the issue. Always report this alarm to your Lely service provider immediately.

Limited safety speed

The MFR's driving speed is monitored by the software. If driving speed limits are exceeded, the limited safety speed function intervenes and stops the MFR. Notify your local Lely service provider if this fault occurs.

Mixing bin overload protection

The mixing bin of the MFR has a fill capacity of 800 kg (1763.7 lb). If the bin is loaded with more than 1000 kg (2204.62 lb) the software will trigger an alarm: overload protection. The MFR will reduce speed and only manual operation is available.

Battery overcharge protection

The operational software of the MFR controls the charge system. This allows to keep the MFR connected to the charge pole during charging, even if the battery is fully charged. The software prevents overcharging the battery and keeps it fully charged until the next operation.

Distance to stop after not finding the next reference point

On the route to the fences and back to the charge pole, the MFR drives until it finds the next reference point, which can be a fence, wall or strip. Due to skid or malfunction, there is a small chance the MFR does not find its next reference point. If the reference point is not found the robot stops after a certain distance. This distance differs on the type of action and the length of the route action the MFR is driving.

2.4.2 Feed grabber

2.4.2.1 Open the feed grabber manually in case of emergency with the handles



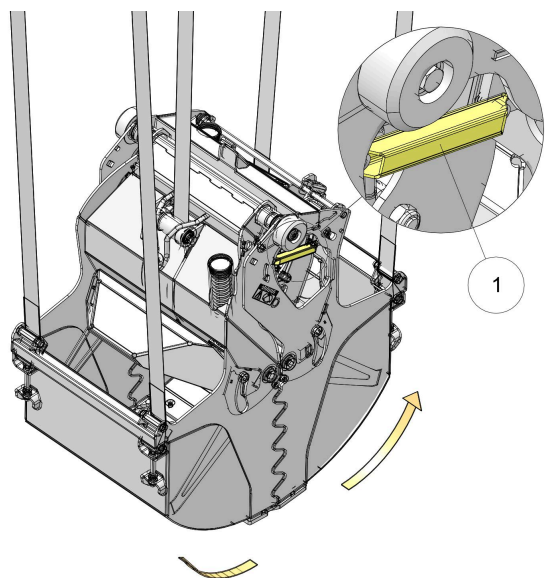
***Sudden release of jaws.
Risk of personal injury.
Only use the handles in case of an emergency. Stand as far away from the jaws of the grabber as possible to prevent getting hit by a released jaw.***

NOTICE

Only open the grabber in case of an emergency because the chain will fall out and it takes some time to reinstall the chain.

1. Stop the system by pushing an emergency button.

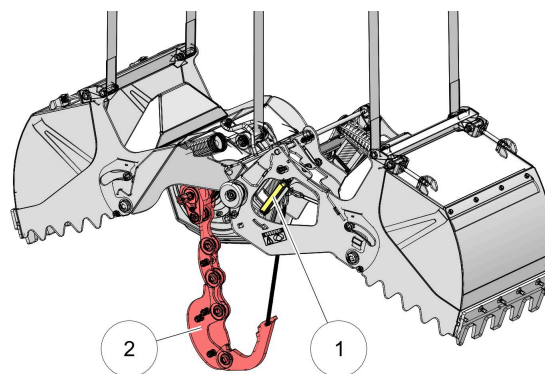
2. Stand clear of the grabber. Pull one of the handles (1) downwards (there is one handle at each side of the grabber).
The chain (2) will fall and the jaws of the grabber will open.



5-3004-manual3-02-001

Figure 19. Feed grabber safety handle

KEY: 1. Safety handle



5-3004-manual4-02-001

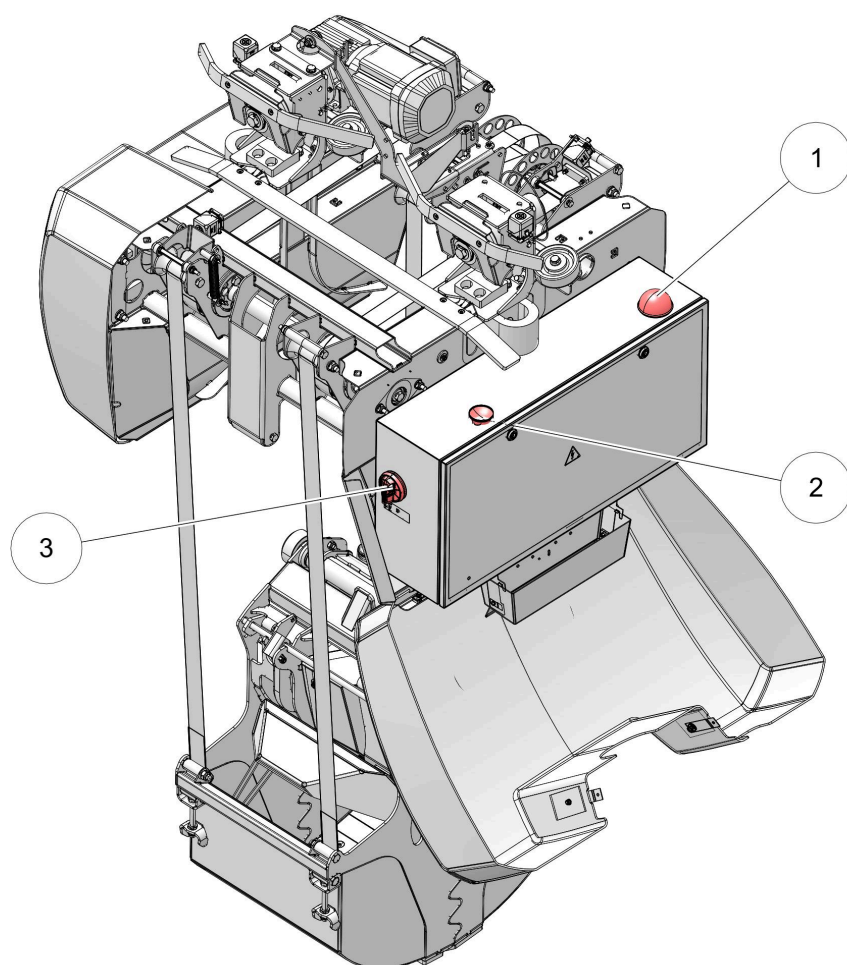
Figure 20. Feed grabber safety handle and chain

KEY: 1. Safety handle - 2. Chain

3. Reinstall the chain (see Reinstall the feed grabber chain after activation of the safety handle on page 7-39).
4. Put the feed kitchen in operation (see page 5-44).

2.4.2.2 Emergency stop button

The emergency stop button (2) is installed on the control box and needs to be used only during emergencies. When the button is pushed, the feed grabber immediately stops. To reset the emergency stop button, turn the button clockwise and pull it out until it locks. Put the feed kitchen into operation.



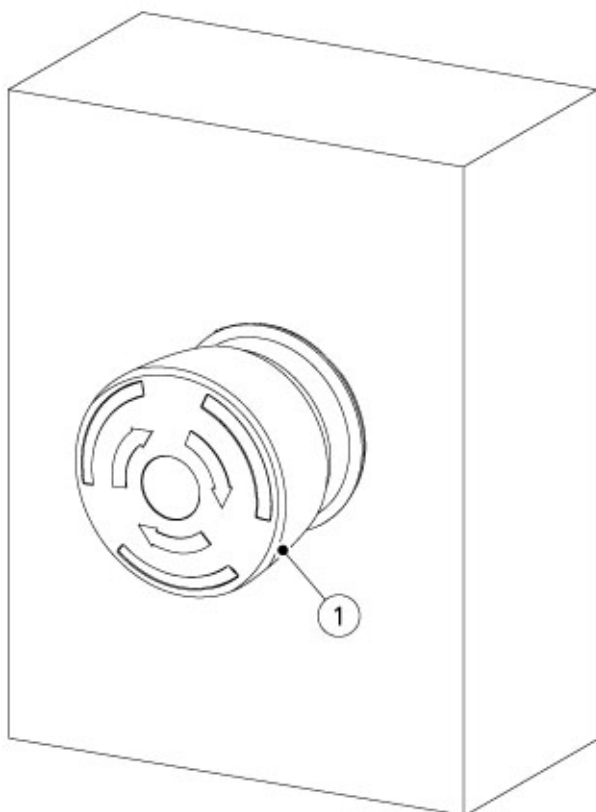
5-3004-manual3-02-003

Figure 21. Emergency stop and main switch

KEY: 1. Bluetooth antenna - 2. Emergency stop button - 3. Main switch

2.4.3 In and near the feed kitchen

2.4.3.1 Emergency stop button



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Figure 22. Emergency stop button

KEY: 1. Emergency stop button

An emergency stop button (1) is installed at the entrance of the feed kitchen and on every side from which the feed kitchen is visible. On long sides on every 24 m (79 ft) an extra emergency stop button must be installed.

When the button is pushed, the feed grabber and bridge crane immediately stop operation.

The MFR will not completely stop operation. However, it may pause mixing for a few seconds before resuming. Whether the MFR stops driving depends on its WiFi connectivity with the PDB and whether it is within the emergency zone. The emergency zone includes route actions where the "emergency zone" option is enabled.

2.4.3.2 Emergency stop button on console

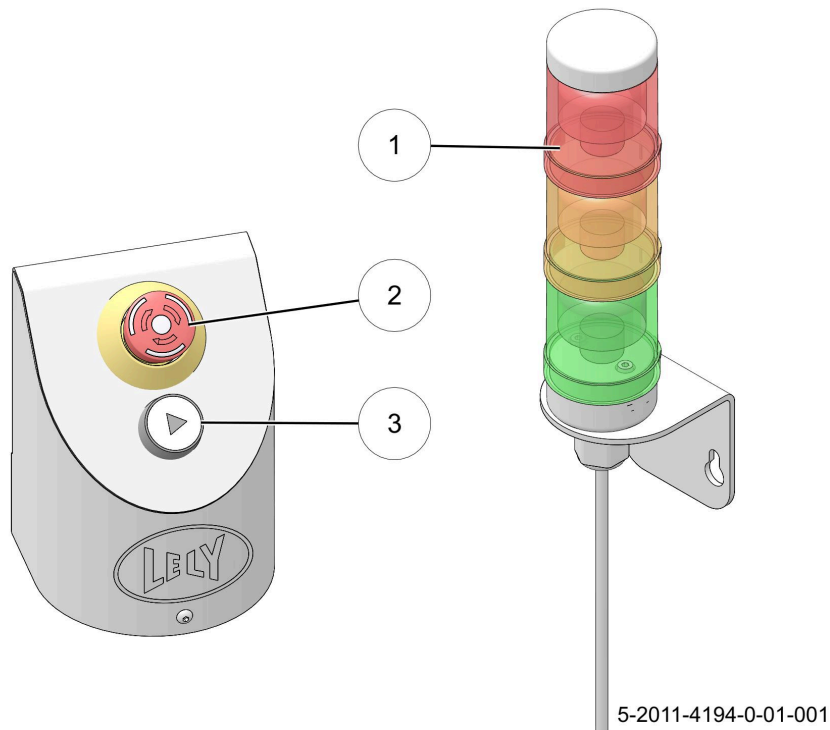


Figure 23. Console

KEY: 1. Signal lights - 2. Emergency button - 3. Start button

An emergency button (2) is installed on the front of the console. It functions similar to the other emergency stops in the feed kitchen.

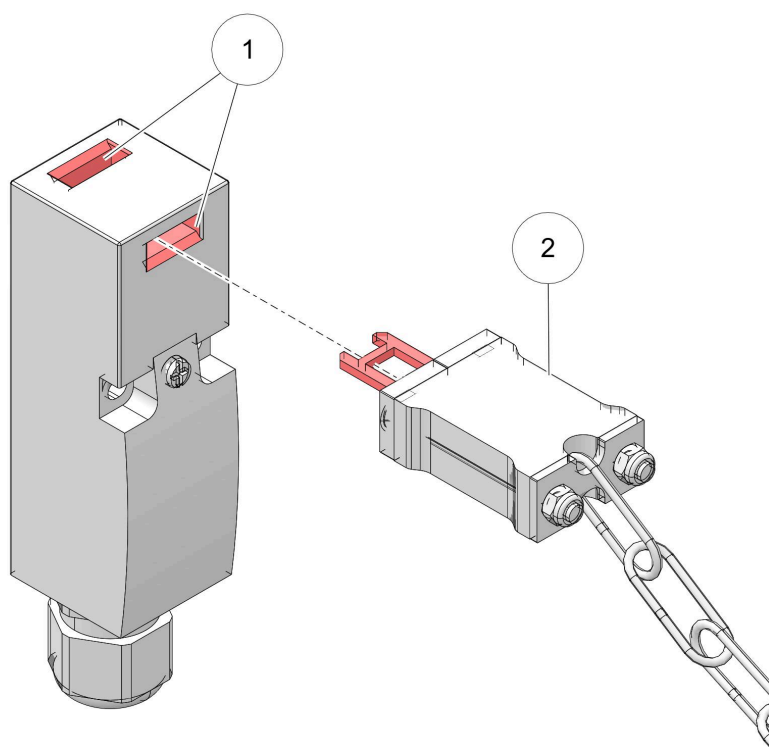
2.4.3.3 Signal Lights

The signal lights (1) (see figure 23 on page 2-30) indicate the following:

Decal		status	
		1	System is switched off
		2	System starts up
		3	System is in operation
		4	One of the devices is out of operation
		5	Emergency stop or critical alarm
		6	Non critical alarm
		7	Kitchen fill mode starts
		8	Kitchen fill mode active
		9	Power failure, system in battery mode

In general the red light indicates there is a critical alarm active. It is also on when the play button still must be pushed after starting up.

2.4.3.4 Safety switch on access doors to the feed kitchen



F000208-001

Figure 24. Example of an access key switch

KEY: 1. Lock - 2. Key



***Risk of accident caused by a malfunctioning safety switch.
Serious injury or death.
Do not tamper with the safety switch.***

On all access doors to the feed kitchen an access control switch, magnetic switch or an access key switch is installed.

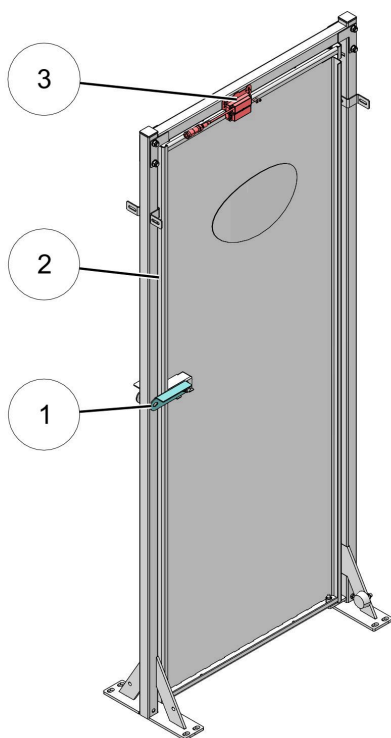
When the access door is opened unauthorized, the control switch switches and the operation of the feed grabber and bridge crane immediately stop.

Be aware that the MFR will not stop operation:

- To reset the access control switch, close the access door.
- To reset the magnetic switch, close the access door.
- To reset the access key switch, lock the door and insert the key (2) in the lock (1).

After the door switch is reset you must put the feed kitchen into operation.

2.4.3.5 Safety door



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5-2011-1170-0-01-09

Figure 25. Safety door

KEY: 1. Lock - 2. Door - 3. Access control switch



***Risk of accident caused by a malfunctioning safety gate.
Serious injury or death.
Do not tamper with the safety gate.***

The safety door (2) has a lock (1) that needs to be opened. When opened the access control switch is activated.

During normal operation when the door is opened unauthorized, the feed grabber and bridge crane immediately stop operation.

Be aware that the MFR will not stop operation.

To reset the access control switch, close and lock the safety door and put the feed kitchen into operation.

2.4.3.6 Safety Fence

Sensors in the tensioner pole of the safety fence detect if the fence is closed and at the correct tension. If the tension is lost the Feed Grabber and Bridge Crane immediately stop operation. Be aware that the MFR will not stop operation. To reset the sensor, close the safety fence and turn the winch until the light goes off.

When the light is on, it indicates an unsafe situation. When the light is off it indicates that the fence is at the correct tension.

2.4.3.7 Safety switch on kitchen fill door



***Risk of accident caused by a malfunctioning safety switch.
Serious injury or death.
Do not tamper with the safety switch.***

On the kitchen fill door an access control switch is installed.

When the kitchen fill door is opened unauthorized, the control switch switches and the feed grabber and bridge crane immediately stop operation.

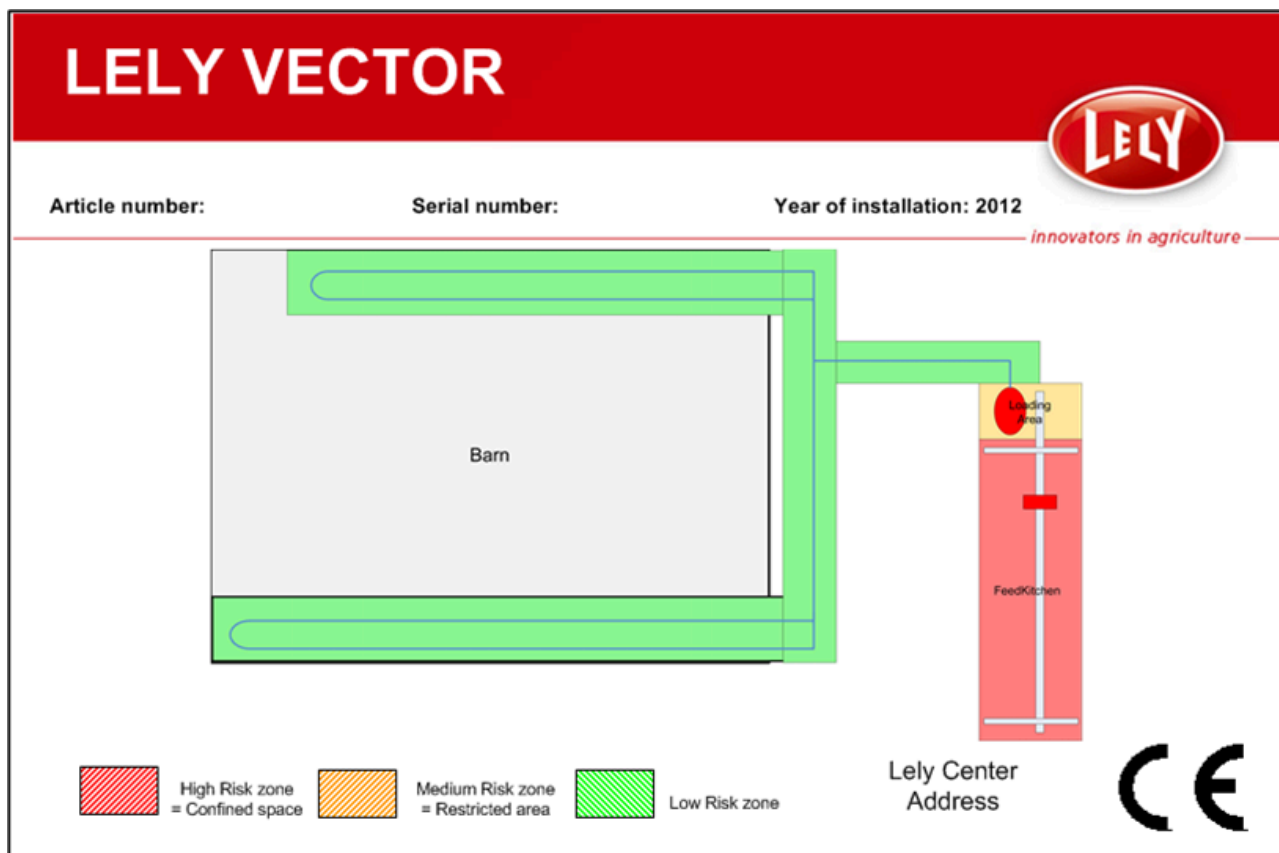
Be aware that the MFR will not stop operation.

To reset the access control switch, close the kitchen fill door and put the feed kitchen into operation.

2.5 Safety zones

2.5.1 General safety zones

The Vector type plate attached on the PDB indicates the risk zones on the farm.



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Figure 26. Example of Vector type plate

2.5.2 Red zone - high risk zone

The feed kitchen is marked on the Vector type plate (see figure 26 on page 2-35) as a red zone. Persons are not admitted in this red zone because of the moving:

- Feed grabber
- Bridge crane

To mark the red zone the following decal is attached at the entrance(s) of the feed kitchen:



5.2011.0866.0.01.002

2.5.3 Yellow zone - medium risk zone

The feed loading zone and small passages are marked on the Vector type plate (see figure 26 on page 2-35) as a yellow zone. In this zone persons (or animals) risk being trapped by the MFR. In that case the MFR is stopped when:

- The emergency button is pushed on the MFR.
- The bumper is hit.

Unauthorised persons are not admitted in this yellow zone because of the moving MFR.

To mark the yellow zone in the feed loading area, the following decal is attached at the entrance of the area:



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To mark the yellow zone in a narrow alley the following decals are attached at the entrance of the narrow alley:



5.2011.0866.0.01.001

2.5.4 Green zone - low risk zone

The routes where the MFR drives are marked on the Vector type plate (see figure 26 on page 2-35) as a green zone, except for the small passages, refer to yellow zone.

To mark the green zone the following decal is attached at the entrance(s) of the area where the MFR drives:



5.2011.0866.0.01.003

2.5.5 Safety and safety distances on routes

- The distance between the metal strip outside a barn and a public road or area is at least 5 m (16.4 ft). The distance must be measured in the straight line the MFR drives from the barn to the strip. This prevents the MFR from ending up on a public road or area when the strip is not found. A bar at the height of the bumper or a line of poles will prevent the MFR from ending up on a public road or in a ditch. This is mandatory if a distance of 5 m is not possible.

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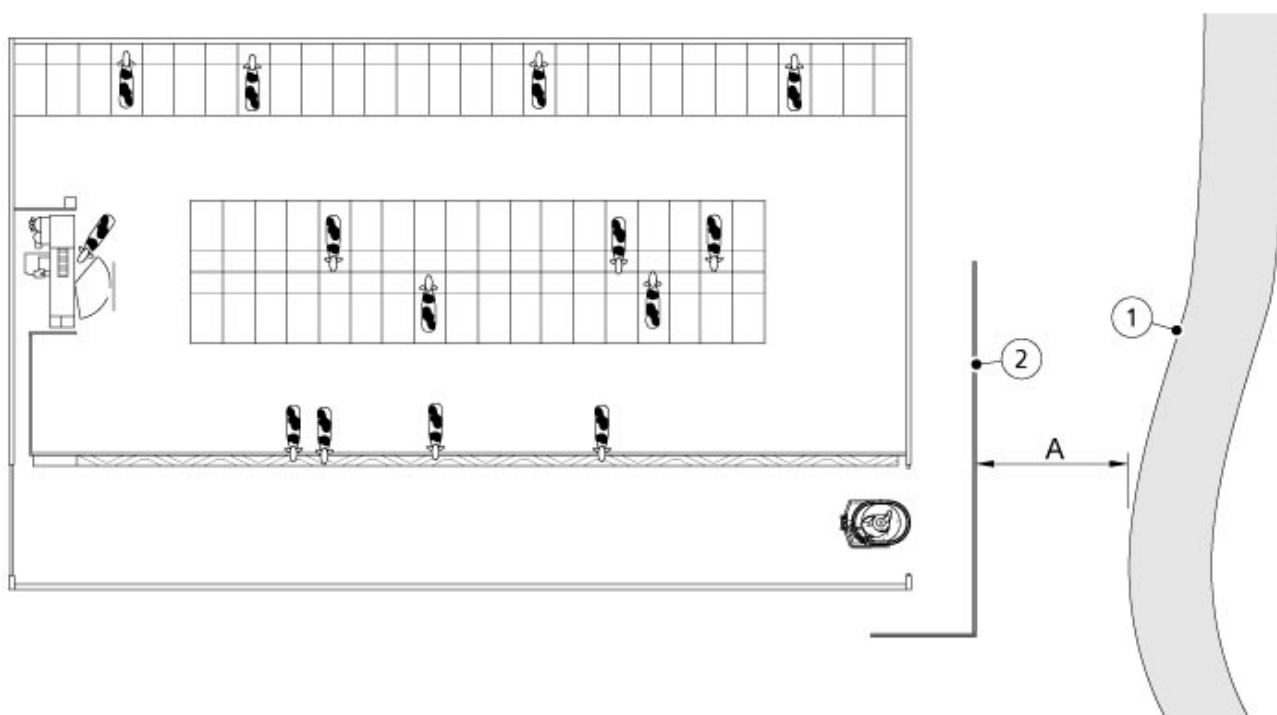


Figure 27. Distance outside a barn

KEY: 1. Public road - 2. Metal strip
A: 5 m (16.4 ft)

- To avoid damage the distance between the metal strip and a ditch or level difference must be at least 5 m (16.4 ft).
- The route of the MFR outside between the barn(s) and feed loading point must be as short as possible.
- The routes of the MFR outside the barn must have sufficient lighting to avoid collisions in the dark.

- The route of the MFR may not cross or access a public road or area.
- The route of the MFR outside the barn must impede the traffic on the farm as little as possible.
- The route of the MFR must be solid and level.
- If the route of the MFR is under an accessible attic or stairway, these must have a railing (1) installed (according to NEN-EN-ISO 14122). This prevents people from falling into the MFR.

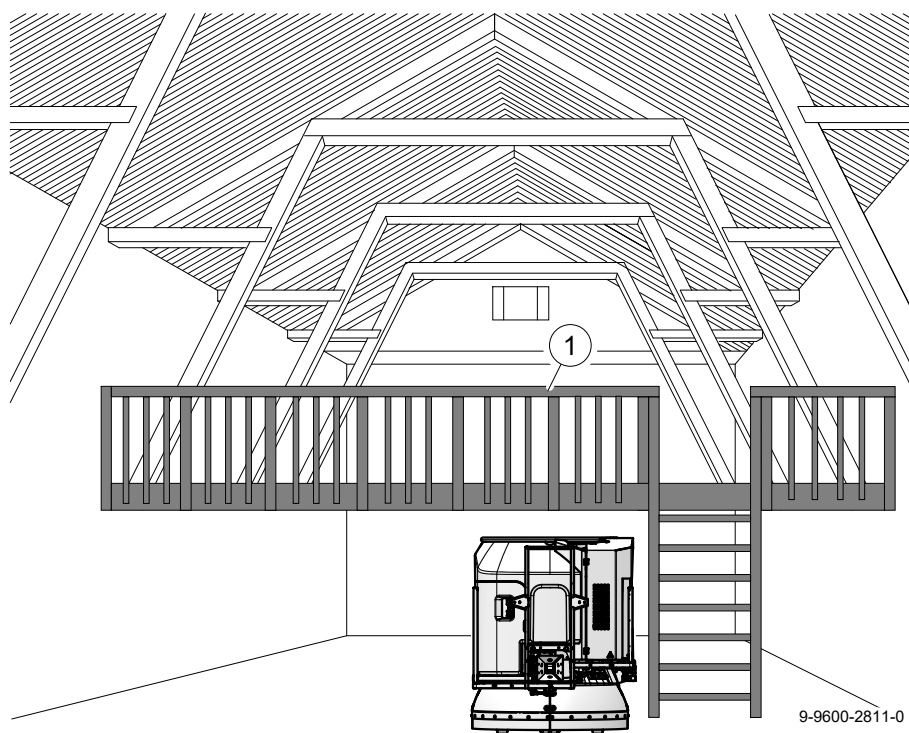
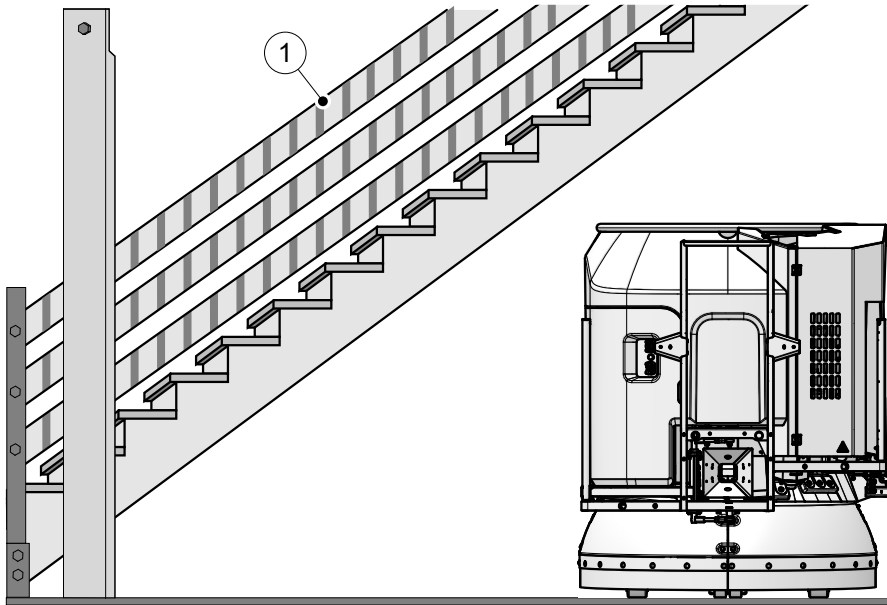


Figure 28. Stairway and attic



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Figure 29. Stairway and attic



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3 Specifications

3.1 Specifications Vector

Specifications and capacity Vector	
Maximum capacity 1 MFR*	Ask your Lely advisor to calculate the capacity on your farm.
Maximum capacity 2 MFRs*	Ask your Lely advisor to calculate the capacity on your farm.
A-weighted emission sound pressure level for the MFR, bridge crane and feed grabber	< 70 dB(A)

* Capacity may vary per farm and ration

Operational conditions	
Ambient temperature Vector machines	-20 - +40 °C (-4 - +104 °F)
Minimum temperature feed kitchen without heating cable in the rail	5 °C (41 °F)
VIOB winter kit	Install: < -10 °C (14 °F) Remove: not necessary
Drive motor gearboxes winter kit	Install: < -10 °C (14 °F) Remove: not necessary
Humidity Vector machines	5 - 95% non-condensing
Weather conditions	All conditions
Driving surface	Concrete C20/25 (outside barns concrete plates are allowed) Minimum thickness: 80 mm (3.14 in)
Altitude	< 2000 m

Feed storage capacity		
Bridge crane (BC B2)	Depth	1.40 - 20 m (4.59 - 65.6 ft)
	Width	10 - 24 m (32.8 - 78.7 ft) (max. effective width 22.1 m (72.5 ft))
Bridge crane (BC B1)	Depth	5 - 20 m (16.4 - 65.6 ft)
	Width	10 - 24 m (32.8 - 78.7 ft) (max. effective width 22.1 m (72.5 ft))
Single fixed rail	Depth	1.60 m (5.25 ft)
	Width	6 - 72 m (19.7 - 236 ft)



Requirements roughage		
Feed blocks	Max. Height	2000 mm (6.6 ft) block must be stable 1800 mm (5.9 ft) to use weight estimation
	Max. depth	1050 mm (3.4 ft)
Loose products from a bin (potatoes, pulp)	Max. depth	1500 mm (4.9 ft)
Bales (only when cut)	Max. depth	1200 mm (3.9 ft)

Capacity MFR		
Capacity mixing bin		150 - 800 kg (330 - 1763.7 lb)
Volume mixing bin		2 m ³ (70 ft ³)
Maximum inclination in driving direction		8 % (Be aware this is percentage and not degrees 80 mm / 1 m (3.14 in / 3.28 ft)) On downwards slopes exceeding 5 %, the MFR must be programmed to not exceed 300 mm/s driving velocity.
Maximum inclination transverse to driving direction		2.5% (Be aware this is percentage and not degrees 25 mm / 1 m (0.982 in / 3.28 ft)) With too much transverse slope the MFR can move away from the feed fence because the required force to push the feed is too high
Maximum inclination in driving direction of the feeding alley during feeding and/or pushing		2% Only if max. slope in transverse direction < 1.5% (Be aware this is percentage and not degrees 20 mm / 1 m (0.786 in / 3.28 ft))
Maximum inclination in driving direction after a stop for example a reset point or automatic door		2% Only if max. slope in transverse direction < 1.5% (Be aware this is percentage and not degrees 20 mm / 1 m (0.786 in / 3.28 ft))
Allowed slope when driving backwards or to a charge pole		Max. 2%
Maximum bump size	With 100% speed 440 mm/s (17.3 in/s)	10 mm (0.39 in)
	With 50% speed 220 mm/s (8.65 in/s)	20 mm (0.786 in)
Feed pushing capacity at the feed fence	Max. feed height	600 mm (23.6 in)
	Max. feed width	720 mm (29.5 in)

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Additives dispenser (frequency pulse)		
Types	Conventional	Additives with low fat (<2%) and large parts (less than 35% smaller than 60 micron)
	Dispenser with stir motor	Additives that are: <ul style="list-style-type: none"> • Hygroscopic (like salt that absorbs water) • Fat (2% - 15%) with large or medium size parts (more than 35% is larger than 120 micron) • Chalk based with large or medium size parts (more than 25% is larger than 120 micron)
Maximum weight to dose		6.5 kg (14.3 lb)
Maximum advised weight to dose		5 kg (11 lb)
Humidity		5 - 70 %
External concentrates and digital output		
Minimum weight to dose		5 kg (11 lb)
Humidity		5 - 70 %

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3.2 Requirements smartphone

Android smartphone or tablet*

- Screen resolution 480 x 800 (or higher).
- Android 8.0 or higher.
- CPU speed: 1 GHz.
- Bluetooth version 2.1, 3.0, 4.0 dual mode (4.0 single mode is not supported).
- For software updates a Wi-Fi or 3G/4G network must be available.
- Storage: SD card (internal or external).
- Smartphone must have at least 10 MB free storage.

*) Use of a tablet is technically possible if it meets the specifications. However, the user interface might not be displayed optimally since it is designed for smartphones.



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4 Description and operation

This chapter contains the component description and operation of the various parts in the Vector system.

4.1 Description

4.1.1 General description Vector system

Most Vector systems have a feed kitchen. This is an enclosed area where blocks of roughage are stored. The feed grabber grabs roughage and loads it into the mixing bin of the MFR. Concentrates and additives can be added. After the feed is mixed, this ration is transported to the group of animals and dosed along the feed fence.

The Vector has three main parts and several options. The three main parts are:

- One or two MFRs and charge poles.
- A PDB and a PSU, with an additional secondary PSU when two MFRs are used.
- A console and signal lights.

Optional parts are:

- A feed grabber.
- A bridge crane or fixed rail, that functions as a transport system for the feed grabber.
- If no feed grabber is present, a (tower) silo or conveyor belt that adds roughage (not Lely parts) needs to be present.
- A safety fence.
- Additives dispensers (frequency pulse).
- Concentrate augers (frequency weight).
- An automatic (barn) door control.

4.1.2 MFR

4.1.2.1 MFR main components

The mixing and feeding robot (MFR) has the following main components:

- Covers and doors.
- Driving mechanism.
- Feeding system.
- Skirt lift and suspension system.
- Power system.
- Control system.
- Safety components.
- Obstacle Detection Sensors (ODS).

- Electronic bumper protection (optional).

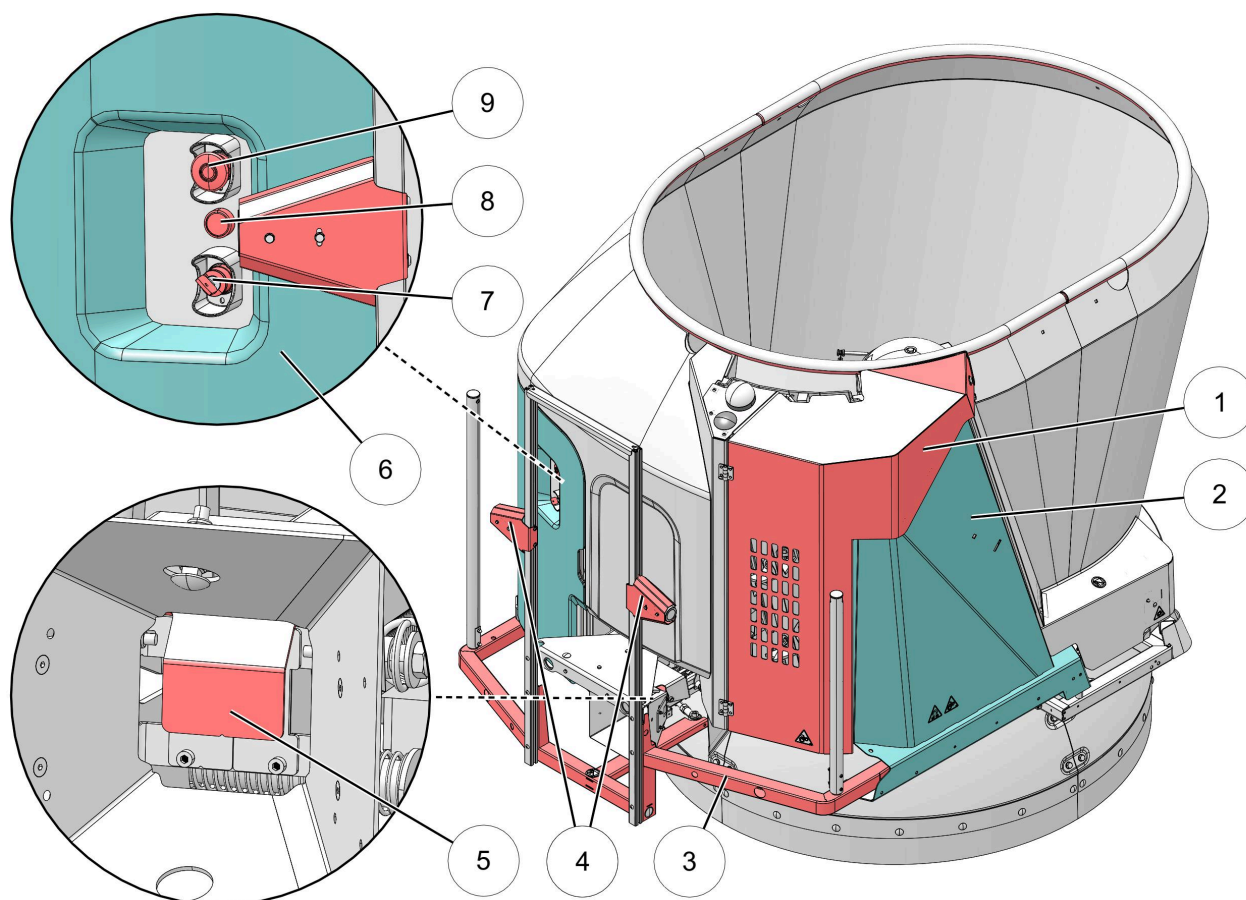


Figure 30. General overview

KEY: 1. Maintenance door - 2. Inspection cover - 3. Bumper - 4. Ultrasonic sensors - 5. Charge input - 6. Power box cover - 7. Service key - 8. Pause button - 9. Emergency button

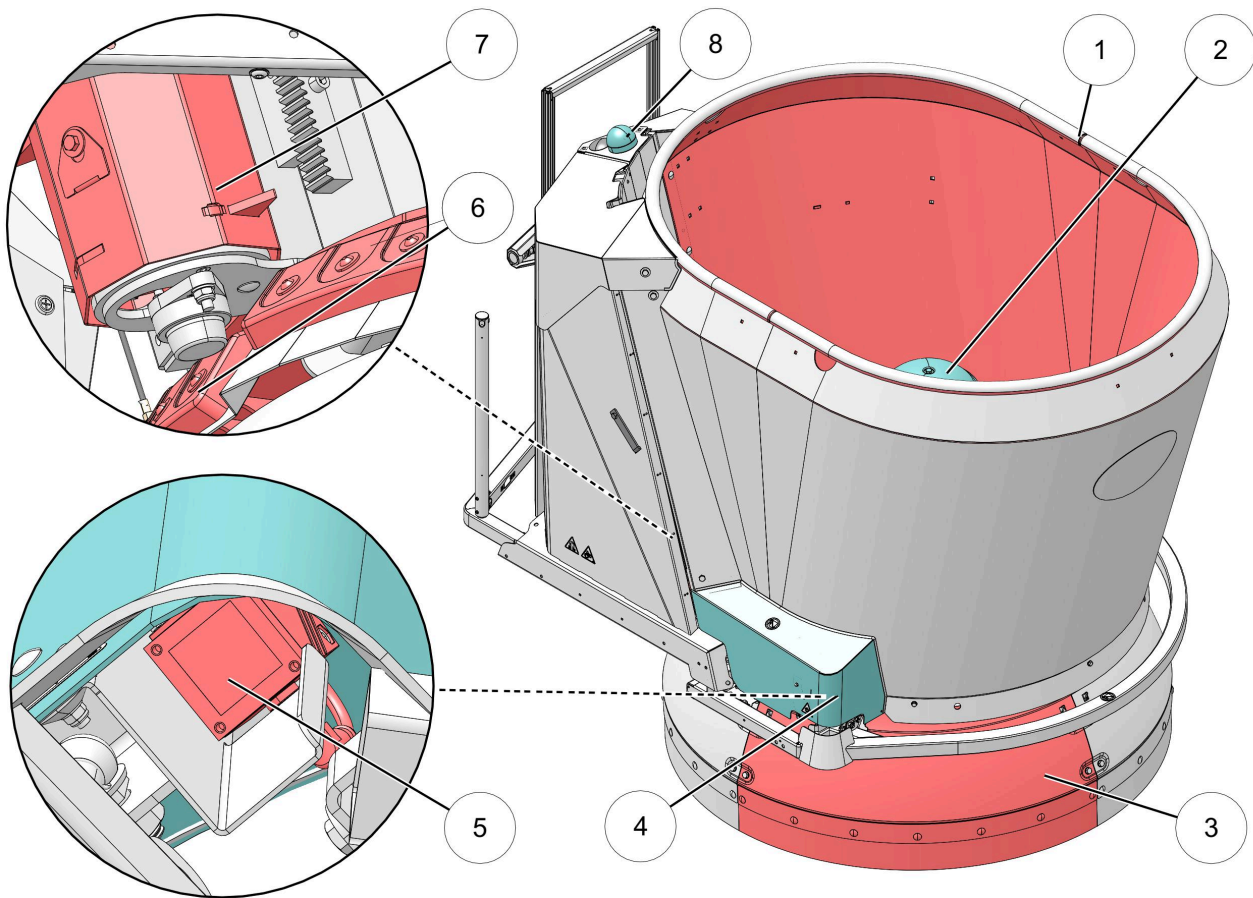
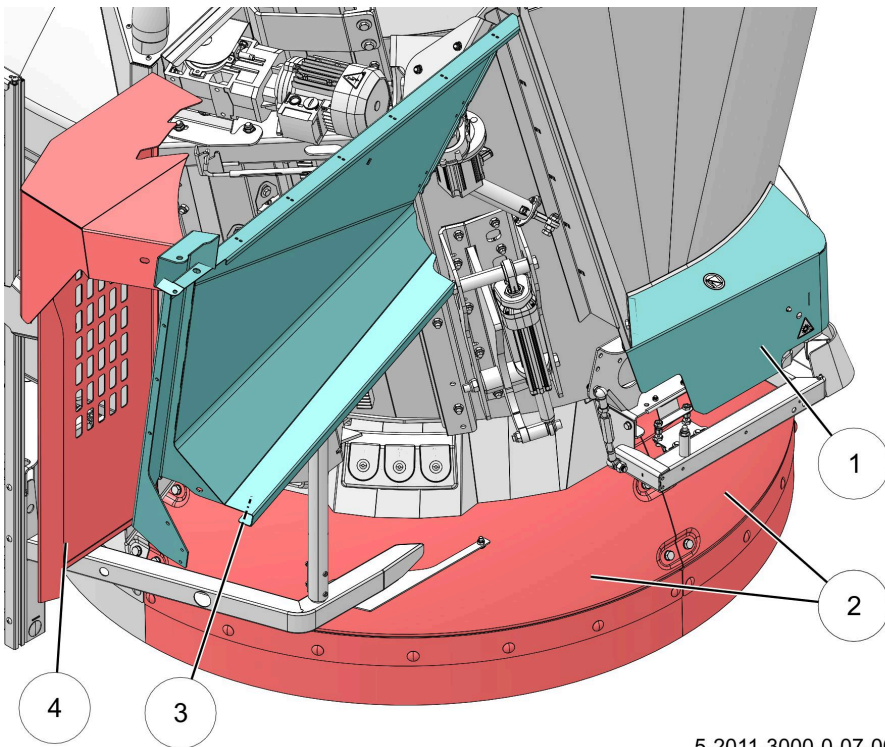


Figure 31. General overview

KEY: 1. Mixing bin - 2. Mixing auger - 3. Skirt - 4. Laser cover - 5. Feed height laser - 6. Magnets - 7. Dosing roll - 8. Antenna

4.1.2.2 Covers and doors

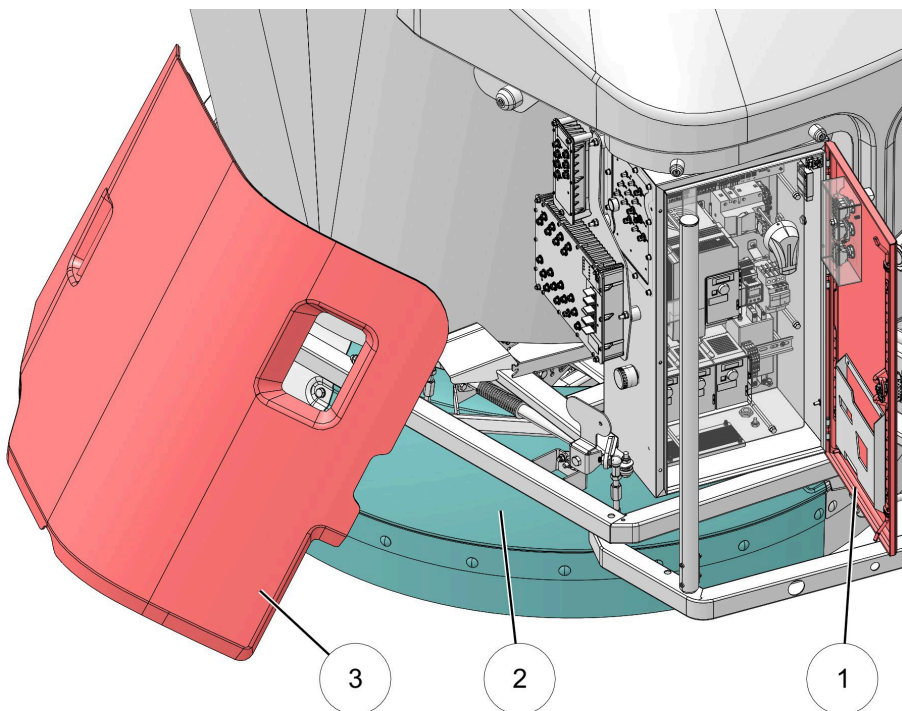
The MFR has the following covers and doors:



5-2011-3000-0-07-004

Figure 32. Covers and doors

KEY: 1. Laser cover - 2. Removable skirt - 3. Inspection door - 4. Maintenance door



5-2011-3000-0-07-003

Figure 33. Covers and doors

KEY: 1. Power box door - 2. Removable skirt - 3. Power box cover

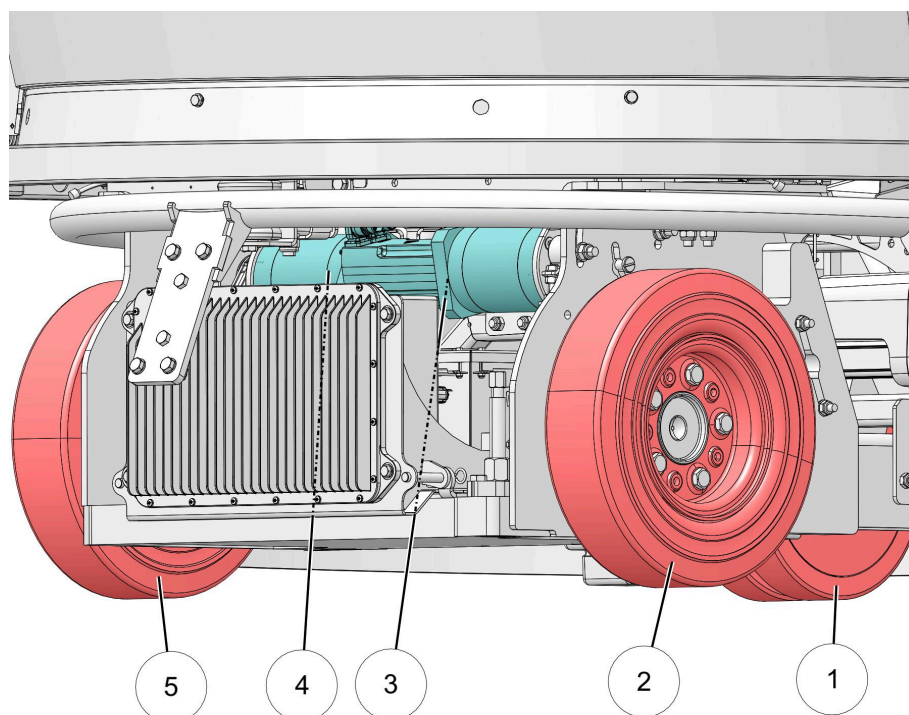
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4.1.2.3 Driving mechanism

The MFR is driven by its two drive motors (3-4) (see figure 34 on page 4-6). The direction of the MFR is controlled by difference in rotation speed of the left and right drive motor.

The motors are equipped with brakes which are engaged when the machine is not driven by the motors. The brakes will be released when the power to the motors is activated.

The driving mechanism of the MFR consist of the following components:



5-2011-3000-0-05-002

Figure 34. Driving mechanism

KEY: 1. Swivel wheel - 2. Right wheel - 3. Drive motor right wheel - 4. Drive motor left wheel - 5. Left wheel

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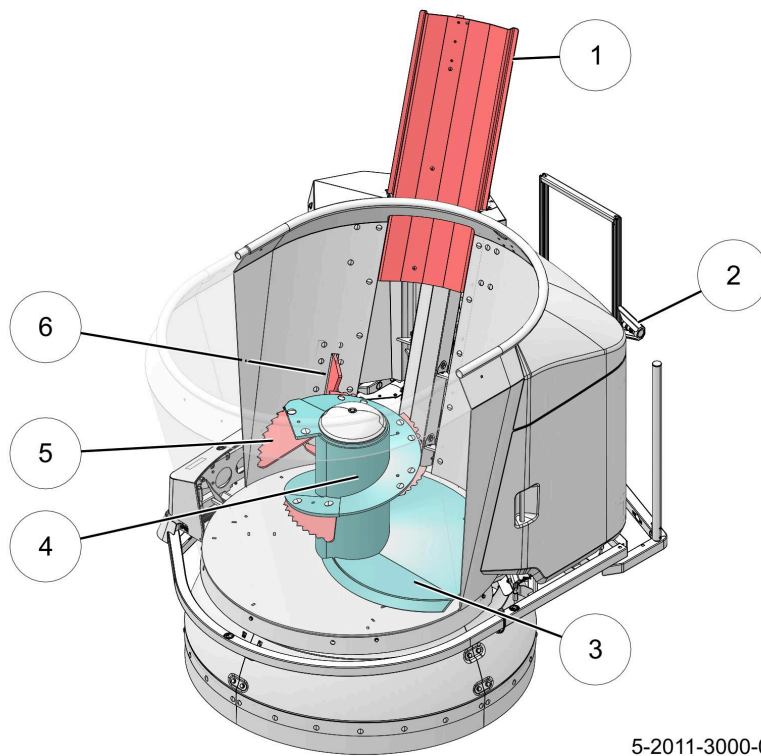
4.1.2.4 Feeding system

Feed that is dispensed into the mixing bin is being weighed by three load cells. The MFR mixes feed with the mixing auger (3). The mixing auger knives (5) and counter knife (6) cut and mix the feed. An encoder on the counter knife actuator detects the position of the counter knife. The feed door (1) opens to dispense the feed at the feed fences (see figure 35 on page 4-7). An encoder on the feed door motor detects the position of the feed door.

The dosing roll (3) doses the feed that is dispensed (see figure 36 on page 4-8). A position sensor detects the dosing roll standby position.

The ultrasonic sensors (2) scan the distance to the feed fence or wall (see figure 35 on page 4-7).

The feeding system of the MFR consists of the following main components:

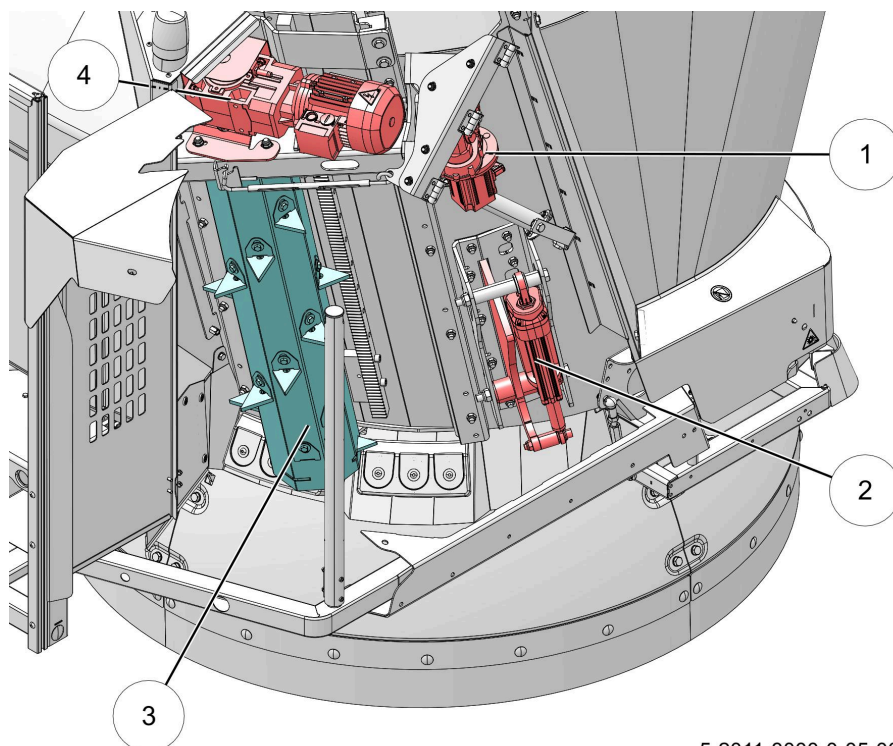


5-2011-3000-0-05-001

Figure 35. Mixing auger and feed door

KEY: 1. Feed door - 2. Ultrasonic sensor - 3. Mixing auger - 4. Mixing auger motor - 5. Mixing auger knife - 6. Counter knife

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5-2011-3000-0-05-007

Figure 36. Dosing roll and motors

KEY: 1. Feed door motor - 2. Actuator counter knife - 3. Dosing roll - 4. Dosing roll motor

5.2011.8636.0 B

4.1.2.5 Skirt lift and suspension system

The skirt lift and suspension system (3) moves the skirt (5) to the lifted middle position or to the left or right feed push position (see figure 37 on page 4-9). In the middle position the skirt is lifted from the ground. This is useful for instance to avoid contamination of the skirt where the machine drives from/to the feed kitchen or from one barn to another. An actuator (6) adjusts the mechanism of the machine to the preferred position. An encoder on the actuator detects the position of the skirt. The skirt rotates through the suspension tube and guiding wheels.

The skirt lift and suspension system of the MFR consist of the following main components:

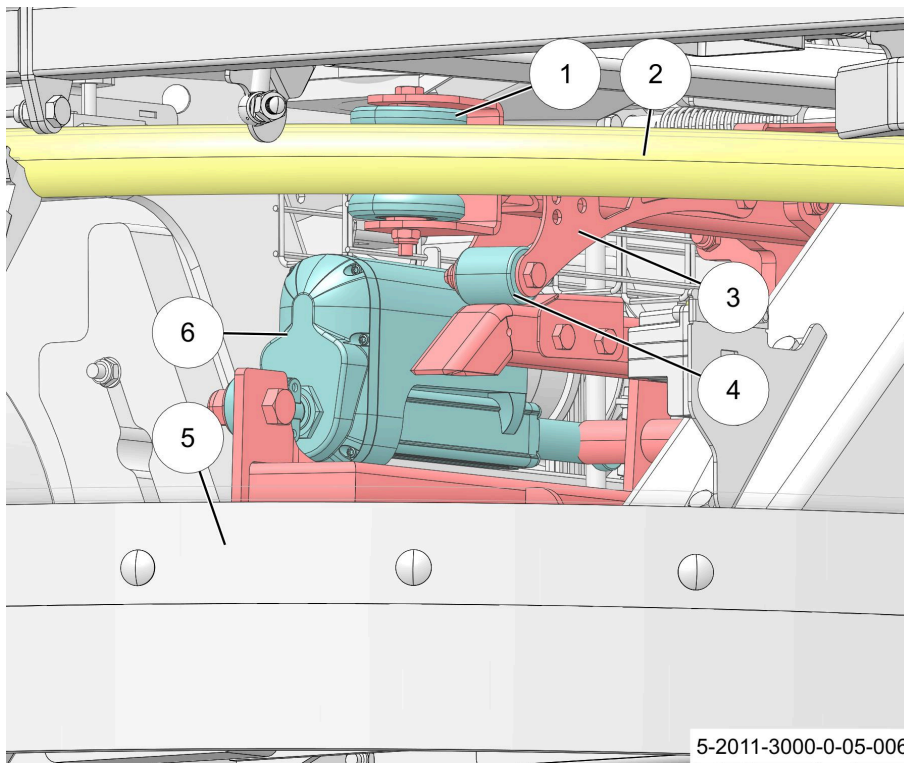
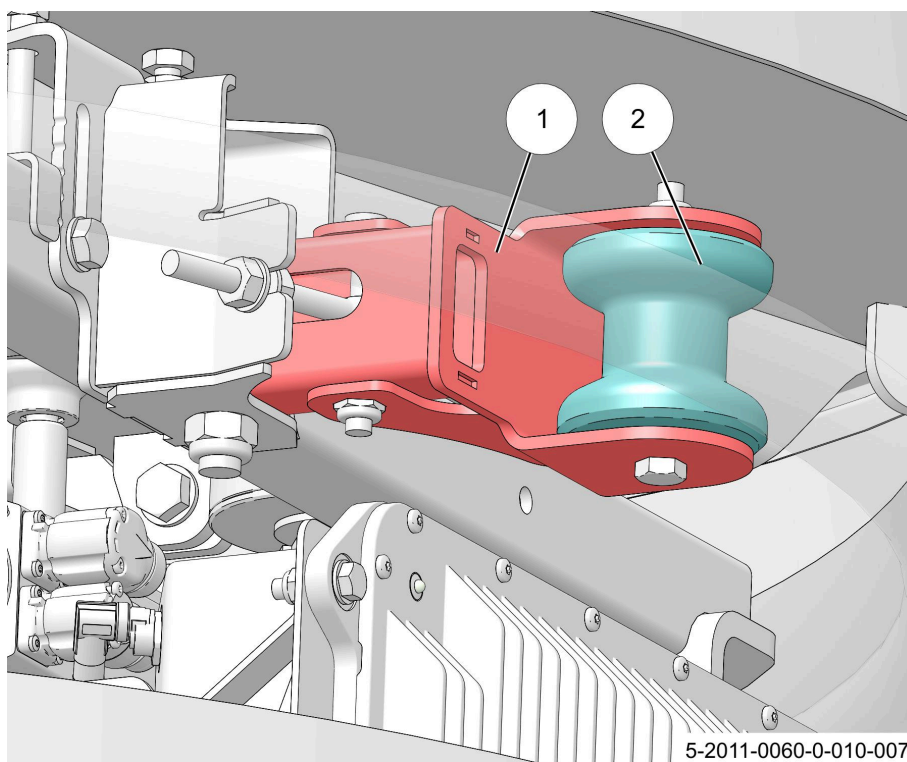


Figure 37. Skirt lift and suspension system

KEY: 1. Guiding wheel - 2. Rotation tube - 3. Skirt lift and suspension system - 4. Roller - 5. Skirt - 6. Skirt lift actuator

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5-2011-0060-0-010-007

Figure 38. Rear skirt support

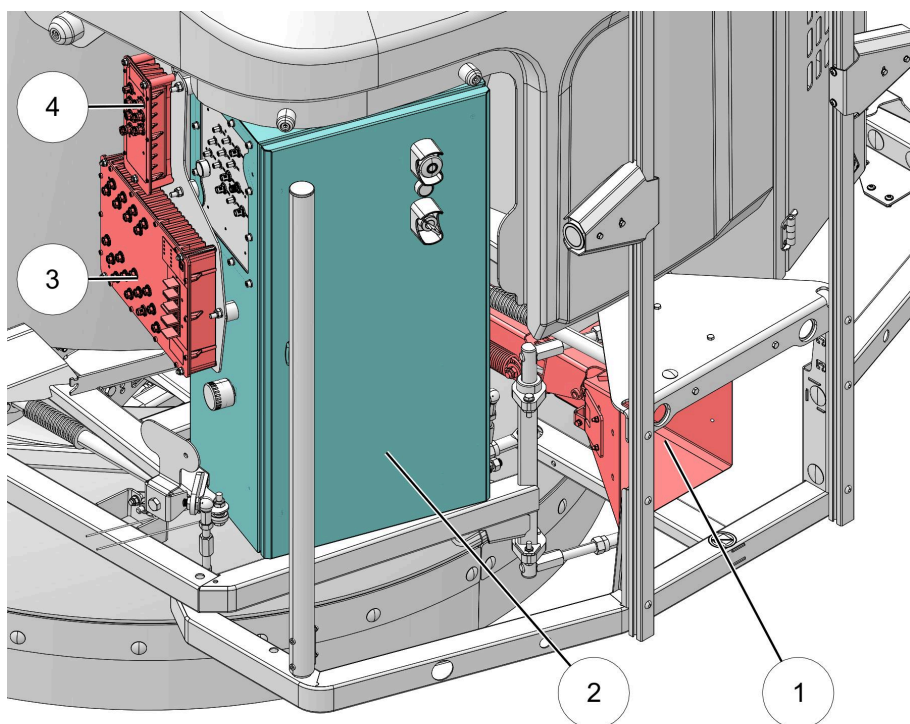
KEY: 1. Rear skirt support - 2. Guiding wheel

5.2011.8636.0 B

4.1.2.6 Power system

The power system stores and distributes the electrical power to the driving, feeding and control systems. Power is supplied by a battery pack (1) and regulated through a power converter (2) (see figure 40 on page 4-12). The battery pack is charged at the charge pole. The power converter initializes the electronic components and regulates the battery charging when docked in the charge pole.

The power system (see figure 39 on page 4-11) and battery pack (see figure 40 on page 4-12) of the MFR consists of the following main components:

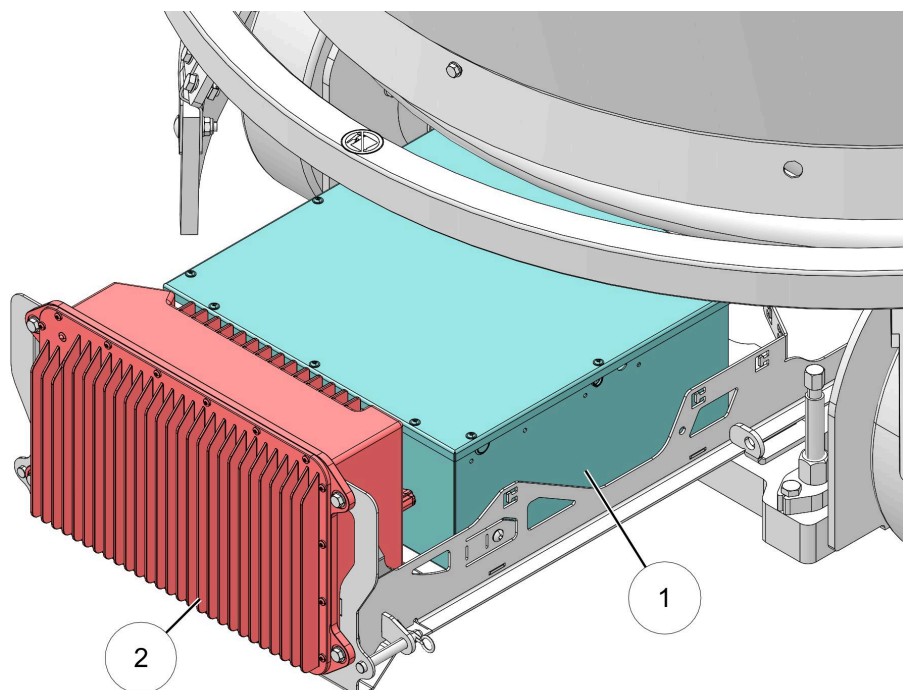


5-2011-3000-0-05-003

Figure 39. Power system

KEY: 1. Charge pole connector - 2. Power box - 3. VIOB - 4. LCIB

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5-2011-3000-0-05-004

Figure 40. Battery pack

KEY: 1. Battery pack - 2. Power converter

When the batteries are ON it is indicated with a led BATTERY ON D10 (1) inside the power box on the PCB.

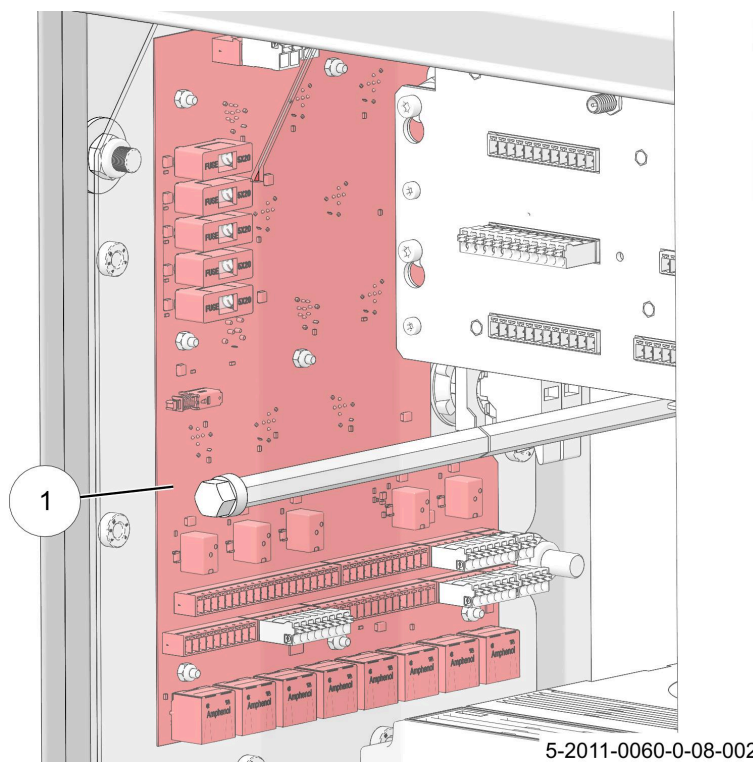


Figure 41. Battery status indicator

KEY: 1. Battery status indicator BATTERY ON D10

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4.1.2.7 Control system

The control system of the MFR controls the day-to-day operation of the MFR, it is monitored by the safety system.

The control system consists of the following components:

- Load cell interface box (LCIB).
- Vehicle input/output box (VIOB).
- Ultrasonic sensor (2x).
- Inductive sensor (2x).
- Obstacle detection sensors (ODS) (3x).
- Inertial measurement unit (IMU).
- Lely Control Plus App.

All the components work together to keep the robot on the correct route.

LCIB

The LCIB processes data from the load cells.

VIOB

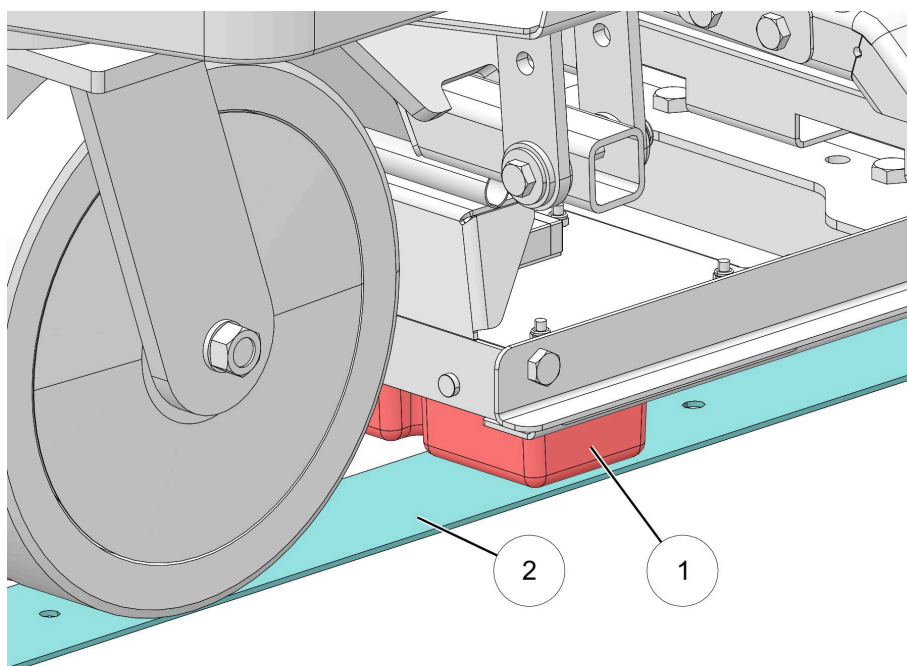
The VIOB is the interface between the sensors and actuators on the machine.

Ultrasonic sensors

The ultrasonic sensors make sure the robot follows the wall or fence at a pre-determined distance.

Inductive sensors

The inductive sensors can detect and follow pre-installed metal strips on the floor. This makes it possible to drive to the feed kitchen or from one barn to another and ensures accuracy of the programmed routes.



5-2011-3000-0-05-005

Figure 42. Inductive sensors

KEY: 1. Inductive sensors - 2. Metal strip

ODS

The ODS detect objects on the front of the MFR. When an object is detected, the MFR stops immediately.

IMU

The IMU measures the turn angle. This information is used by the robot to find the correct direction.

Lely Control Plus app

Lely Control Plus is the mobile app used to manually operate the MFR and the automatic (barn) door control. It also provides important information about the MFRs status and tasks.

4.1.2.8 Safety components

The MFR has safety components to:

- Protect people and animals against mechanical hazards by a set of safety devices that stop the machine:
 - Emergency button.

- Service key:
 - Prevent unexpected start-up of motors during maintenance activities.
- Safety bumper:
 - Hard bumper stop: monitor collision-triggered stop.
 - Bumper recovery stop: monitor MFR movement during bumper recovery.
- Monitor the MFR's speed. If the speed limit is exceeded, the MFR will trigger an alarm.
- Warn people and animals with an acoustic warning device.
- Warn people and animals with a safety light.
- Make sure that a fault in the hardware or software does not lead to hazardous situations:
 - Voltage detection to detect the voltage from the charge pole.
 - Insulation detection to monitor the electrical insulation.
 - Overload protection of the drive motors.
 - Overload protection of the electrical circuit.
- Ask permission before driving to the feed loading point (emergency zone and kitchen point settings on routes).

If safety limits are violated or safety components are manually activated (for example with an emergency stop or service key), all motors of the MFR are stopped. This occurs with a power removal, which cuts power to the motors upon activation. The mechanical brakes on the drive motors are activated to limit the stopping time and distance, preventing the MFR from rolling on slopes.

The following motors receive a power removal:

- Drive motors and if applicable mechanical braking activated.
- Mixing auger motor.
- Dosing motor.
- Feed door motor.
- Counter knife motor.
- Skirt motor.

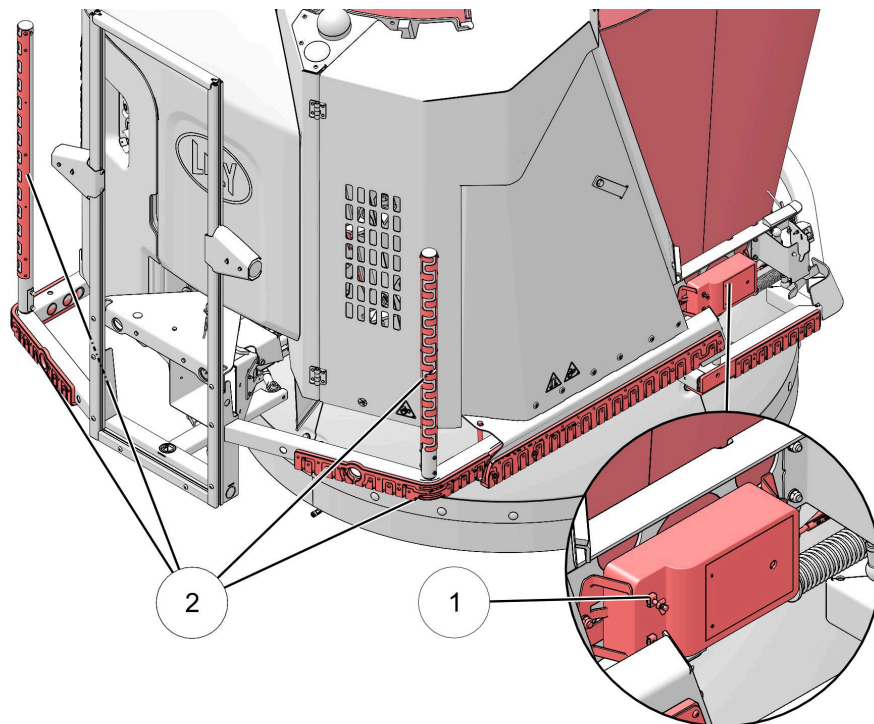
4.1.2.9 Optional

The following options can be installed on the MFR:

- Electronic bumper protection, to prevent the animals from touching the bumper too often and stop the MFR (see Electronic bumper protection on page 4-15).
- Door push set, to push open a door without activation of the safety bumper (see Door push set on page 4-16).

Electronic bumper protection

The electronic bumper protection consists of the following components:



5-2011-0060-0-01-001

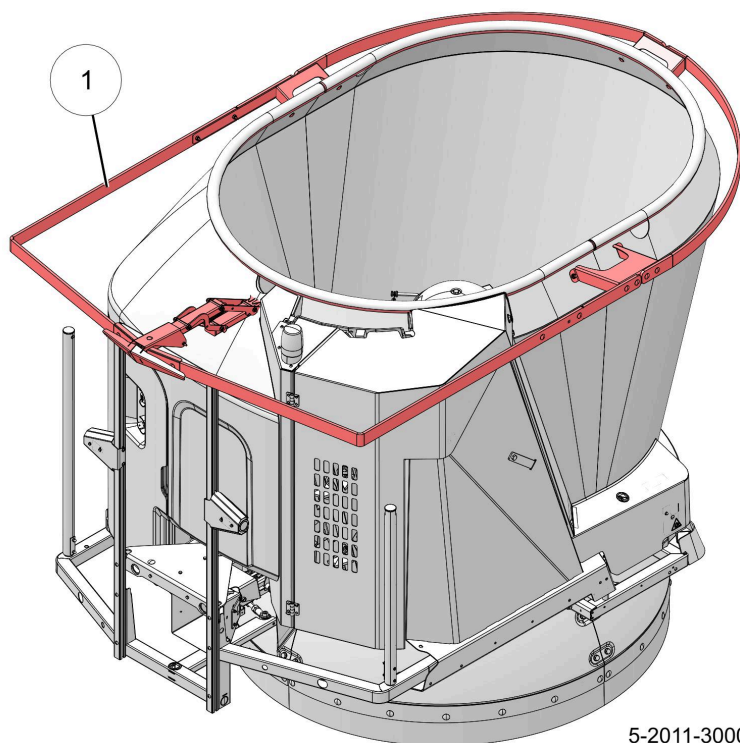
Figure 43. Overview electronic bumper protection

KEY: 1. Shock device - 2. Electronic bumper protection strip

Door push set

There are two variants of the door push set (1):

- A door push set used for swinging doors.
- A door push set used for a plastic strip curtain.



5-2011-3000-0-07-005

Figure 44. Door push set

KEY: 1. Door push set

5-2011.8636.0 B

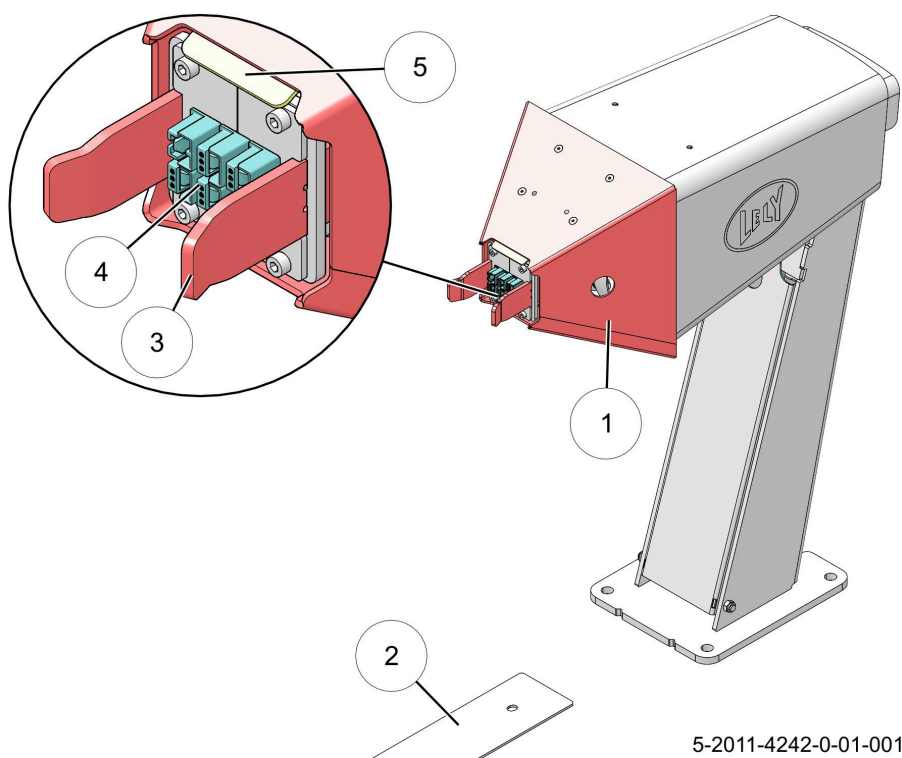
4.1.3 Charge pole

The charge pole is installed under the feed loading point in the feed kitchen. The charge pole supplies power to the MFR. This power is used to charge the batteries and run the mixing auger at full speed when loading feed.

At approximately 75 cm (29.5 in) from the charge pole, the MFR starts driving slowly to the charge pole. When it pushes against the socket guide (1), the cover (5) is pushed backwards exposing the charge socket (4). The MFR connects to the socket (4), guided by the guiding plates (3), and stops driving. The MFR stops charging when the batteries are full or it must do a feed or scan task.

If there is a second MFR, a second charge pole is needed. This is installed at the parking position near the feed kitchen. The secondary charge pole has no metal strip (2) under it.

The charge pole receives power from the PSU. The secondary charge pole receives power from a secondary PSU.



5-2011-4242-0-01-001

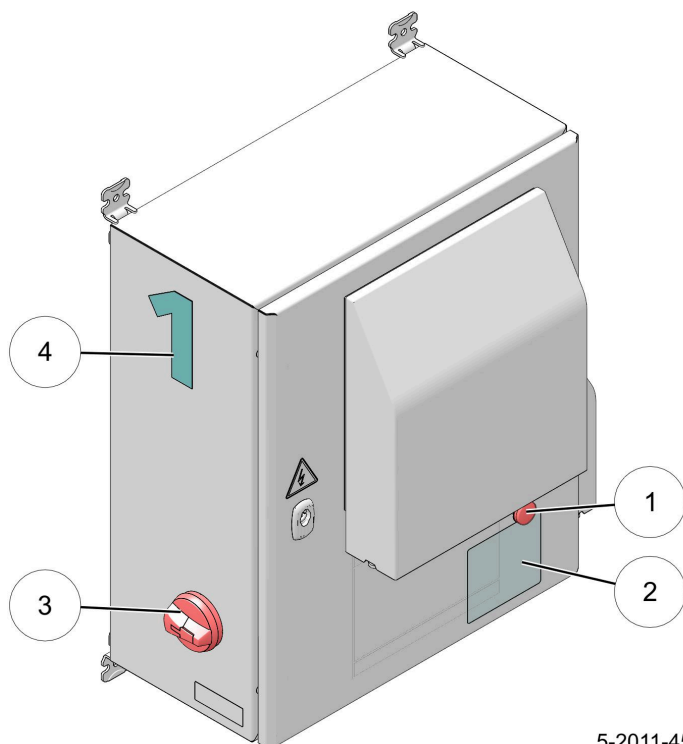
Figure 45. Charge pole

KEY: 1. Socket guide - 2. Metal strip - 3. Guiding plate - 4. Charge socket - 5. Cover

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4.1.4 PSU

The power supply unit (PSU) is a control box in the feed kitchen. It is connected to the charge pole. When a MFR is connected to the charge pole, the PSU receives a signal from the MFR and starts to supply power to the charge pole. The power indicator (1) indicates whether the MFR receives power from the charge pole. This confirms that the MFR is correctly connected to the pole.



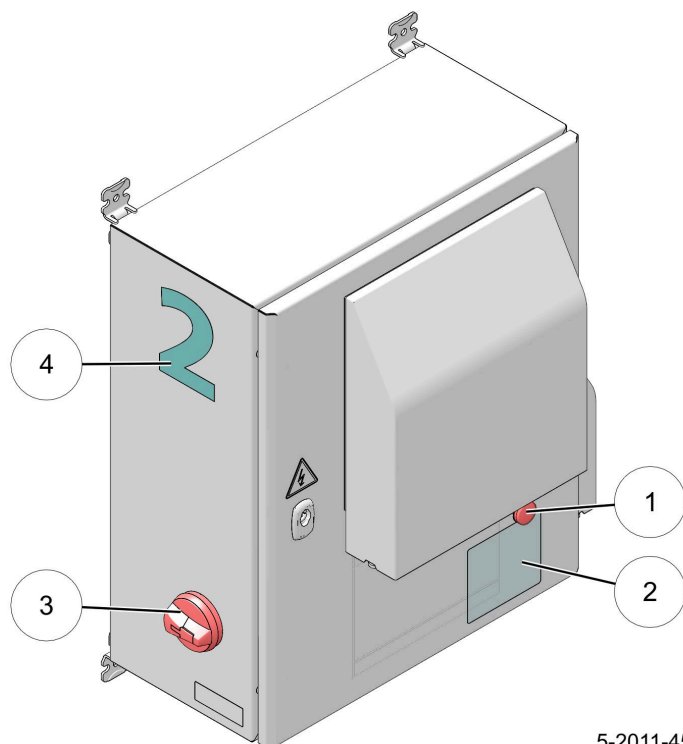
5-2011-4500-0-03-002

Figure 46. PSU

KEY: 1. Power indicator - 2. Decal power indicator - 3. Main switch - 4. Decal main PSU

If there is a second MFR, a secondary PSU is needed. This is installed near the parking charge pole.

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5-2011-4500-0-03-003

Figure 47. Secondary PSU

KEY: 1. Power indicator - 2. Decal power indicator - 3. Main switch - 4. Decal secondary PSU

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4.1.5 PDB

The power distribution box (PDB) is a control box of the Vector system in the feed kitchen. It distributes power to:

- The power supply unit(s) that supplies power to the charge pole(s).
- Bridge crane and feed grabber (optional).
- Control box additives dispenser (frequency pulse) (optional).
- Control box external concentrates (frequency weight) (optional).
- Safety fence (optional).

The PDB is connected to the Horizon PC or the farms network that is connected to the Horizon PC.

The PDB can give an on/off signal to a digital output (optional) to start/stop a (tower) silo or conveyor belt.

The feed controller software runs on the PCB in the PDB.

4.1.6 Console and signal lights

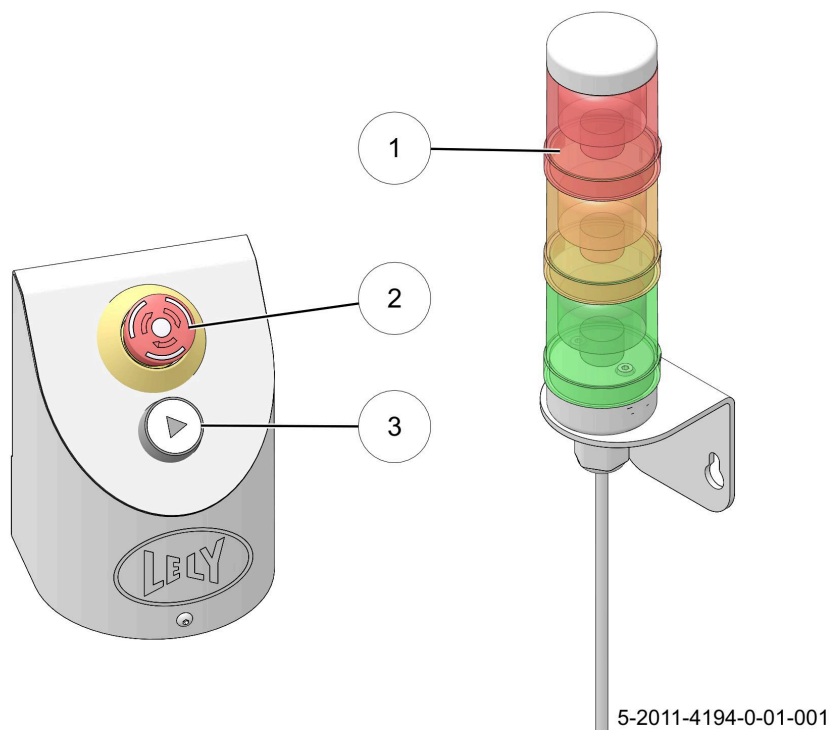
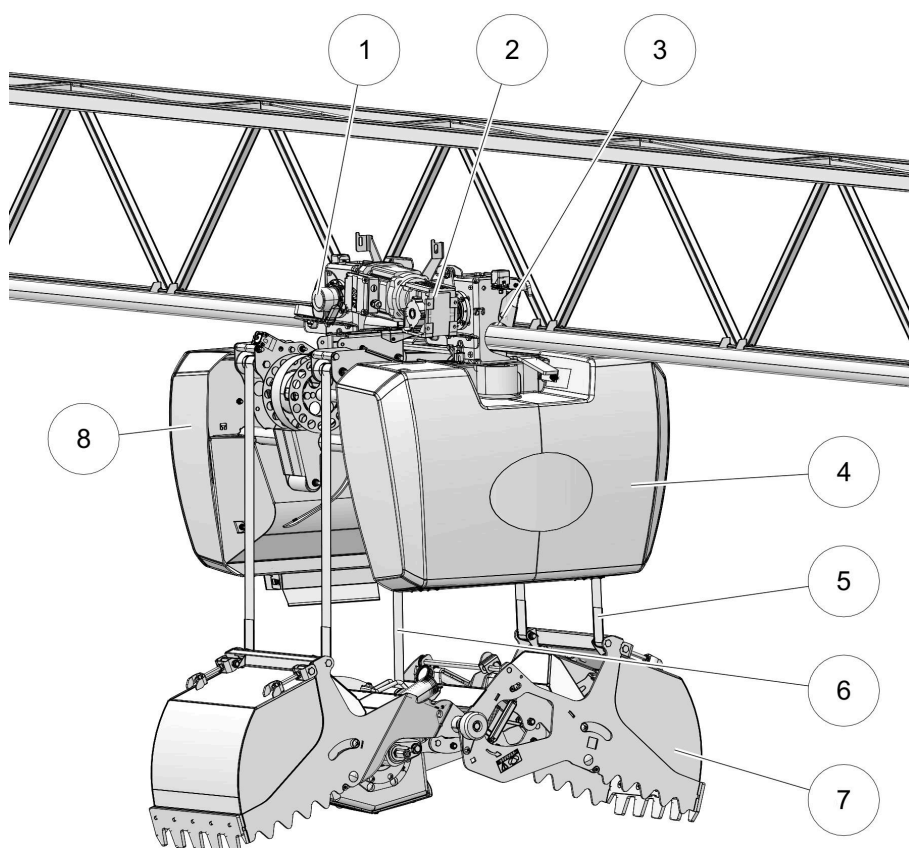


Figure 48. Console and signal lights

KEY: 1. Signal lights - 2. Emergency button - 3. Start button

The start button (3) on the signal console is used to put the feed kitchen in operation. In the paragraphs about the safety devices you can find more information about the emergency stop button and the signal lights (see Emergency stop button on console on page 2-30).

4.1.7 Feed grabber (FG F2)



5-3004-manual1-01-010

Figure 49. Feed grabber (FG F2)

KEY: 1. Front wheel - 2. Drive motor - 3. Rear wheel - 4. Rear cover - 5. Lifting belt - 6. Closing belt - 7. Grabber jaw - 8. Front cover

The feed grabber has the following motors:

- Drive motor.
- Lifting motor.
- Closing motor.

The feed grabber has the following sensors:

- Laser detection to detect the feed height.
- Encoder to determine the travelled distance and to calculate the speed.
- Magnet sensor on the front driving wheel to detect the reset magnets.
- Loose belt detection for the closing belt.
- Loose belt detection for the lifting belt.
- End rail detection.
- Encoders on the axis of the lifting and closing belts.

4.1.8 Bridge crane (BC B2 & BC B1)

The feed grabber drives along a rail that is part of a bridge crane. There are two bridge crane versions:

- Bridge crane (BC B2).
- Bridge crane (BC B1). To be discontinued.

4.1.8.1 Bridge crane (BC B2)

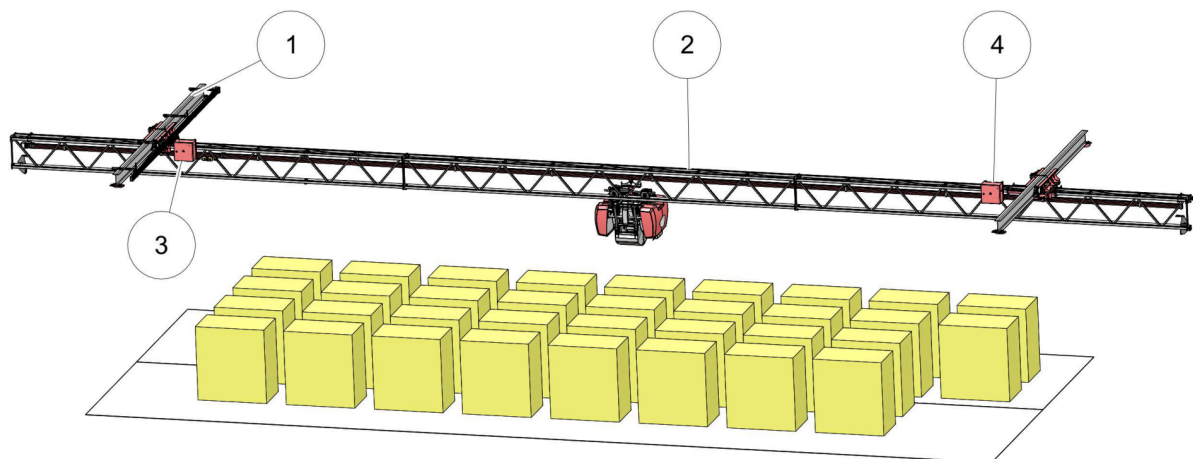
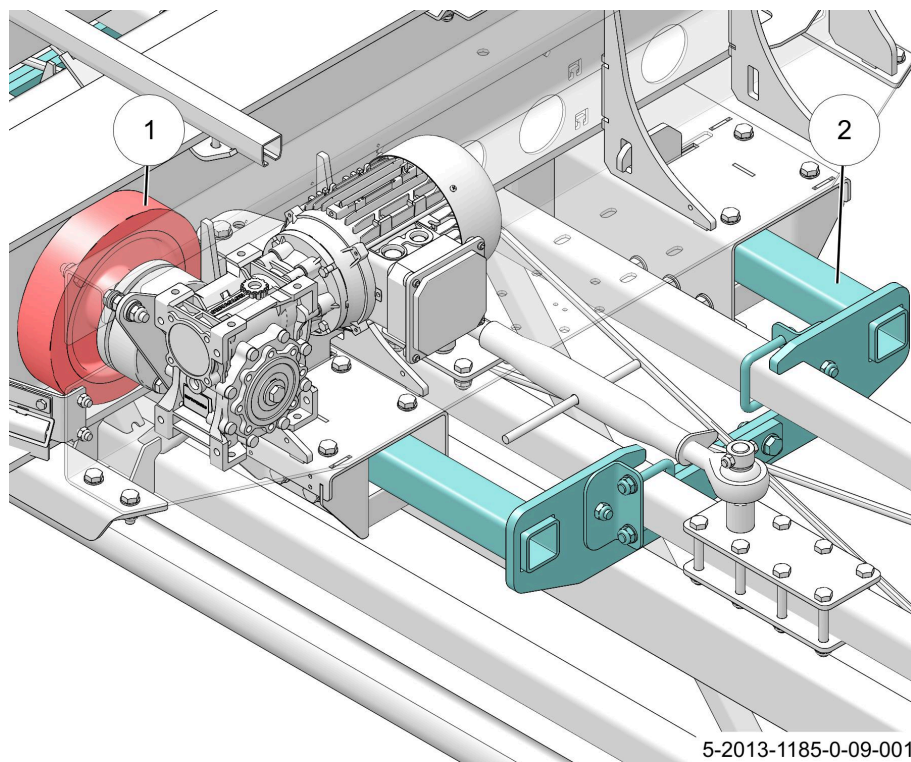


Figure 50. Bridge crane (BC B2)

KEY: 1. I-beam - 2. Lattice girder with rail - 3. Control box - 4. Control box

- The bridge crane has two drive motors, one on the master side and one on the slave side.
- The bridge crane has magnet sensors on both wheel sets to detect the reset magnet on the I-beam. There are two encoders one on the master side and one on the slave side. Each encoder is used to measure the driven distance and to calculate the speed.
- The bluetooth antenna is located on one of the control boxes.

- The bridge crane (BC B2) has wheels (1) with a diameter of 230 mm (9.05 in) and a connection bracket (2).



KEY: 1. Wheel - 2. Connection bracket

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4.1.8.2 Bridge crane (BC B1)

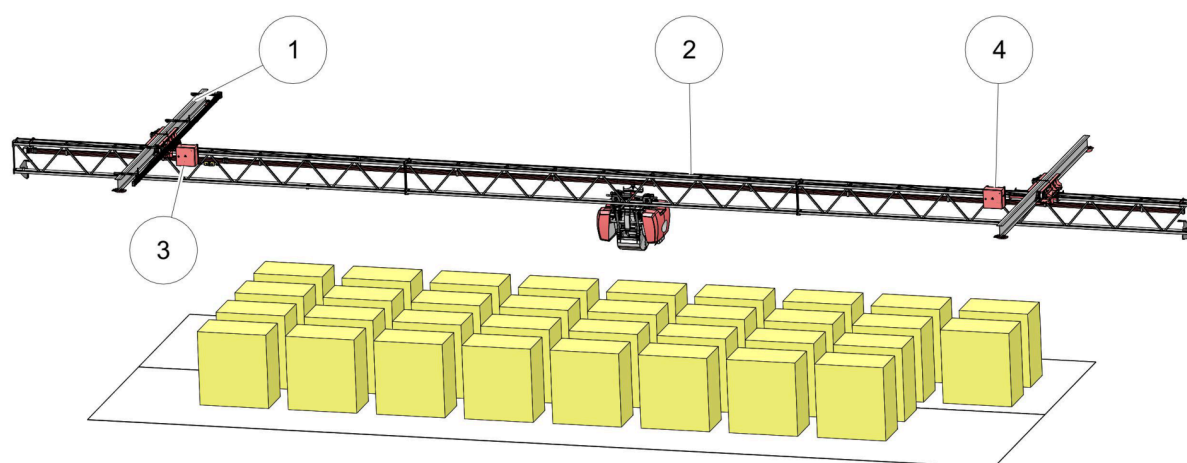


Figure 51. Bridge crane (BC B1)

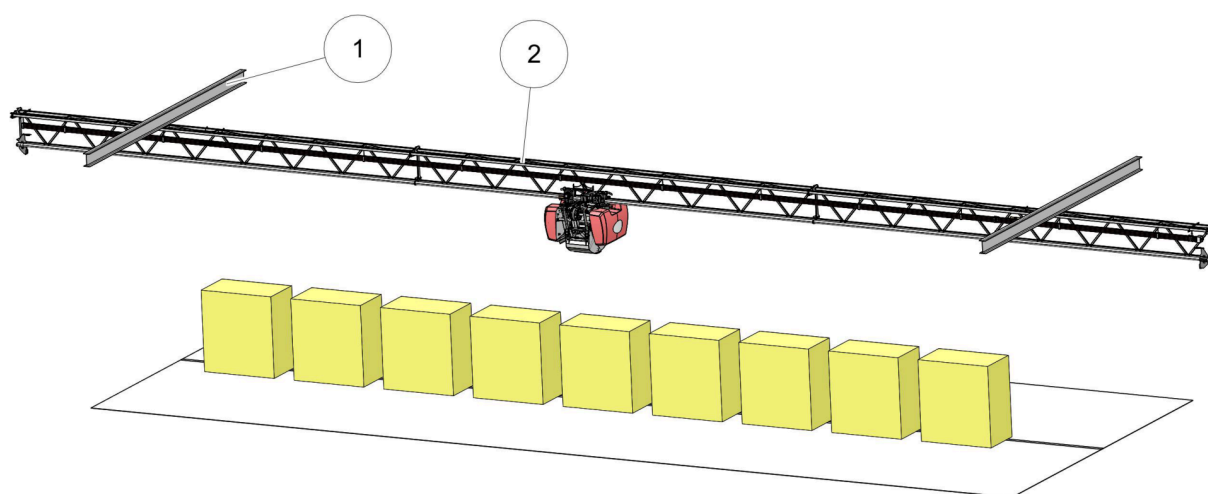
KEY: 1. I-beam - 2. Lattice girder with rail - 3. Control box - 4. Control box

- The bridge crane has two drive motors, one on the master side and one on the slave side.

- The bridge crane has magnet sensors on both wheel sets to detect the reset magnet on the I-beam. There are two encoders one on the master side and one on the slave side. Each encoder is used to measure the driven distance and to calculate the speed.
- The bluetooth antenna is located on one of the control boxes.
- The bridge crane (BC B1) has wheels (1) with a diameter of 160 mm (6.3 in).

4.1.9 Single fixed rail

The feed grabber drives along a rail that is fixed to two I-beams.



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Figure 52. Single fixed rail

KEY: 1. I-beam - 2. Lattice girder with rail

4.1.10 Additives dispenser (frequency pulse)

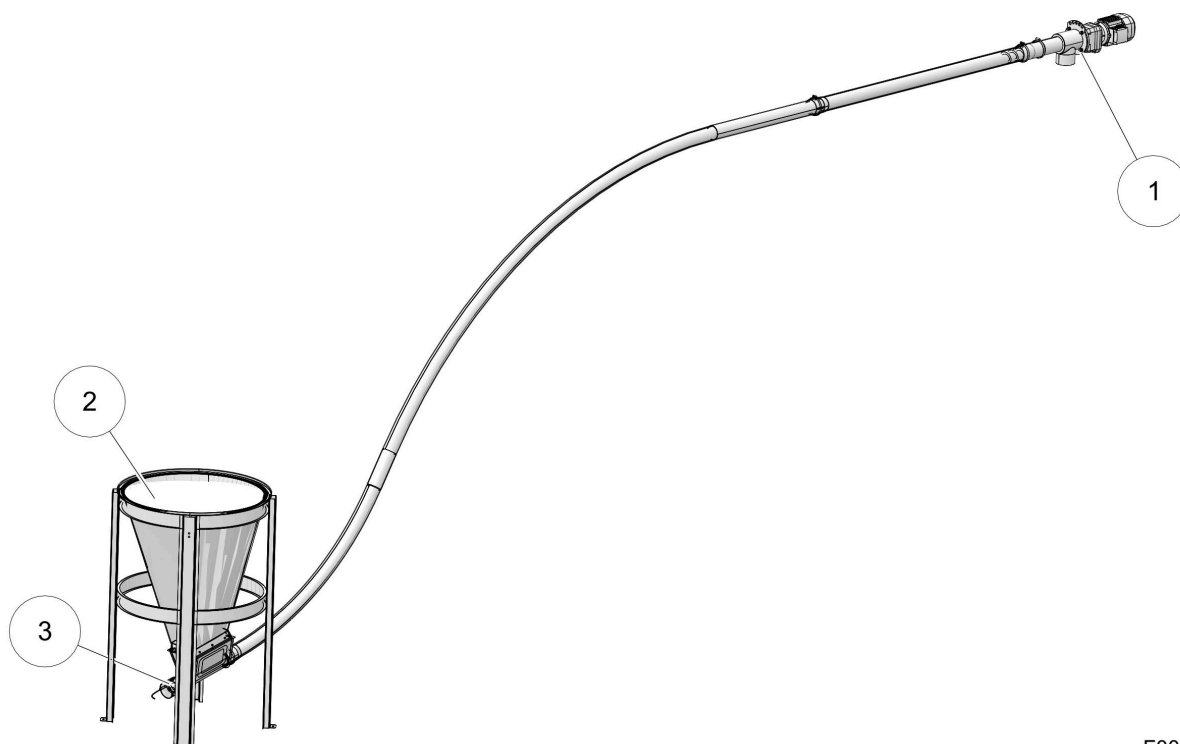
4.1.10.1 Additives dispenser (frequency pulse)

Two types of additives dispensers are available:

- Conventional additives dispenser (a vibrating motor is optional for this dispenser) (see Conventional additives dispenser (frequency pulse) on page 4-25).
- Additives dispenser with stir motor (see Additives dispenser with stir motor (frequency pulse) on page 4-26).

4.1.10.2 Conventional additives dispenser (frequency pulse)

- A control box with one or more frequency regulators (one for each additives dispenser) is installed in the feed kitchen.
- The frequency regulator regulates the number of pulses of the motor of the additives dispenser.
- The dispenser doses per pulse, in the software this is called **FreqCon Pulse**.



F000151-002

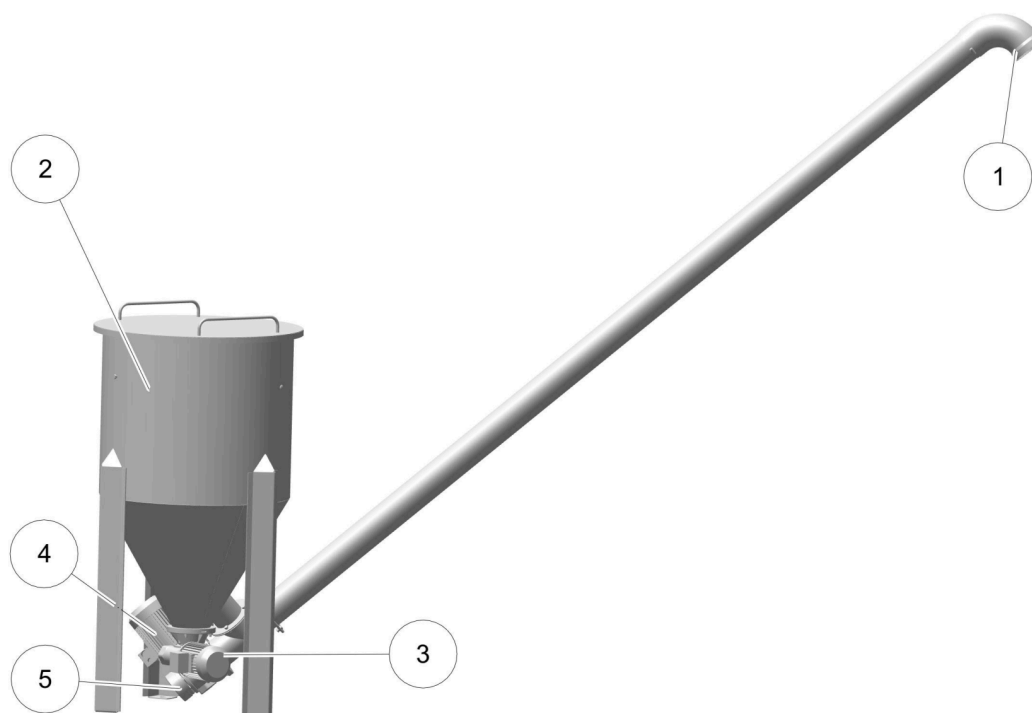
Figure 53. Conventional additives dispenser

KEY: 1. Drop pipe and motor - 2. Silo - 3. Sensor for light pulses

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4.1.10.3 Additives dispenser with stir motor (frequency pulse)

- A control box with two or more frequency regulators is installed in the feed kitchen. One frequency regulator for the auger motor and one for the stir motor.
- The frequency regulator regulates the number of pulses of the motor of the additives dispenser.
- The dispenser doses per pulse, in the software this is called **FreqCon Pulse**.



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Figure 54. Dispenser with stir motor

KEY: 1. Drop pipe - 2. Dispenser silo - 3. Auger motor - 4. Stir motor - 5. Sensor pulse counter

4.1.11 External concentrates (frequency weight)

A control box with one or more frequency regulators (one for each concentrate) regulates the on/off signal for distribution of the concentrate. This signal switches to Off when the MFR has measured the set weight. The runtime is protected by a maximum runtime, this is the expected runtime plus 30%.

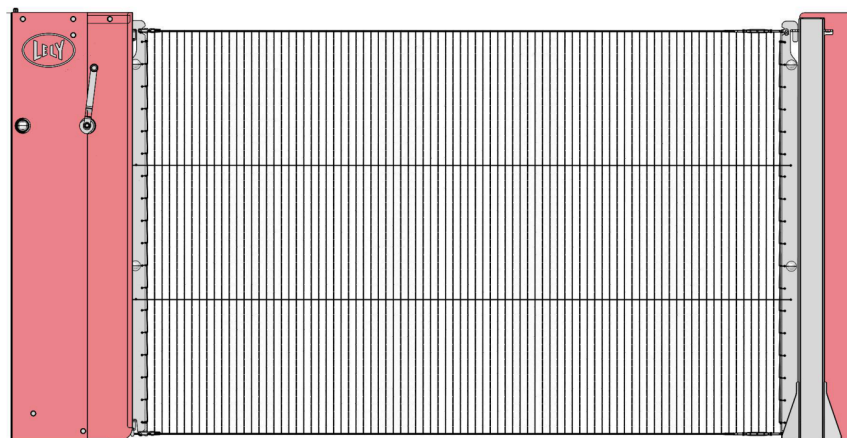
The MFR weighs the concentrates during loading. In the software this is called **FreqCon Weight**.

4.1.12 Digital output

The PDB can give an on/off signal to a conveyor belt, tower silo, water pump or other device that distributes feed. This signal is controlled by the MFR. The MFR weighs the amount of feed and when the target weight to stop is reached, the signal is switched off. The dosing is protected with a maximum runtime, based on the history of dosing and some settings.

In the software this type of dosing is called **Digital Output**.

4.1.13 Safety fence (Optional)



5-2011-2800-0-03-11

Figure 55. Safety fence

The safety fence is installed in front of the feed kitchen to keep persons and large animals out. The fence is put under tension, the tension can be released or applied by turning the winch. When the tension is released the fence can be unhooked.

When the safety fence is hooked on the fixed pole and tensioner pole and the tension is set correct, the light on the tensioner pole switches off. When there is not enough tension on the fence, the light switches on and an emergency stop is generated. The feed grabber and bridge crane are disconnected from the power and a critical alarm is generated.

4.1.14 Automatic (barn) door control (optional)

A control box regulates the opening and closing of an automatic (barn) door when the MFR needs to pass. When the machine drives from one barn to another, it communicates with the barn door control unit to open/close the barn door(s). The control box:

- Is connected to a sensor that detects if the door is open.
- Gives a start and stop signal to a motor that opens and closes the door (this is not a Lely part but a motor from the supplier of the door).

The control box has a switch to set automatic operation On or Off.

4.1.15 Software

4.1.15.1 General description

The feeding management of the Vector system is controlled through the Horizon management software on the PC connected to the system. Settings for the feed grabber, locations, fences, rations, routes, and the feed kitchen are configured in Horizon. When a setting is changed, the new settings are sent to the Vector. The feed controller software on the PDB starts feed and scan tasks based on these settings. After each task, the feed and scan results are sent to Horizon.

If Horizon software stops working or if the connection to the Vector is lost, the Vector continues operating with the last received settings. Data (for Horizon), such as feeding results, is stored and sent once the connection is restored.

Several devices within the Vector system run their own software. Most devices communicate via Bluetooth, except for the MFR, the barn door control box and the feed controller (PDB software), which use WiFi. The system can be controlled using a smartphone with an Android operating system through the Lely Control app or the Lely Control Plus app.

Software	Operated with
MFR	Lely Control Plus app
Automatic door control (if applicable)	Lely Control Plus app
Feed controller (on the PDB)	Lely Control app and WebUI
Feed grabber (if applicable)	Lely Control app
Bridge crane (if applicable)	Lely Control app

The feed controller software can be operated with both the Lely Control app and the WebUI. With the WebUI you can monitor and control the software that runs on the PDB and thus monitor the Vector system remotely via the internet. The WebUI can be displayed in a browser on a laptop or PC that is connected, through a cable or WiFi, to the Horizon network.

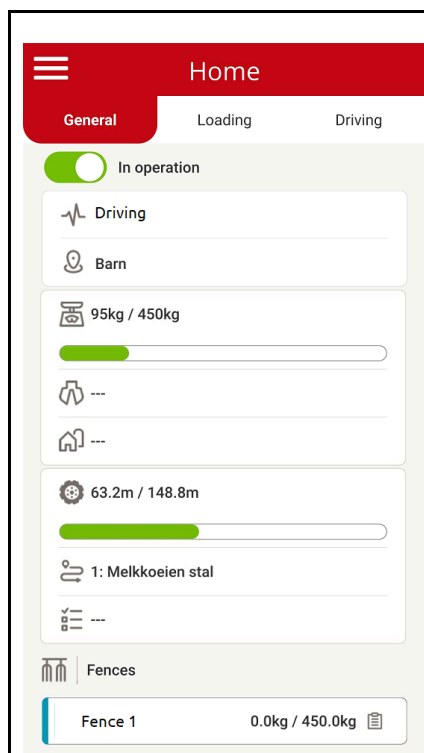
4.1.15.2 MFR software

General description

A connection to the software that runs on the MFR must be made with the Lely Control Plus app on the smartphone.

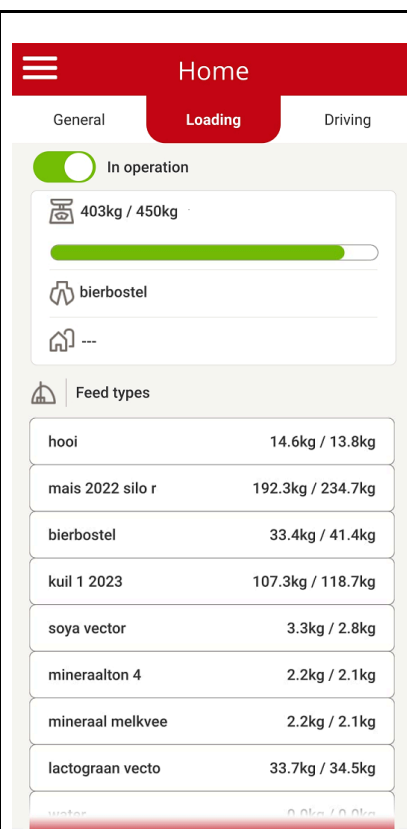
The home page of the MFR software has three tabs that show information about the current process.

The button  on every tab is used to switch between in and out of operation.



The tab **General** shows information about:

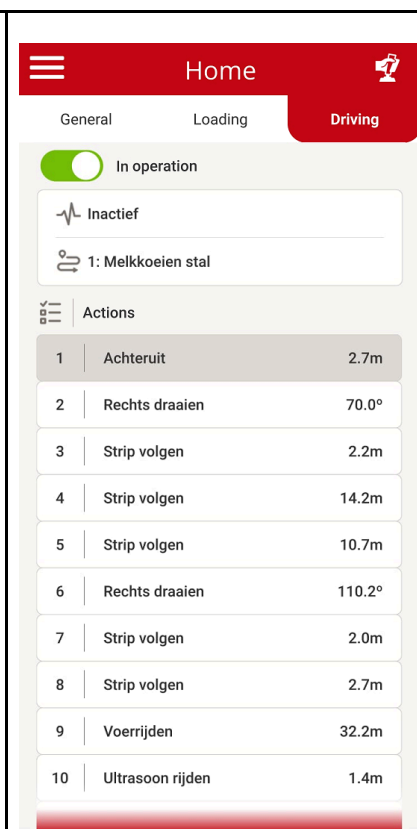
- The current activity of the MFR (for example driving).
- Location of the MFR (in the barn or charge pole).
- How many kg is in the mixing bin. Which feed type is being loaded by either the feed grabber or by a silo or feed system linked to the PDB.
- How many meters on the route is driven and how many more to go. The name of the route, and the current route action.
- The name(s) of the fence(s) that is being fed, how much feed (kg) is distributed and the total amount of feed that should be distributed at this fence.



The tab **Loading** shows information about:

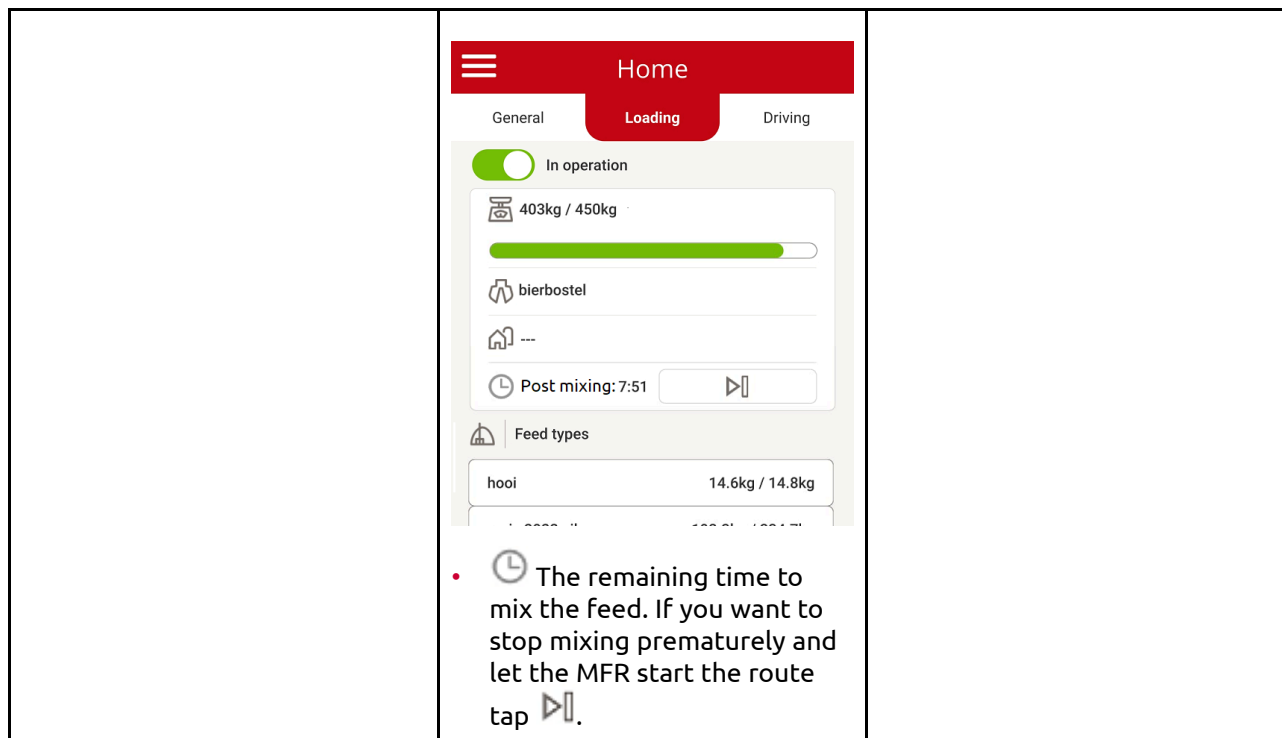
- The loaded weight / target weight in the mixing bin.
- The feedstuff that is currently grabbed and loaded by the feed grabber.
- The feedstuff that is currently dispensed by the PDB. The PDB controls the dispensers (frequency pulse or frequency weight) and the digital output (for example water, tower silo etc).
- **Feed types** The list of feed types shows the loaded weight and target weight of each feed type in this feed task.

After all the feed is loaded an extra line with information about post mixing and a button appears (see next page):



The tab **Driving** shows information about:

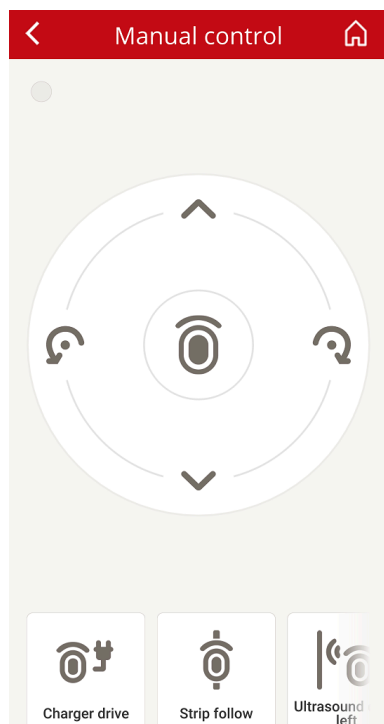
- Status of the MFR and on which route the task is.
- The driven route actions.
- The button (in the top right) starts the page for manual driving.








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Manual control

The page **Manual control** is used to manually move the machine.





Description buttons:

-  Joystick: to move the MFR in all directions, the MFR stops when you let go of the button.
-  **Charge pole drive:** to drive straight forward and detect the strip towards the charge pole and follow it and connect to the charge pole. The MFR stops when the charge pole is detected or when you push the button **Charge pole drive** again.
-  **Strip follow:** to drive straight forward and detect the strip and follow the strip. The MFR only stops when the strip is no longer detected (end of the strip or a reset point) or when you push the button **Strip follow** again.
-  **Ultrasound drive left:** to follow a wall or fence at the left side of the MFR at the current distance from the wall or fence using ultrasound. The MFR only stops when you push the button **Ultrasound drive left** again.
-  **Ultrasound drive right** to follow a wall or fence at the right side of the MFR at the current distance from the wall or fence using ultrasound. The MFR only stops when you push the button **Ultrasound drive right** again.




- 
Straight drive: to drive straight forward. During straight driving you can adjust the drive speed with a slider. The MFR only stops when you push the button **Straight drive** again.
- 
Reverse straight drive: to drive straight backward. During straight driving backward you can adjust the drive speed with a slider. The MFR only stops when you push the button **Reverse straight drive** again.
- 
Turn left: to turn the MFR to the left. A screen appears to adjust the speed before you start the turn. The MFR only stops when you push the button **Turn left** again.
- 
Turn right: to turn the MFR to the right. A screen appears to adjust the speed before you start the turn. The MFR only stops when you push the button **Turn right** again.
- 
Dose feed: several buttons appear at the bottom, at the top is displayed how many kg feed is in the bin. Use this button, for instance, when the mixing bin is full but the feed does not need to be dispensed to the livestock.


NOTICE

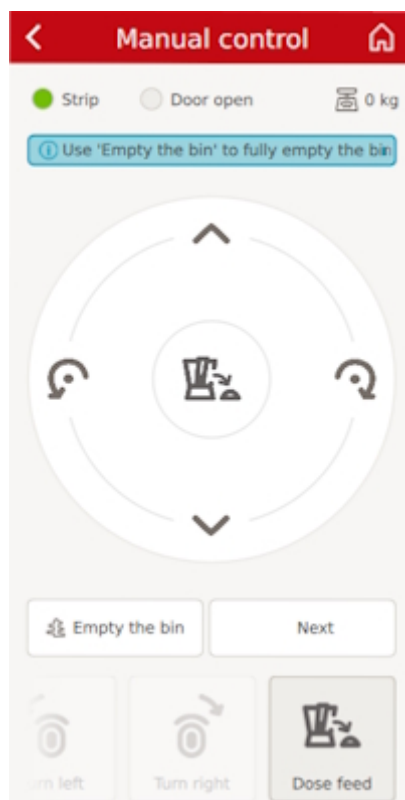
When you select the  **Dose feed** button, the auger and dosing roll start to turn when the  joystick is used, even when the feed door is closed. This causes the dosing roll to hit the feed door, which makes recovery of the dosing roll and feed door difficult.



Dose feed buttons (hold to run):

- 
Open: to open the feed door.
- 
Joystick: to drive with manual control along a fence. When the feed door is completely open, the feed is dosed while you drive the MFR. Dosing starts when you start driving the MFR and will stop when you stop driving.
- 
Empty the bin: to spin the mixing auger fast to throw out the last bit of feed and empty the feed bin.

-  **Close:** to close the feed door.



4.1.15.3 Feed controller software

Connection to the feed controller software

NOTICE

A connection to the feed controller software on the PDB can be made in two ways:

- With the Lely control app on a smartphone.
- With the WebUI.

Feed controller on the smartphone

A connection to the feed controller software that runs on the PDB can be made with the Lely Control app on the smartphone.

The home page shows a menu:



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You can use this menu for example to:

- Put the feed controller in or out of operation.
- Calibrate the feed dispenser.
- Start a feed or scan task manually.

Most other options are easier to perform with the WebUI.

WebUI

The WebUI page displays information and has several buttons. The buttons (4) (see figure 56 on page 4-36) on the bottom of the screen give access to the main pages: **Status, Alarms, Fences, Kitchen** and **Settings**. There can be a button (2) in the screen that will show a screen or options to make changes in the settings. With arrow buttons you can either:

- Button ◀ (1) return to the previous page
- Button ▶ show a detailed page

The signal light (3) displays colours similar to the signal light in the feed kitchen and shows the status of the system.

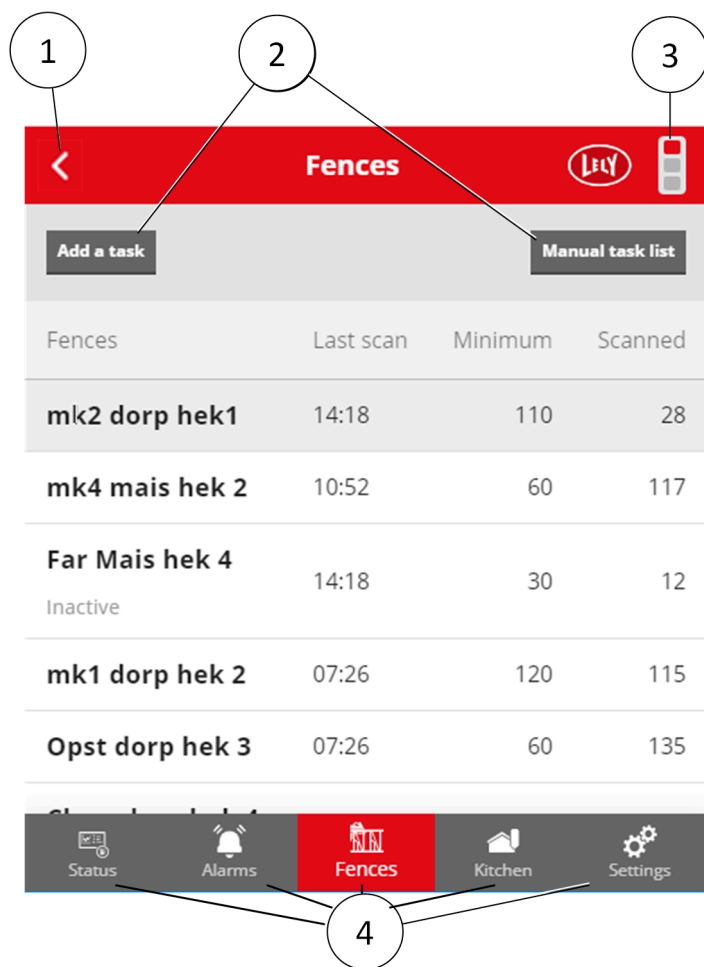


Figure 56. Example of a WebUI page

KEY: 1. Button to return to the previous page - 2. Buttons - 3. Signal light similar to the signal light in the feed kitchen - 4. Buttons to go to the main pages

4.1.15.4 Feed grabber software

A connection to the feed grabber software can be made with the Lely Control app on the smartphone.

The home page when the feed grabber is in operation shows:



When taken out of operation the feed grabber menu shows:



You can use this menu:

- To put the feed grabber in or out of operation.
- Test the feed grabber.
- Drive the feed grabber to another location.

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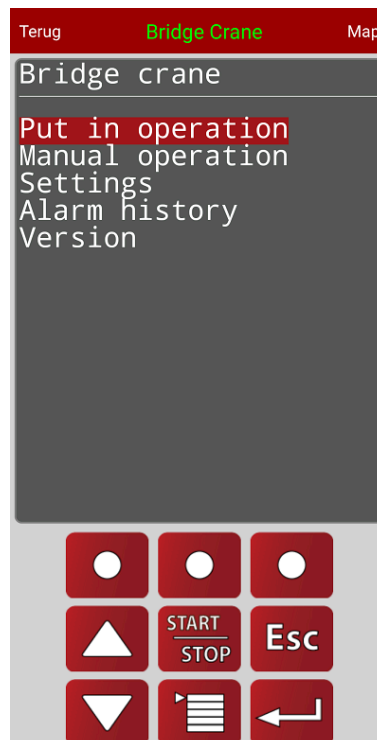
4.1.15.5 Bridge crane software

A connection to the bridge crane software can be made with the Lely Control app on the smartphone.

The home page when the bridge crane is in operation shows:



When taken out of operation the bridge crane menu shows:



You can use this menu:

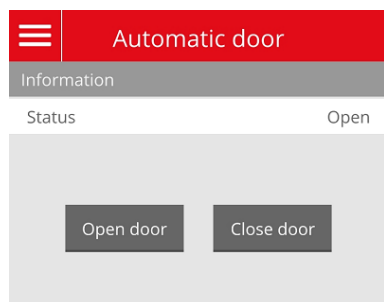
- To put the bridge crane in or out of operation.
- View alarms.
- Drive the bridge crane to another location.

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4.1.15.6 Automatic barn (door) control software

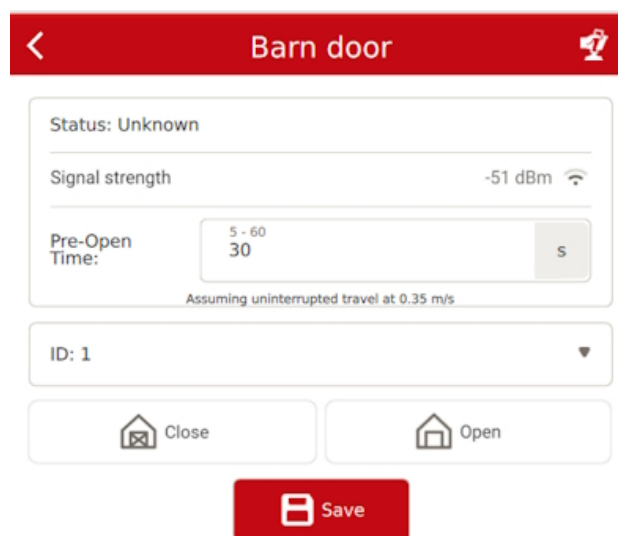
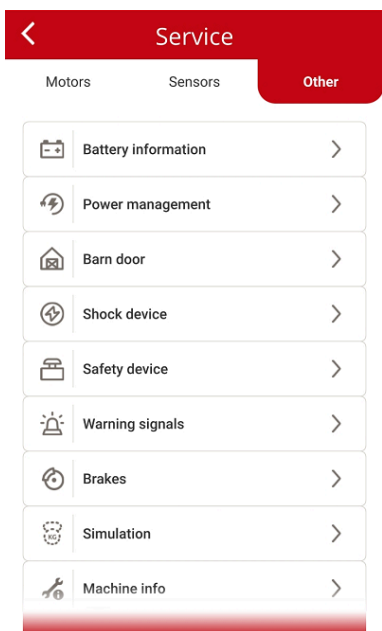
A connection to the barn door software can be made with the Lely Control Plus app on the smartphone.

The home page shows:



It is also possible to operate the barn door via the software of the MFR:

For each barn door (ID 1 to 8), a Pre-Open Time can be set between 5 and 60 seconds. The preset value is 30 seconds.



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4.1.15.7 Horizon

The farm management application Horizon is used to:

- Setup the Vector system.
- Set settings per fence
- Set the rations per location.
- Analyse feeding data, like feed intake, costs etc.

In Horizon there are several KPIs which give a nice overview of some data points and also how the Vector system performs.

The Horizon app receives data requests from the feed controller.

The Horizon app sends data (new and updated) to the feed controller.

The Horizon application is displayed in a browser on a PC (or in an app on a smartphone). The dashboard has the following parts:

- Header
- Navigation bar
- Data page

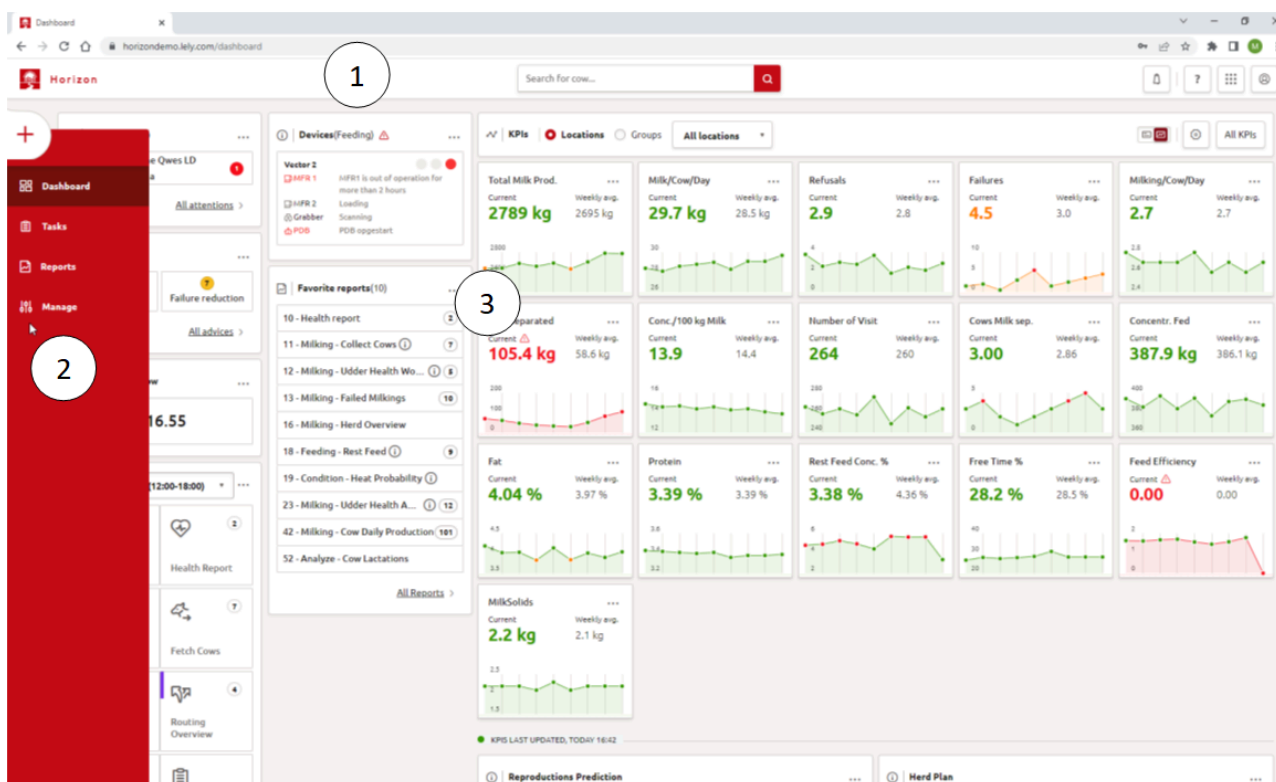


Figure 57. Horizon

KEY: 1. Header - 2. Navigation bar - 3. Data page

For more information about settings for the Vector system and feed reports in Horizon ask your FMS advisor.

4.2 Operation

4.2.1 Major processes

The major processes of the Vector system are:

- Feed loading and mixing process.
- Driving from the feed loading point to the feed alley.
- Measuring the feed height at the fences and feed pushing.
- Feed dosing.
- Driving to the feed loading point and connect to the charge pole.

The MFR has one route (or more routes) in every barn with animals that need to be fed. On this route the feed fence and the location of every group of animals is specified in Horizon. A ration is a mixture of certain amounts of feedstuff. Several rations are set in Horizon, the rations are linked to locations. To supply the feed at the correct frequency and to determine the priority between groups of animals several settings can be set in Horizon.

4.2.2 Feed loading and mixing process

The process of feed loading and mixing with a feed grabber has the following steps:

1. The MFR is connected to the charge pole under the feed loading point and reports it is available.
2. PDB sends a feed task containing the route, how much to feed at which fence and what ration.
3. MFR starts mixing and demands feedstuff from the relevant source (feed grabber, silo etc.).
 - When feedstuff is loaded by the feed grabber the MFR sends a requests to the feed grabber for that feed type with information about the weight that is still needed. A margin is applied to ensure the grabbed weight does not exceed the required amount too much.
 - In the MFR the mixing auger knives and counter knife cut the feed and help to mix the feed types.
4. The feed grabber goes to the storage place that has priority.
5. The feed grabber measures the height of the feed and determines where to grab.
6. The feed grabber grabs and estimates the weight if the amount is not within the margins of the required amount, the feed grabber retries.
7. If the estimated weight is within the margin, the MFR is asked for permission to dump.
8. If the MFR is not busy receiving feed from feed dispensers or with in between mixing, the dump permission is given.
9. The MFR weighs how much feed is loaded.
10. The feed grabber grabs more feed from the feed kitchen.
 - Depending on the filling sequence of the feed types set in Horizon, the feed grabber will grab a load of the same or the next type of feed set in the ration.
 - The feed types will be loaded until the set amount of each feed type is loaded into the MFR.
11. An extra mixing time (in between mixing) can be set to improve the mixing during loading.
12. During the feed loading and mixing, also other types of feed can be added:
 - Roughage or liquids when one or more (tower) silos, conveyor belts or pumps are installed. They are operated via a digital output signal that is sent to switch on and switch off the dosing.
 - Concentrates when one or more concentrate distributors (frequency weight) are installed.
 - Minerals or other additives when one or more additive dispensers (frequency pulse) are installed.
 - Concentrates or other feed types using a digital output.
13. After all feed types and additives are loaded, the mixing continues for a set time (post mixing).

4.2.3 Drive from the feed loading point to the feed alley

The process of driving from the feed loading point to the feed alley has the following steps:

1. The MFR is loaded and mixed.
2. The MFR starts to drive toward the feed fences, it drives backwards from the charge pole and turns to the direction of the feed alley.
 - Outdoors the MFR must follow the metal strips using the inductive sensors.
 - There are one or more reset points where the metal strips are interrupted for a short distance.
 - During driving toward the feed alley the skirt is usually lifted.

4.2.4 Measuring feed height, feed pushing and feed dosing

4.2.4.1 Measuring the feed height at the fence and feed pushing

The process of measuring and feed pushing has the following steps:

1. The MFR arrives at the feed alley.
2. The MFR lowers the skirt on the left or right side at the set position inside the barn.
3. The MFR starts to drive, while using the ultrasonic sensors to keep a fixed distance from the fence/wall, the feed is pushed towards the animals.
4. On the route of the MFR:
 - The skirt rotates and pushes feed toward the fence of all locations with animals.
 - The laser measures the height of the feed of all locations with animals while passing the feed fences on the left side.
Be aware when pushing feed to the right side, the feed height is not measured.

4.2.4.2 Feed dosing

The process of feeding has the following steps:

1. The MFR stops when it arrives at the first designated feed fence for the animals to be fed.
2. The feed door of the MFR opens. When the feed door is opened to the calibrated position:
 - The dosing roll starts to dose the feed.
 - The mixing auger starts turning.
 - The MFR starts to drive along the feed fences.
3. During feed dosing the MFR pushes the feed toward the fence and measures the height of the feed.
4. At the end of the location the mixing bin is empty and the mixing auger spins fast to throw feed remains from the mixing auger, after that it stops rotating.
5. The MFR stops driving, the dosing roll reverses the turning direction and stops at a certain point and the feed door closes.
6. After the feed door is closed, the MFR continues the route in the barn.
7. On the way to finish the route the MFR will again measure and push feed of other locations with animals.

If more fences need the same ration the distribution can be combined but only if:

- The MFR can drive with an open feed door from one location to the next (fences are in the same feeding section). The door is closed if there are actions between the two locations that do not require feed, but no check is done whether the door is completely closed. There is a good chance that there is feed under the door, preventing it from closing completely.
- The feed request for one fence is lower than the ration limit (calculations are made to combine feed tasks for two or more fences).

4.2.5 Drive to the feed loading point and connect to the charge pole

The process of driving to the feed loading point and connecting to the charge pole has the following steps:

1. The MFR starts to drive toward the feed loading point.
 - Outdoors the MFR must follow the metal strips using the inductive sensors.
 - There are one or more reset points where the metal strips are interrupted for a short distance.
 - During driving toward the feed loading point the skirt is usually lifted.
2. If applicable the MFR asks permission to enter the area (emergency zone and kitchen point) near the feed kitchen (see Emergency zone and kitchen point on page 4-44).
 - If all is safe the MFR connects to the charge pole.
3. If there are two charge poles, the feed controller decides where the MFR must go.

4.2.6 Control system

The control system keeps the MFR on the correct route. Two inductive sensors on the bottom detect the metal strips on the floor. The ultrasonic sensors make sure that the robot follows a wall or feed fence at a predetermined distance. An IMU guides the robot into the correct direction when a turn is programmed.

4.2.6.1 Driving

- Direction:
 - The MFR has an IMU that is used to make it turn and to determine the direction the robot must follow.
- Driving distance and speed:
 - Encoders on the drive motors measure the number of motor revolutions. The measured value is used to calculate the travelled distance and current speed. For safety reasons, the different maximum allowable speeds are required based on the direction of travel or specific conditions.
- Distance to a wall or fence:
 - The ultrasonic sensor sends a pulsed ultrasound wave at the object and then measures the time for the sound echo to return. Knowing the speed of sound, the sensor determines the distance of the MFR to a wall, fence or other object. The control software uses the ultrasound data along with data that comes from other sensors to determine the motor speeds that the VIOB must set.

4.2.6.2 Obstacles

The MFR has obstacle detection sensors on the front to detect large objects, at a distance of 40 cm (16 in), and stop driving before the robot bumps into the object. If a door push set is present on the MFR, the detection distance can be set to 70 cm (28 in). The left and right sensors are split and can be used independently, obstacle sensing on the left and/or on the right side can be set per route action.

The MFR has a bumper that stops the MFR when it hits an object that is at least 45 cm (17.7 in) above floor level, unless the object is in the center of the MFR there the bumper is lowered. For further information about the safety bumper (see Safety bumper on page 2-17).

4.2.6.3 Emergency zone and kitchen point



*Unmanned moving vehicle.
Risk of being crushed.
To achieve maximum safety, emergency zone and kitchen point settings must be set on the routes near the feed kitchen.*

Emergency zone

The emergency zone is a zone where the MFR must stop driving when the emergency button in the feed kitchen is pushed. For each route action in the emergency zone, the setting emergency zone must be switched on (ask your Lely technician). The MFR will check at the start of a route action if an emergency button is active. If an emergency is active, then the MFR will stop and wait until it receives permission to start driving again. If the MFR loses connection to the PDB, it will finish the route action it is driving and if the next route action is also in the emergency zone it will stop and wait for permission.

Kitchen point

The kitchen point is a zone near the feed kitchen (on the Vector type plate usually marked yellow). The MFR will check at the start of a kitchen point if kitchen fill mode is active. If kitchen fill mode is active, then the MFR will stop and wait until it receives permission to start driving again. If the MFR loses connection to the PDB, it will also stop and wait.

When no emergency zone or kitchen point is set (ask your Lely technician), the MFR will always drive to the charge pole and connect.

4.2.6.4 Automatic barn (door) control

When the MFR drives from one barn to another, it communicates with the barn door control unit to open/close the barn door(s). The MFR is only allowed to start the drive action to go through the door when the door reports it is open. Only when the MFR drove completely through the door opening, it should give the signal that the door can start to close. These settings should only be changed with care.

4.2.7 Alarm system



Lely is not liable for (consequential) damages or losses due to a malfunction of the alarm system.

Alarms in the Vector system are indicated:

- In the feed kitchen:
 - As a sound.
 - With the safety lights.
- On the MFR:
 - As a sound.

- The safety light.
- As a message in the Horizon app. If you do not respond to that notification, the alarm will be forwarded to the MODalarm (see below).
- As a message from the MODalarm.
 - Some alarms will generate a phone call or SMS. This depends on the settings.
- As a message in the WebUI, shown in the list of **Active alarms**.
- In the Lely Control Plus App and the Lely Control App on the smartphone.

The alarm system combines the following functions:

- Collection of active alarm messages.
- Make alarms audible by buzzer and a SMS or speech message by phone.
- Make alarms visible on the WebUI.
- Make alarms visible with the safety lights in the feed kitchen and safety light on the MFR.
- Identify alarm priorities.
- Reset alarms.
- Acknowledge alarms.
- Temporarily suppress alarm messages.

You must acknowledge each alarm and remove the cause of the alarm.

4.2.7.1 Telephone Calls

If an alarm continues for a specified period of time and if a priority was set, a telephone call will be made to the active user. Generation of telephone calls within a preset time (day or night) can be set for each alarm. A maximum of five alarms can be reported sequentially during each telephone call. Alarms during the night which are set 'not active' during the night time, will be reported to the active user at the transfer to night to day time.

4.2.7.2 MODalarm

The MODalarm notifies the farmer, by calling or sending an SMS, when a machine in the Vector system has an alarm.

Connection to the MODalarm can be achieved by:

- Connecting with the smartphone (Lely Control app).
- Connecting with the Horizon PC or on a PC connected to the farms network which is connected to the MODalarm. The default IP-address for the MODalarm is 10.4.1.210.

4.2.8 Smart routing

The MFR uses software to determine the most efficient driving route, optimising the overall driving time. By skipping route segments that do not require feeding or scanning, the MFR can prioritise high-priority tasks while still occasionally including lower-priority segments. This approach ensures that all necessary routes are covered efficiently, allowing the MFR to incorporate segments that would normally be driven only when higher-priority tasks are completed.



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5 Operating instructions

This chapter contains the operating procedures to operate the Vector system.

5.1 Preparation

If you use the Vector system for the first time make sure:

- You have read and understood all operating - and safety instructions.
- The Lely Control Plus app is installed on your smartphone.
- The Lely Control app is installed on your smartphone.
- You know how to handle alarms.

When the technicians finished the installation and you have signed the handover declaration the Vector system is in operation and all components are installed.

5.2 Connect the Lely Control Plus app

5.2.1 Install or update the Lely Control Plus app on your smartphone

1. On the smartphone go to the Play Store.
2. Download the Lely Control Plus app.



Lely Control Plus
Lely International N.V

3. Install the app.

NOTICE

If there is new software available, a notification is displayed on the icon of the Play Store. Usually automatic update is set and updates are done automatically.

5.2.2 Connect the Lely Control Plus app to the machine

WARNING

*Unexpected movement of the machine.
Risk of being crushed.
Make sure the MFR and its immediate surroundings are void of people and animals. Only operate the MFR with the smartphone when it is in your line of sight.*


NOTICE

This app is used to control the MFR and the barn door.



A machine can not be connected to more than one smartphone simultaneously.

1. Open the Lely Control Plus app.

2. Go to  **Find machine**. The machines near the smartphone will be found, if there are no machines found, repeat this step.
3. Select the machine you want to operate.
The Lely technician can give each machine a unique name that is easy to recognize.
4. Confirm the message that appears on the smartphone to pair it with the machine.
5. The smartphone connects to the machine.
-

NOTICE

The Lely technician will provide the password at the installation of the Vector system.



The first time a phone connects to a machine that has new pictures for the user interface, the pictures are downloaded, this increases the speed of the user interface afterwards.

6. A login screen appears:
 1. Enter the password you received from the Lely technician.

5.3 Connect the Lely Control app

5.3.1 Install or update the Lely Control app on your smartphone


NOTICE

If there is new software available, a notification is displayed on the icon of the Play Store. Usually automatic update is set and updates are done automatically.

1. On the smartphone go to the Play Store.
2. Download the Lely Control app.



Lely Control
Lely International N.V

3. Install the app.
4. Wait until the software is correctly installed.
5. Start the Lely Control app.
6. Select **Settings**  in the left bottom corner.



Go to chapter: Rename the machines on the Lely Control app to change the name, system ID, LDN and password for each machine.

7. Enter the **System Id** (usually 160, in rare situations 161 if another Vector system is nearby, or with more Vector systems).

NOTICE

Set the System Id to 0 if you have more Vector systems (two or more PDBs) or a Discovery 90 that is using the Lely Control App. Setting this to 0 shows all systems within range. However the Discovery and each Vector system can not use the same system id to avoid interference.

8. Enter the **Password**.

NOTICE

The Lely technician will provide the password at the installation of the Vector system.

9. Push **Save** in the top right corner.

5.3.2 Connect the Lely Control app to the machine

WARNING

*Unexpected movement of the machine.
Risk of being crushed.
Make sure the MFR and its immediate surroundings are void of people and animals. Only operate the MFR with the smartphone when it is in your line of sight.*

NOTICE

This app is used to control the PDB (feed controller), feed grabber and bridge crane.

NOTICE

Lely Control requires your phones location to be ON to connect to machines.



A machine can not be connected to more than one smartphone simultaneously.








1. Make sure you are near the machine and you can see it before you start the app.
2. Start the Lely Control app.
If Bluetooth was not in operation the following question appears:
The application tries to switch on Bluetooth, continue?
 1. Tap **Yes**.

3. Go to **Search for devices**. The machines near the smartphone will be found, if there are no machines found, repeat this step.
4. Select the machine you want to operate.
A connection will be made with the selected software.
The title is displayed in green letters when the connection is made.
If the smartphone loses connection the green title turns red:

1. Move towards the device to make the connection again.

The smartphone shows a keyboard and a display that can be used to operate the software.

In general the buttons have the following function:

-  Confirms the action on the display above the applicable button.
-  Starts or stops an action.
-  Moves the selector up one item or increases a value by one.
-  Moves the selector down one item or decreases a value by one.
-  Opens the selected function or the next menu screen.
-  Returns to the previous screen and saves the changes.
-  Program button with specific action.

5.4 Start the WebUI

NOTICE

This app is used to control the PDB (feed controller) on your PC.






NOTICE



You can use the WebUI on a laptop or PC that has a web-browser and is connected to the Horizon network via a cable or Wifi.

1. Start a web-browser, for example Google Chrome.
2. In the address bar type: **10.4.1.85** and push enter (or go).
If the LDN address of your PDB is not 85 the address will be different:
10.4.1.xx
At the position of the xx the correct LDN number must be set, you have received this information from your local Lely service provider.

When started on a PC the WebUI shows the status page (see figure 58 on page 5-7).

All pages have buttons at the bottom of the screen that give access to the following pages, the active page button is red:

- 
 - the **Status** page, this screen displays the status of the PDB, MFR and all connected devices. The signal light in the top right corner displays the same colours and blink similar as the signal light near the feed kitchen.
- 
 - the **Alarms** page, this screen displays the active alarms and the alarm history. Some active alarms can be confirmed.
- 
 - the **Fences** page, this screen displays the set and the measured feed height of all fences. It has buttons to add a feed or scan task and to view the scheduled tasks.
- 
 - the **Kitchen** page, this screen displays the feed blocks in the feed kitchen, the blocks can have the following indications:
 - Green block: this feed block is not empty.
 - Grey block: this feed block is empty.
 - Red block: this feed block is rejected.
 - 
: this is the preferred feed block of this feed type, the Feed Grabber starts to grab from this block when this feed type is requested.

The kitchen page has buttons to put the feed kitchen in the fill mode and buttons to set a feed block to empty, filled and preferred.
- 
 - the **Settings** page, this screen gives access to several settings. Do not change the settings.
- 
 - return to the previous page without saving changes. This button appears in the upper left corner when there is a page to return to.

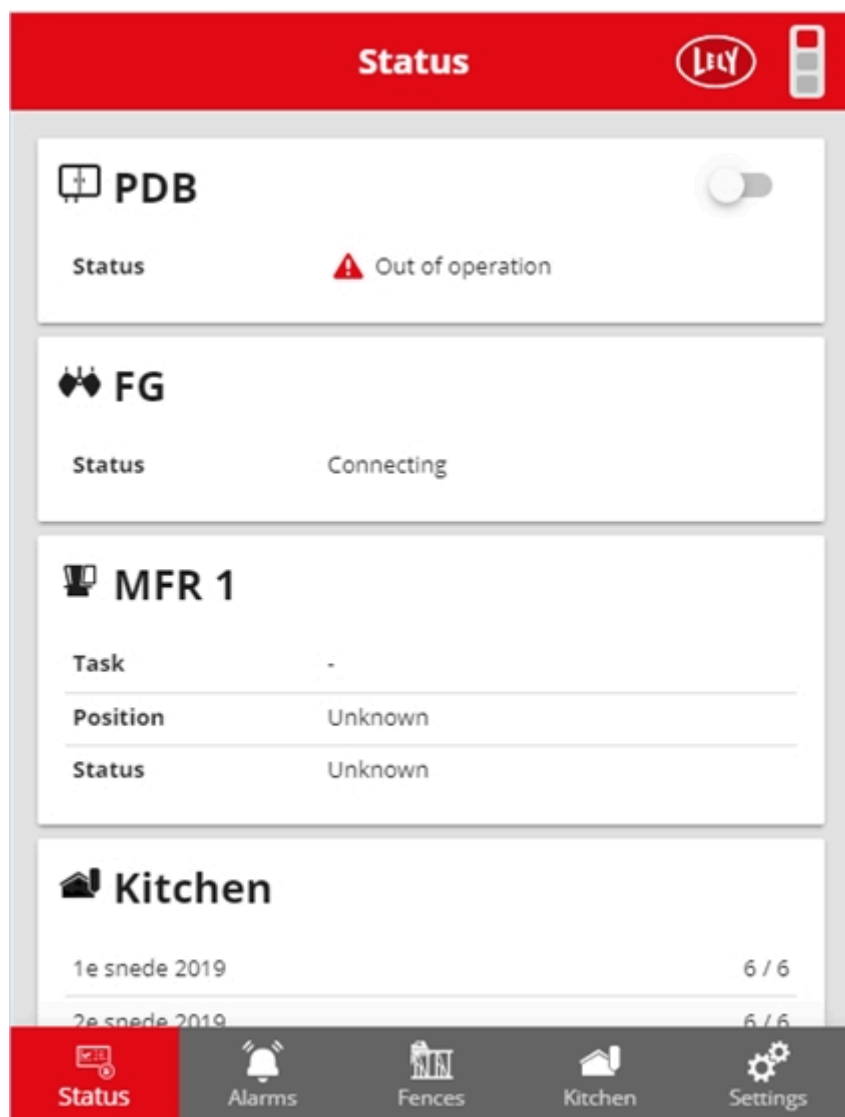


Figure 58. WebUI: status page

5.5 Switch OFF/ON the Vector system

5.5.1 Switch OFF the Vector system

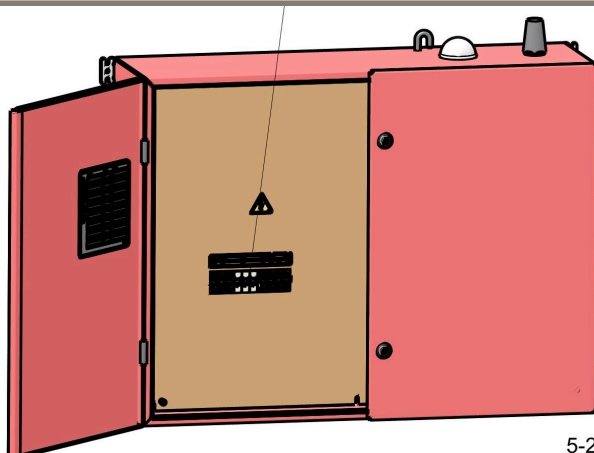
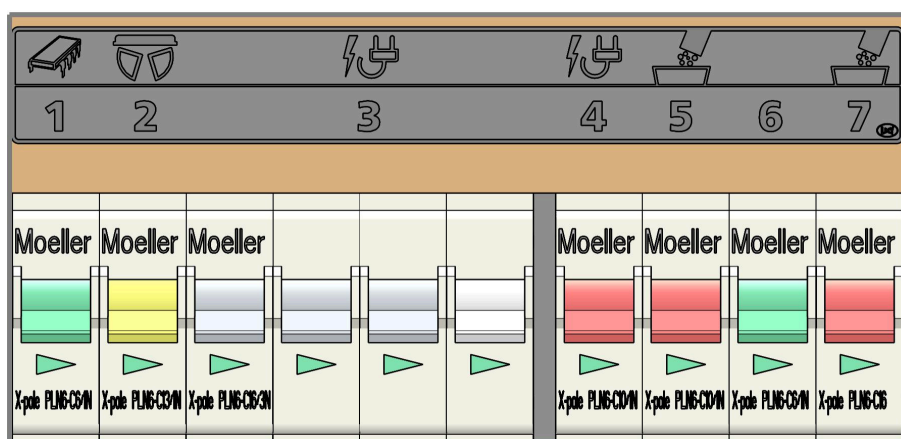
NOTICE

Only do this procedure when you do not want to use the Vector system for a longer period and want to disconnect it from the power.

NOTICE

If the system must be switched OFF for a longer period of time, put some support blocks under the MFR. This to prevent the tires from getting flat.

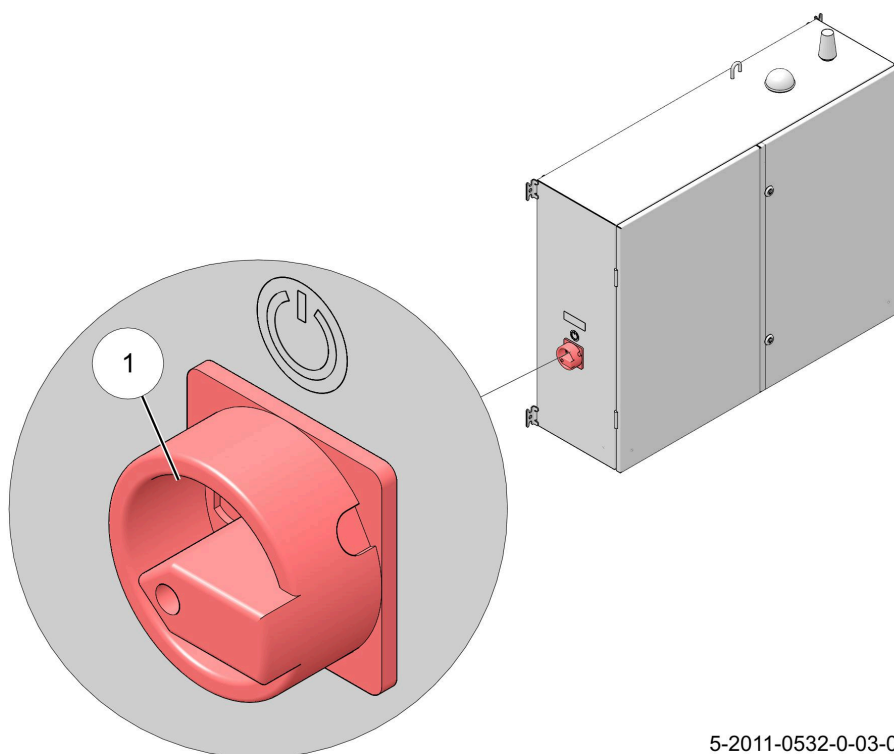
1. Put the feed kitchen in the filling mode with the console (see page 5-46).
2. If the MFR is connected to the charge pole, manually drive the MFR backward to disconnect it from the charge pole (see Drive the MFR manually on page 5-61).
3. If a second MFR is connected to the additional charge pole, manually drive the MFR backward to disconnect it from the charge pole (see Drive the MFR manually on page 5-61).
4. Put the MFR on supports to store for a longer period (see page 5-10).
5. Open the PDB.
6. Switch OFF the circuit breakers one by one from right (7) to left (1).



5-2011-0532-0-03-01

KEY: 1. PCB PDB - 2. Bridge crane (optional) and feed grabber (optional) - 3. PSU (power supply unit), power input for the charge pole - 4. Secondary PSU (optional), power input for parking charge pole - 5. Additives dispenser (optional) - 6. Not in use - 7. External concentrate augers (optional)

7. Switch OFF the main switch (1) on the PDB (see figure 59 on page 5-9).



5-2011-0532-0-03-04

Figure 59. Main switch on the PDB

KEY: 1. Main switch

8. Disconnect the connector (1) of the backup battery (2) from the PCB.

9. Remove and store the battery in a dry and clean location without weather influences.

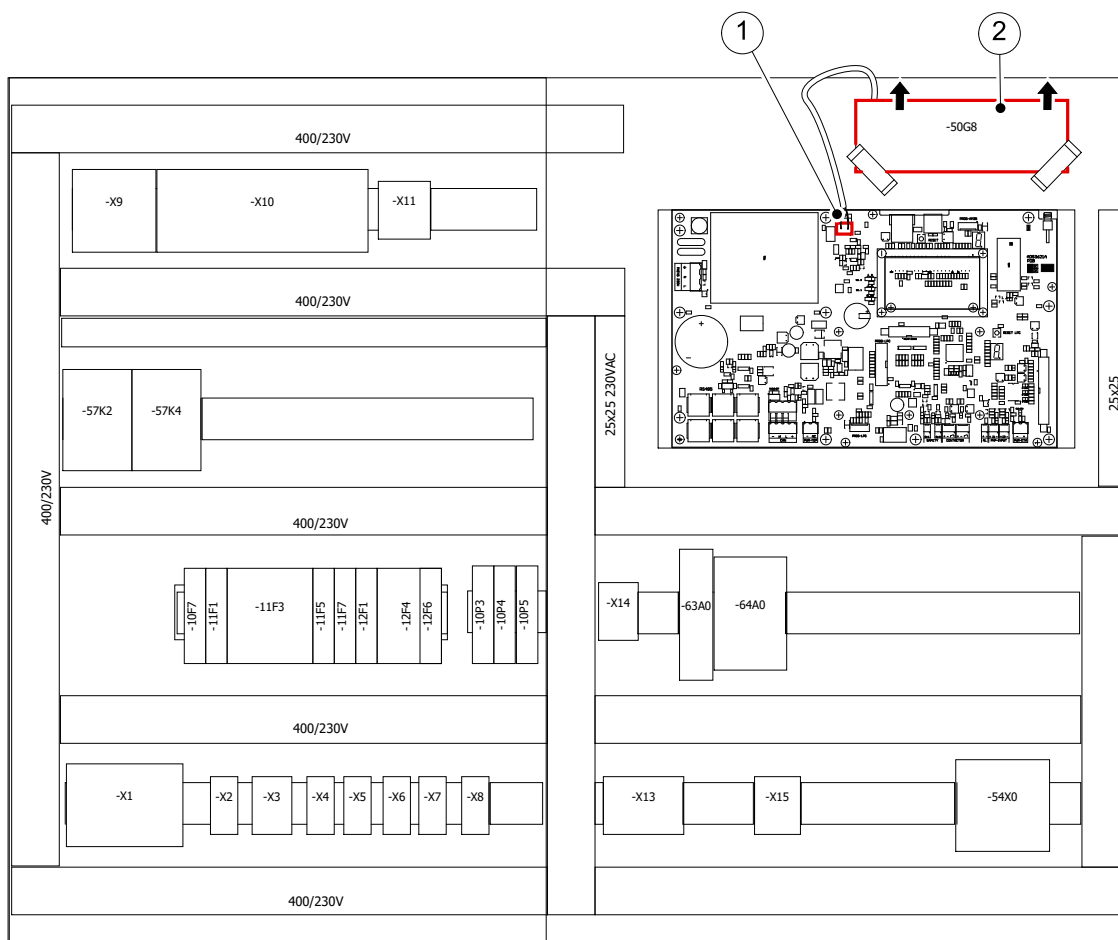


Figure 60. Disconnect the battery in the PDB

KEY: 1. Connector - 2. Battery

10. Close the PDB.

5.5.1.1 Put the MFR on supports to store for a longer period



Pinch point.
Tilting machine can crush or cut.
Keep hands and feet clear.

NOTICE

Make sure you have three wooden blocks or other solid supports of a height between 70-80 mm (2.8-3.1 in), that can hold the weight of the MFR.

NOTICE

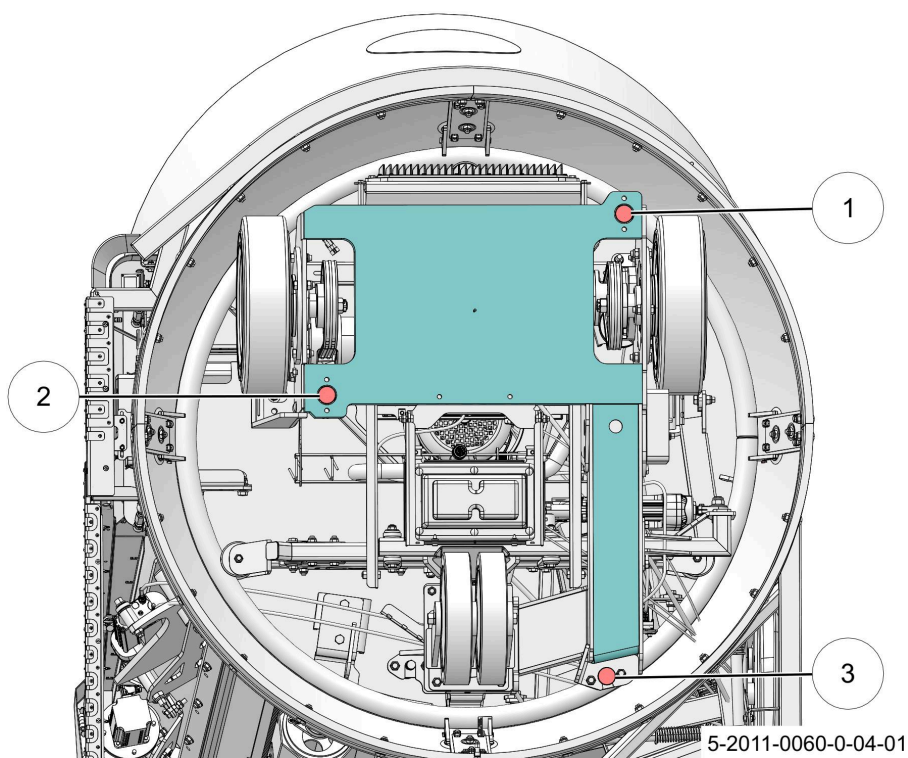
It is best to empty the battery to 40% before storage and store the MFR at 20 °C. This keeps the battery in best condition and prevents it from degenerating. The MFR can be stored for up to a year without recharging in between. To see how far the battery is charged see the state of charge of the batteries on the page Service > Other > Battery information. Charge the batteries at the charge pole when the state is less than 40%. If the state of charge is far above 40% drive the MFR manually to empty the batteries to approximately 40%.

1. Empty the mixing bin before you put it on supports (see Manually dose feed from the MFR on page 5-64).
2. Manually drive the MFR to a clean, dry and level location without weather influences to store it (see Drive the MFR manually on page 5-61). This must be on a concrete C20/25 floor with a thickness of 150 mm. This is the concrete type and thickness as specified for the driving surface near the charge pole.
3. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).

4. Switch OFF the power to the MFR with the high voltage switch (see page 5-17).

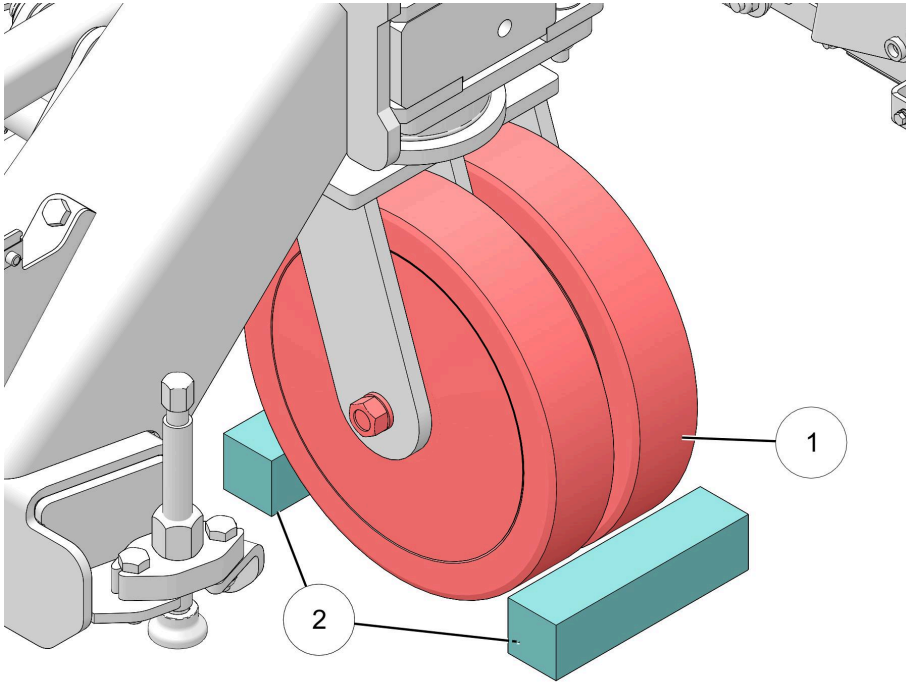
NOTICE

The MFR must be supported by three solid supports (for example wooden blocks) to prevent the tires from getting flat. There are three jacks to lift and lower the MFR, do this with only one of the jacks at the time. Do this in the order as indicated in the picture below. If needed contact your local Lely service provider for help.



5. Remove a skirt piece (see Remove or install a skirt piece on page 5-31).

6. Put bricks or wooden blocks (2) in front of and behind the swivel caster (1) to prevent the MFR from moving.

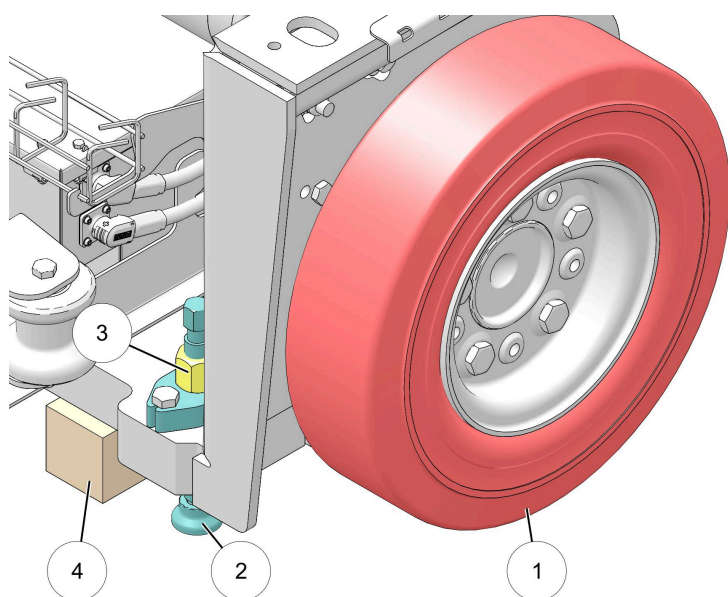


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5-2011-2600-0-02-004

7. First lift the MFR with the jack (2) at the right drive wheel:

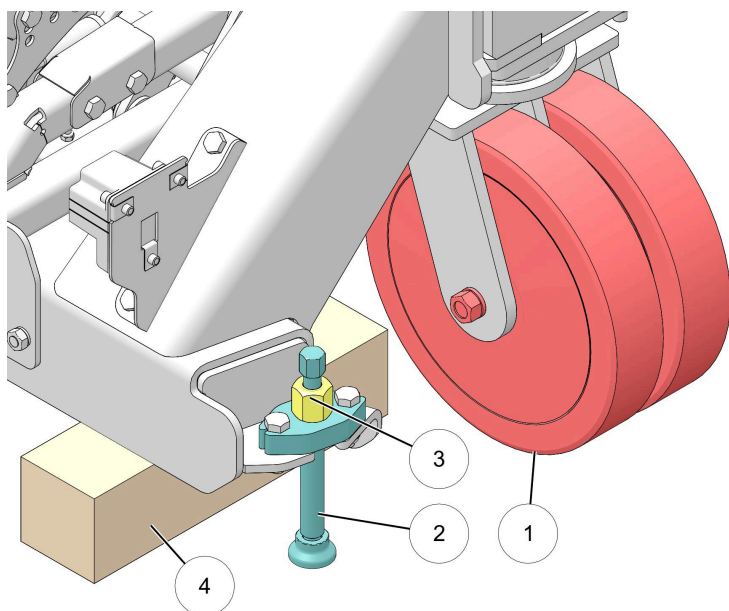
- 1.** Loosen the nut (3) and lower the jack.
- 2.** Lift the left drive wheel (1) with the jack.
- 3.** Put a solid wooden support (4) under the frame at the location of the jack (see figure 61 on page 5-15).
- 4.** Lift the jack completely and fasten the nut, the frame at the wheel of the MFR now rests on the wooden support.
- 5.** Examine if the MFR is stable.



5-2011-2600-0-02-003

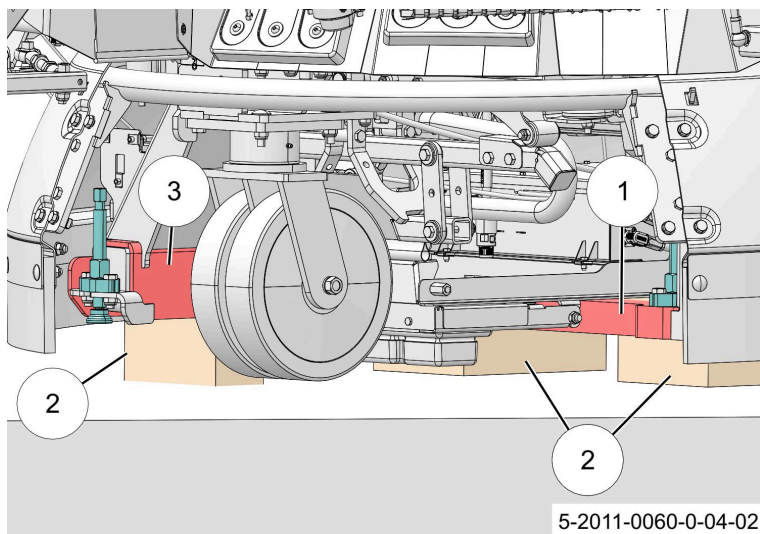
- 8.** Repeat step 7 for the left drive wheel.
- 9.** Remove the bricks or wooden blocks (2) at the swivel caster.

10. Repeat step 7 for the swivel caster wheel (1).



5-2011-2600-0-02-001

11. You can leave the MFR for a longer period with the wooden supports (2) under the frames (1) and (3).



5-2011-0060-0-04-02

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Figure 61. Support the MFR

12. Install the skirt piece.

13. If necessary, repeat the steps below for the second MFR.

5.5.1.2 Turn and remove the service key to switch off the power to the motors and actuators

 DANGER

**Risk of electric shock.
Risk of severe personal injury or death.
This procedure only switches OFF the power to the motors and actuators. The power current on the circuit remains. Only do maintenance as instructed in this manual.**

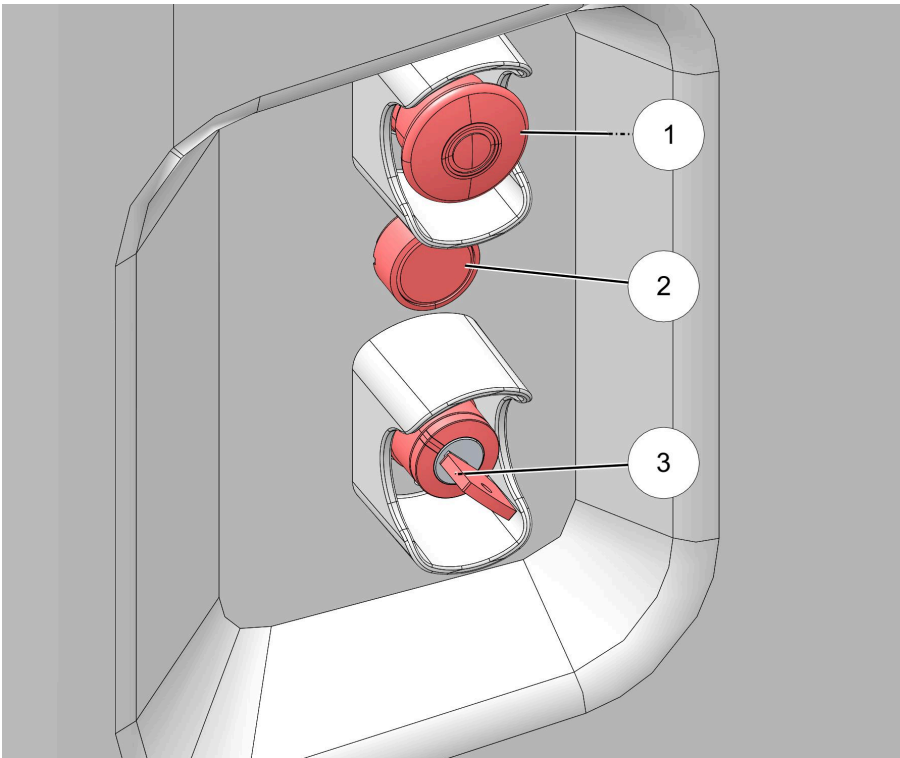


 WARNING

***Unexpected movement of the machine.
Risk of being crushed.
Always drive the MFR to a level location before you turn off the motors and actuators of the MFR with the service key. Be aware that the mechanical brakes are not enforced.***

-
1. If necessary pause (2) the current action of the MFR.
 2. Turn the service key (3) counter-clockwise in the OFF position, to switch off the power to the motors and actuators.

3. Remove the service key and keep it with you.



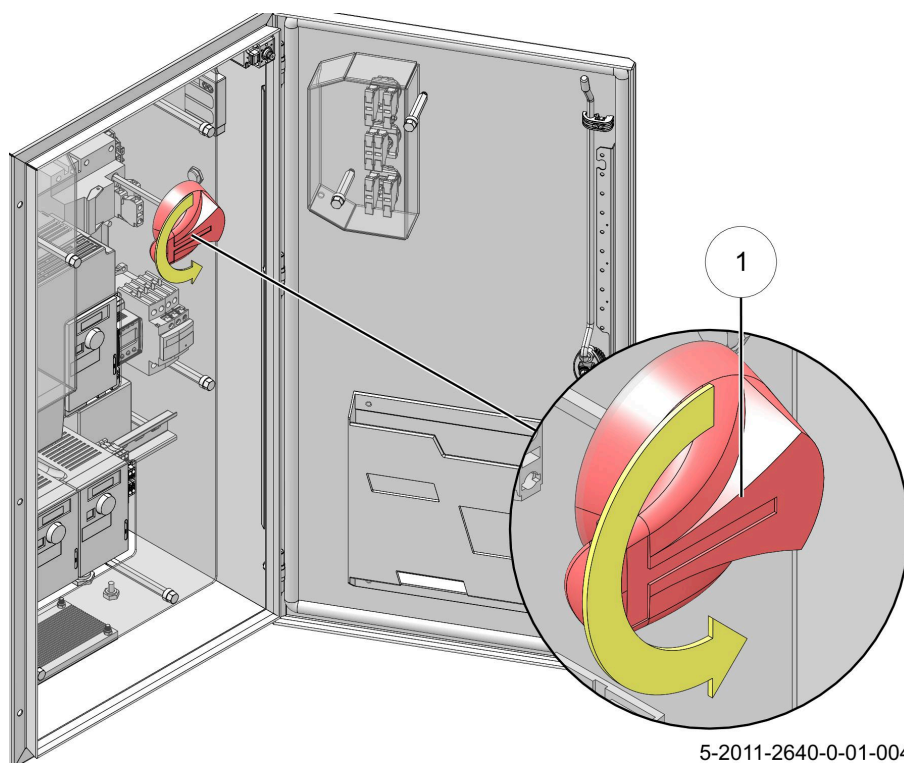
KEY: 1. Emergency button - 2. Pause button - 3. Service key

5.2011.8636.0 B

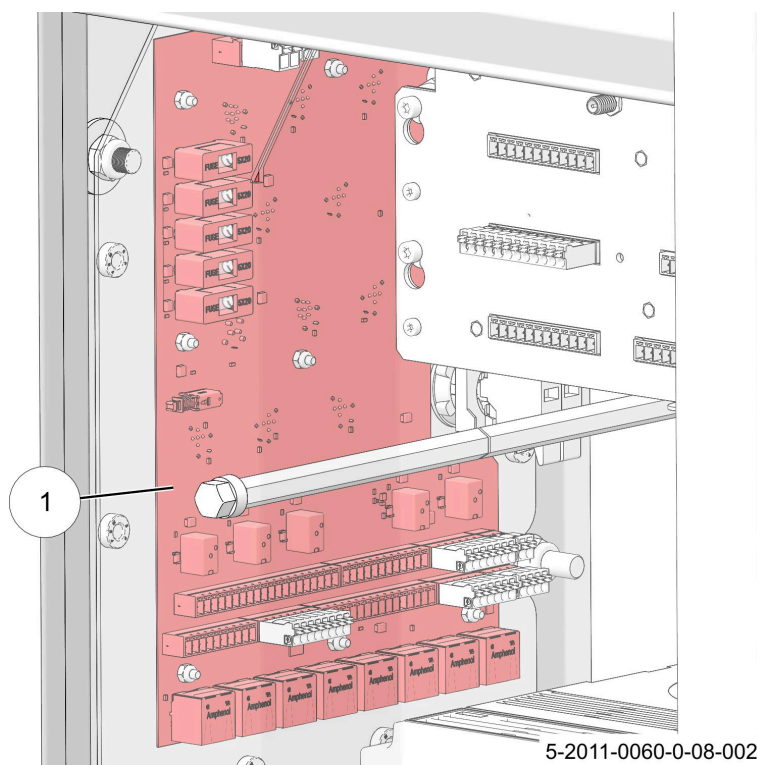
5.5.1.3 Switch OFF the power to the MFR with the high voltage switch

1. Remove the power box main cover, see Remove or install the power box main cover (see page 5-40).
2. Open the power box door, see Open or close the power box door (see page 5-39).

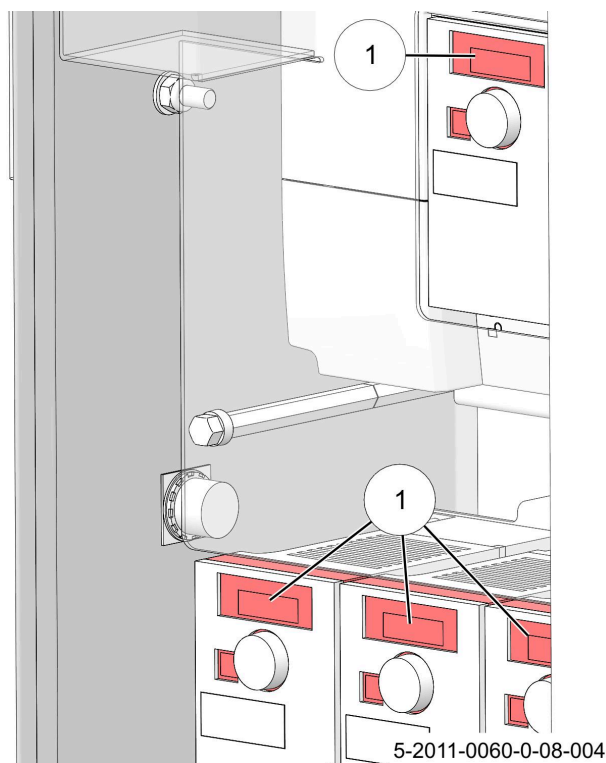
3. Switch OFF the high voltage switch (1) to switch off the entire machine.



4. Install a padlock on the high voltage switch.
5. Examine if the battery indicator D10 (1) on the PCB in the power box is off.



6. Examine if the frequency drives (1) are switched off.



7. Close the power box door, see Open or close the power box door (see page 5-39).
8. Install the power box main cover, see Remove or install the power box main cover (see page 5-40).

5.5.2 Switch ON the Vector system

NOTICE

Make sure the PDB main switch is turned OFF.

1. Open the PDB.
2. Install the backup battery (2) in the PDB.

3. Connect the connector (1) of the battery (2) to the PCB.

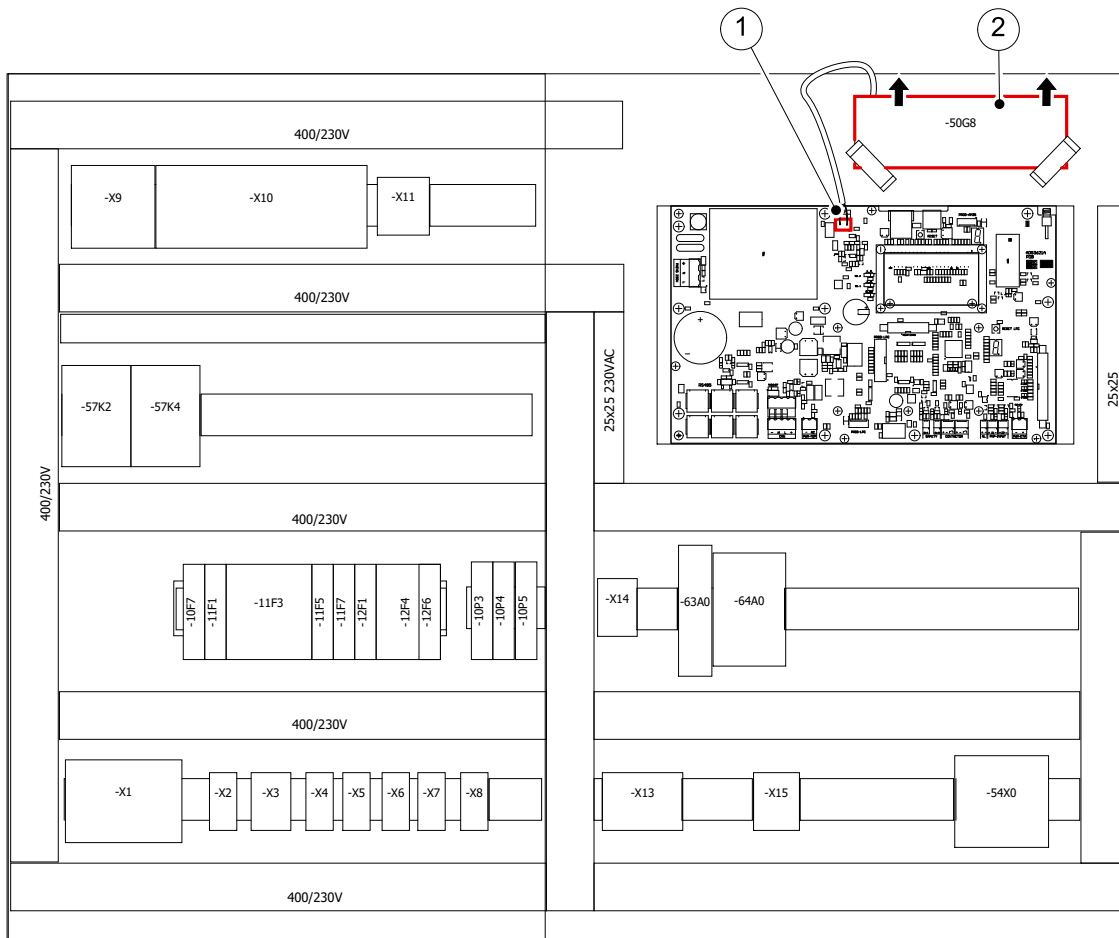
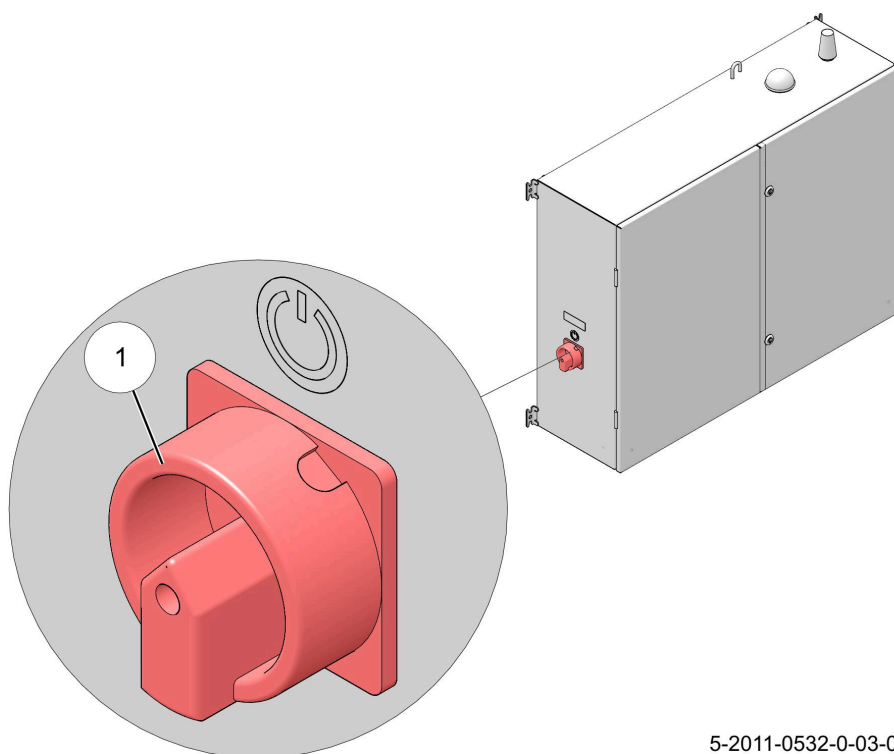


Figure 62. Connect the battery in the PDB

KEY: 1. Connector - 2. Battery

4. Switch ON the main switch (1) on the PDB (see figure 63 on page 5-21).



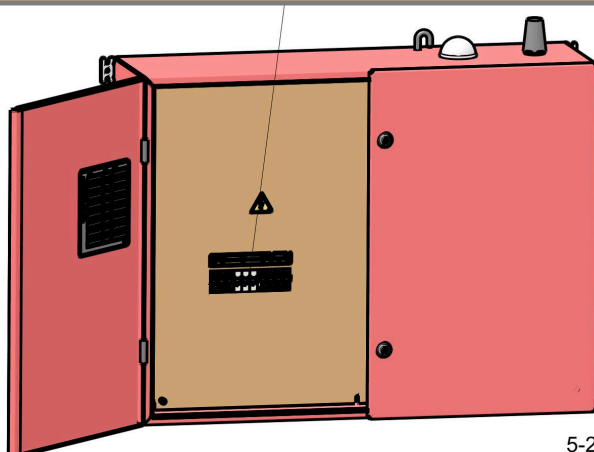
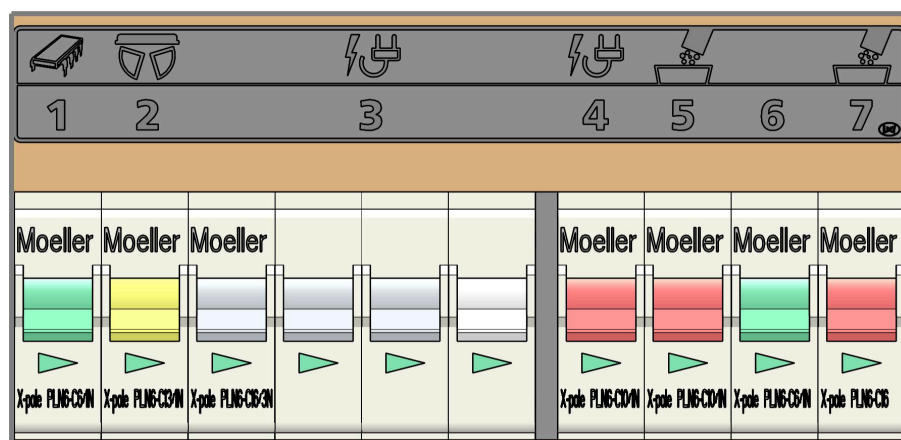
5-2011-0532-0-03-02

Figure 63. Main switch on the PDB

KEY: 1. Main switch

5.2011.8636.0 B

- Switch ON the circuit breakers one by one from left (1) to right (7).



5-2011-0532-0-03-01

5.2011.8636.0 B

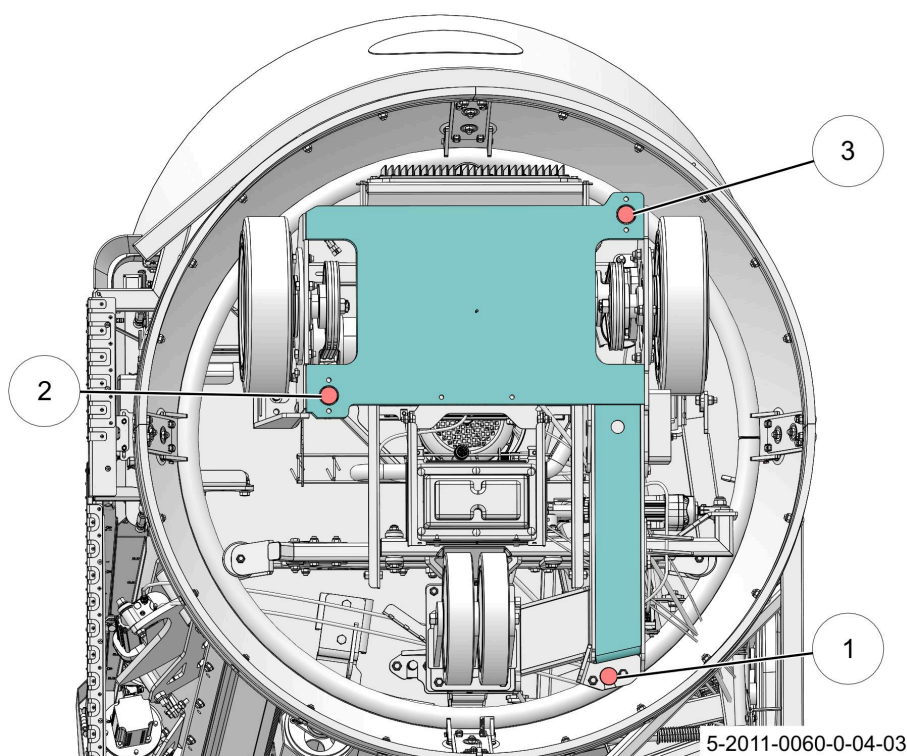
KEY: 1. PCB PDB - 2. Bridge crane (optional) and feed grabber (optional) - 3. PSU, power input for the charge pole - 4. Secondary PSU (optional), power input for parking charge pole - 5. Additives dispenser (optional) - 6. Not in use - 7. External concentrate augers (optional)

- Close the PDB.
- If the MFR was put on supports and stored for a longer remove the supports, see Remove the supports from under the MFR (see page 5-23).
- Switch ON the power to the MFR with the high voltage switch (see page 5-25).
- Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
- Put all devices in operation:
 - Put the feed grabber in operation (see page 5-51).
 - If present Put the bridge crane in operation (see page 5-51).
 - Put the MFR in operation with the smartphone (see page 5-47).
- Put the feed kitchen in operation (see page 5-44).

5.5.2.1 Remove the supports from under the MFR

NOTICE

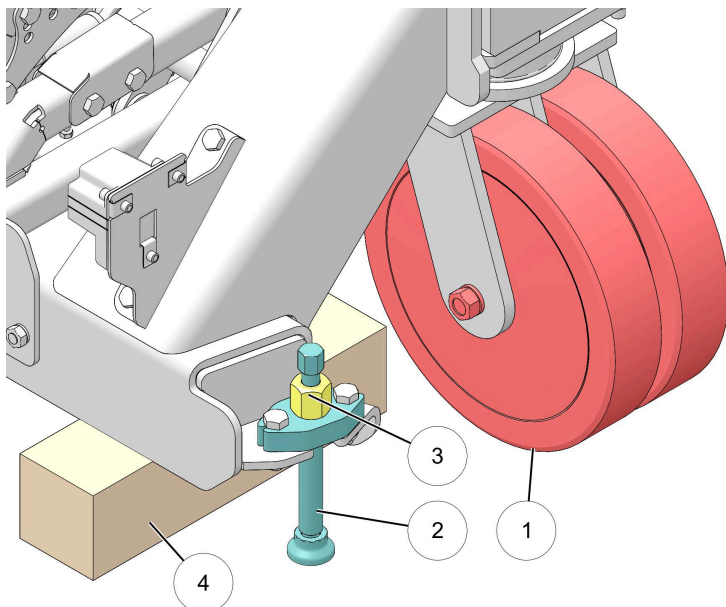
There are three jacks (1-3) on the MFR to remove the supports. Make sure you lift and lower the MFR with only one of the jacks at the time. Do this in the order as indicated in the picture below.



1. Remove a skirt piece (see Remove or install a skirt piece on page 5-31).

2. First lift the MFR with the jack (2) at the swivel caster (1):

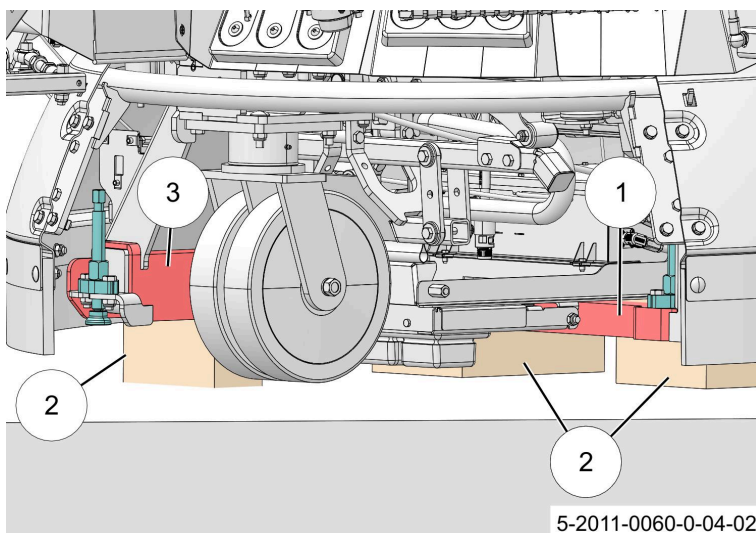
1. Loosen the nut (3) and lower the jack.



5-2011-2600-0-02-001

2. Use the jack to lift the frame of the swivel caster (3) up from the wooden support (2).

3. Remove the wooden support at the swivel caster from under the frame.



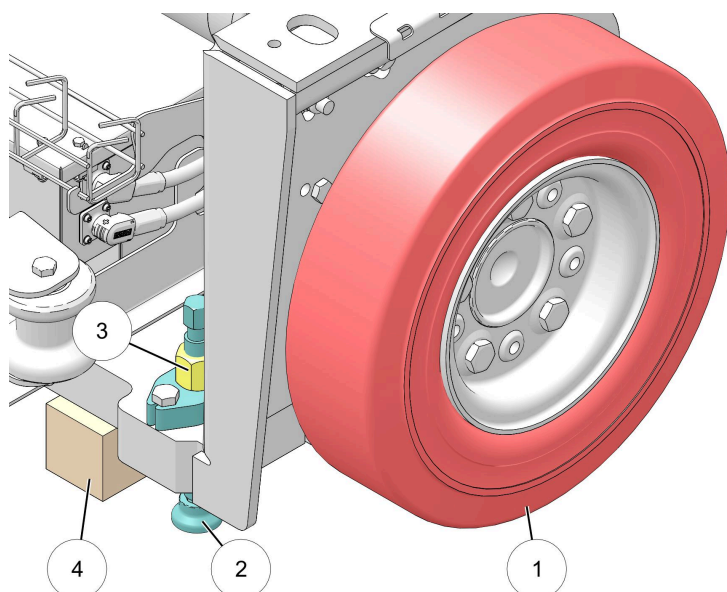
5-2011-0060-0-04-02

4. Lift the jack completely and fasten the nut, the front of the MFR now rests on the swivel caster.

5. Examine if the MFR is stable.

3. Repeat step 2 for the left drive wheel.

4. Repeat step 2 for the right drive wheel.



5-2011-2600-0-02-003

5. Install the skirt piece.
6. If necessary, repeat the steps below for the second MFR.

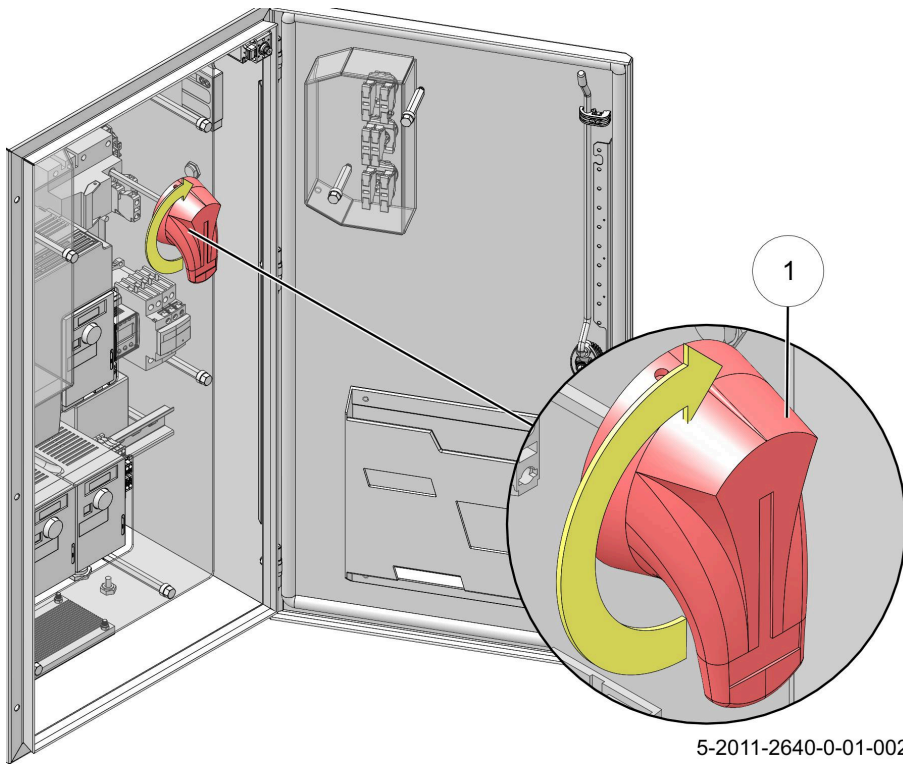
5.5.2.2 Switch ON the power to the MFR with the high voltage switch

NOTICE

The MFR needs a few minutes to start up and prepare the system for use. Wait for the safety LED on the VIOB to light up green, before you connect with the Lely Control Plus app to the MFR.

1. Remove the power box main cover, see Remove or install the power box main cover (see page 5-40).
2. Open the power box door, see Open or close the power box door (see page 5-39).
3. Remove the padlock from the high voltage switch (1).

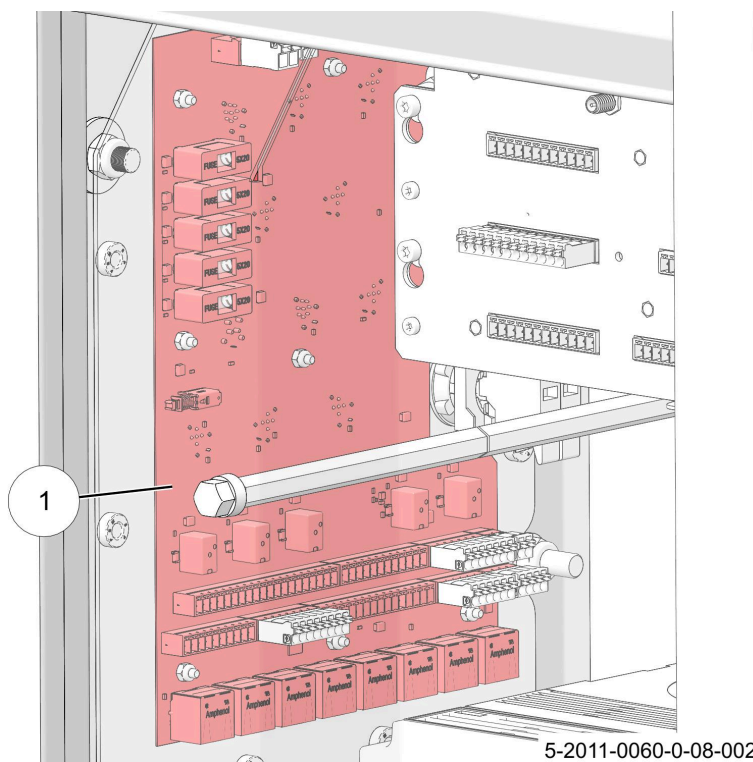
4. Switch ON the high voltage switch to switch on the entire machine.



5-2011-2640-0-01-002

5. The MFR initiates the startup procedure:

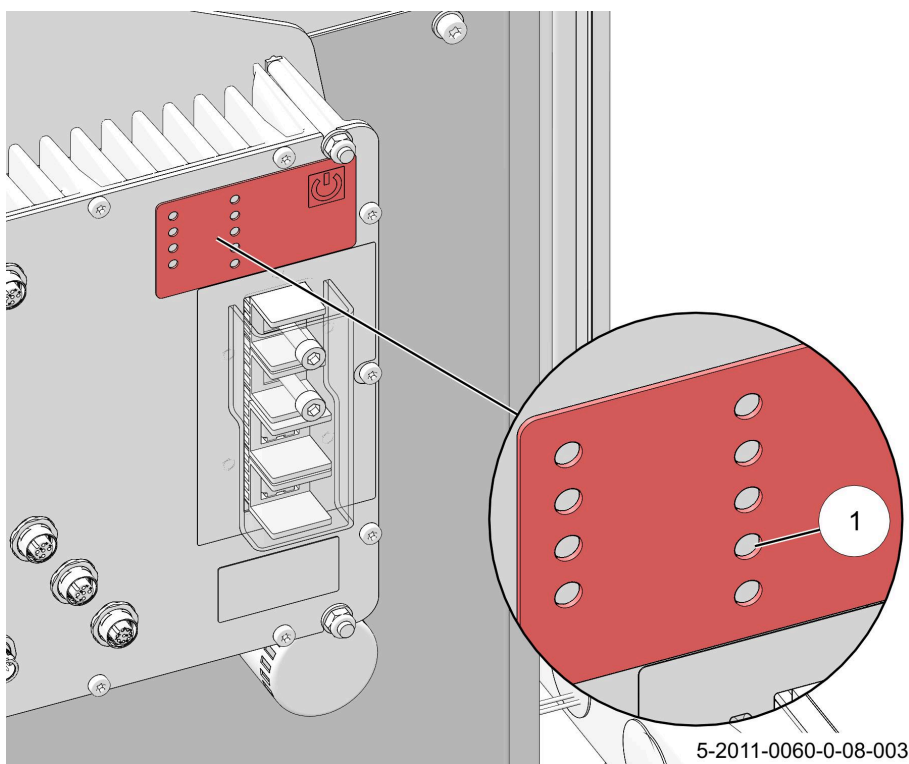
1. Examine if the battery indicator D10 (1) on the PCB is on, this indicates that the batteries are able to supply power.



2. Examine if the white LED cabinet lights are on. These indicate that the 24Vdc is activated.
3. Examine if the safety LED (1) on the VIOB is lid green. This may take a few minutes.



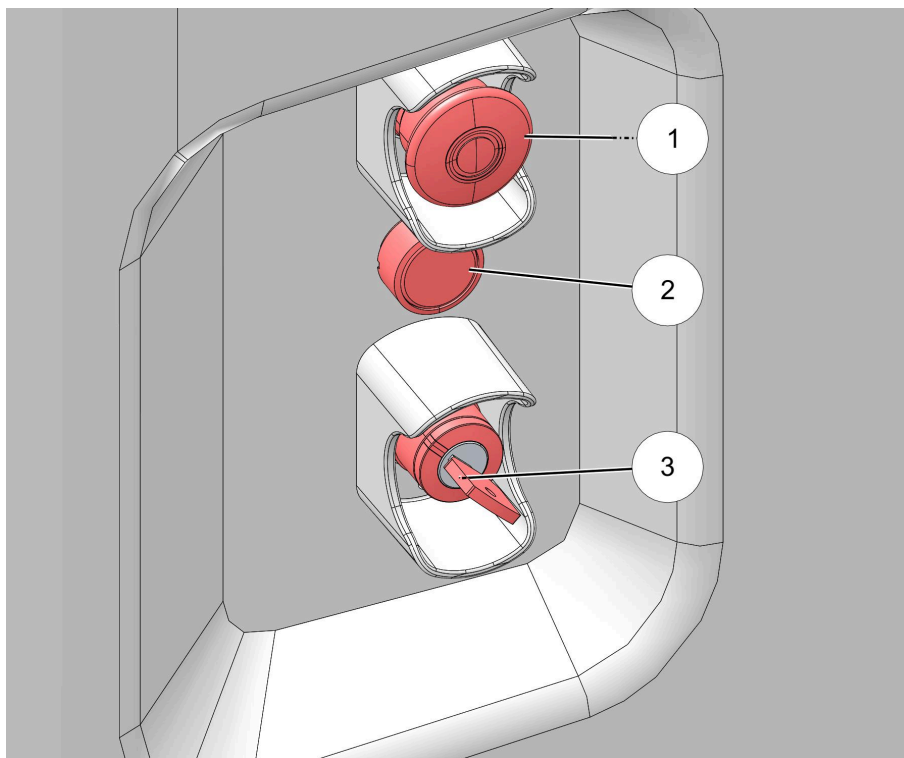
When the safety LED (1) on the VIOB is lid green, you can connect with the Lely Control Plus app to the MFR and get an interface.



6. Close the power box door, see Open or close the power box door (see page 5-39).
7. Install the power box main cover, see Remove or install the power box main cover (see page 5-40).

5.5.2.3 Turn ON the power to the motors and actuators of the MFR with the service key

1. Insert the service key (3) and turn it clockwise to the **ON** position, to switch on the power to the motors and actuators.



KEY: 1. Emergency button - 2. Pause button - 3. Service key

5.2011.8636.0 B

5.6 Switch OFF/ON the PSU

5.6.1 Switch OFF the PSU

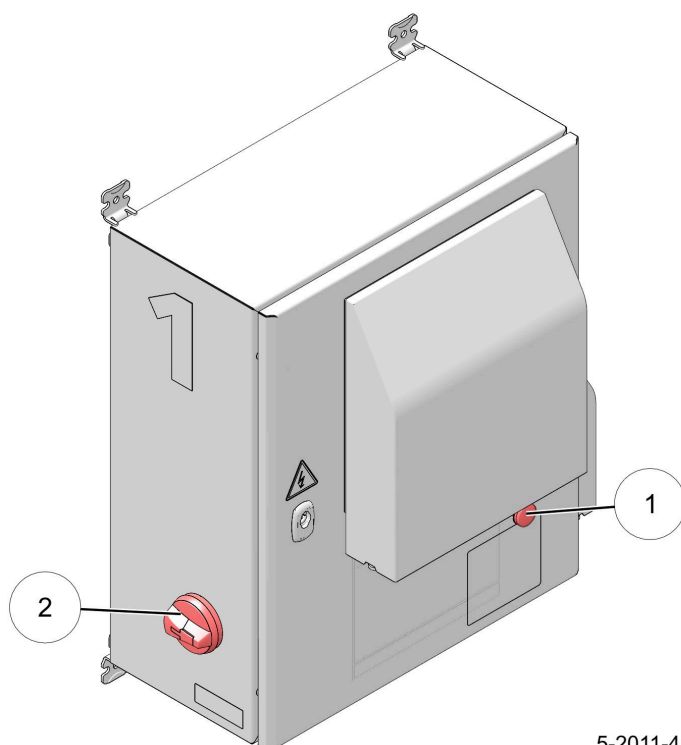


**Risk of electric shock.
Risk of severe personal injury or death.
Always wait 15 minutes after switching OFF
the PSU before opening it, for all residual
current to leave the PSU.**



1. Put the feed kitchen in the filling mode with the console (see page 5-46).
2. If the MFR is connected to the charge pole, manually drive the MFR backward to disconnect it from the charge pole (see Drive the MFR manually on page 5-61). Make sure the power indicator (1) is OFF.

3. Switch OFF the power on the PSU with the main switch (2). After 15 minutes the PSU can be opened.



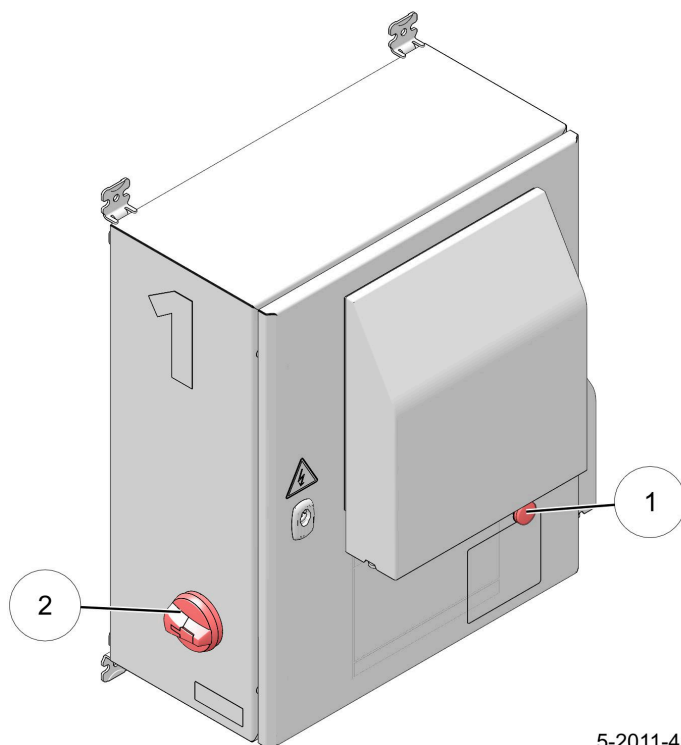
5-2011-4500-0-03-004

KEY: 1. Power indicator that shows the MFR receives power from the charge pole - 2. Main switch

4. If necessary repeat steps 2–3 for the secondary MFR and PSU.

5.6.2 Switch ON the PSU

1. Switch ON the power on the PSU with the main switch (2).



5-2011-4500-0-03-004

KEY: 1. Power indicator that shows the MFR receives power from the charge pole - 2. Main switch

2. If necessary:

1. Put the MFR in operation with the smartphone (see page 5-47).
2. Repeat steps 1–2 for the secondary PSU and MFR.
3. Put the feed kitchen in operation (see page 5-44).

5.7 Covers and doors

5.7.1 Remove or install a skirt piece

1. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).

2. Remove the two bolts (1) and washers (2) on both sides of the skirt piece (see figure 64 on page 5-32).

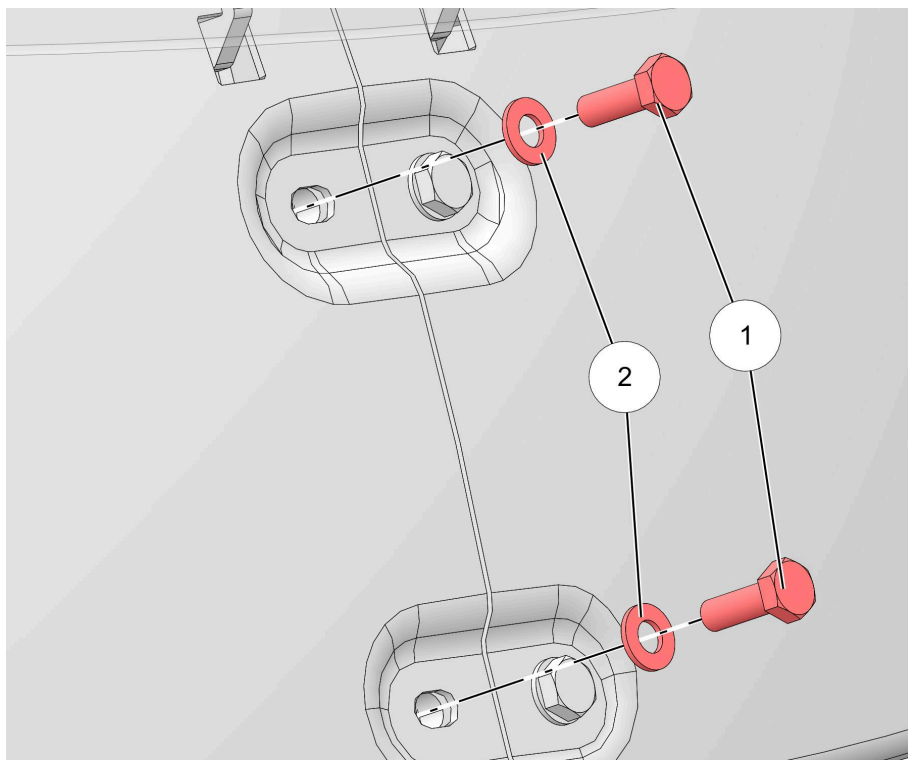


Figure 64. Remove or install a skirt piece

3. Lift and remove the skirt piece (2) from the two hooks (1) (see figure 65 on page 5-32).

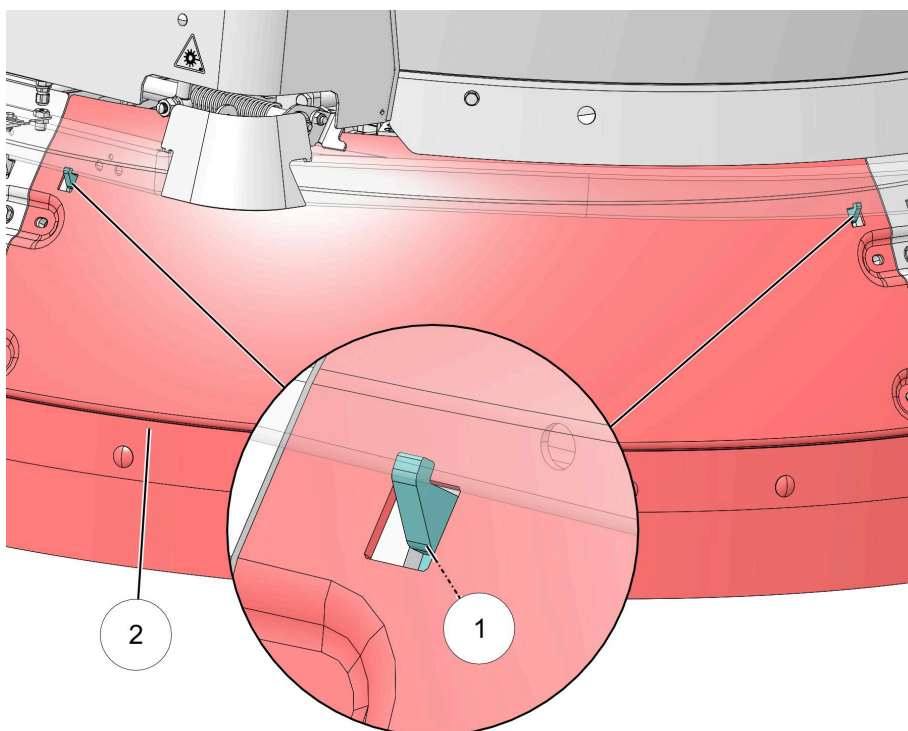


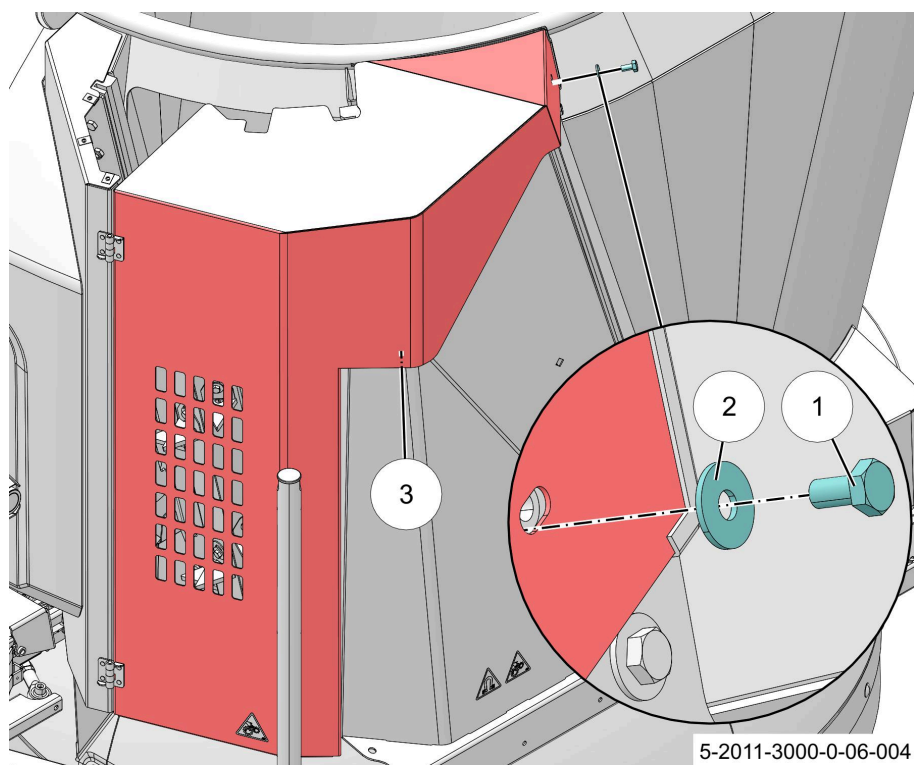
Figure 65. Remove or install a skirt piece

5-2011-3000-0-01-004

4. Install the skirt piece with the steps (2 – 3) in reverse order.
Make sure the skirt piece is fixed behind the two hooks (1).
5. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).

5.7.2 Open or close the maintenance door

1. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
2. Remove the bolt (1) and washer (2) from the maintenance door (3).
3. Open the maintenance door (3).



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Figure 66. Open or close the maintenance door

4. Close the maintenance door with the steps (2 – 3) in reverse order.
5. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).

5.7.3 Open or close the inspection cover

NOTICE

The support bar (1) (see figure 68 on page 5-35) for the inspection cover is a hook shaped bar connected with an eye to a bracket on the MFR. The bar consists of two bars connected with a spring. The connection to the MFR makes it possible to move the support bar in all directions. When the hook is inserted in the slot in the opened inspection cover, it fixes the cover in a safe position and allows you to do maintenance in a safe way.

1. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
2. Open the maintenance door (see Open or close the maintenance door on page 5-33).
3. Remove the bolt (1) and washer (2) from the door handle (2) of the inspection cover.

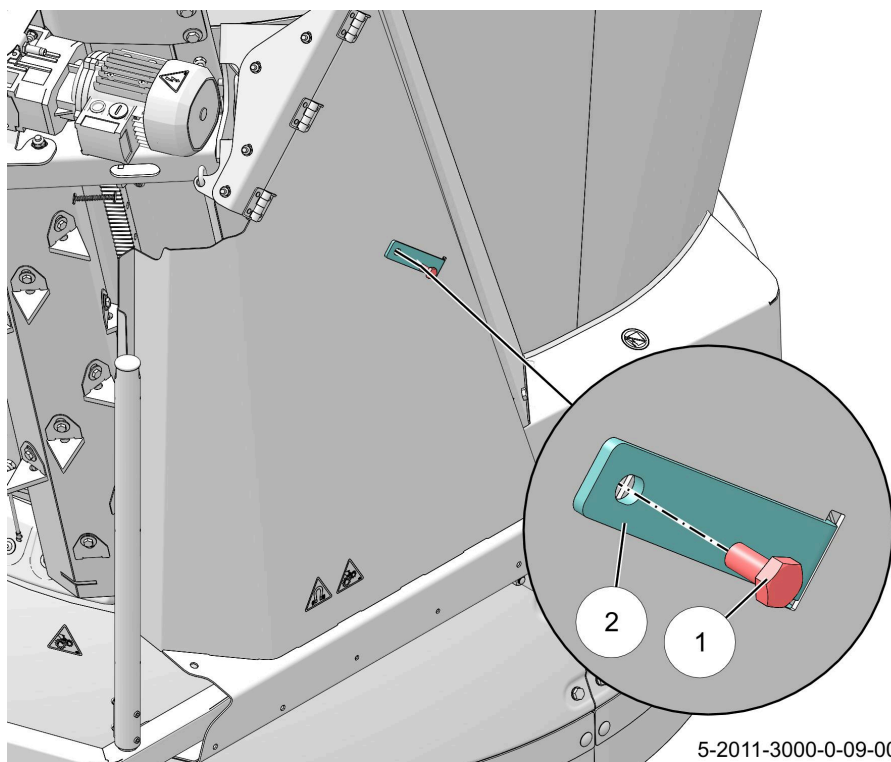


Figure 67. Remove the bolt

4. Release the support bar (1) for the inspection cover.

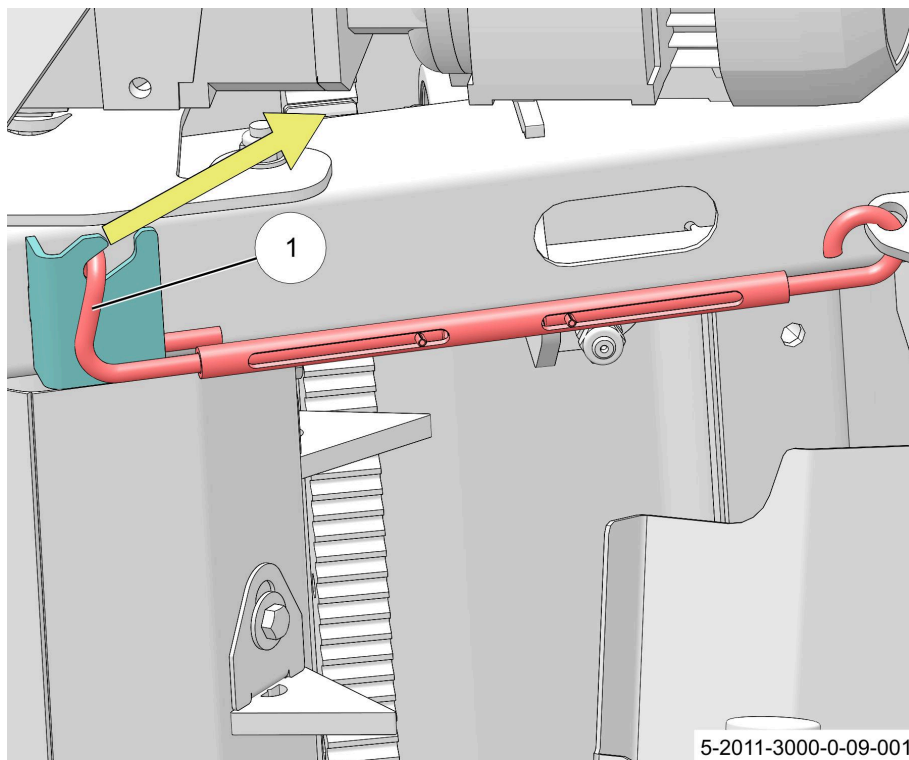


Figure 68. Support bar

5. Release the handle (1) through the hole in the inspection cover (2).

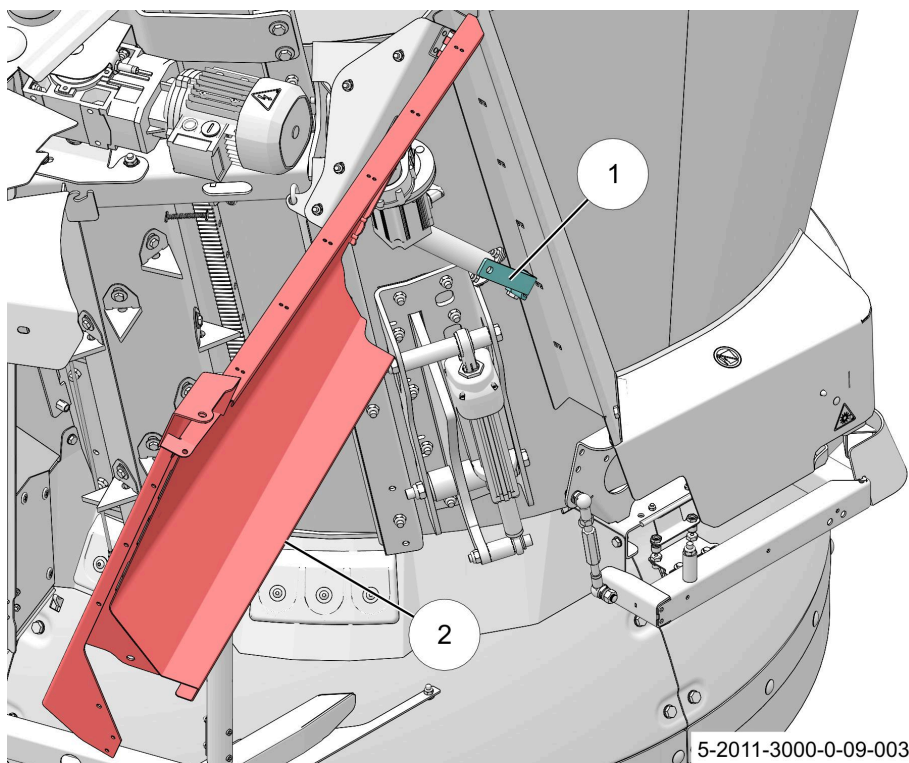


Figure 69. Release the handle

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6. Completely lift the inspection cover with your right hand and keep it lifted.
7. Pull and turn the support bar (3) with your left hand and insert the hook (1) into the slot (2) of the cover.

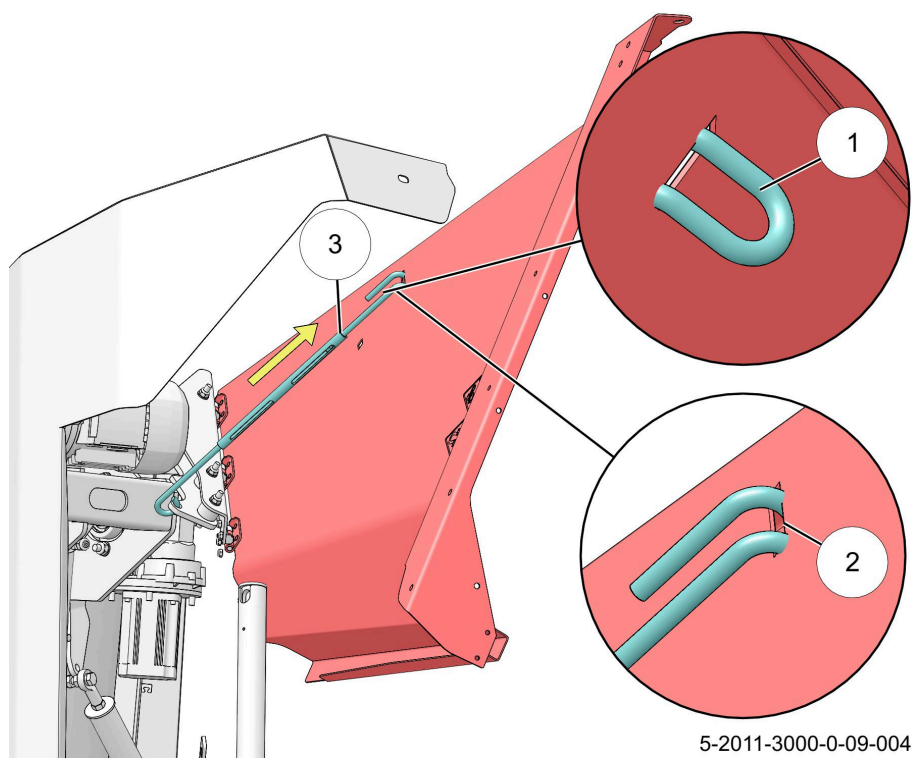
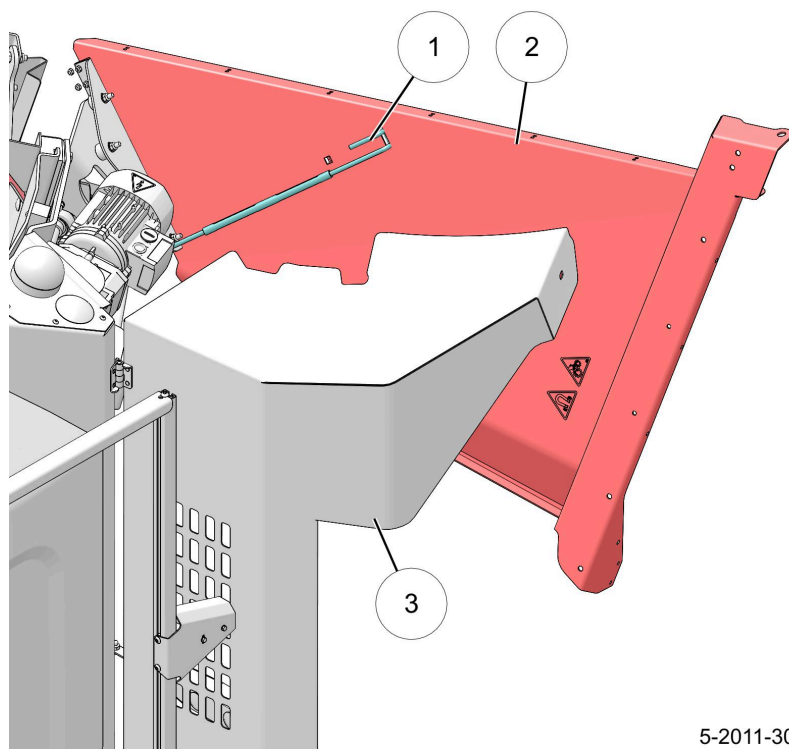


Figure 70. Insert the hook of the support bar

8. Lower the cover with your right hand until the hook is secured in the slot.

NOTICE

Make sure the slot is in good shape to ensure a safe environment to work in.



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5-2011-3000-0-09-005

Figure 71. Opened and supported inspection cover

KEY: 1. Support bar - 2. Inspection cover - 3. Maintenance door

9. Close the inspection cover with the steps (3 – 8) in reverse order.
10. Close the maintenance door (see Open or close the maintenance door on page 5-33).
11. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).

5.7.4 Remove or install the feed height laser cover

5.7.4.1 Remove the feed height laser cover



*Laser light.
Risk of getting blind.
Do not stare into the beam.*

1. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
2. Push the button (2) on the laser cover (1) to release the lock, turn and the cover upwards (A) and pull (B) the laser cover to the back of the MFR to remove it.

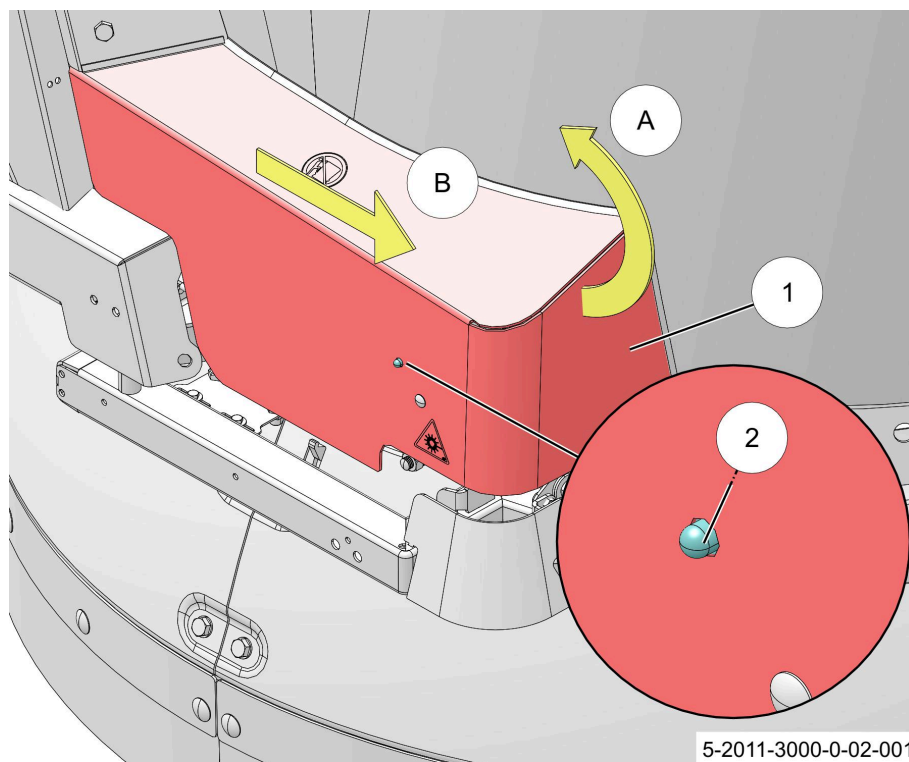
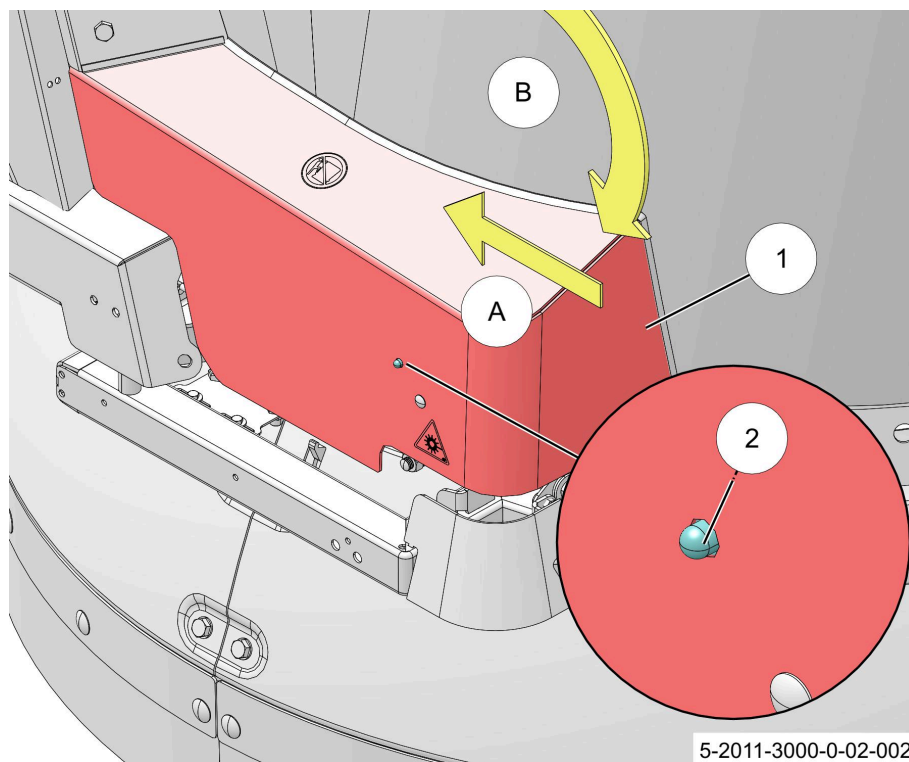


Figure 72. Remove the laser cover

5.7.4.2 Install the feed height laser cover

1. Push (A) the laser cover (1) towards the front of the MFR and turn and push (B) it down until the button (2) pops out.



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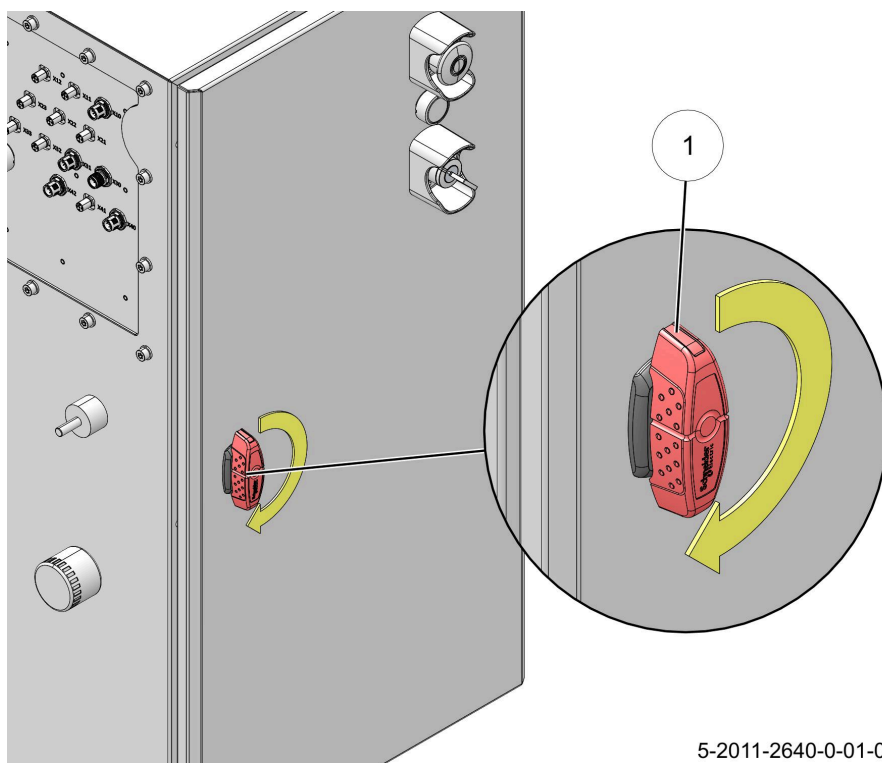
Figure 73. Install the laser cover

2. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).

5.7.5 Open or close the power box door

1. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
2. Remove the power box cover (see Remove or install the power box main cover on page 5-40).

3. Rotate the doorknob (1) clockwise to open the power box door.



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Figure 74. Open or close the power box door

4. Close the power box door and rotate the doorknob (1) counter clockwise to close it.
5. Install the power box cover (see Remove or install the power box main cover on page 5-40).
6. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).

5.7.6 Remove or install the power box main cover

1. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).

2. Pull (A) outward and slide the main cover in direction (B) to remove it.

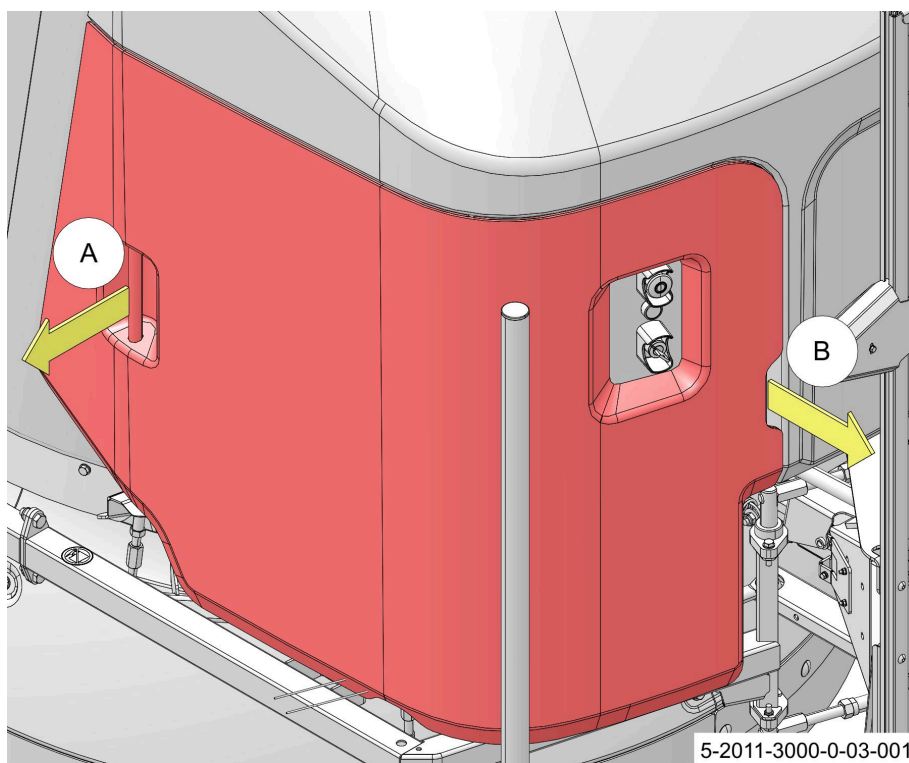


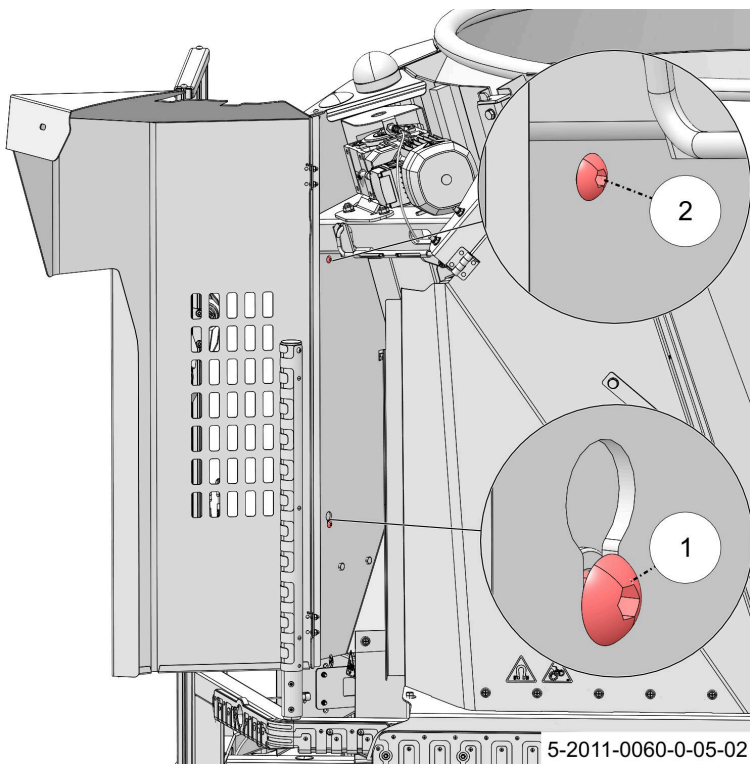
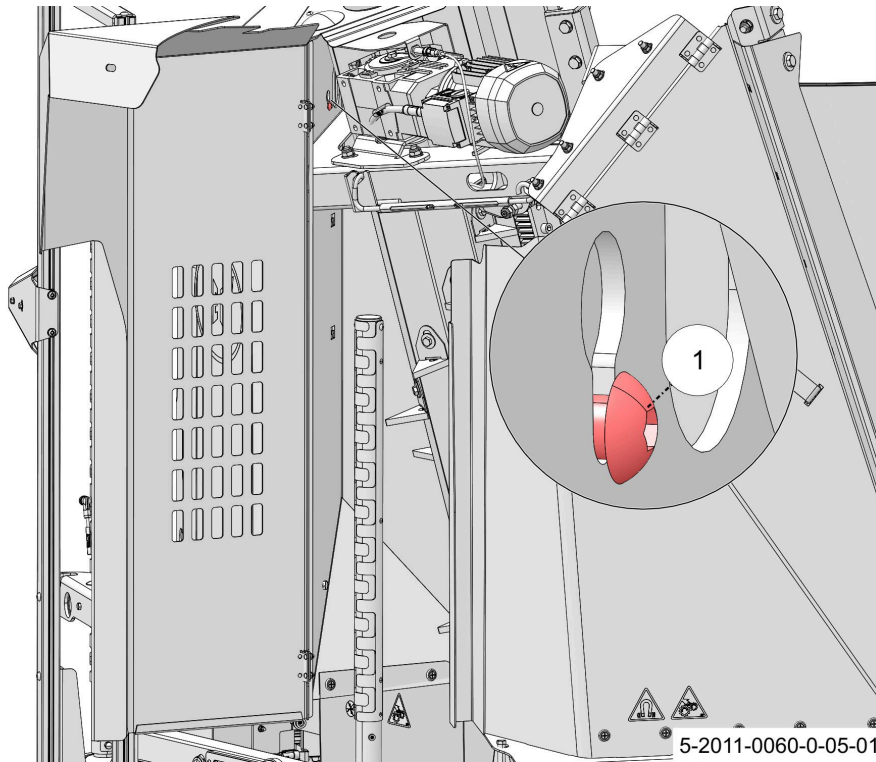
Figure 75. Remove and install the power box main cover

3. Push the power box main cover (B - A) toward the MFR to install it.
4. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).

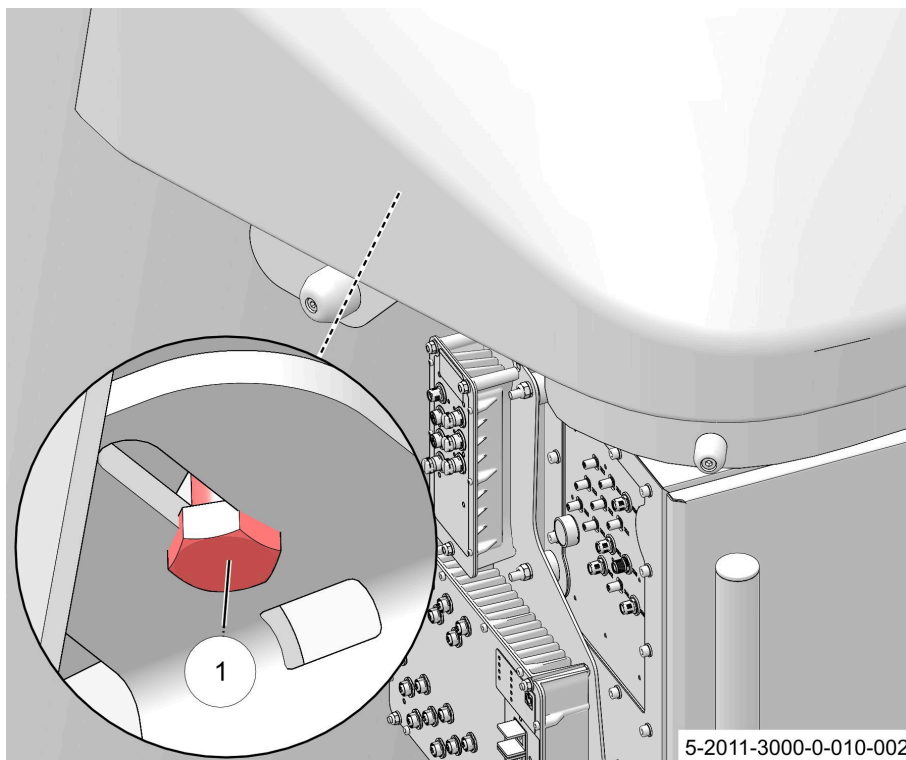
5.7.7 Remove or install the power box cover

1. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
2. Remove the power box main cover (see Remove or install the power box main cover on page 5-40).
3. Open the maintenance door (see Open or close the maintenance door on page 5-33).
4. Loosen the two bolts (1) on the right side of the power box cover.

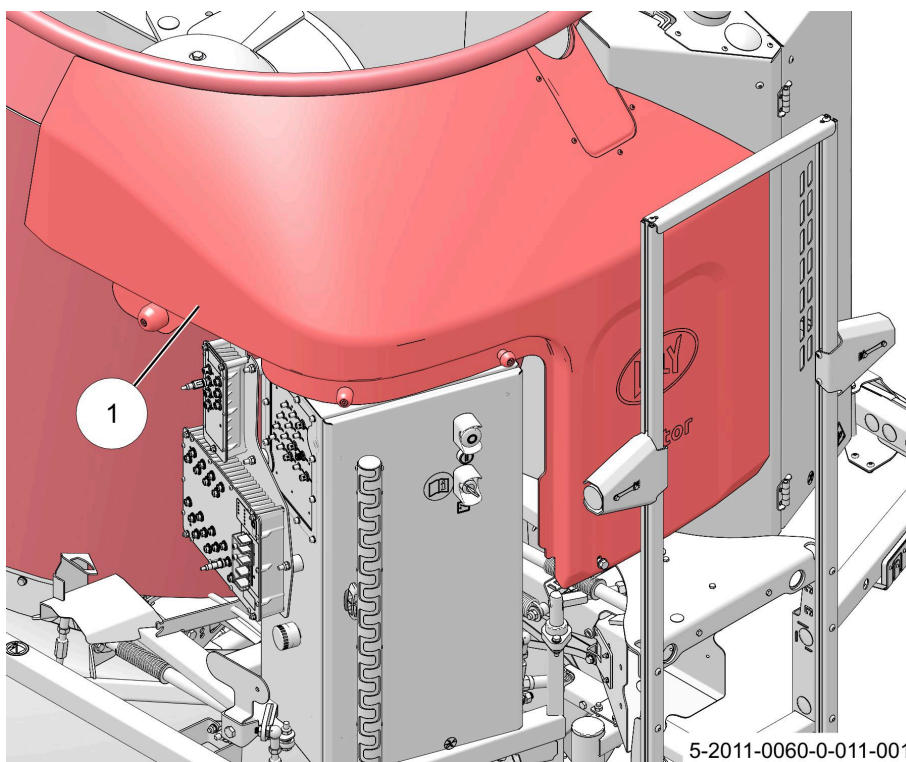
5. Remove the locking bolt (2).



6. Remove the bolt (1) on the left side of the power box cover.



7. Remove the power box cover (1).



8. Install the power box cover with the steps (4 – 7) in reverse order.

9. Close the maintenance door (see Open or close the maintenance door on page 5-33).

10. Install the power box main cover (see Remove or install the power box main cover on page 5-40).
11. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).

5.8 Start up and stop

5.8.1 Put the feed kitchen in operation

WARNING

*Unexpected movement of machines.
Risk of being crushed.
Make sure the feed kitchen is void of people, animals, machines or anything other than roughage.*

NOTICE

If the orange light stays on after waiting two minutes, at least one of the devices is not in operation yet. Make sure the devices in your Vector system are in operation, for example the MFR(s), PDB, feed grabber and bridge crane. Connect your smartphone to each device and check.

NOTICE

When the feed kitchen is put in operation after it was in the fill mode, all storage locations in the feed kitchen are marked as filled. The feed grabber will start grabbing at the same storage location of each feed type that is used before the kitchen was filled. The feed grabber will scan the storage location before grabbing.

1. Make sure the feed kitchen is void of persons, animals, machines or anything other than roughage.
2. Close all feed kitchen doors and the safety fence.
3. On the console, push start (1), the system checks if all gates and doors are closed and the start button blinks quickly.

4. When the start button no longer blinks, push start (1) again, the system starts. While the feed grabber and bridge crane start up the orange light is on. When the green signal light is continuously on the system is started.

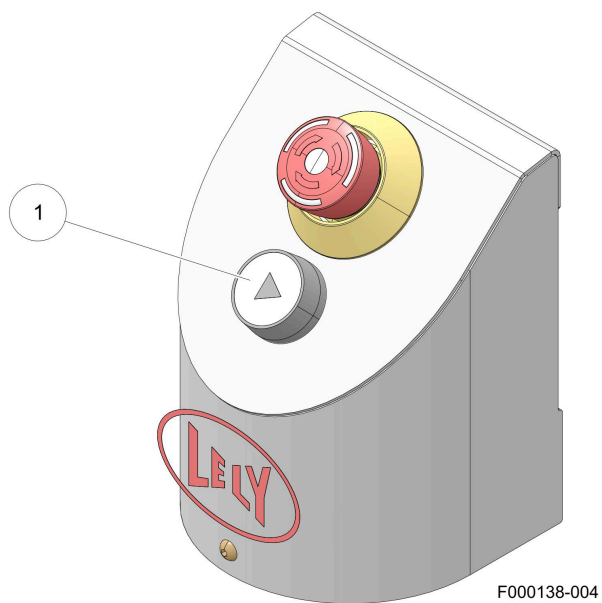


Figure 76. Start button on console

KEY: 1. Start button

5.8.2 Take the feed kitchen out of operation in the filling mode

5.8.2.1 Put the feed kitchen in the filling mode with the console

1. On the console, push the start button (1).
The signal lights start blinking green and orange. The feed grabber will be parked.

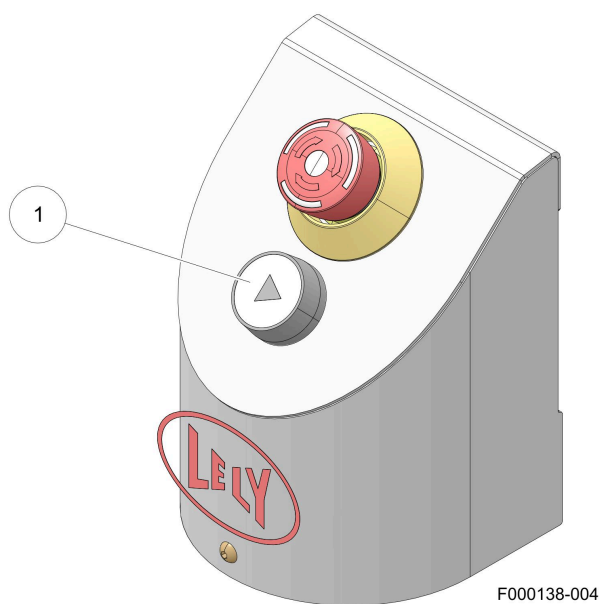



Figure 77. Start button on console

2. Wait until the signal light is blinking green. It is then safe to open, enter and fill the feed kitchen.

5.8.2.2 Put the feed kitchen in the filling mode with the smartphone

NOTICE

When for example driving on a (silage) block cutter, you can take the feed kitchen out of operation with a smartphone without leaving the vehicle.

1. Open the Lely control app on the smartphone and connect to the feed controller (PDB).
2. Go to the page **Feed kitchen**.
3. Push .
The signal lights start blinking green and orange. The feed grabber will be parked.
4. Wait until the signal light is blinking green. It is then safe to open, enter and fill the feed kitchen.

5.8.2.3 Put the feed kitchen in the filling mode with the WebUI

NOTICE

Be aware that you can only put the system back in operation at the console, that is why using the WebUI from a remote location is not a solution to a "kitchen empty" alarm.

1. Start the WebUI (see page 5-5).



2. Push the button **Kitchen**.

3. Push the button **Start fill mode**.

The signal lights start blinking green and orange. The feed grabber will be parked.

4. Wait until the signal light is blinking green. It is then safe to open, enter and fill the feed kitchen.

5.8.3 Put the MFR in operation with the smartphone

WARNING

*Unexpected movement of the machine.
Risk of being crushed.*

Make sure the MFR and its immediate surroundings are void of people and animals. Only operate the MFR with the smartphone when it is in your line of sight.

1. Open the Lely Control Plus app and connect to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2).
2. Connect the MFR manually to the charge pole (see page 5-63).



3. Go to **Home**.

4. Turn on the **Out of operation** toggle to **In operation**.

5. Make sure you have a clear view on the MFR and acknowledge the question:

SAFETY WARNING: Putting in operation is permitted only with a clear overview of the vehicle.
Continue?

5.8.4 Take the MFR out of operation using the smartphone

1. Open the Lely Control Plus app and connect to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2).



2. Go to **Home**.

3. Turn off the  **In operation** toggle to  **Out of operation**.

5.8.5 Pause the operation of the MFR

5.8.5.1 Pause the operation of the MFR using the pause button

NOTICE

Use the pause button to pause or continue operation of the MFR. Always use the emergency button (1) in case of an emergency.

1. Push the pause button (2).

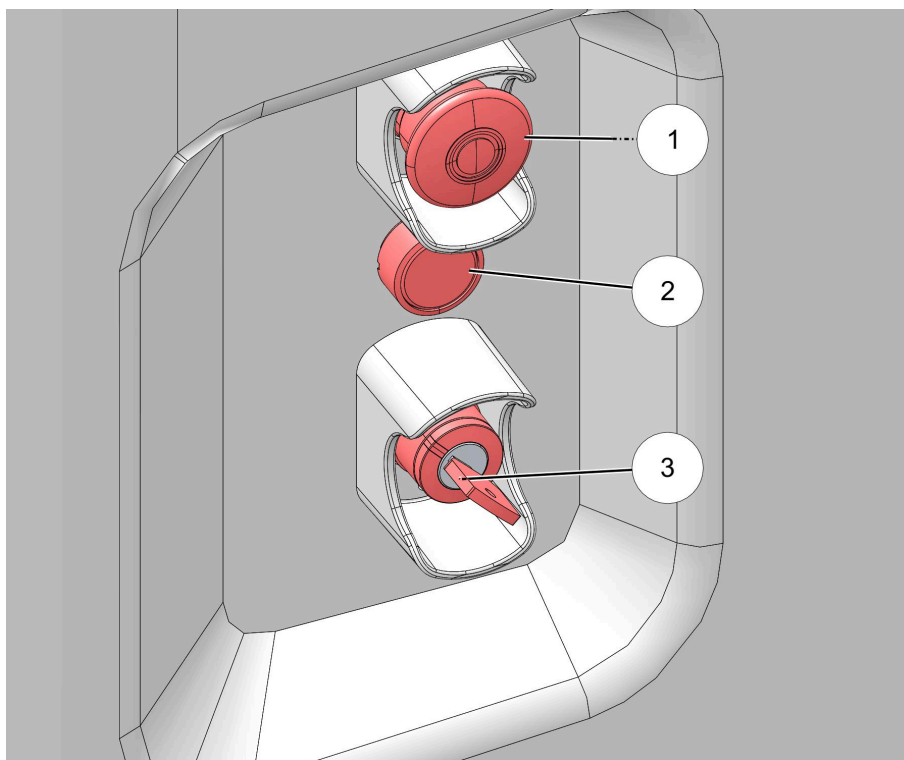


Figure 78. Pause button

KEY: 1. Emergency button - 2. Pause button - 3. Service key

5.8.5.2 Resume operation of the MFR using the pause button



***Unexpected movement of the machine.
Risk of being crushed.
Make sure the MFR and its immediate surroundings are void of people
and animals before you put the MFR in operation.***

1. When the MFR was taken out of operation with the pause button:
 1. Push the pause button (2).
 2. The MFR will continue operation.

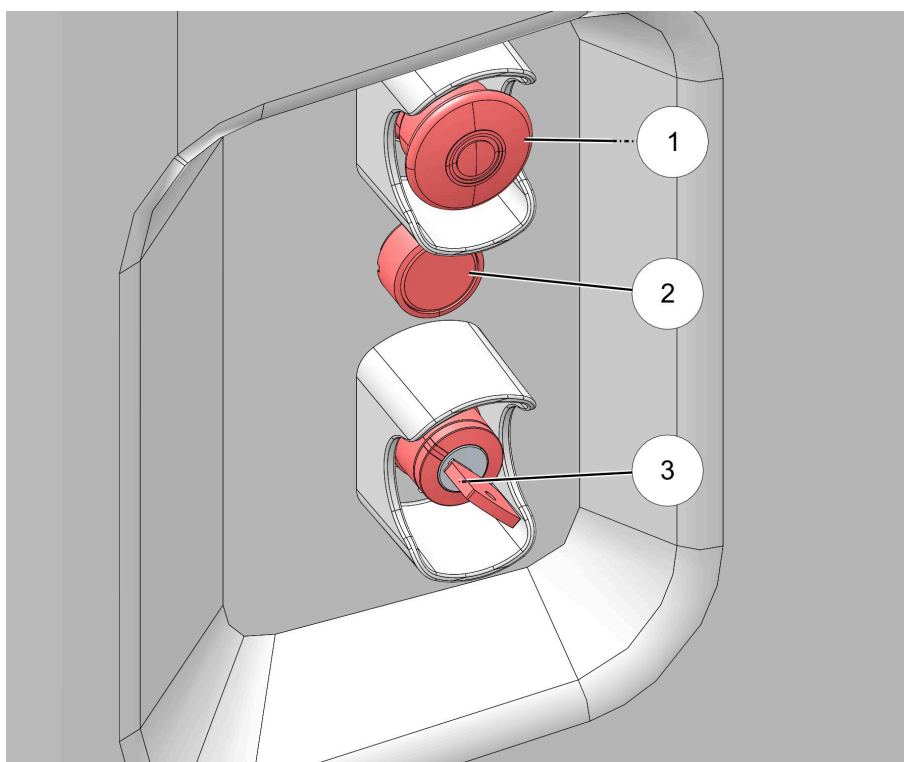


Figure 79. Pause button

KEY: 1. Emergency button - 2. Pause button - 3. Service key

5.8.6 Put the feed kitchen devices in operation

5.8.6.1 Put the PDB in operation

Put the feed controller (PDB) in operation

1. There are two ways to put the feed controller (PDB) in operation:
 1. Put the feed controller (PDB) in operation with the WebUI (see page 5-50).
 2. Put the feed controller (PDB) in operation with the smartphone (see page 5-51).

Put the feed controller (PDB) in operation with the WebUI

1. Start the WebUI (see page 5-5).



2. Push the button **Status**.
3. Click on the switch (1), the color of the switch changes from grey to green.

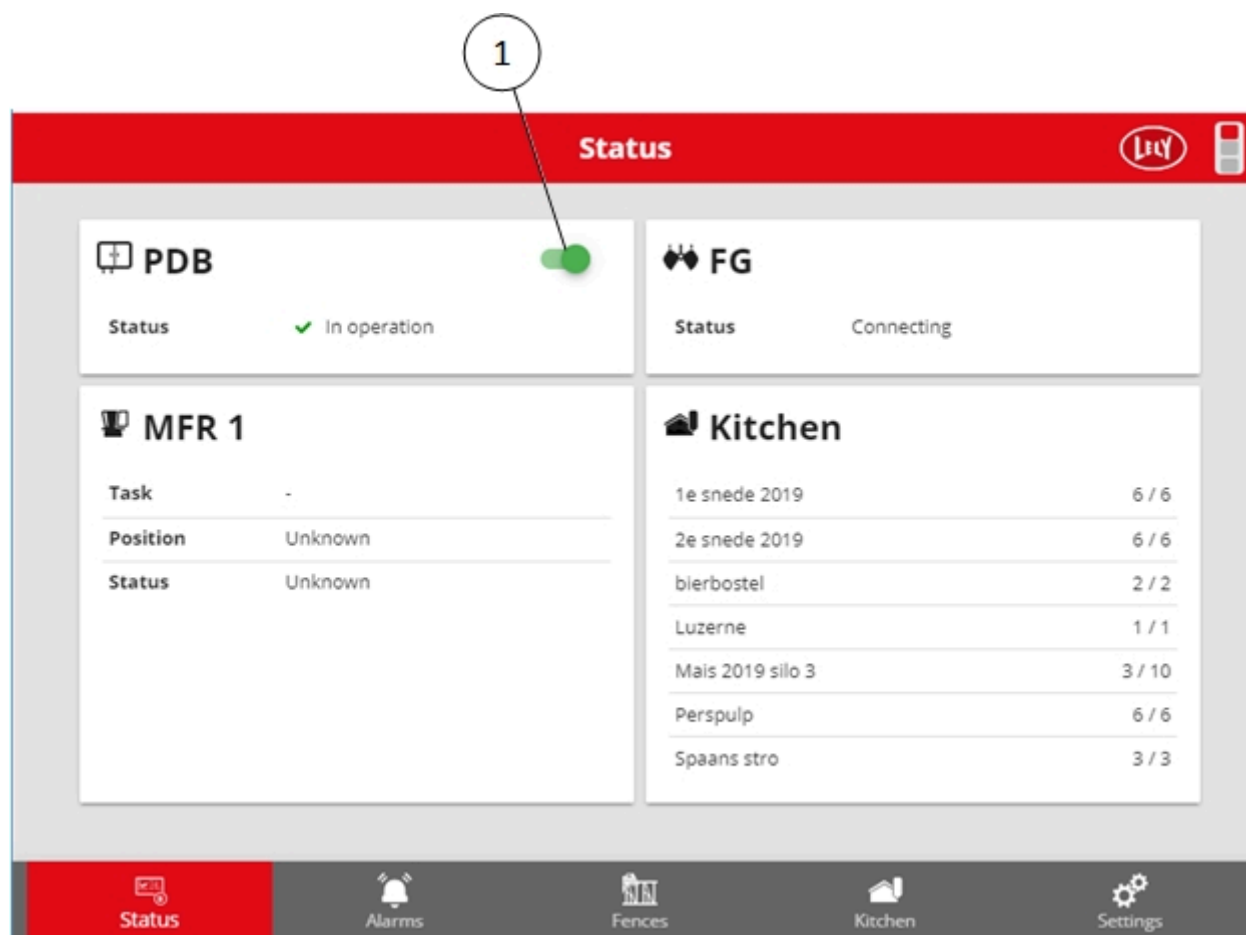



Figure 80. Status screen

KEY: 1. Switch to put the PDB in or out of operation




Put the feed controller (PDB) in operation with the smartphone

1. Open the Lely Control app on the smartphone and connect to the feed controller (PDB).
2. Go to the page **Work**.
The page displays the current status (**off**).
3. Push .
The feed controller is switched to **on**.

5.8.6.2 Put the feed grabber in operation

NOTICE

If the feed grabber is powered ON, for example after a power failure, it automatically drives until it detects the main reset point. When the feed grabber detected the main reset point it is automatically set to in operation.

1. Open the Lely Control app on the smartphone and connect to the feed grabber.
2. Select **Operation**, the page displays the current status.
3. Push .
4. If you want to go on with the present task, select **Resume Operation** and push .
5. If you want to restart the program, select **Restart Operation** and push .

5.8.6.3 Put the bridge crane in operation


NOTICE

When the bridge crane starts after the power is put on the Vector system it automatically goes in operation.

NOTICE

The bridge crane will automatically drive to detect the reset magnets after it receives the first task from the feed grabber.

1. Open the Lely Control app on the smartphone and connect to the bridge crane.
2. Select the page **Put in operation**
The page displays the current status.

3. Push the button .

5.8.7 Take the feed kitchen devices out of operation

5.8.7.1 Take the feed controller (PDB) out of operation

NOTICE

When the feed controller is out of operation, no new routes are started automatically. All other functions of the PDB continue, like distribute power to the PSU, the safety fence, feed grabber and bridge crane etc.

1. There are two ways to take the feed controller (PDB) out of operation:
 1. Take the feed controller (PDB) out of operation with the WebUI (see page 5-52).
 2. Take the feed controller (PDB) out of operation with the smartphone (see page 5-53).

Take the feed controller (PDB) out of operation with the WebUI

1. Start the WebUI (see page 5-5).

2. Push the button  **Status**.

- Click on the switch (1), the color of the switch changes from green to grey.

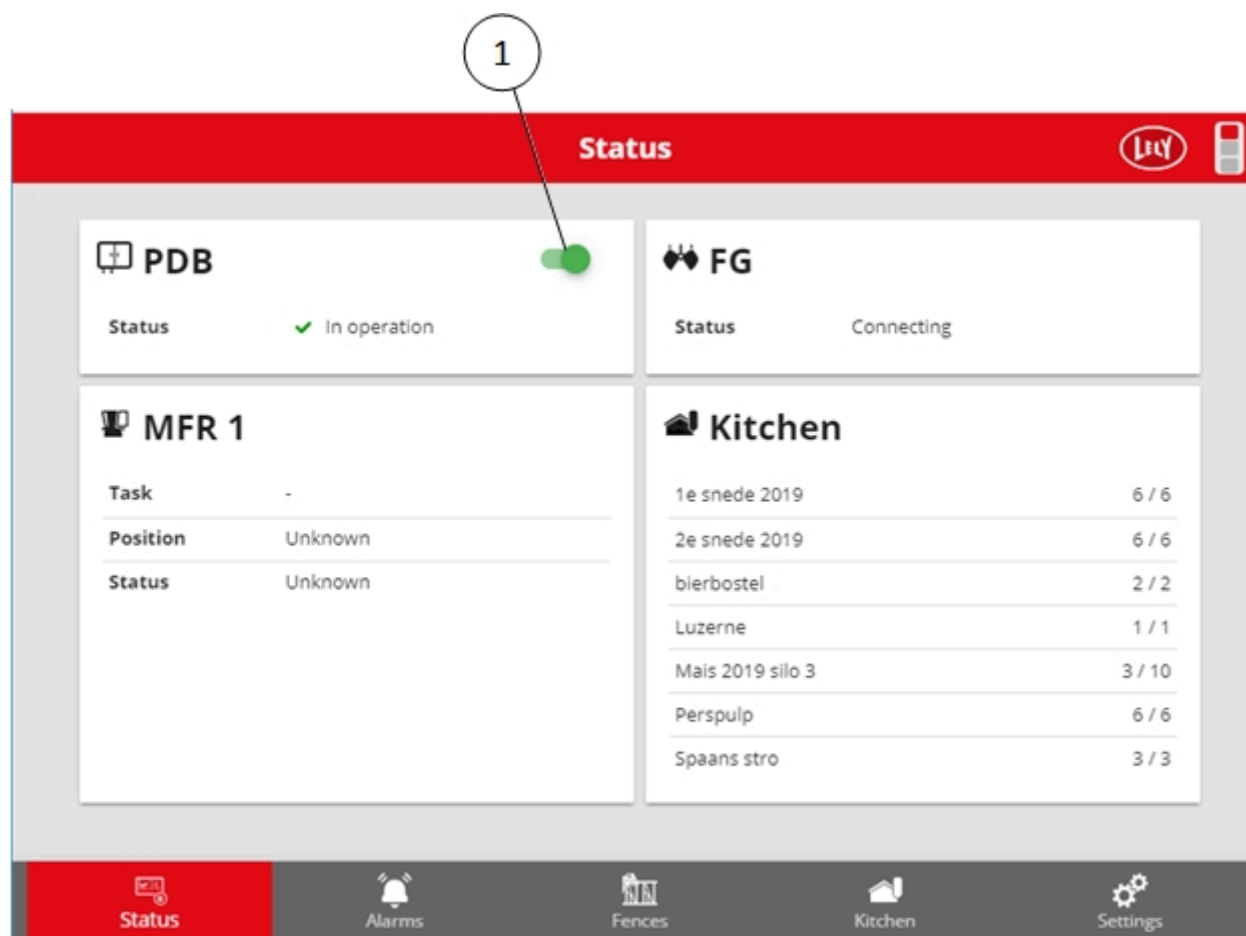




Figure 81. Status screen



KEY: 1. Switch to put the PDB in or out of operation

Take the feed controller (PDB) out of operation with the smartphone

- Open the Lely Control app on the smartphone and connect to the feed controller (PDB)
- Go to the page **Work**.
The page displays the current status (**on**).
- Tap .
The feed controller is switched to **off**.



5.8.7.2 Take the feed grabber out of operation

- Open the Lely Control app on the smartphone and connect to the feed grabber.
- Select the page **Operation**,
The page displays the current status.
- Push the button .

4. If you want to stop operation immediately, select **Stop Immediately** and push the button .
5. If you want to stop operation after the current task is finished, select **Stop After Task** and push the button .

When the feed grabber is out of operation you can push  to go to the menu.

5.8.7.3 Take the bridge crane out of operation

1. Open the Lely Control app on the smartphone and connect to the bridge crane.
2. Make sure the page shows that the bridge crane is in operation.
3. Push the button .
4. Follow instructions on the display and push  again.
The bridge crane is now out of operation.

You can push  to go to the menu.

5.9 Fill the feed kitchen

5.9.1 Fill the feed kitchen

1. Put the feed kitchen in the filling mode with the console (see page 5-46).
2. Open the safety fence (if applicable) (see Open the safety fence on page 5-57) or open the kitchen door.
3. Clean the feed kitchen, for example sweep all remains of roughage to one location.
After filling the feed kitchen you can add the remains on top of the new feed blocks.
4. Make sure you know the feed types of every location. This is often posted near the PDB.
5. Use a block cutter or a silage block cutter to cut the feed blocks up to 1.05 m (3.44 ft) deep.
6. Position the feed blocks in the center of every feed location.

7. Ask your FMS advisor if your round bales (1) need to be cut, and how to cut them.
For example: first cut bales in halves, pile the halves and if necessary cut in quarters (2) push each pile (3) to the center of a separate feed location.

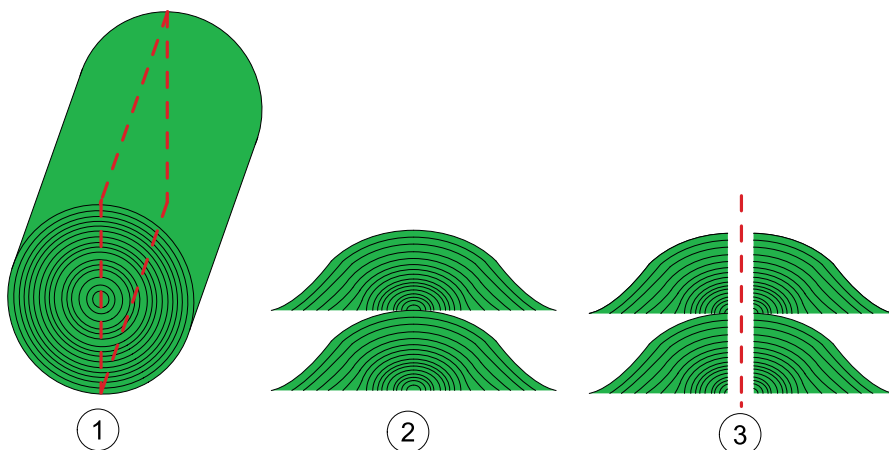


Figure 82. Cut round bales

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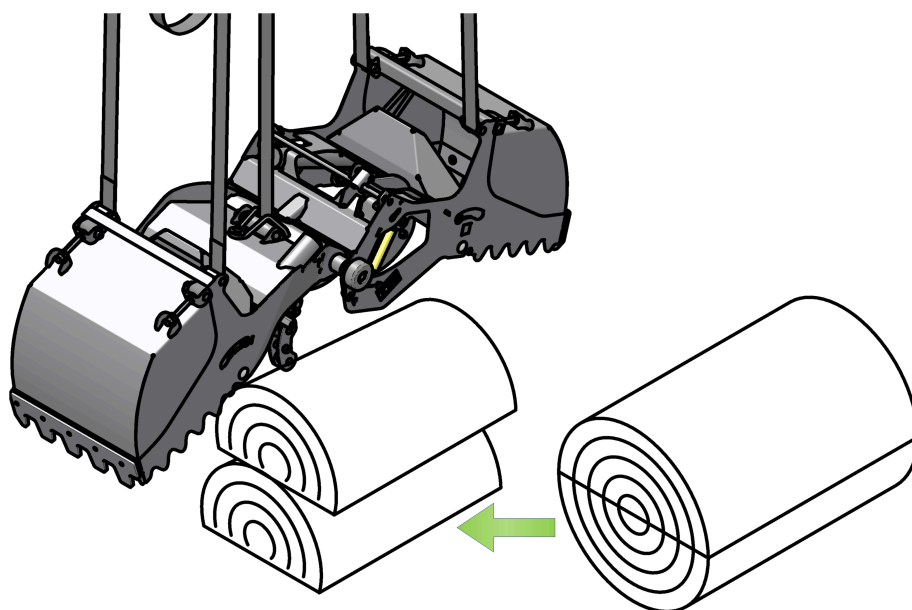


Figure 83. Example of grabbing round bales

8. Remove all equipment from the feed kitchen.
9. Put the feed kitchen in operation (see page 5-44).
When the feed kitchen goes in operation after the filling mode, all storage locations are set to filled.
10. Wait and check if the feed grabber has started and found the reset magnet.

5.9.2 Change the preferred storage place with the WebUI

1. Start the WebUI (see page 5-5).




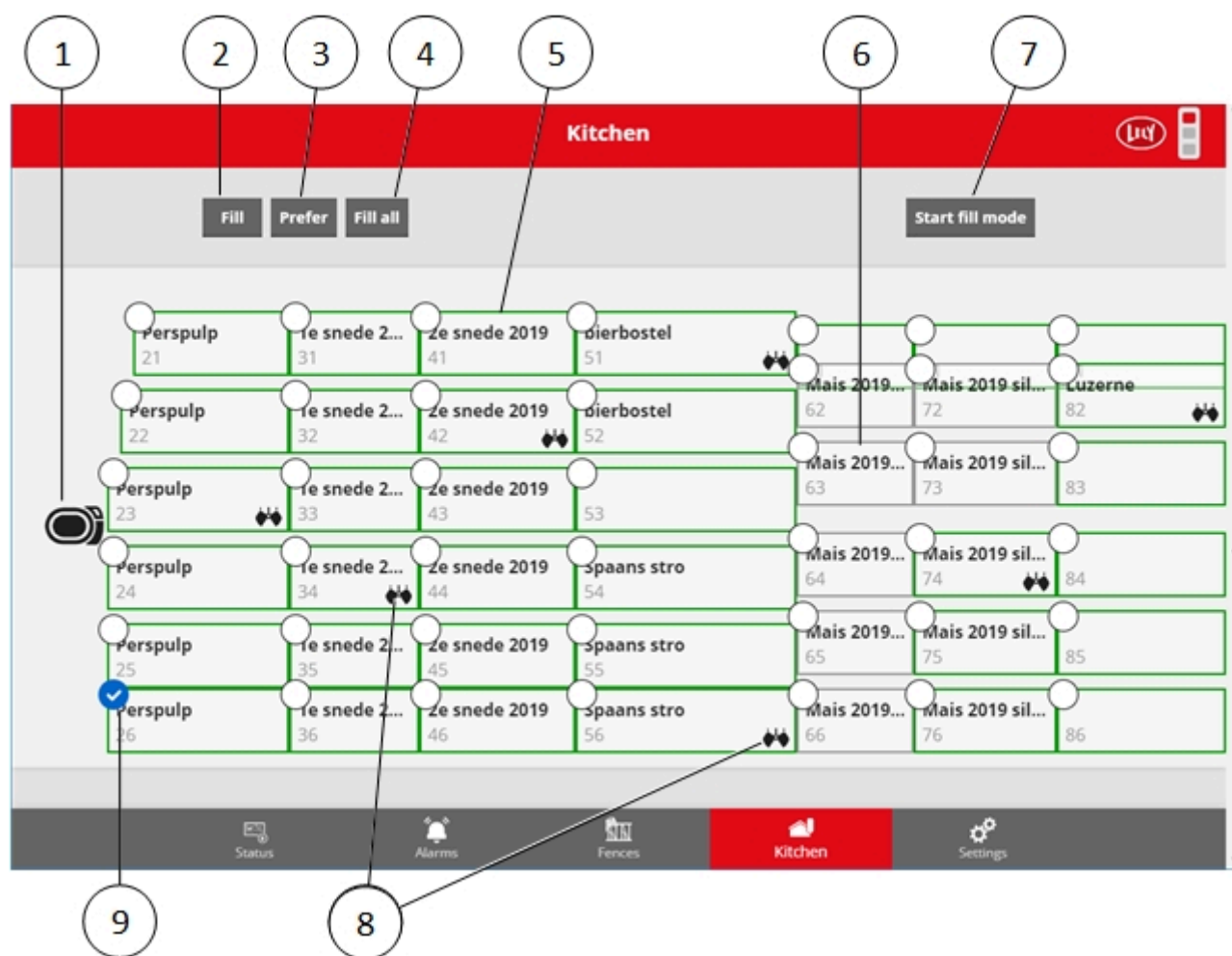
2. Push the button **Kitchen**.

- Click on the feed storage place.

When a block is selected a check mark appears .

- Push the button **Prefer** (3).

A grabber icon  (8) appears in the bottom right corner of the block. Per feed storage place only one feed type can be selected.




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Figure 84. Kitchen page

KEY: 1. Feed loading point - 2. Fill button, marks selected blocks as filled - 3. Prefer button, marks a selected block as a preferred block - 4. Fill all button, marks all storage places as filled - 5. Green border indicates the block is not empty - 6. Grey border indicates the block is empty - 7. Button to start the fill mode - 8. Icon indicates the preferred block of that feed type - 9. Icon indicates a selected block

5.9.3 Change the preferred storage place with the smartphone

- Open the Lely Control app on the smartphone and connect to the feed controller.
- Select the page **Feed kitchen> Storage places**.
- Select the feed storage place.

4. Push button  **Prefer**
Per feed storage place only one feed type can be selected.

5.10 Enter the feed kitchen

NOTICE

All entrances of the feed kitchen are secured to prevent entrance when the Feed Grabber is in operation. If a feed kitchen door, moving screen, the safety gate or the safety fence is opened, the emergency stop is activated. If you want to enter the feed kitchen you must put it in: **filling mode** (see Put the feed kitchen in the filling mode with the console on page 5-46).

1. Park the Feed Grabber and deactivate the gate/door(s) (see page 5-57).
2. Activate the feed kitchen (see page 5-57).

5.10.1 Park the Feed Grabber and deactivate the gate/door(s)

1. Put the Feed Kitchen in the filling mode (see Put the feed kitchen in the filling mode with the console on page 5-46).
2. Open the door or gate of the feed kitchen.

5.10.2 Activate the feed kitchen

1. Close all doors and gates of the feed kitchen.
2. Put the feed kitchen in operation (see page 5-44).

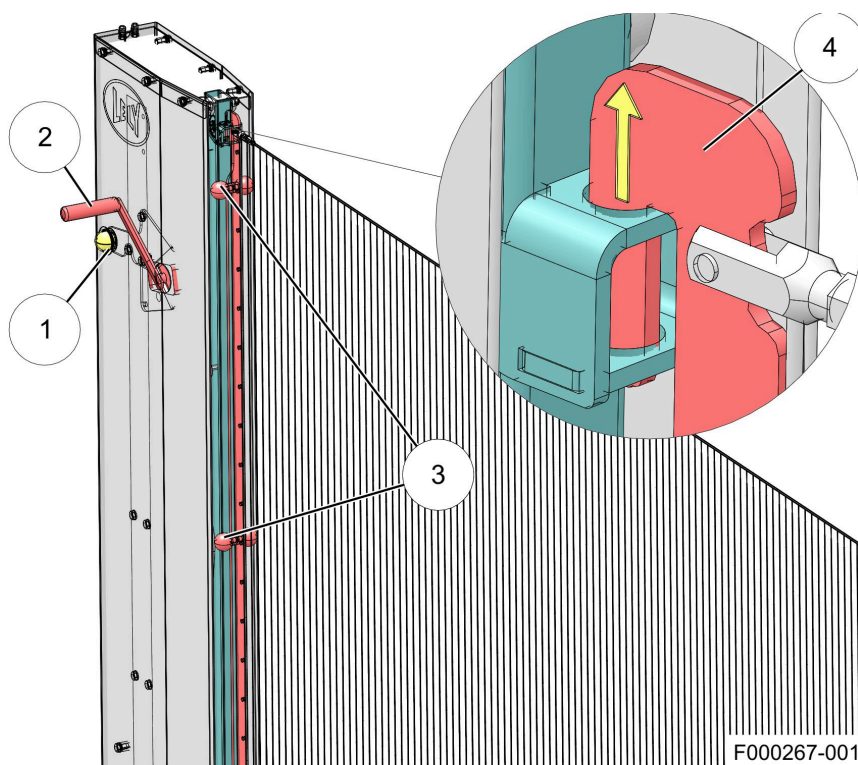
5.11 Open or close the safety fence

1. Put the feed kitchen in the filling mode with the console (see page 5-46).
2. Open the safety fence (see page 5-57).
3. Close the safety fence (see page 5-58).
4. Put the feed kitchen in operation (see page 5-44).

5.11.1 Open the safety fence

1. Turn the winch (2) to release the tension on the fence. Turn until the fence connector (4) no longer moves.
2. Use the handles (3) to lift and unhook the fence.

3. Drag the fence to the side and prevent that vehicles drive over it.



F000267-001

Figure 85. Open the safety fence

KEY: 1. Light - 2. Winch - 3. Handle - 4. Fence connector

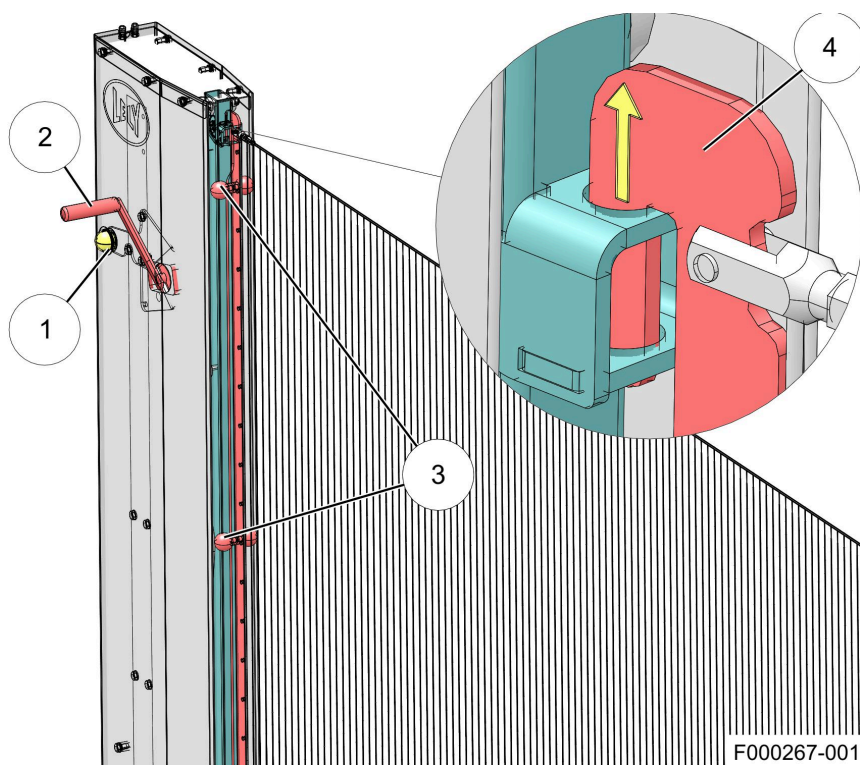
5.11.2 Close the safety fence

NOTICE

An extra margin is already taken into account when the light switches off. It is therefore not recommended to make any extra turns. Keep on turning will cause an overload and may damage the safety fence.

1. Use the handles (3) to lift and hook the fence connector (4) to the tension pole.

2. Turn the winch (2) to put tension on the fence. Stop turning until the light (1) is OFF.



F000267-001

Figure 86. Close the safety fence

KEY: 1. Light - 2. Winch - 3. Handle - 4. Fence connector

Safety fence light triggers:

- If for any reason the tension on the fence drops significantly or the fence is opened when the system is not in the filling mode, the light (1) will go on and an alarm will follow immediately.
- If the light went on, you must turn the winch to put tension on the fence until the light goes off.
- It is possible to put the Vector system into operation when the light is on. In that case, there is enough tension to have a safe situation, but the tension is insufficient for a reliable system. Safety related alarms are triggered much sooner in that case.
- **Always** turn the winch until the light goes off, before you put the feed kitchen in operation.

Closing the safety fence			
	Tension on the fence	Status of the system	Light on the tension pole
1	Insufficient tension	Unsafe and unreliable	On
2	Insufficient tension	Safe but unreliable	On
3	Sufficient tension	Safe and reliable	Off


5.12 Fill the additives dispenser (frequency pulse)





Crushing due to moving parts.
Risk of being crushed.
Keep hands, feet, hair and clothing away from all moving parts due to crushing.



Unexpected movement of the machine.
Risk of being crushed.
Take the MFRs out of operation and turn them off with the service key if no emergency zone settings or kitchen point settings have been set and are active.

1. If the MFR is at the feed loading location:
 1. Manually drive the MFR away from the feed loading location (see Drive the MFR manually on page 5-61).
 2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
 3. If necessary repeat step 1-2 for the second MFR.
2. Put the feed kitchen in the filling mode with the console (see page 5-46).
3. Remove the lid from the dispenser.
4. Fill the dispenser with a certain amount of additives.
5. Close the lid.
6. Calibrate the additives dispenser if a new type of additive is used. Otherwise calibrate the additives dispenser every month (see Calibrate the additives dispenser (frequency pulse) on page 6-36).
7. If the auger was empty, fill the auger:
 1. Take the feed controller (PDB) out of operation with the smartphone (see page 5-53).
 2. Go to the page **Service >FreqCon Pulse >Test FreqCon Pulse**.
 3. Tap 

A window appears with the number of the dispenser.
 4. Tap the white box that displays the number, set the number and push OK.
 5. Tap button  **PREFILL** to start the motor and fill the pipe.
 6. Wait until additives fall from the drop pipe and the auger is filled.
 7. Tap button  **PREFILL** to stop the motor.
 8. Put the feed controller (PDB) in operation with the smartphone (see page 5-51).

8. Put the feed kitchen in operation (see page 5-44).
9. If necessary:
 1. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
 2. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).
 3. Repeat step 1-2 for the second MFR.

5.13 Manual control the MFR

5.13.1 Drive the MFR manually




***Unexpected movement of the machine.
Risk of being crushed.
Make sure the MFR and its immediate surroundings are void of people
and animals. Only operate the MFR with the smartphone when it is in
your line of sight.***

1. Open the Lely Control Plus app and connect to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2).
2. Make sure the MFR is out of operation (see Take the MFR out of operation using the smartphone on page 5-47).







3. Tap **Manual control**.
4. Make sure you have a clear view on the MFR and acknowledge the question:
**SAFETY WARNING: Putting in operation is permitted only with a clear overview of the vehicle.
Continue?**

5. Tap, hold and slide the icon  of the MFR in the direction or turn you want to make, the MFR will move as long as you hold the icon.

NOTICE


For driving into the charge pole always use charge pole drive to prevent misalignment or driving into the charge pole too fast (see Connect the MFR manually to the charge pole on page 5-63).


You can drive the machine in the following directions:


-  forward
-  backward
-  turn left
-  turn right


You can combine the movements, for example when you slide the icon to the top left corner the MFR will drive forwards while turning left.


6. To drive certain movements automatically you can use the buttons in the ribbon:


- 


• **Strip follow:** to drive straight forward and detect the strip and follow the strip. The MFR only stops when the strip is no longer detected (end of the strip or a reset point) or when the button **Strip follow** is pushed again.
- 

• **Ultrasound drive left:** to follow a wall or fence at the left side of the MFR at the current distance from the wall or fence using ultrasound. The MFR only stops when the button **Ultrasound drive left** is pushed again.
- 

• **Ultrasound drive right:** to follow a wall or fence at the right side of the MFR at the current distance from the wall or fence using ultrasound. The MFR only stops when the button **Ultrasound drive right** is pushed again.
- 

• **Straight drive:** to drive straight forward. During straight driving you can adjust the drive speed with a slider. The MFR only stops when the button **Straight drive** is pushed again.
- 

• **Reverse straight drive:** to drive straight backward. During straight driving backward you can adjust the drive speed with a slider. The MFR only stops when the button **Reverse straight drive** is pushed again.
- 

• **Turn left:** to turn the MFR to the left. A screen appears to adjust the speed before you start the turn. The MFR only stops when the button **Turn left** is pushed again.
- 

• **Turn right:** to turn the MFR to the right. A screen appears to adjust the speed before you start the turn. The MFR only stops when the button **Turn right** is pushed again.



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5.13.2 Connect the MFR manually to the charge pole



***Unexpected movement of the machine.
Risk of being crushed.
Make sure the MFR and its immediate surroundings are void of people and animals. Only operate the MFR with the smartphone when it is in your line of sight.***

1. Open the Lely Control Plus app and connect to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2).
2. Make sure the MFR is out of operation (see Take the MFR out of operation using the smartphone on page 5-47).

3. Tap  **Manual control.**
4. Make sure you have a clear view on the MFR and acknowledge the question:
SAFETY WARNING: Putting in operation is permitted only with a clear overview of the vehicle.
Continue?
5. Manually drive the MFR (see Drive the MFR manually on page 5-61) towards the metal strip in front of the charge pole and make sure the MFR is on the strip with the charge plug toward the charge pole.
6. Tap  **Charge pole drive.**
The MFR follows the strip until it connects to the charge pole.



You can now put the MFR into operation (see Put the MFR in operation with the smartphone on page 5-47).

5.13.3 Manually dose feed from the MFR



Unexpected movement of the machine.
Risk of being crushed.
Make sure the MFR and its immediate surroundings are void of people and animals. Only operate the MFR with the smartphone when it is in your line of sight.





Crushing due to moving parts.
Risk of being crushed.
Make sure the MFR and its immediate surroundings are void of persons and animals. Stand clear from the MFR during this procedure.

1. Open the Lely Control Plus app and connect to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2).
2. Make sure the MFR is out of operation (see Take the MFR out of operation using the smartphone on page 5-47).

3. Tap  **Manual control.**



4. Make sure you have a clear view on the MFR and acknowledge the question:
SAFETY WARNING: Putting in operation is permitted only with a clear overview of the vehicle. Continue?
5. Manually drive the MFR (see Drive the MFR manually on page 5-61) towards the feed fence or location where you want to dump the feed from the mixing bin. The feed door of the MFR must stand parallel to the feed fence.

6. Go to  **Dose feed**, several buttons appear at the bottom, at the top is displayed how many kg feed is in the mixing bin.

7. Tap and hold  **Open** to open the feed door. Release it when the feed door is completely open.





When the feed door is completely opened, the feed is dosed while you drive the MFR. The feed is dispensed because the mixing auger and the dosing roll will automatically start turning when you drive the MFR and they will stop as soon as you stop driving.

8. Tap, hold and slide the icon  in the correct direction  to drive and dose feed along the feed fence.

NOTICE

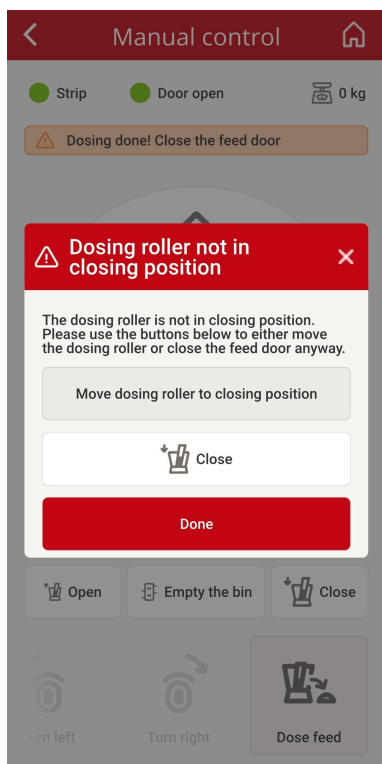
To start the empty the bin mode, the dosing speed must be below 20% of the expected speed, and the weight in the mixing bin must be less than 70 kg. Empty the bin mode gives a noise level of 72 dB.

9. Tap and hold  **Empty the bin**. The mixing auger and dosing roll will start to spin fast to throw out the last bit of feed to empty the mixing bin.

10. Release  **Empty the bin** to stop the mixing auger and dosing roll.



11. Tap **Close** a warning **Dosing roller not in closing position** appears. Tap **Move dosing roller to closing position**. Make sure the warning: **Dosing done! Close the feed door** appears in the app. The feed door can now be safely closed.



12. Tap and hold **Close** to close the feed door and wait until it is fully closed.
13. Tap **Done**.
14. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

5.13.4 Continue a route from a known route action



***Unexpected movement of the machine.
Risk of being crushed.
Make sure the MFR and its immediate surroundings are void of people and animals. Only operate the MFR with the smartphone when it is in your line of sight.***

NOTICE

If the MFR loses the route during a scan or feed task due to skid or obstacles, you can drive the MFR manually to a known route action. For example at the start of a turn or strip follow action. From that point you can restart that route action and continue the task.

1. Make sure all alarms are accepted (see Reset the alarm on the MFR and continue the task on page 5-85).
2. Make sure the MFR is out of operation (see Take the MFR out of operation using the smartphone on page 5-47).



3. Go to **Manual control**.

4. Make sure you have a clear view on the MFR and acknowledge the question:

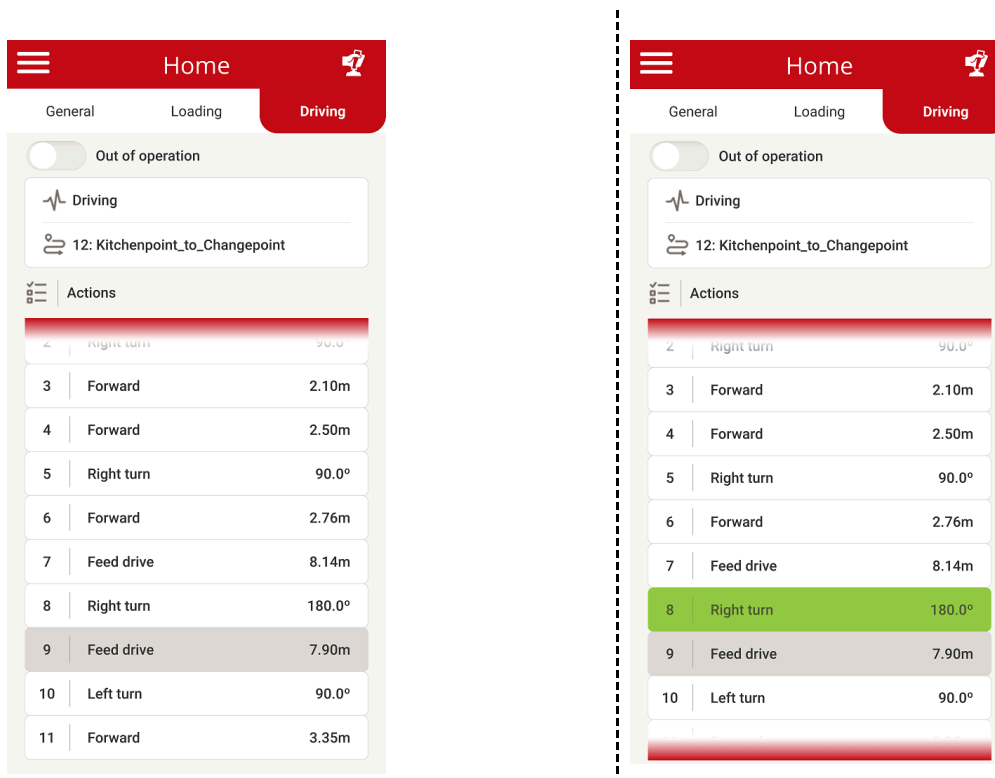
SAFETY WARNING: Putting in operation is permitted only with a clear overview of the vehicle.
Continue?



5. Manually drive the MFR (see Drive the MFR manually on page 5-61) towards the starting point of the known route action.

6. When the MFR is at the start of the route action and positioned in the correct direction: go to **Home** and tap **Driving**.



7. Tap and hold the route action on the screen until the line turns green.
In the example below the MFR stopped at route action 9, the MFR was driven manually to the start of route action 8. In the figure on the right, route action 8 is selected.



8. Turn on the  **Out of operation** toggle to  **In operation**.
9. Make sure you have a clear view on the MFR and acknowledge the question:
SAFETY WARNING: Putting in operation is permitted only with a clear overview of the vehicle. Continue?
10. A question will appear if you are sure to switch from the old to the new action in the route. Tap **Yes** the MFR resumes the route from the selected route action.
11. If the MFR now generates an alarm because the reset point or strip can not be found but the reset point or strip is nearby, refer to: Reset the alarm on the MFR and continue the task (see page 5-85).

12. If the MFR has been completely off route and there was no route present anymore, use the following procedure to get the MFR back to the charge pole:

1. Drive the MFR manually to the charge pole (see Drive the MFR manually on page 5-61)
2. Go to **Routes**.
3. Select the route action for the MFR to move away from the charge pole.

4. Tap  **Start**.

NOTICE


Be aware this is a test function for driving a route, not an autonomous action. The MFR will not stop when you press the pause button on the MFR, always use the pause button in the LCP app. Be aware that the MFR will be out of operation when it has finished the route.

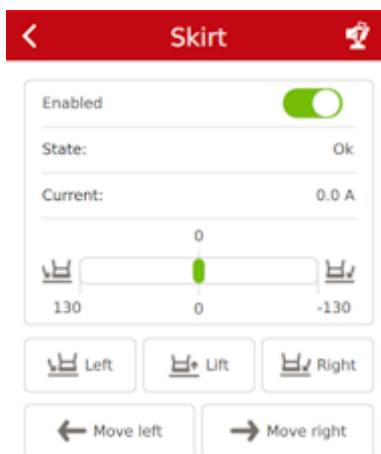
5. Put the MFR in operation again to start automatic operation (see Put the MFR in operation with the smartphone on page 5-47).

5.14 Enable or disable the skirt or counter knife


1. Open the Lely Control Plus app and connect to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2).
2. Take the MFR out of operation using the smartphone (see page 5-47).

3. Go to  menu overview.
4. Tap **Service > Motors > Skirt**.

5. Enable or disable the skirt with the toggle button .



6. Tap **Service >Motors > Counter knife**.

7. Enable or disable the counter knife with the toggle button .



5.15 Lower the skirt of the MFR to clear the route of snow

NOTICE

De-icing salt is not preferred on the routes of the MFR. This may cause corrosion and damage the MFR. It is best to use sand.

During periods of frost and snowfall the routes of the MFR outside the barn must be de-iced and cleared of snow. During this period it is recommended to let the MFR drive outside the barn with a lowered skirt. With heavy snowfall use for example a shovel to clear the route.

1. Start the WebUI (see page 5-5).



2. Go to **Settings**.

3. Go to **Routes**.

4. Select a route (➔).

5. Scroll to the route actions outside the barn and select it (➔).
A page with details of the route action is shown.

6. Turn on the toggle **Skirt down**, the toggle is now red:

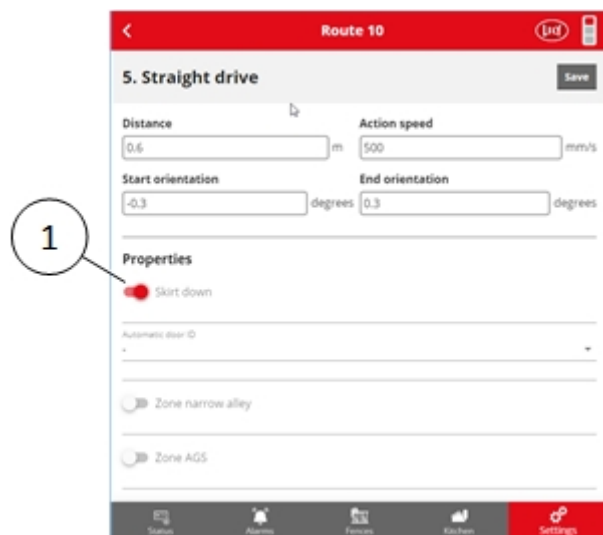


Figure 87. Route detail action page

KEY: 1. Skirt down switch

7. Tap **Save**.

In the list of route actions a skirt icon is displayed to show the skirt is down on that route action:


8. Repeat step 4-7 for all route actions outside the barn.

When there is no longer risk of snow and ice on the route, the skirt must be set in the lifted position while driving outside the barn. Repeat the procedure described above but in step 6 turn off the toggle,

the toggle must be grey:  Skirt down .



Instead of changing the setting on each route action separately, you can push the button **Edit properties**. A drop down list with all possible switches is shown in the top of the screen and boxes appear in front of all route actions.

- Select a toggle, in this case **Skirt down**.
- Set the toggle to the correct position.
- Select all route actions you want to change, when a route action is selected a check mark appears .
- Tap **Save**.

5.16 Start a feed or scan task manually

5.16.1 Settings necessary for a manual feed or scan task

After all Vector settings are set in Horizon for automatic operation, it is also possible to start manual tasks with the PDB software (feed controller).

The Horizon settings that are necessary for the Vector system are:

- Settings for the routes (fences, scan interval).
- Settings for the feed fences (locations with animals, rations, feed height).
- Settings for the feed kitchen (storage location of feed types).
- Settings for the rations (amounts of feed types, mixing order, mixing times).
- Library settings for feed types.

5.16.2 Start a feed task manually

1. There are three ways to start a feed task manually:
 1. Start a feed task manually with the WebUI (see page 5-73).
 2. Start a feed task manually with Horizon (see page 5-74).
 3. Start a feed task manually with the smartphone (see page 5-74).

5.16.2.1 Start a feed task manually with the WebUI

1. Start the WebUI (see page 5-5).



2. Click on the button **Fences**.

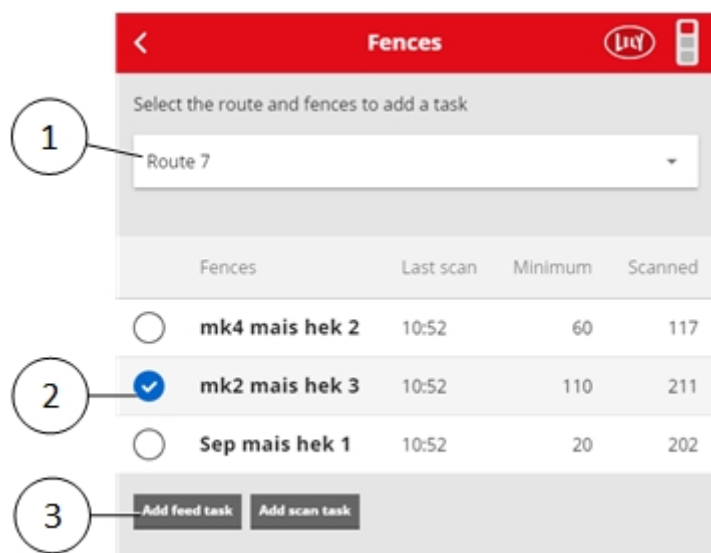
3. Click on the button **Add a task** (1).

4. Select the route or combined routes in the drop down list (1).

5. Select one or more fences, when a fence is selected a check mark appears (2).

6. Click on the button **Add feed task** (3).

All tasks including the pending manual tasks are shown in the order of execution.



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Figure 88. Add manual tasks page

KEY: 1. Drop down list to select route - 2. Selected fence - 3. Button to add a feed task for selected fences



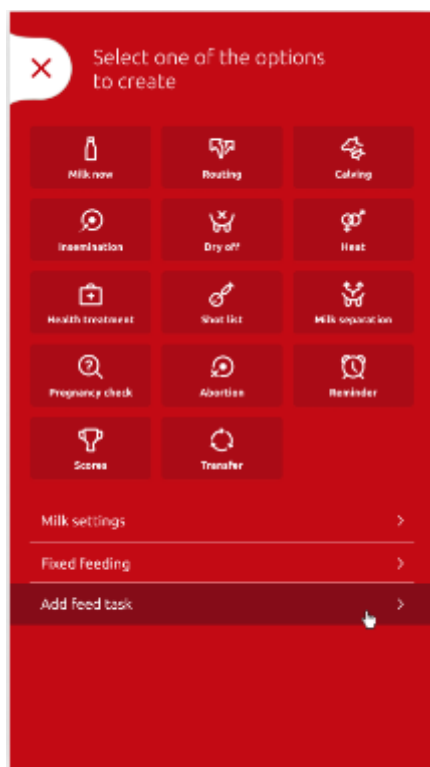
The tasks start when the MFR is in operation and connected to the charge pole under the feed loading point, the PDB and feed kitchen are in operation.

When all the tasks are done, the system will continue to work automatically.

If you want to delete a manual task in the list, push the button at the end of a line.









5.16.2.2 Start a feed task manually with Horizon

1. Go to the Horizon PC and in Horizon push the plus button in the navigation bar.
A list of options to create appears:



2. Click on the line **Add feed task** to start a manual feed task.

5.16.2.3 Start a feed task manually with the smartphone

1. Open the Lely Control app and connect to the feed controller (PDB) (see Connect the Lely Control app to the machine on page 5-4).
2. Go to **Manual tasks**.
3. Tap  **Feed**.
4. Use  and  and tap  **Select** to select a route.
A page appears with the fences with animals on the route.
5. Use  and  and tap  **Add** to add a fence to the task list.
6. If one fence is selected, it is possible to add another fence if there is another fence in the same feed section on the route with the same ration.
The fences that can not be combined have - - signs behind them.
7. When all fences are added, tap  **Done**
All tasks are shown in the order of execution.

8. Tap  to start the list of tasks.



The tasks start when the MFR is in operation and connected to the charge pole under the feed loading point and the feed kitchen is in operation.

When all the tasks are done, the system will continue to work automatically.

5.16.3 Start a scan task manually

1. There are three ways to start a scan task manually:
 1. Start a scan task manually with the WebUI (see page 5-75).
 2. Start a scan task manually with Horizon (see page 5-76).
 3. Start a scan task manually with the smartphone (see page 5-76).

5.16.3.1 Start a scan task manually with the WebUI

1. Start the WebUI (see page 5-5).




2. Click on the button **Fences**.
3. Click on the button **Add a task**.
4. Select the route or combined routes in the drop down list.
5. Click on the button **Add scan task**.
All tasks are shown in the order of execution.



The tasks start when the MFR is in operation and connected to the charge pole under the feed loading point, the PDB and feed kitchen are in operation






When all the tasks are done, the system will continue to work automatically.

If you want to delete a manual task in the list, push the button  at the end of a line.

5.16.3.2 Start a scan task manually with Horizon

1. Go to the Horizon PC and in Horizon push the plus button in the navigation bar.
2. Click on the line **Add scan task** to start a manual scan task, make sure no fences are selected: the button will change to add feed task.

5.16.3.3 Start a scan task manually with the smartphone

1. Open the Lely Control app and connect to the feed controller (PDB) (see Connect the Lely Control app to the machine on page 5-4).
2. Go to **Manual tasks**.
3. Tap  **Scan**.
4. Use  and  and tap  **Select** to select a route.
The manual task(s) is shown on the page.
5. Tap  to start the list of tasks.




The tasks start when the MFR is in operation and connected to the charge pole under the feed loading point, the PDB and feed kitchen are in operation.

When all the tasks are done, the system will continue to work automatically.

5.17 Change the feedstuff in a feed storage place

1. Put the feed kitchen in the filling mode.
2. In the feed kitchen, determine the feed storage places where the new feedstuff will be set and write down the numbers.
3. Fill the feed storage places, and do not put the feed kitchen in operation yet.

4. Go to the Horizon PC and in Horizon:
 - If necessary add the new feedstuff to the library (click on the + sign and select **Add Feedstuff** fill out the form, activate the feedstuff and click on **Apply Changes**).
 - On the feed kitchen page (**Manage>Feed>Feed kitchen** select **Feed grabber**) click on the storage place which needs to be changed, select via the drop down menu the new feedstuff and click on **Apply Changes**.
 - Remove the old feedstuff from the rations (**Manage>Feed>Mixed ration**, select a ration and on the ration composition page 1 click on  to remove the old feed stuff and click on **Apply Changes**).
 - Add the new feedstuff to the rations (**Manage>Feed>Mixed ration**, select a ration and click on the plus symbol and add the feed stuff to the ration composition (page 1) and click on **Apply Changes**).
 - Make sure you also enter the feed stuff at the second mixed ration page (**Manage>Feed>Mixed ration**. Make sure you add the feedstuff in the desired loading order step.
 - The next new feed task received by the MFR can use the new or changed feedstuff from the storage place(s).
5. Put the feed kitchen in operation.
6. If applicable, update the board near the PDB showing all feed types.

5.18 Change the feed in the digital output

During installation the Lely technician made settings for the feed in the digital output.




The first time the digital output is used and when the digital output is filled with a new feedstuff, a person must be present to view how much feed is loaded. The first time the feed is loaded into the mixing bin the system assumes a certain flow, but that can be different from the actual flow. Make sure the mixture is safe to feed to the animals. If it is not safe, for example if too much is loaded by the digital output, you must empty the mixing bin and discard the feed. The second time the feed is loaded, the system has “learned” what the flow is.

If a new type of feed causes too many alarm messages, you must ask your Lely technician to adjust the settings.

5.19 Drive the feed grabber manually

NOTICE



A no go zone is an area in the feed kitchen with a wall or equipment over which the feed grabber must never drive. If there is a no go zone in your feed kitchen, first drive the bridge crane away from the no go zone before you drive the feed grabber when necessary.

1. Take the feed grabber out of operation (see page 5-53).
2. Push  to go to the menu.
3. Go to the page **Testing > Test Drive Motor**. Use the password you received from your Lely technician.
4. Use the buttons  **BACKWARD** or  **FORWARD** to drive the feed grabber.

5.20 Drive the bridge crane manually

NOTICE

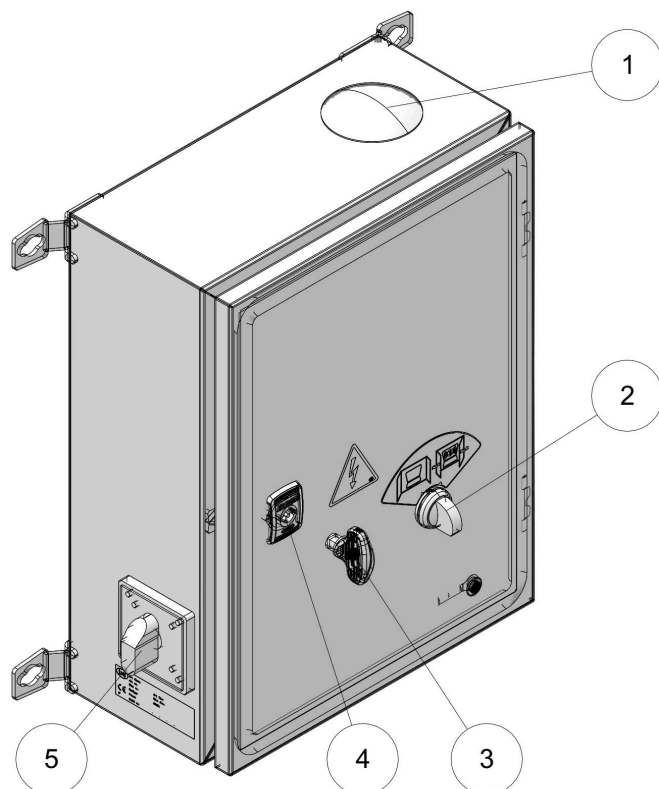
A no go zone is an area in the feed kitchen with a wall or equipment over which the feed grabber must never drive. If there is a no go zone in your feed kitchen, first drive the feed grabber away from the no go zone before you drive the bridge crane when necessary.

1. Take the bridge crane out of operation (see page 5-54).
2. Go to the page **Manual operation > Driving**. Use the password you received from your Lely technician.
3. Use the buttons  **Backward** or  **Forward** to drive the bridge.

5.21 Set the automatic (barn) door control

5.21.1 Set the automatic (barn) door to automatic control

1. Turn the switch (2) on the door control box to automatic open-close.



F000173-001

Figure 89. Barn door control box

KEY: 1. Bluetooth antenna - 2. Continuously open / auto open-close switch - 3. Key - 4. Door lock - 5. Main power supply switch



The software will open the door and when the Lely switch detects that the door is open a message is send to the MFR that it can drive through it.

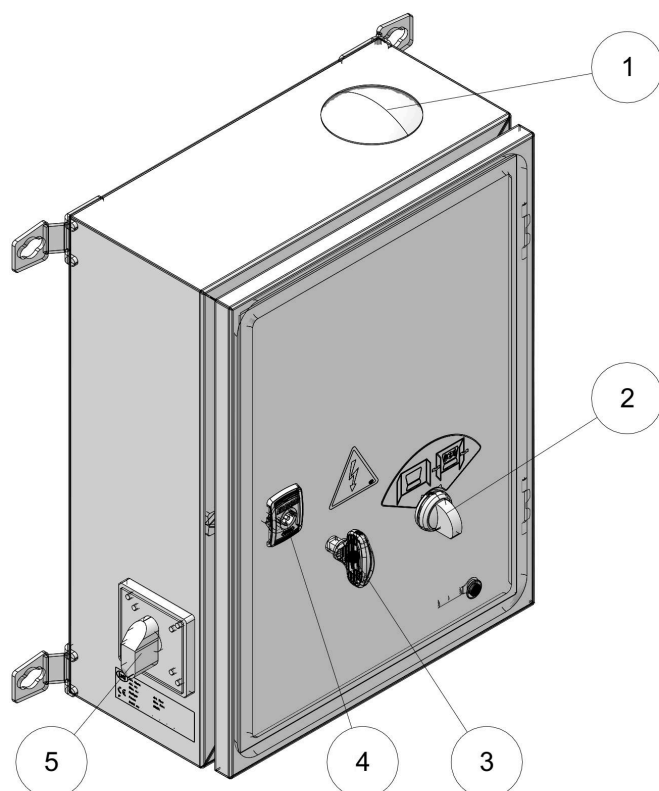
2. Release or activate the door control, see the manual of the supplier of your automatic door.

5.21.2 Set the automatic (barn) door to continuously open

NOTICE

With continuously open the software will no longer monitor the door control, but sends a message to the MFR that the door is open when the MFR wants to pass. The software will not close the door when the continuously open switch is active.

1. Manually set the automatic door to continuously open, see the manual of the supplier of your automatic door.
2. Turn the switch (2) on the barn door control box to manual.



F000173-001

Figure 90. Barn door control box

KEY: 1. Bluetooth antenna - 2. Continuously open / auto open-close switch - 3. Key - 4. Door lock - 5. Main power supply switch

5.22 Alarm handling

5.22.1 View all alarms

5.22.1.1 View all alarms

To get an overview of all alarms you can display the list in two ways:

- View the alarm list on the WebUI (see page 5-81).
- Start Horizon and go to the page **Alarms**.

5.22.1.2 View the alarm list on the WebUI

1. Start the WebUI (see page 5-5).



2. Open the **Alarms** page.
The page shows the last 100 alarms.

5.22.1.3 View the alarm list on the MFR

1. Open the Lely Control Plus app and connect to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2).



2. Go to menu overview.
3. Go to **Alarms**. The page shows the last 100 alarms in the past two weeks on the MFR.

5.22.2 Read and accept alarms and continue operation

5.22.2.1 General information


You can either use the WebUI or the smartphone to accept alarms of the feed controller (PDB) and other devices.

However, the active alarms of the MFR are only shown in the feed controller after the MFR was able to make contact with the PDB via WiFi.

If there is a safety related or a critical alarm on the MFR, the MFR stops operation. The safety light blinks and an alarm signal sounds of four beeps every minute. If the MFR stopped on the route during a scan or feed task, you must reset the alarm on the MFR.

5.22.2.2 Use the smartphone to accept alarms and continue operation



1. Open the Lely Control app on the smartphone and connect to the feed controller (PDB).
2. If there is an alarm on the feed controller it is shown on the display.

3. Read the alarm message and remove the cause of the alarm, if necessary see chapter Troubleshooting what actions should be taken to remove the cause.
4. Tap  to confirm the alarm message.
5. If there is an alarm on another device go to the page **Alarms > Active alarms**.
6. Continue to steps 7-12 in Use the WebUI to accept alarms and continue operation (see page 5-82).

5.22.2.3 Use the WebUI to accept alarms and continue operation

1. Start the WebUI (see page 5-5).



2. Click on the button  **Alarms**.
3. If there is an alarm on the Feed Controller or another device, it is shown in the list of **Active alarms**.
4. Read the alarm message and remove the cause of the alarm, if necessary see chapter Troubleshooting what actions should be taken to remove the alarm.
5. If there is an accept button behind the alarm message, click on **Accept** to confirm the alarm message, no further actions are necessary.
6. If there is an alarm on another device, this is shown in the list **Active alarms**.
7. If the alarm is on the feed grabber or bridge crane:
 1. Open the Lely Control app on the smartphone and connect to the feed grabber or bridge crane with the alarm.
 2. Read the alarm message and resolve the alarm, if necessary go to the chapter Troubleshooting to see what actions should be taken to remove the cause of the alarm.
 3. Tap  to confirm the alarm message.
8. If the alarm is on the MFR: Reset the alarm on the MFR and continue the task (see page 5-85).

9. If the MFR gave the alarm that the automatic barn door could not be closed or opened:
 1. Remove any blockage from the automatic door.
 2. Make sure the sensor is still in the correct position and can detect that the door is open or closed.
 3. Use the buttons on the controller of the supplier of the door to reset the alarm.
 4. Open and close the door.
-

NOTICE

If you connect the smartphone to the barn door and it shows to be in an error state and the barn door is open, then there is a good chance that it was opened by the door's own safety system the last time it was supposed to close. If the "door open" sensor still detects that the door is "open" after a considerable time, the control box of the door will go into an error state. Now a restart of the door control box is required to reset it, but first investigate (and resolve) what caused the door to open again during closing.

5. If this does not work, restart the barn door system by switching the power OFF for a few seconds and ON again.
6. Open the Lely Control Plus app on the smartphone and connect to the MFR.
7. Tap the button **Accept** to confirm the alarm message.
8. Test the automatic barn door (see page 7-48).

10. If the alarm comes from the additives dispenser (frequency pulse):
 1. Make sure the bin is not empty and the transport pipe is not clogged, especially check if the drop pipe that drops feed into the MFR is not clogged.
 2. Open the Lely Control app on the smartphone and connect to the feed controller (PDB).
 3. Go to the page **Alarms > Active alarms**.
 4. Tap the button **ACCEPT**.
 5. Test the additive dispenser (frequency pulse), go to the page **Service > FreqCon Pulse > Test FreqCon Pulse**
 6. Tap .
A window appears with the number of the dispenser.
 7. Tap the white box that displays the number, set the number and tap OK.
 8. Tap and .
A window appears with the weight.
 9. Tap the white box that displays the weight, set the weight for testing and tap OK.

NOTICE

Be aware that feed falls from the feed pipe during the test.

10. Tap .
The additive dispenser (frequency pulse) will operate and dose the additive with the set weight. During operation check if the light of the sensor (3) (see figure 91 on page 5-84) or (5) (see figure 92 on page 5-84), blinks with every pulse, if it is OFF the sensor is broken. Check if the set weight is dispensed, if not calibrate the additive dispenser (frequency pulse) (see Calibrate the additives dispenser (frequency pulse) on page 6-36).

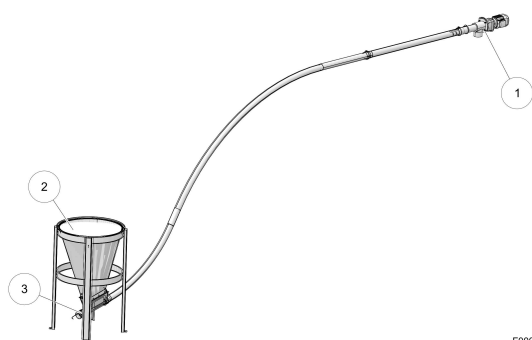


Figure 91. Conventional dispenser

KEY: 3. Sensor -

F000151-002

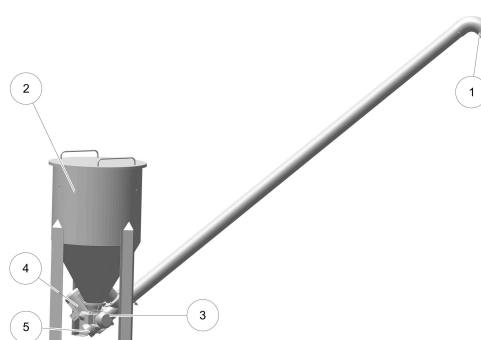


Figure 92. Dispenser with stir motor

KEY: 5. sensor -

11. If necessary reset the MODalarm (see Reset the MODalarm on page 5-88).

12. When all alarms are solved and accepted and all devices are in operation, the Vector system will automatically continue operation.

5.22.2.4 Reset the alarm on the MFR and continue the task



Unexpected movement of the machine.

Risk of being crushed.

Make sure the MFR and its immediate surroundings are void of people and animals. Only operate the MFR with the smartphone when it is in your line of sight.



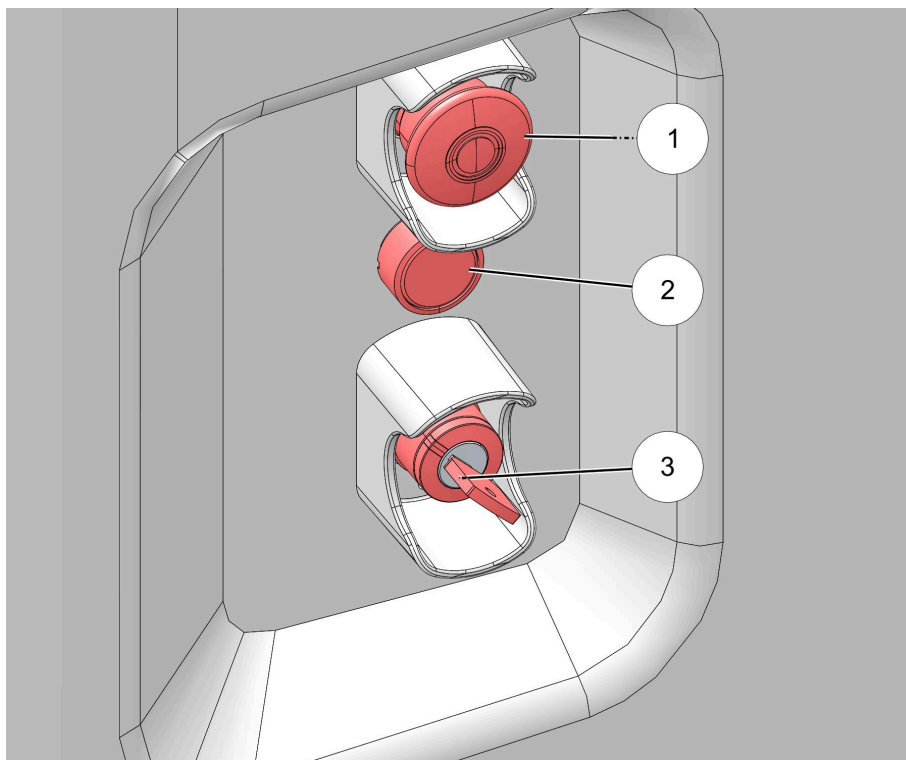
NOTICE

When an unfinished task is still present when the MFR is put back into operation a question appears if you want to continue that task.

- Use Yes, if you stopped during a feed task and want the MFR to continue where it stopped. If it was waiting for the feed grabber to dump feed in the mixing bin, the MFR will send the task to the feed grabber again. If it was driving a route action it will continue with the route action.
 - Only use No, if you want all data from the feed task to be deleted and you want the feed controller to send a new task to the MFR. Keep in mind that when a task is stopped after feed has been dispensed at the feed location, this data is lost and is not reported to Horizon.
-

1. Open the Lely Control Plus app and connect to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2).
2. Read the alarm message in the popup screen. If necessary call your local Lely service provider for help.
3. Resolve the alarm, if necessary go to the chapter Troubleshooting to see what actions should be taken to remove the cause of the alarm.

4. Push the pause button (2). Tap **Accept** to confirm the alarm message.



KEY: 1. Emergency button - 2. Pause button - 3. Service key

5. A question appears: **Continue task?**, select:

- **Yes:** to allow the MFR to resume the feed or scan task. Make sure you have a clear view on the MFR and acknowledge the question:
SAFETY WARNING: Putting in operation is permitted only with a clear overview of the vehicle.
Continue?
- **No:** to stop the feed or scan task. You must manually drive and connect the MFR to the charge pole and put it in operation.
- **Manual control:** to drive the MFR manually to a location on the route.

1. Perform the steps 2-3 below if **Manual control** is selected.

2. Make sure you have a clear view on the MFR and acknowledge the question:

SAFETY WARNING: Putting in operation is permitted only with a clear overview of the vehicle.
Continue?

3. Drive the MFR manually to the location where the MFR interrupted the route. You can restart the route from a previous or next route action, see Continue a route from a known route action (see page 5-66).

6. Select **Yes** to continue the task.

7. If the MFR now generates an alarm because the reset point or strip can not be found but the reset point or strip is nearby, repeat this procedure.

5.22.2.5 Reset an emergency button in or near the feed kitchen



**Unexpected movement of machines.
Risk of being crushed.
Make sure the feed kitchen is void of people, animals, machines or anything other than roughage.**

1. Pull the emergency button (2) out until it locks.

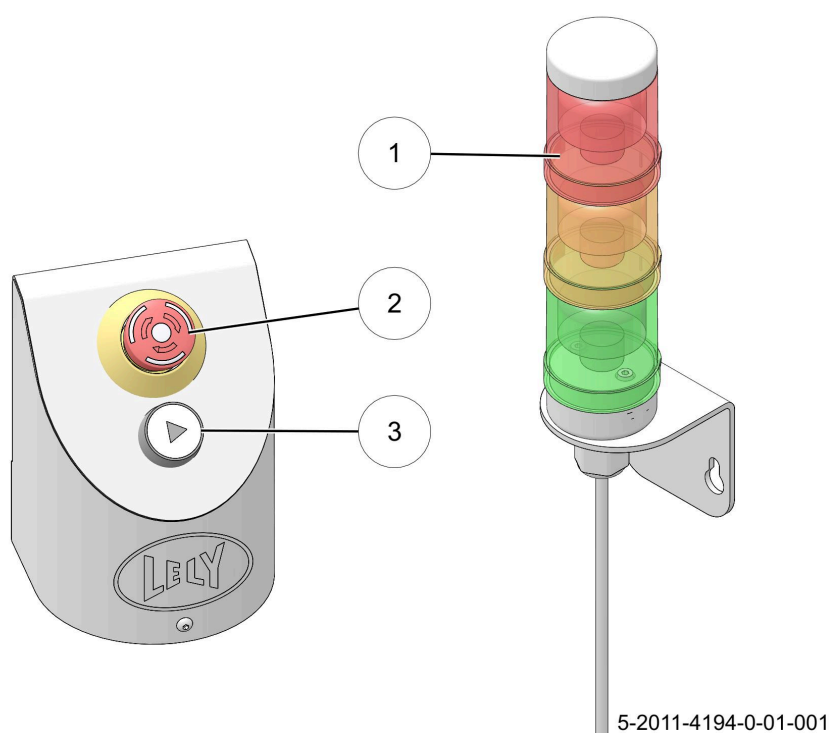


Figure 93. Console and signal lights

KEY: 1. Signal lights - 2. Emergency button - 3. Start button

2. Make sure:
 - The feed kitchen is void of people, animals, machines or anything other than roughage.
 - The safety fence is closed.
 - All gates and feed kitchen doors are closed.
3. If necessary reset the MODalarm (see Reset the MODalarm on page 5-88) or the alarm on the CRS.
4. On the console push the start button (3).
The start button starts blinking and the system tests if all gates are closed and emergency stop buttons are in safe position.
5. Wait until the light in the start button is continuously on.
If necessary manually put the feed grabber and/or bridge crane in operation.

6. On the console push the start button again.

5.22.2.6 Reset the MODalarm


Reset the MODalarm

NOTICE

There is only one type of alarm that is not generated by the Vector system but by the MODalarm . This is the Watchdog alarm and this has to be reset in the MODalarm. The watchdog alarm indicates there is a problem with the Ethernet connection to the PDB, or if the PDB does not respond (because of software problems). First investigate and resolve the problems with the connection to the PDB, and then reset the MODalarm. All other alarms are reset in the MODalarm when they are solved and accepted in the Vector system.

1. You can reset the MODalarm on the CRS (if this is installed), on the smartphone or on the Horizon PC.
 1. Reset the MODalarm on the smartphone in the feed controller.
 2. Reset the MODalarm on the Horizon PC.

Reset the MODalarm on the smartphone in the feed controller

1. Open the Lely Control app on the smartphone and connect to the feed controller (PDB).
2. Go to the page **Alarms > Reset ModAlarm**.
3. Push the button  **RESET**, to reset the MODalarm.

Reset the MODalarm on the Horizon PC

NOTICE

Do this procedure on the Horizon PC or on a PC connected to the farms network that is connected to the MODalarm of the Vector.

1. On the web browser go to the page: <http://10.4.1.210>
2. Wait until the page is found, in the top bar three options are displayed:
 - Login.
 - Connected devices.
 - Active alarms.
3. Click on login and use the username and password you received from your Lely technician to log in.
4. Select the device at **Connected devices**.
5. Click on **Reset alarms** to reset the alarms.

5.22.3 Add or change a phone number in the MODalarm

5.22.3.1 Preparation to add or change a phone number

NOTICE

Do this procedure on the Horizon PC or a PC connected to the farm network that is connected to the MODalarm of the Vector. Use the login name and password you received from your Lely technician.

1. Start a web browser on the Horizon PC.
2. On the web browser go to the page: <http://10.4.1.210>.
3. Wait until the page is found and the tab **Dashboard** is displayed.

The screenshot shows the MODalarm web interface. At the top, there is a red header with the LELY logo and the text 'Producers in agriculture'. Below the header, there is a navigation bar with a 'Dashboard' tab selected. A notification banner at the top of the dashboard reads: '28-10-2013 18:18 The SMS Service Center number is not on the SIM card'.

The main content area is divided into several sections:

- Login:** A form with fields for 'Username' and 'Password', a 'Login' button, and a message: 'Session expired, please login again'.
- Information:** A table displaying system details:

System language	English (en)
Primary interface	GSM (Not available)
Secondary interface	PSTN (No network)
MAC address	00:18:31:88:D8:42
Serial number	MP2-124007
Product type	M20000A-PG-X101
Software version	1.0.7_NewDb
T-code	7255
- Connected devices:** A table listing alarms:

Alarms	LDN nr.	Name	Type
1	210	Modalarm	Modalarm
1	85	Vector	Vector
- Active alarms:** A table listing active alarms:

Mr	LDN nr.	Type	Active alarms	Date	Time
1000000002	210	Modalarm	Unknown alarm (Critical)	28-10-2013	20:52
1000000003	85	Vector	Watchdog alarm (Critical)	28-10-2013	20:51
- Logbook:** A table listing log entries with columns for 'Timestamp', 'Module', and 'Message'. The messages include various alarm notifications and system events.

4. Enter the username.
5. Enter the password.
6. Tap **Login**.
Next to the tab **Dashboard** the following tabs are displayed:
 - Phonebook
 - Logbook
 - Profile
 - Settings

7. If applicable: click on **Reset** to reset the alarms of a device.

5.22.3.2 Add a contact

NOTICE

The sequence of the names is the sequence in which the contacts will be called. The contact at the top of the list will be called first. If you want to change the order, you can click on a name and drag it to the position in the phone book you want.

1. Go to the tab **Phonebook**.
2. Tap **Add contact**.

KEY: 1. Phonebook - 2. Add contact

3. Type the:
 - Name
 - Phone number
 - a four digit pincode

Add contact ✕

Name *

Phone number *

Pincode *

Wait time sec.

Day Yes No

Night Yes No

Sms Yes No

4. Waiting time can be adjusted based on preference, usually 30-40 seconds is sufficient as a waiting time. The wait time is the time the MODalarm waits for the contact person to pick up the phone before calling the next contact.

5. Check the box for the part of the day the person may be called.
6. Check the box SMS if the person needs to receive an SMS message with the alarms after the call.
7. Tap **Save**.

5.22.3.3 Change the phone number or day and night period

1. Click on the tab **Phonebook**.
2. Find the line with the name of the person you want to make changes for, click on the right side on **Edit**.
3. Edit all changes for this contact.
4. Tap **Save**.

5.22.3.4 Change the start of the day or night schedule for calling

1. Use your mouse to put the cursor above the left dark square on the timeline.
2. Click on the left mouse button and drag the square to the left or right, On the right the period of the day and night schedule change.
3. Repeat steps 1-2 for the right dark square.
Time settings are valid for all contacts.
4. Tap **Edit** behind the text **Day time alarms**.
5. Select the new person and click on ► to add the person to the list.
6. Tap **Save**.
7. Repeat steps 2-4 for **Night time alarms** and **Attentions**.
8. Tap **Logout**.



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6 Maintenance



**Electric shock.
Risk of severe injury or death.
Electrical maintenance is only permitted by a certified Lely technician. Do not perform any maintenance on the electrical system.**



This chapter contains the preventive maintenance schedule and the applicable preventive maintenance procedures for the Vector system.

6.1 Preventive maintenance schedule (farmer)

The following tables show the preventive maintenance schedule for the Vector system defined by Lely. When performing preventive maintenance, comply with all applicable local regulations.



The frequency of the tasks shown in the tables are the minimum recommended frequency.

Maintenance during the day

Task	Hours
Examine the attention alarms in Horizon.	8
Examine the attention list in Horizon.	8
Examine the feeding reports in Horizon (see page 6-3).	8
Examine the MFR feeding at the feed fences (see page 6-3).	8
Examine the stock (see page 6-33).	8

Daily maintenance

Task	Days
Correct the number of animals in the group in Horizon.	1
Sweep the feed kitchen and remove spilled feed.	1
Fill the feed kitchen (see page 5-54).	1-3

Weekly maintenance

Task	Weeks
Clean and inspect the feed loading point (see page 6-34).	1
Examine and if needed replace the metal strips (see Metal strips on page 6-4).	1
Clean the feed height laser on the MFR (see page 6-9).	1
Clean the safety light on the MFR (see page 6-17).	1
Clean and test the obstacle detection sensors (see page 6-10).	1
Clean the ultrasonic sensors on the MFR (see page 6-12).	2
Clean the feed height laser on the feed grabber (see page 6-28).	2
Clean the additives dispenser(s) drop pipe (frequency pulse) (see page 6-35).	2
Clean the dosing roll, position sensor and dosing motor on the MFR (see page 6-13).	2
Clean the magnets on the MFR (see page 6-16).	2
Clean the head- and taillights on the MFR (see page 6-19).	2

Maintenance during the year

Task	Months
Calibrate the additives dispenser (frequency pulse) (see page 6-36).	1
Examine the skirt condition (see page 6-20).	1
Examine the mixing auger knives (see page 6-22).	1
Clean the feed grabber teeth (see page 6-32).	1
Use compressed air to remove all dirt from the dosing roll and dosing motor of the MFR (see Clean the dosing roll, position sensor and dosing motor on the MFR on page 6-13).	2
Clean the MFR (see page 6-24).	2
Examine the drive wheels (see page 6-26).	3
Examine the swivel caster wheels (see page 6-26) .	3
Clean the VIOB and the LCIB (see page 6-27).	3
Clean the I-beams of the bridge crane (see page 6-39).	4
Clean the control boxes (see page 6-40).	6
Let a certified company approve the bridge crane, feed grabber and the Vector step ladder.	12

6.2 MFR

WARNING

Unexpected movement of the machine.

Risk of being crushed.

Before doing maintenance on the MFR, drive it to a clean, level location. Take the MFR out of operation, switch it off with the service key, remove the key, and keep it with you. After maintenance, make sure all covers are installed and secured. Never put the MFR into operation without the covers in place.

CAUTION

Risk of damage to the machine.

Damage to the electronics.

Be aware that towing and pushing the machine will cause damage to the electronics. Only tow or push the machine in case of an emergency.



Do not lubricate the nipples on the ball bearings of the dosing roll and feed door on the MFR.

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6.2.1 Examine the MFR feeding at the feed fences

1. Examine the feed distributed at the feed fence and see if it is well mixed and cut.
2. If necessary examine the mixing auger knives in the MFR (see Examine the mixing auger knives on page 6-22) or adjust the feed settings in Horizon. Ask Lely FMS for more advise about feeding.

6.2.2 Examine the feeding reports in Horizon

1. Examine the feeding reports in Horizon.
2. If necessary adjust certain settings in Horizon:
 - Proportions in a ration.
 - Scan interval.
 - In between and post mixing times.
 - Loading order.
 - Dosing weight.

6.2.3 Examine and replace the metal strips



*Sharp, protruding object.
Risk of being cut or damage to the machine.
Make sure the metal strips are properly attached to the floor and do not point upwards at one side.*



The metal strip must be installed in its original place. If the machine does not find the metal strip on the same location it can get lost on the route and generate an alarm.



Do not use an impact wrench to remove and tighten the screws from the metal strips.



Only the hole (A) in the center is round. The holes B and C are slots to allow the metal strip to shrink and expand a bit with temperature changes. The metal strips are not symmetrical. If (after some time) a hole in the concrete can not be used anymore, you can turn the strip over the long side and drill new holes in the concrete.

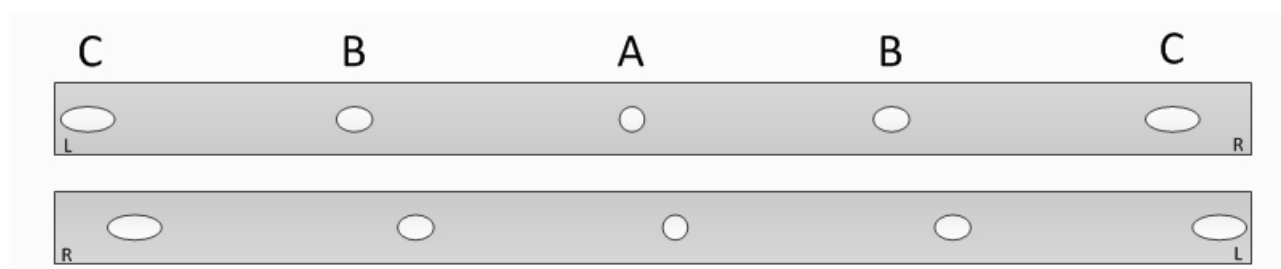


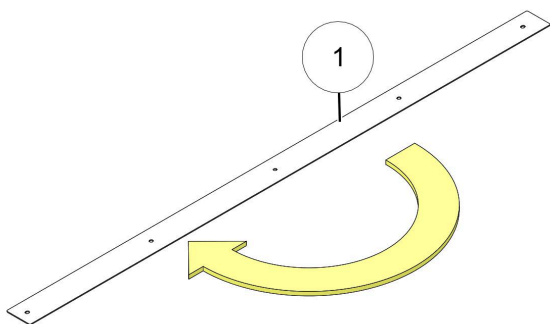
Figure 94. Metal strips

KEY:
A: Round hole
B: Slotted hole
C: Slotted hole
L = left
R = right

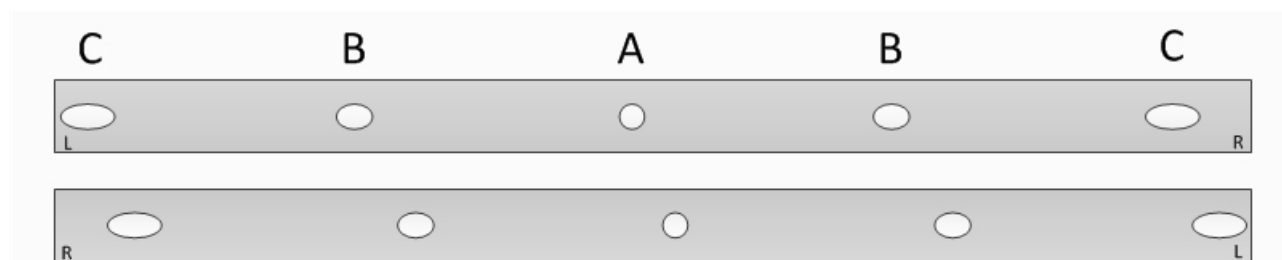
1. Manually drive the MFR away from the route with the metal strips (see Drive the MFR manually on page 5-61).
2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
3. If necessary repeat steps 1-2 for the second MFR.
4. Examine if all metal strips are installed correctly to the floor.
5. If necessary determine if you must:
 - Replace the screws of the strip (see page 6-5).
 - Replace the metal strip (see page 6-6).
6. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
7. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).
8. If necessary repeat steps 6-7 for the second MFR.

6.2.3.1 Replace the screws of the strip

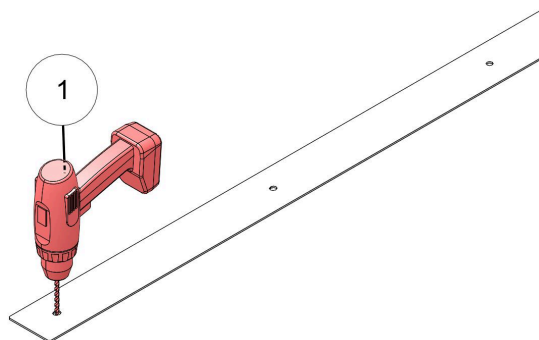
1. Remove all screws of the strip (1).
2. Turn the strip (1) around over the long side so the holes in the strip do not match the old holes in the floor.



3. Mark the position of the holes. Start to mark the hole in the center (A) of the strip. Mark the slotted holes (B) and (C) in the center of the holes.



4. Drill new holes in the floor with a 10 mm drill (1) and >65 mm deep.



5. Clean the holes.
6. Insert S10 plugs.
7. Use a hammer to insert the plug through the metal strip. Make sure the top of the plug is level with the concrete.
8. Use a bit T30 to tighten the metal strip with the screws (BT 6x65). Tighten only with a torque of 20 Nm. It must still be possible that the metal strip can shrink and expand a bit when temperature changes occur.

6.2.3.2 Replace the metal strip

NOTICE

Make sure that strips recessed in the floor are installed flush with the floor level or slightly above the floor level. Do not install strips below the floor level.

NOTICE

If a metal strip sticks out over the edge of a concrete plate (2x2 m) the swivel wheel of the machine will deform the metal strip and the screws will brake due to the tension.

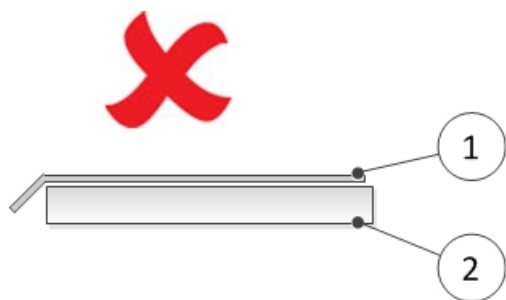


Figure 95. Metal strip positioning (1)

KEY: 1. Metal strip - 2. Concrete plate

1. Remove the screws, plugs and old metal strip.
2. Put the new strip on the floor. If necessary cut the strip with a grinder. Make sure:
 - The MFR will find the metal strip on the exact same position as the old one.
 - The strip does not stick out over the edge of the concrete plate or on other surfaces than concrete plates: leave at least 10 mm of space between two metal strips.

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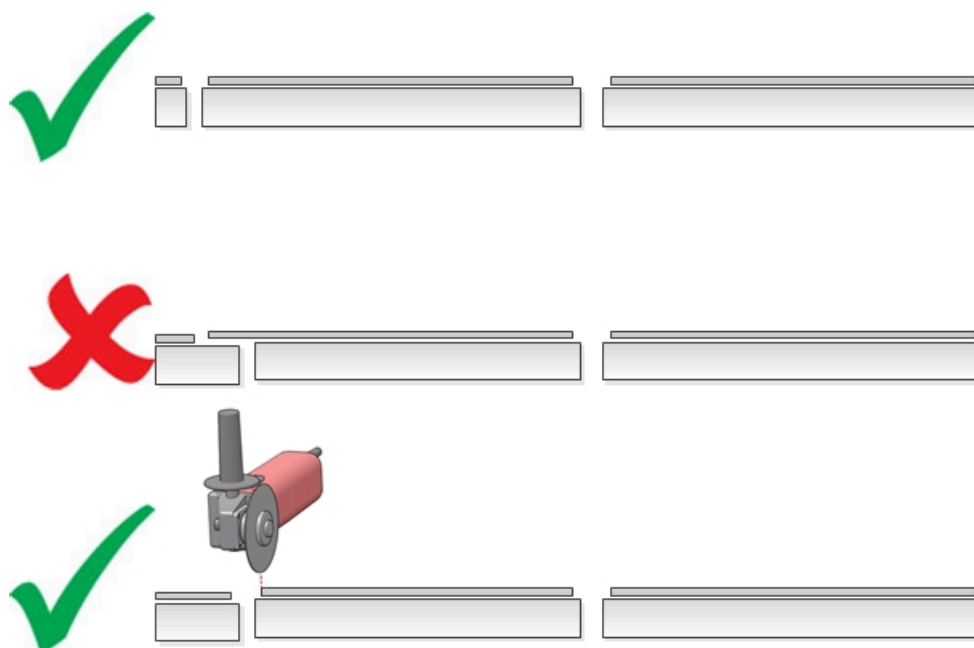
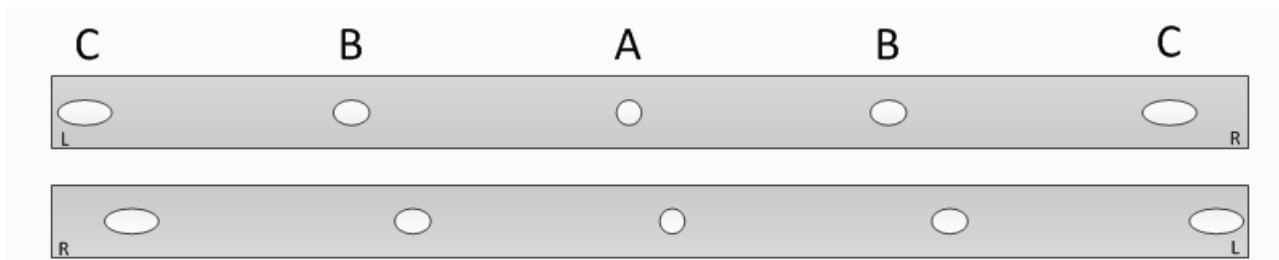


Figure 96. Metal strip positioning (2)

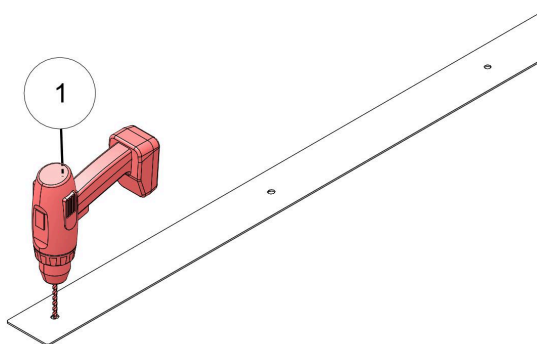
3. If possible use the old holes and go to step 5.

4. When new holes are necessary:

1. Mark the position of the holes. Start to mark the hole in the center (A) of the strip. Mark the slotted holes (B) and (C) in the center of the holes.



2. Drill new holes in the floor with a 10 mm drill and >65 mm deep.



3. Clean the holes.
5. Insert S10 plugs.
6. Use a hammer to insert the plug through the metal strip. Make sure the top of the plug is level with the concrete.
7. Use a bit T30 to tighten the metal strip with the screws (BT 6x65). Tighten only with a torque of 20 Nm, it must still be possible to move the strip.

6.2.4 Clean the feed height laser on the MFR

DANGER

**Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean
the machine.
Keep doors of the electrical cabinets closed
while cleaning the machine.**



CAUTION

*Laser light.
Risk of getting blind.
Do not stare into the beam.*

NOTICE

Do not use sharp objects to clean the feed height laser.

1. Manually drive the MFR to a clean, dry and level location (see Drive the MFR manually on page 5-61).
2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
3. Remove the feed height laser cover (see page 5-38).
4. Use a small brush and/or cloth to remove all dirt and cobwebs under (A) the feed height laser (1).

5. Use a wet cloth to clean fly droppings and dirt from the glass of the laser.

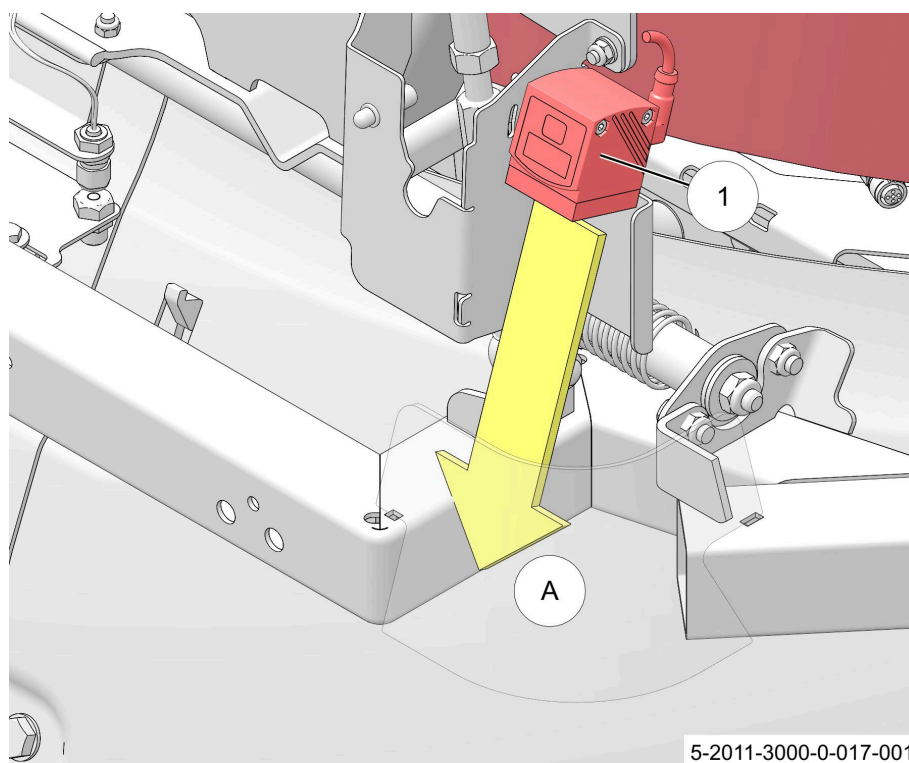


Figure 97. Clean the laser

KEY: 1. Feed height laser

6. Install the feed height laser cover (see page 5-39).
7. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
8. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

6.2.5 Clean and test the obstacle detection sensors


DANGER

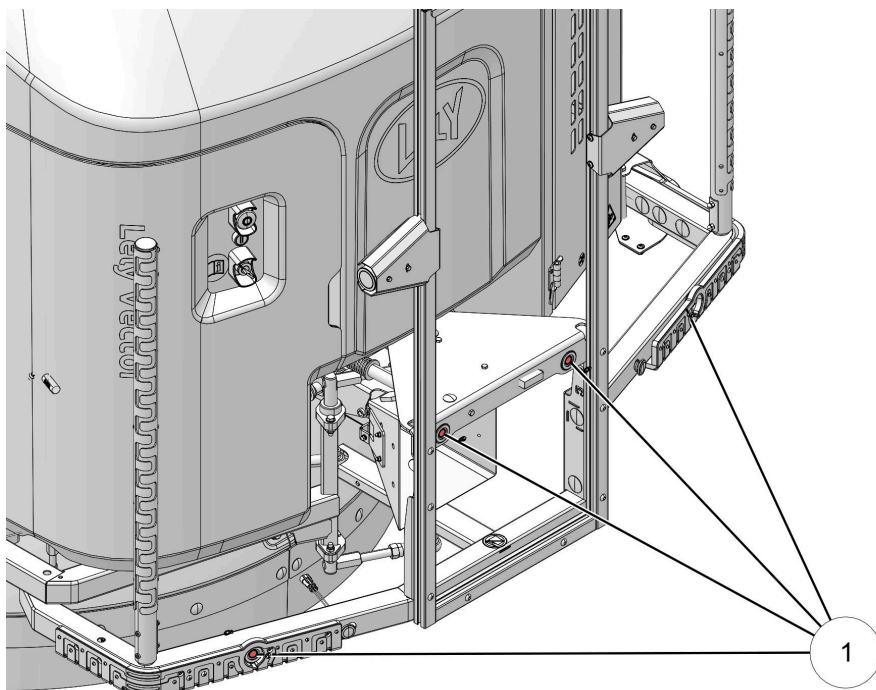
**Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean
the machine.
Keep doors of the electrical cabinets closed
while cleaning the machine.**



NOTICE

Do not use sharp objects to clean the obstacle detection sensors.

1. Manually drive the MFR to a clean and level location (see Drive the MFR manually on page 5-61).
2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
3. Use a wet cloth to remove all dirt from the obstacle detection sensors (1).
4. Open the Lely Control Plus app and connect to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2).
5. Go to  menu overview.
6. Go to **Service > Sensors > Obstacle detection sensors**.
7. Stand in front of the first obstacle detection sensor (1) at a distance of 40 cm (16 in) or a bit less, and look at **Obstacle detection sensors** to see if the green dot indicates that an obstacle is detected.



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KEY: 1. Obstacle detection sensors

8. Repeat this for all obstacle detection sensors.
If a sensor does not function correctly, call your Lely service provider and have it repaired.
9. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).

10. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

6.2.6 Clean the ultrasonic sensors on the MFR

DANGER

**Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean
the machine.
Keep doors of the electrical cabinets closed
while cleaning the machine.**

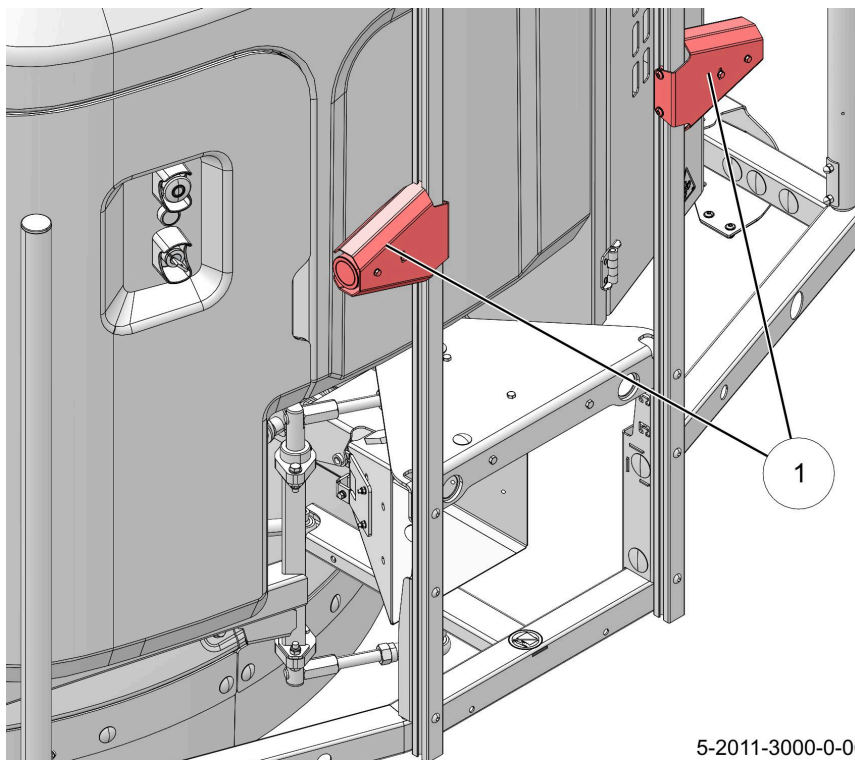


NOTICE

Do not use sharp objects to clean the ultrasonic sensors.

1. Manually drive the MFR to a clean and level location (see Drive the MFR manually on page 5-61).
2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).

3. Use a wet cloth to remove all dirt from the ultrasonic sensors (1).



5-2011-3000-0-06-007

Figure 98. Clean the ultrasonic sensors

KEY: 1. Ultrasonic sensor

4. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
5. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

6.2.7 Clean the dosing roll, position sensor and dosing motor on the MFR



**Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean
the machine.
Keep doors of the electrical cabinets closed
while cleaning the machine.**



WARNING

*Sharp knives and edges.
Risk of being cut by sharp knives or edges.
Wear gloves with a cut resistance according to the standards mentioned in the paragraph 'Cut resistant clothing' (see Cut resistant clothing on page 2-5).*

NOTICE

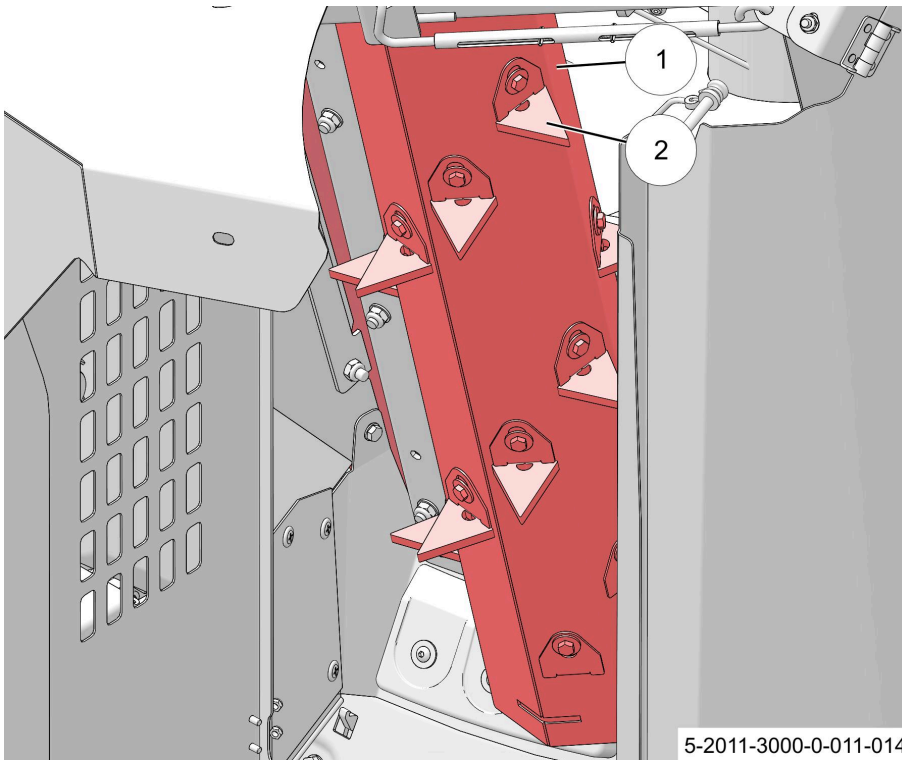
Do not use sharp objects to clean the dosing roll and position sensor.

NOTICE

Combine this procedure with cleaning of the feed door motor. Every two months use compressed air to blow all dirt from the dosing roll motor and the feed door motor.

1. Manually drive the MFR to a clean, dry and level location (see Drive the MFR manually on page 5-61).
2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
3. Open the maintenance door (see Open or close the maintenance door on page 5-33).

4. Carefully remove all feed remains from the dosing roll (1) and dosing teeth (2).



5. Remove all dirt in the top area and between the motor (1) (see figure 99 on page 6-15).

6. Remove all dirt and fibres between the position sensor (2) and the sensor arm (3).

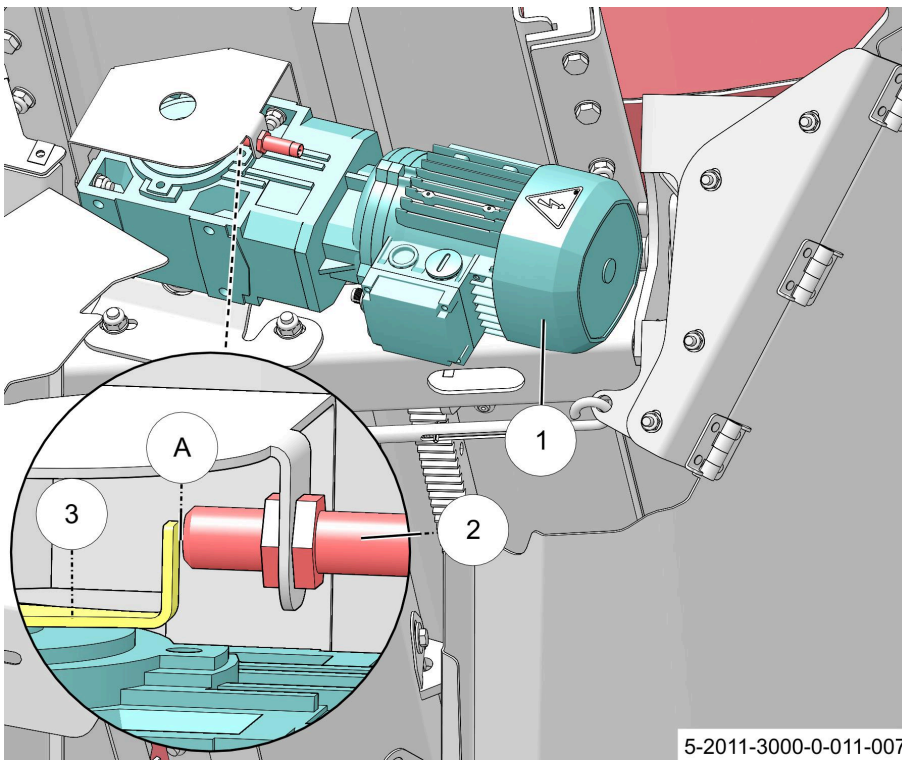


Figure 99. Clean the motor

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7. Close the maintenance door (see Open or close the maintenance door on page 5-33).
8. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
9. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

6.2.8 Clean the magnets on the MFR

DANGER

Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean the machine.
Keep doors of the electrical cabinets closed while cleaning the machine.



WARNING

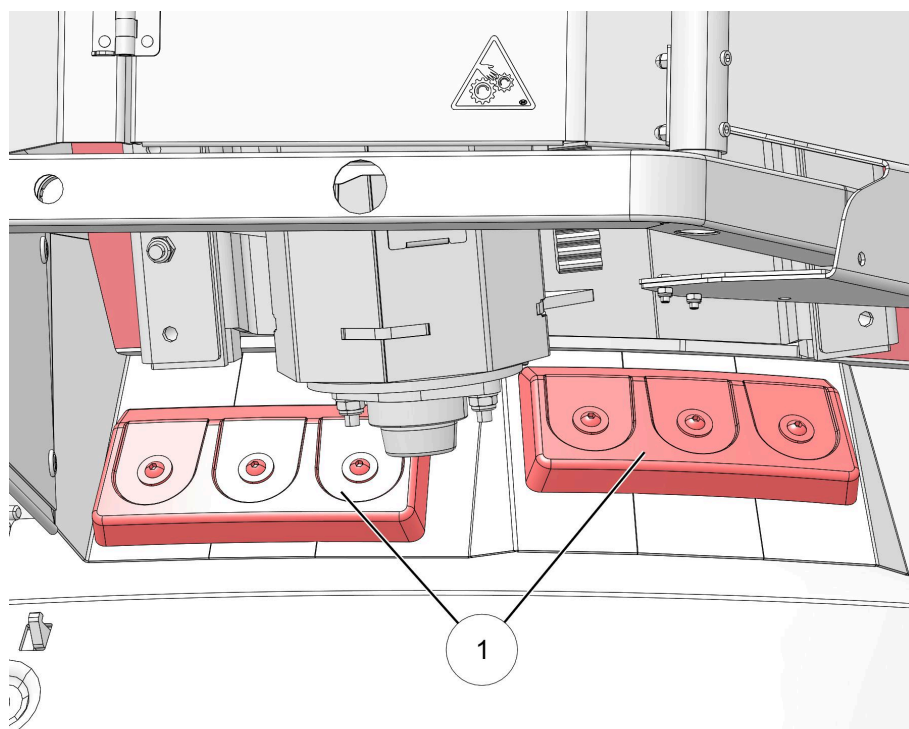
Magnetic fields.
Risk of malfunctioning cardiac pacemaker or implant.
Do not work near the magnets if you have a cardiac pacemaker or other implants that can be impaired by magnetic fields.

CAUTION

May contain sharp objects.
Risk of being cut by sharp metal objects.
Wear gloves with a cut resistance according to the standards mentioned in the paragraph 'Cut resistant clothing' (see Cut resistant clothing on page 2-5).

1. Manually drive the MFR to a clean and level location (see Drive the MFR manually on page 5-61).
2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).

3. Push all metal parts upwards and remove them from the magnets (1).



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Figure 100. Clean the magnets

KEY: 1. Magnets

4. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
5. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

6.2.9 Clean the safety light on the MFR

DANGER

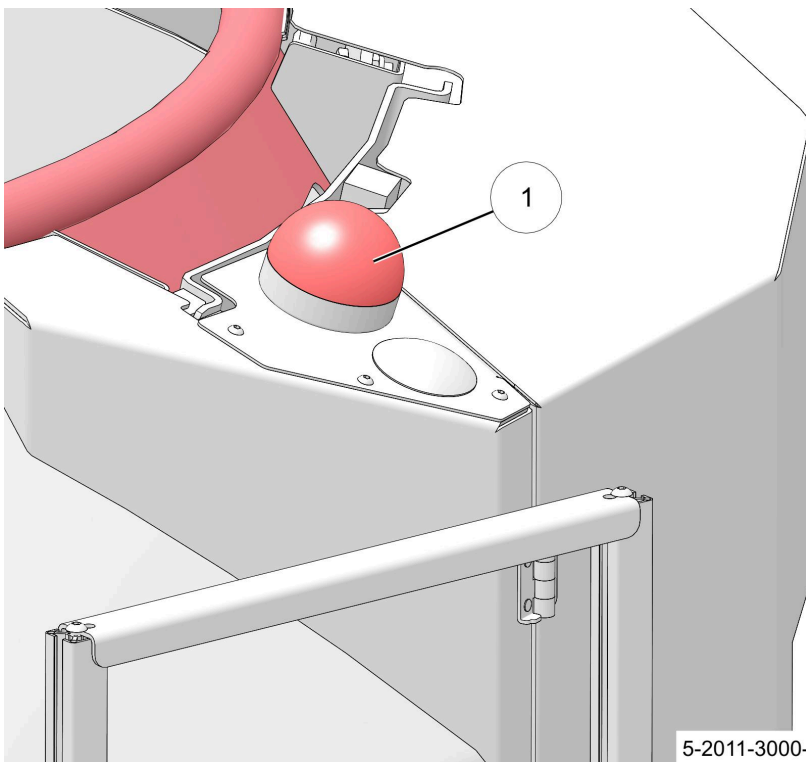
**Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean
the machine.
Keep doors of the electrical cabinets closed
while cleaning the machine.**



NOTICE

Do not use sharp objects to clean the safety light.

1. Manually drive the MFR to a clean and level location (see Drive the MFR manually on page 5-61).
2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
3. Clean the safety light (1) with a wet cloth.



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4. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
5. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

6.2.10 Clean the head- and taillights on the MFR

⚠ DANGER

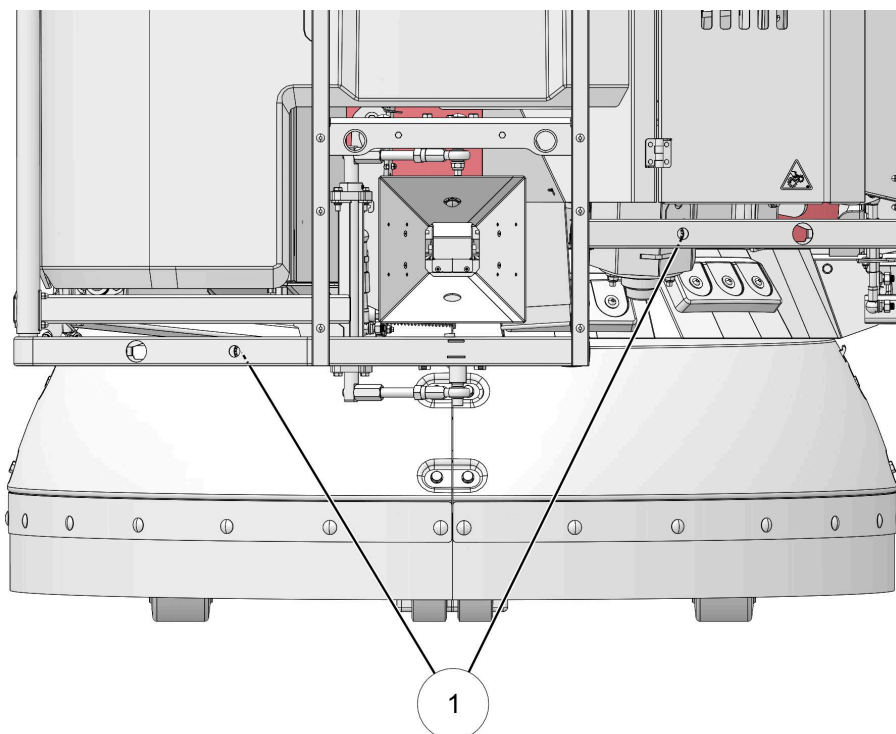
**Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean
the machine.
Keep doors of the electrical cabinets closed
while cleaning the machine.**



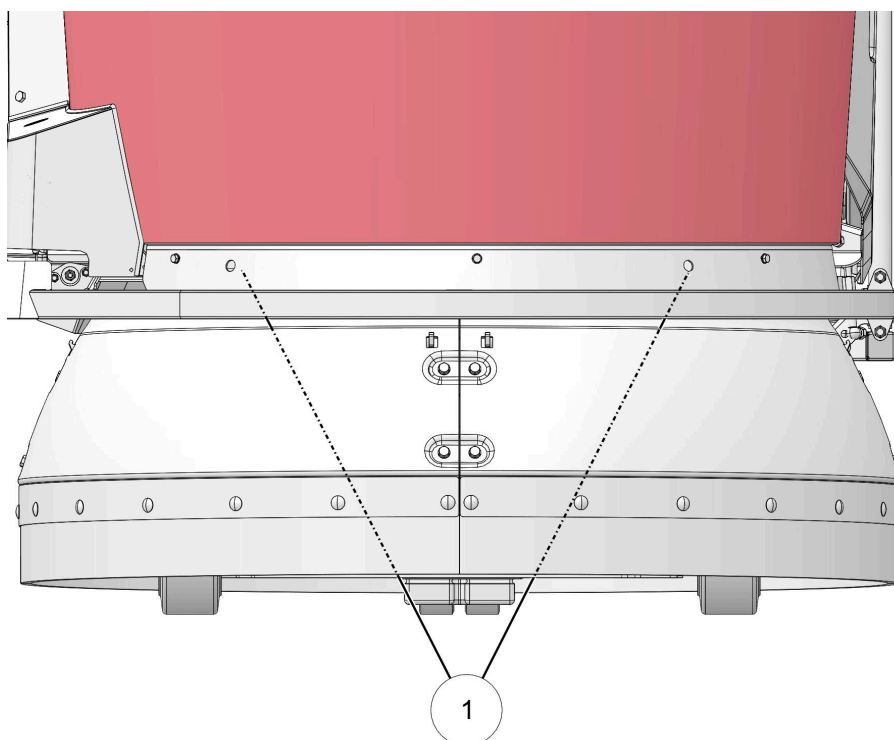
NOTICE

Do not use sharp objects to clean the lights.

1. Manually drive the MFR to a clean and level location (see Drive the MFR manually on page 5-61).
2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
3. Clean the head- and taillights (1) with a wet cloth.



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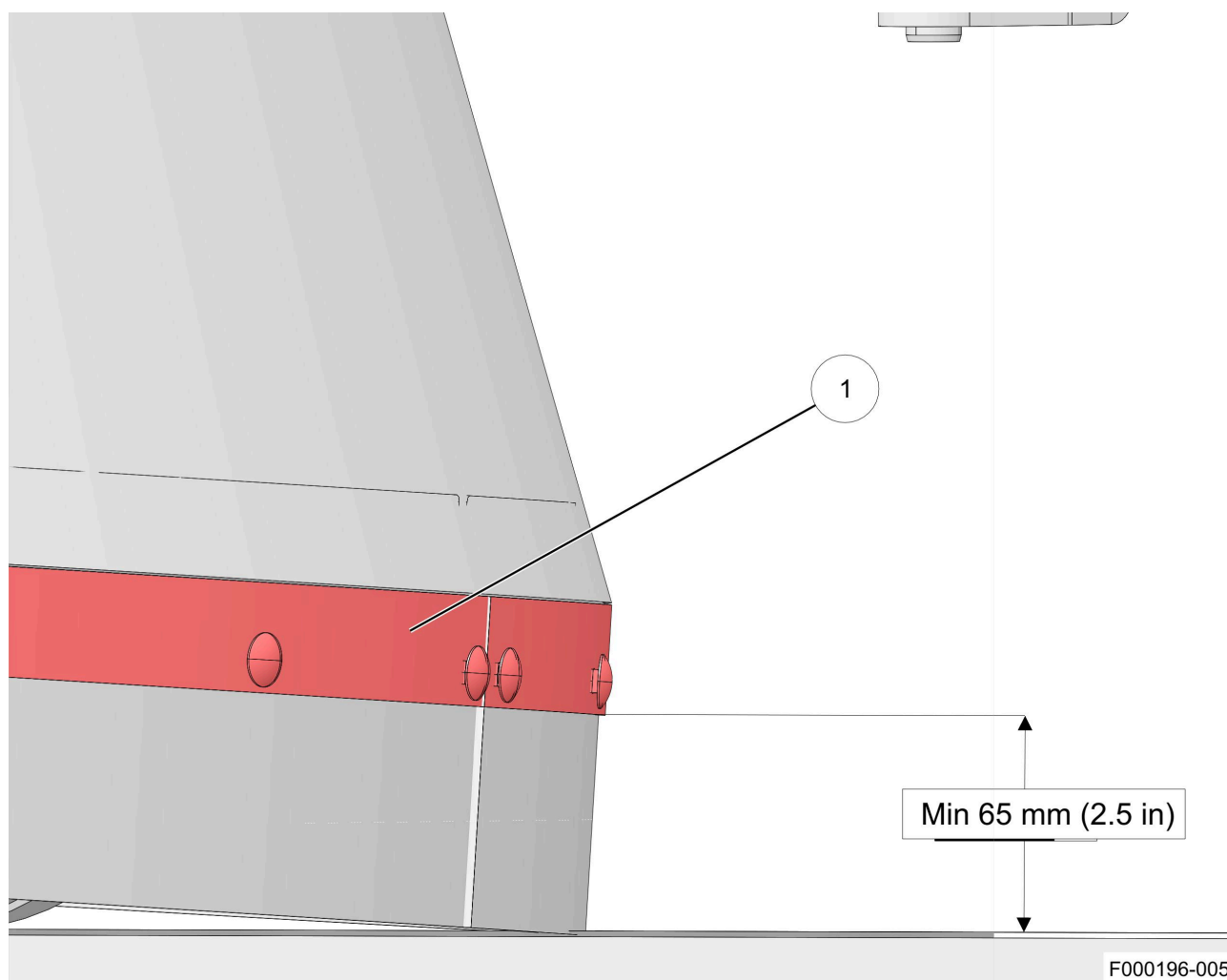
4. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
5. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

6.2.11 Examine the skirt condition

1. Manually drive the MFR to a clean and level location (see Drive the MFR manually on page 5-61).
2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
3. Examine the skirt for dirt. If necessary clean the skirt.

4. Examine the condition of the rubber of the skirt, call your local Lely service provider if:
 1. The rubber is severely damaged.
 2. The rubber is worn and metal parts almost touch the ground during feed pushing.
 3. The height of the skirt is less than 65 mm (2.5 in) measured from the metal plate (1) to the bottom of the rubber strip.

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5. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
6. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

6.2.12 Examine the mixing auger knives

 DANGER

**Sharp rotating knives.
Risk of severe injury or death.
Never enter the mixing bin and keep hands and feet clear.
Only trained Lely technicians are permitted to enter the mixing bin.**

 DANGER

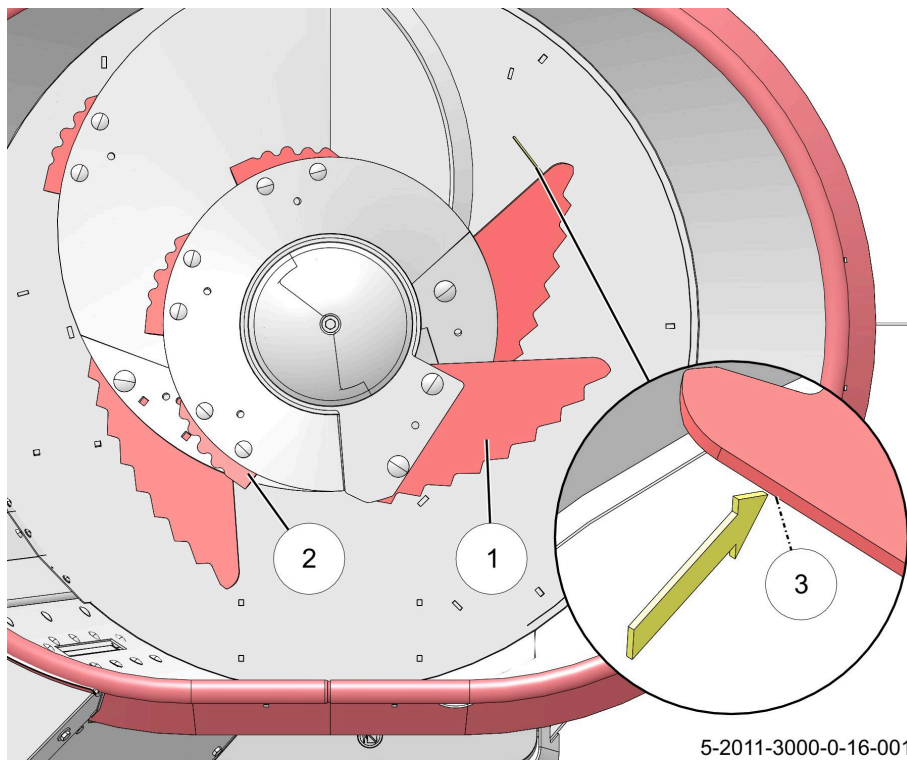
**Sharp rotating knives.
Risk of severe injury or death.
Remove the service key and take it with you before you do work in the mixing bin.**



Use the Vector step ladder to do this procedure.

1. Examine the feed at the feed fence and see if it is mixed and cut as good as when the mixing auger knives were new.
If the ration and mixing time are the same, but the feed is badly mixed and cut, it may indicate that the knives are dull or worn.
2. Examine the alarms and notifications. If there is an alarm that the mixing auger is blocked, this may be an indication that the knives are dull or worn.
3. Manually drive the MFR to a clean, dry and level location (see Drive the MFR manually on page 5-61).
4. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
5. Put the Vector step ladder next to the MFR.
6. Climb on the step ladder service platform.
7. Carefully look into the mixing bin and examine the knives (1-2). Do not climb into the mixing bin and keep hands and feet clear.
8. The knives may not be broken or worn and need to be sharp.

9. The big knives (1) (new knives are 8 mm thick) must be at least 4 mm thick at the location of the arrow (3).



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Figure 101. Examine the mixing auger knives

KEY: 1. Big knife - 2. Small knife - 3. 4 mm thick at this location

10. Climb down the Vector step ladder.
11. Remove the Vector step ladder.
12. Call your local Lely service provider when the mixing auger knives are dull or worn.
13. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
14. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

6.2.13 Clean the MFR

 DANGER

**Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean the machine.
Keep doors of the electrical cabinets closed while cleaning the machine.**



 DANGER

**Sharp rotating knives.
Risk of severe injury or death.
Never enter the mixing bin and keep hands and feet clear.
Only trained Lely technicians are permitted to enter the mixing bin.**

 DANGER

**Sharp rotating knives.
Risk of severe injury or death.
Remove the service key and take it with you before you do work in the mixing bin.**



Use the Vector step ladder to do this procedure.

-
1. Empty the mixing bin (see Manually dose feed from the MFR on page 5-64).
 2. Manually drive the MFR to a clean, dry and level location (see Drive the MFR manually on page 5-61).
 3. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).



The in- and outside of the MFR can also be cleaned with pressurized air.


4. Put the Vector step ladder next to the MFR.
5. Climb on the step ladder service platform.
6. Remove all feed from the mixing bin with a pitchfork. Do not climb into the mixing bin and keep hands and feet clear.
7. Clean the inside of the mixing bin with a wet brush. Do not climb into the mixing bin and keep hands and feet clear.
8. Climb down the Vector step ladder.
9. Remove the Vector step ladder.
10. Clean the outside of the MFR with a wet soft brush.
11. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
12. When all feed has been removed from the mixing bin and the weight has a negative value, tare the load cells (see Tare the load cells on page 6-25).
13. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

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6.2.14 Tare the load cells

NOTICE

Tare the load cells with an empty mixing bin. If the bin is not empty, empty it first: (see Manually dose feed from the MFR on page 5-64).

1. Tare the load cells of the mixing bin:
 1. (see Connect the Lely Control Plus app to the machine on page 5-2) .
 2. Go to  menu overview.
 3. Go to **Service > Sensors > Load cells > Tare.**
 4. Wait until the taring is accepted.
2. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

6.2.15 Examine the swivel caster wheels

1. Manually drive the MFR to a clean, dry and level location (see Drive the MFR manually on page 5-61).
2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
3. Remove a skirt piece (see Remove or install a skirt piece on page 5-31).
4. Examine the profile of the swivel caster wheels for damage and wear.
If the profile shows signs of heavy wear like large areas of missing material, call your local Lely service provider for replacement of the swivel caster wheels.



Figure 102. Too much wear on swivel wheel

NOTICE

The drive surface may show signs of wear, but there should be no damage such as missing material of more than 4 cm².



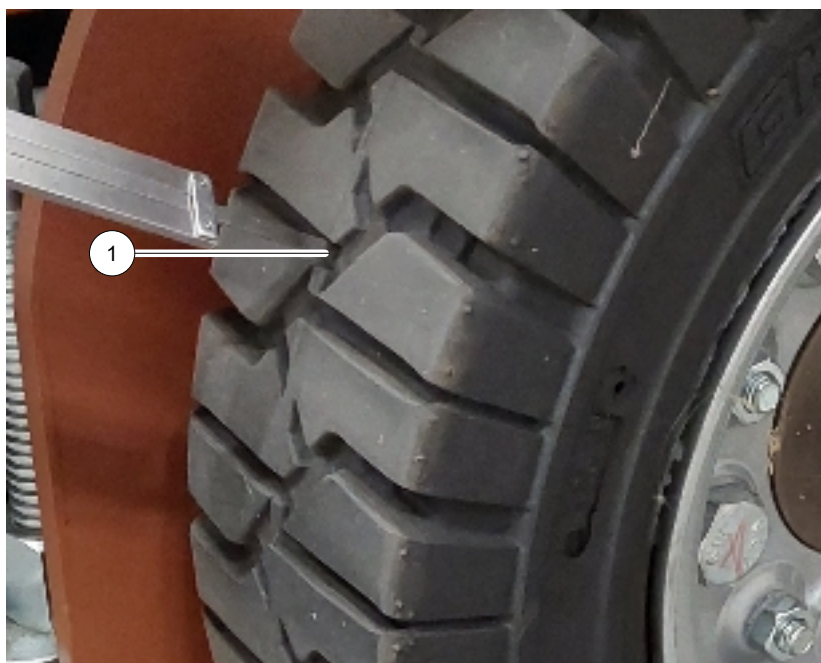
If more material is missing the wheel surface is smaller and the remainder of material will be overloaded causing significant more wear.

5. Install the skirt piece (see Remove or install a skirt piece on page 5-31).
6. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
7. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

6.2.16 Examine the drive wheels

1. Manually drive the MFR to a clean, dry and level location (see Drive the MFR manually on page 5-61).
2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
3. Remove a skirt piece (see Remove or install a skirt piece on page 5-31).

4. Examine both drive wheels for damage and wear.
5. Measure the profile of the wheel (1). If the profile is less than 4 mm (0.16 in) deep or there is too much damage and wear, contact your local Lely service provider for replacement of the drive wheel.



6. Install the skirt piece (see Remove or install a skirt piece on page 5-31).
7. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
8. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

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6.2.17 Clean the VIOB and the LCIB

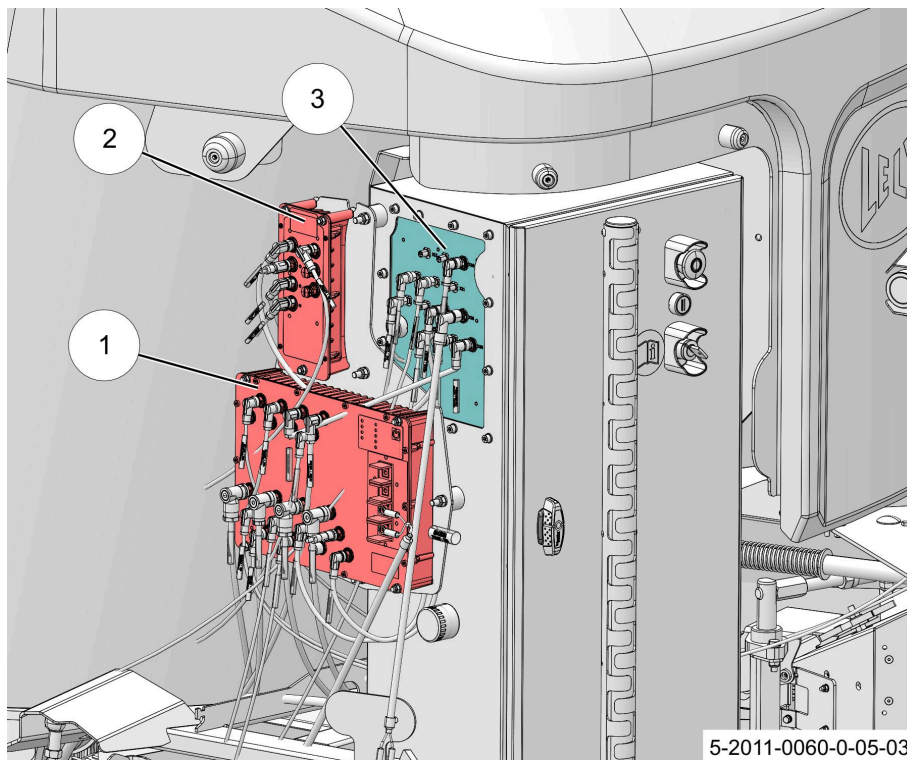
DANGER

**Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean
the machine.
Keep doors of the electrical cabinets closed
while cleaning the machine.**



1. Manually drive the MFR to a clean, dry and level location without weather influences (see Drive the MFR manually on page 5-61).
2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
3. Remove the power box main cover (see Remove or install the power box cover on page 5-41).

4. Use a small dry brush and/or cloth to carefully remove all dirt and feed remains from the VIOB (1), the LCIB (1), the power box (3) and the cables.



5. Install the power box main cover (see Remove or install the power box cover on page 5-41).
6. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
7. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

6.3 Feed grabber

6.3.1 Clean the feed height laser on the feed grabber

DANGER

**Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean
the machine.
Keep doors of the electrical cabinets closed
while cleaning the machine.**



 **WARNING**

*Crushing due to moving parts.
Risk of being crushed.
Keep hands, feet, hair and clothing away from all moving parts due to crushing.*

 **WARNING**

*Unexpected movement of the machine.
Risk of being crushed.
Take the MFRs out of operation and turn them off with the service key if no emergency zone settings or kitchen point settings have been set and are active.*

 **CAUTION**

*Laser light.
Risk of getting blind.
Do not stare into the beam.*

 **CAUTION**

*Unexpected movement of the lattice girder.
Risk of injury.
Never use the lattice girder as a support for a step ladder. Always use the Vector step ladder or an aerial work platform for maintenance and installation activities at height. Only for inspections is it allowed to use the I-beam as a support for a step ladder.*



Use the Vector step ladder to do this procedure.

1. Put the feed kitchen in the filling mode with the console (see page 5-46).
2. Put the Vector step ladder under or near the feed grabber.
3. Climb on the step ladder service platform.

4. Use a cloth or soft brush to remove all feed, dirt and cobwebs from:
 - The cover (1) and the feed height laser (2).
 - Under the laser and in the field of vision of the laser.
5. Use a wet cloth to remove fly droppings and dirt from the glass of the laser (2).

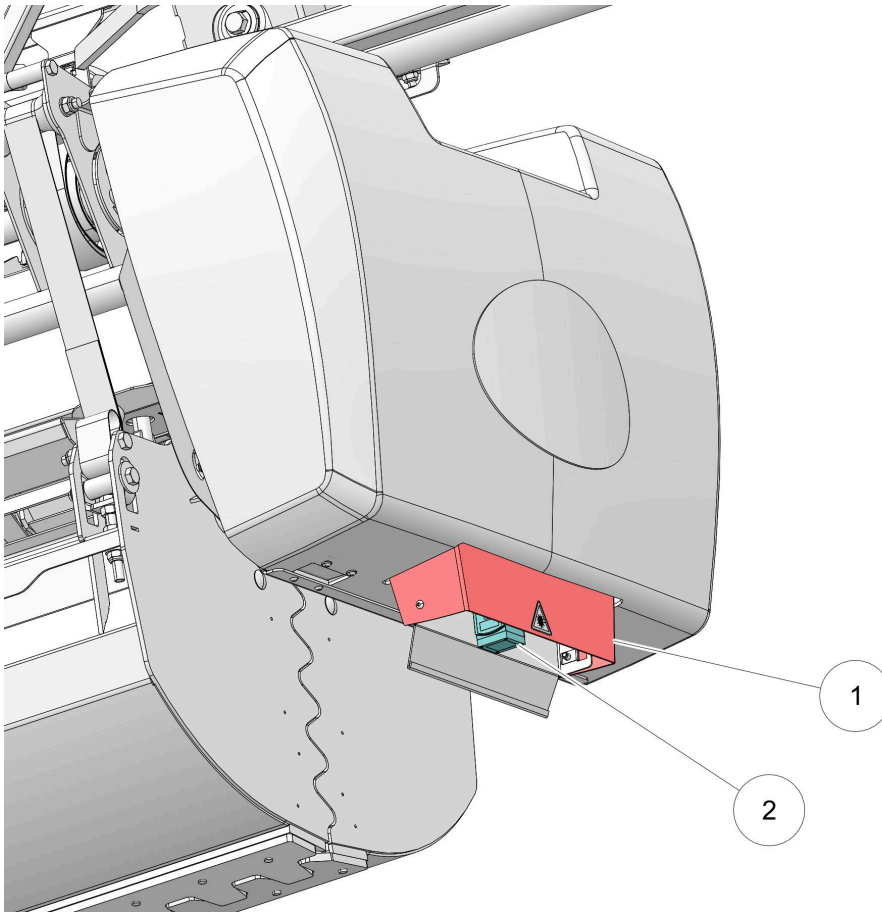


Figure 103. Feed height laser

KEY: 1. Cover - 2. Laser

6. Climb down the Vector step ladder.
7. Remove the Vector step ladder from the feed kitchen.
8. Put the feed kitchen in operation (see page 5-44).

6.3.2 Clean the teeth of the feed grabber

⚠ DANGER

**Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean
the machine.
Keep doors of the electrical cabinets closed
while cleaning the machine.**

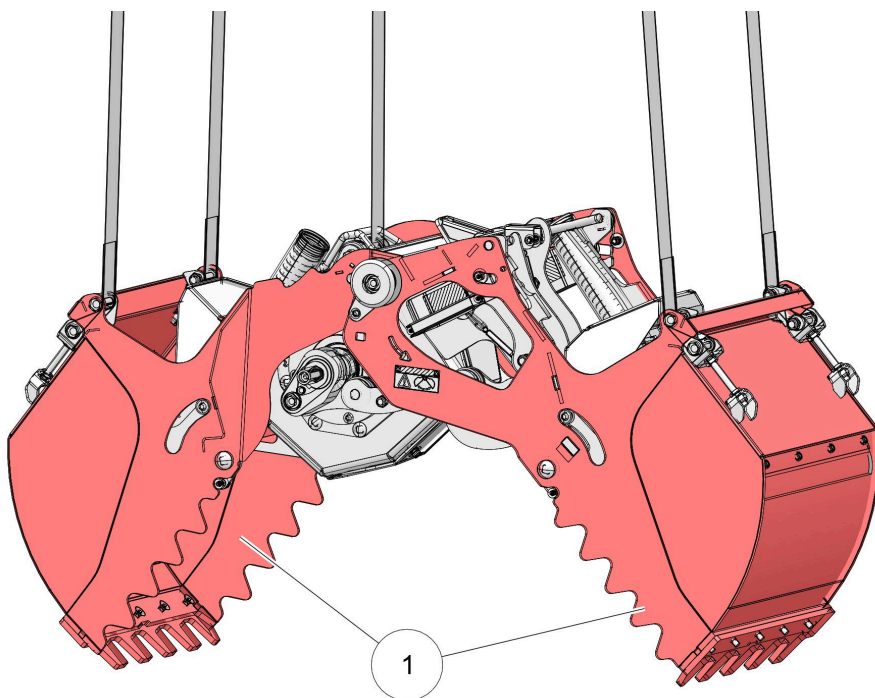


⚠ WARNING

***Crushing due to moving parts.
Risk of being crushed.
Keep hands, feet, hair and clothing away from all moving parts due to
crushing.***

1. If the MFR is at the feed loading location:
 1. Manually drive the MFR away from the feed loading location (see Drive the MFR manually on page 5-61).
 2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
 3. If necessary repeat step 1-2 for the second MFR.
2. Position the feed grabber for cleaning (see page 6-33).


3. Use a (wall) scraper or putty knife to remove all feed remains from the teeth (1). Clean the in- and outside of the teeth.



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Figure 104. Clean the feed grabber teeth







KEY: 1. Teeth

4. Connect the smartphone to the feed grabber.
5. Make sure the grabber is still open for 60 - 65%.
6. Go to **Testing > Test Lift Motor**.
7. Tap  **UP** to lift the grabber all the way up.
8. Put the feed grabber in operation (see page 5-51).
9. Put the bridge crane in operation (see page 5-51).
10. If necessary:
 1. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
 2. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).
 3. Repeat step 1-2 for the second MFR.

6.3.2.1 Position the feed grabber for cleaning

NOTICE

A no-go zone is an area in the feed kitchen with a wall or equipment over which the feed grabber must never drive. If there is a no-go zone in your feed kitchen, first drive the feed grabber away from the no-go zone before you drive the bridge crane.

1. Drive the bridge crane manually (see page 5-78) to the Y position of the feed loading point.
2. Drive the feed grabber manually (see page 5-77) to the feed loading point.
3. Tap  to go to the menu.
4. Go to **Testing > Test Lift Motor**.
5. Go to **Go To Position**.
6. Use  **UP** and  **DOWN** to position the grabber to a height where you can easily clean the feed grabber.
7. Tap  to go to the menu.
8. Go to **Testing > Test grabber**.
9. Go to **Go To Position**.
10. Use  **OPEN** and  **CLOSE** to make sure the grabber is opened between 60 and 65%.

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6.4 Feed kitchen

6.4.1 Examine the stock

1. Examine the stock of all the feed types, roughage, additives and concentrates.
2. If necessary:
 - Fill the feed kitchen (see page 5-54).
 - Fill the additives dispenser (frequency pulse) (see page 5-60).
 - Fill the concentrates silo.

6.4.2 Clean and inspect the feed loading point



***Crushing due to moving parts.
Risk of being crushed.
Keep hands, feet, hair and clothing away from all moving parts due to crushing.***



***Unexpected movement of the machine.
Risk of being crushed.
Take the MFRs out of operation and turn them off with the service key if no emergency zone settings or kitchen point settings have been set and are active.***

1. Put the feed kitchen in the filling mode with the console (see page 5-46).
2. Inspect the MFR when it is at the feed loading point, make sure:
 1. The weight measurement is not influenced.
 2. The MFR does not lean against any object.
 3. No auger pipes, damaged fences, dugout or other objects lean on the MFR.
3. Wait for the MFR to leave the feed loading location, or:
 1. Manually drive the MFR away from the feed loading location (see Drive the MFR manually on page 5-61).
 2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
 3. If necessary repeat step 1-2 for the second MFR.
4. Clean the area at the feed loading point and charge pole.
5. Put the feed kitchen in operation (see page 5-44).
6. If necessary:
 1. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
 2. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).
 3. Repeat step 1-2 for the second MFR.

6.4.3 Clean the additives dispenser(s) drop pipe (frequency pulse)



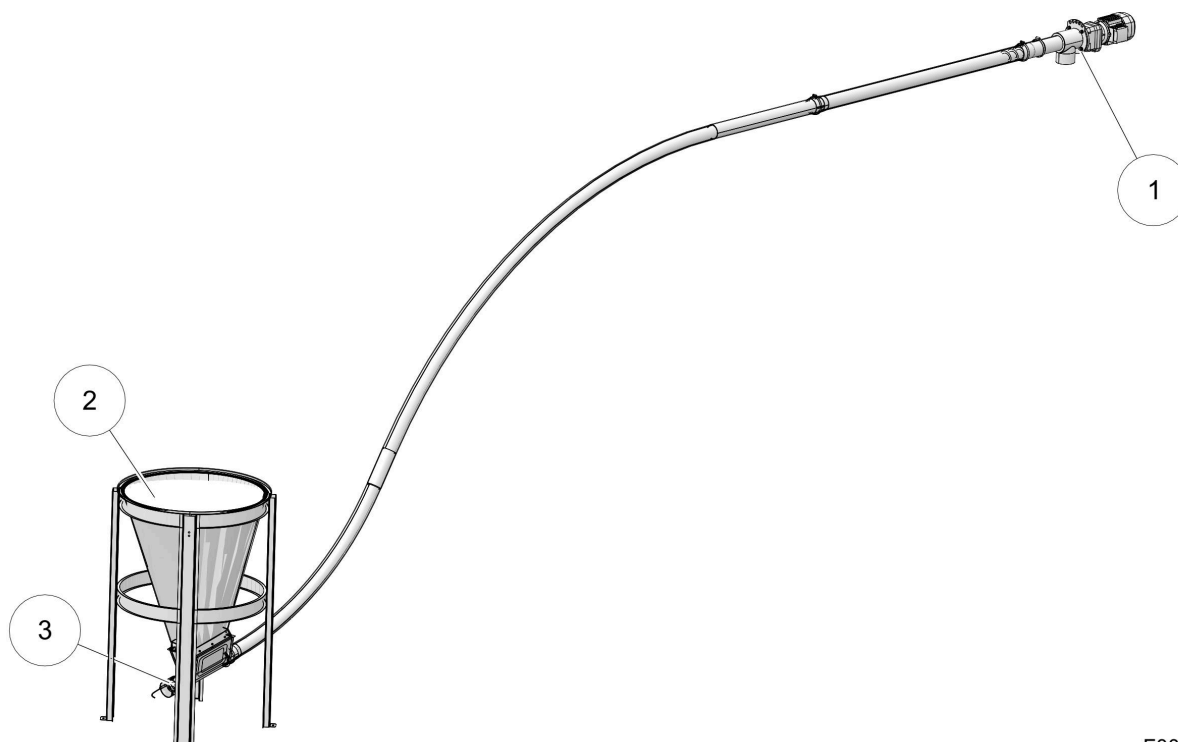
***Crushing due to moving parts.
Risk of being crushed.
Keep hands, feet, hair and clothing away from all moving parts due to crushing.***



***Unexpected movement of the machine.
Risk of being crushed.
Take the MFRs out of operation and turn them off with the service key if no emergency zone settings or kitchen point settings have been set and are active.***

1. If the MFR is at the feed loading location:
 1. Manually drive the MFR away from the feed loading location (see Drive the MFR manually on page 5-61).
 2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
 3. If necessary repeat step 1-2 for the second MFR.
2. Put the feed kitchen in the filling mode with the console (see page 5-46).

3. Use a stick to remove feed from the inside of the drop pipe (1).



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Figure 105. Clean the drop pipe of the additives dispenser (frequency pulse)

KEY: 1. Drop pipe and motor - 2. Silo - 3. Sensor for light pulses

4. Put the feed kitchen in operation (see page 5-44).
5. If necessary:
 1. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
 2. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).
 3. Repeat step 1-2 for the second MFR.

6.4.4 Calibrate the additives dispenser (frequency pulse)



**Crushing due to moving parts.
Risk of being crushed.
Keep hands, feet, hair and clothing away from all moving parts due to crushing.**

WARNING

Unexpected movement of the machine.

Risk of being crushed.

Take the MFRs out of operation and turn them off with the service key if no emergency zone settings or kitchen point settings have been set and are active.

NOTICE

Do the following procedure when:

- A new type of additive is going to be used.
 - After the weather or humidity has changed.
 - The coarseness of a new badge of additives has changed.
 - Once a month.
-

NOTICE



Special tools:

- Bucket for 3 to 6 kg (6.6 to 13 lb).
 - Scale with an accuracy in grams.
-



Make sure the speed is optimal for this type of additive. Sometimes calibrating at a slower speed may improve the accuracy in certain rations, ask Lely FMS for advise.

1. If the MFR is at the feed loading location:
 1. Manually drive the MFR away from the feed loading location (see Drive the MFR manually on page 5-61).
 2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
 3. If necessary repeat step 1-2 for the second MFR.
2. Put the feed kitchen in the filling mode with the console (see page 5-46).
3. Make sure the transport pipe with the spring auger is completely filled with the additive. If necessary, fill the transport pipe (see Fill the additives dispenser (frequency pulse) on page 5-60).
4. Position a clean bucket under the drop pipe.

5. Connect the smartphone to the feed controller (PDB) (see Connect the Lely Control app to the machine on page 5-4).
6. Go to **Service > FreqCon Pulse > Test FreqCon Pulse**.
7. Select **Calibrate bin**.
8. Select **Bin** and set the number of the bins you want to calibrate.
9. Select **RPM(Hz)** and if necessary change the RPM frequency (Hz) (default value = 50 Hz). This set frequency is used during calibration and dispensing.
 - For conventional dispensers default value = 50 Hz.
 - For dispensers with a stir motor default value = 20 Hz.
10. Push the button  to start calibration.
11. Wait until the spring auger has made 60 turns and stops.
12. Tare the bucket and weigh the additive in the bucket.
13. A text box is displayed **Enter calibration weight:**.
14. Enter the weight of the additive.
15. An info screen shows the calibrated gram per pulse and time per pulse. If **gr/pulse** is zero and a message **Calibration failed! check configuration and try again.** is displayed, do the calibration again. This often happens when the smartphone screen locks because it takes too much time before the weight is entered. Try to enter the weight in time. If that does not work, ask a Lely technician to do the following:
 - Examine and if necessary correct the connections.
 - Examine and if necessary correct the address IDs.
 - Examine if the pulse sensor detected that the motor rotated.
 - Unblock the motor.
16. Push the button  to exit the info screen.
17. Put the feed kitchen in operation (see page 5-44).
18. If necessary:
 1. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
 2. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).
 3. Repeat step 1-2 for the second MFR.

6.4.5 Clean the I-beams of the bridge crane

DANGER

**Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean
the machine.
Keep doors of the electrical cabinets closed
while cleaning the machine.**



WARNING

*Unexpected movement of the machine.
Risk of being crushed.
Take the MFRs out of operation and turn them off with the service key if
no emergency zone settings or kitchen point settings have been set and
are active.*

CAUTION

*Unexpected movement of the lattice girder.
Risk of injury.
Never use the lattice girder as a support for a step ladder. Always use the
Vector step ladder or an aerial work platform for maintenance and
installation activities at height. Only for inspections is it allowed to use
the I-beam as a support for a step ladder.*

NOTICE

Also clean the master and slave control box of the bridge crane with a dry brush during this procedure.



Use the Vector step ladder to do this procedure.

1. Put the feed kitchen in the filling mode with the console (see page 5-46).
2. Put the Vector step ladder under the I-beam.
3. Climb on the step ladder service platform.

4. Use a dry brush to clean the I-beam.
5. Climb down and move the ladder to the next part of the I-beam.
6. Repeat step 2-5 until both I-beams are clean.
7. Remove the Vector step ladder from the feed kitchen.
8. Put the feed kitchen in operation (see page 5-44).

6.4.6 Clean the control boxes



**Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean
the machine.
Keep doors of the electrical cabinets closed
while cleaning the machine.**



***Unexpected movement of the machine.
Risk of being crushed.
Take the MFRs out of operation and turn them off with the service key if
no emergency zone settings or kitchen point settings have been set and
are active.***

NOTICE

To prevent corrosion all control boxes that are covered by or have contact with minerals and concentrates must be cleaned regularly.

1. Put the feed kitchen in the filling mode with the console (see page 5-46).
2. Use a wet cloth to clean the outer parts of the control boxes, except those of the bridge crane (see Clean the I-beams of the bridge crane on page 6-39), in the green and yellow zone (see General safety zones on page 2-34).
3. Put the feed kitchen in operation (see page 5-44).

6.4.7 Clean the PSU filters

DANGER

**Electric shock.
Risk of severe injury or death.
Do not use a high pressure cleaner to clean
the machine.
Keep doors of the electrical cabinets closed
while cleaning the machine.**

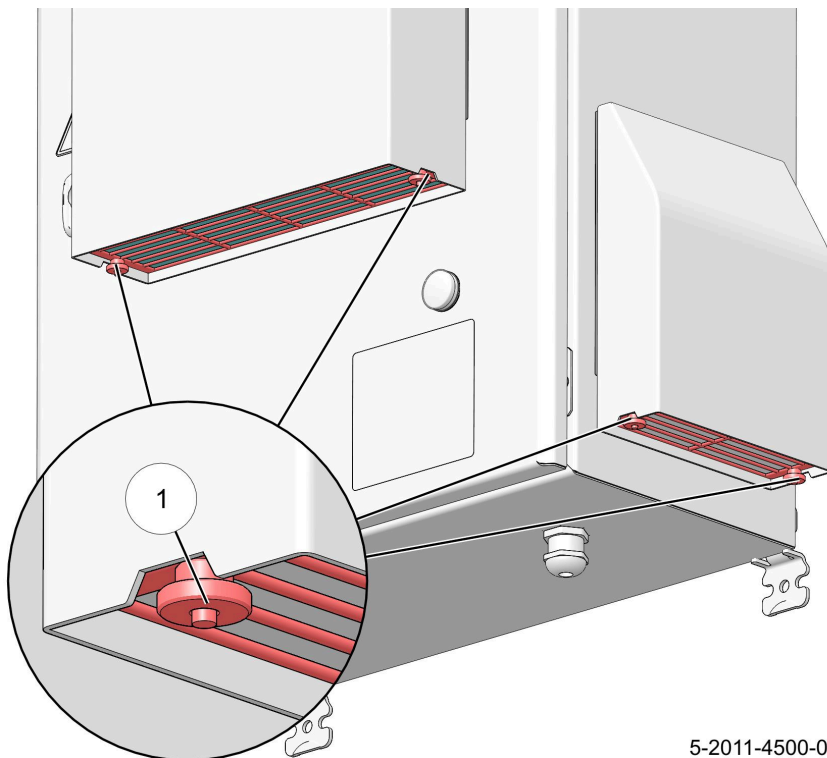


WARNING

***Unexpected movement of the machine.
Risk of being crushed.
Take the MFRs out of operation and turn them off with the service key if
no emergency zone settings or kitchen point settings have been set and
are active.***

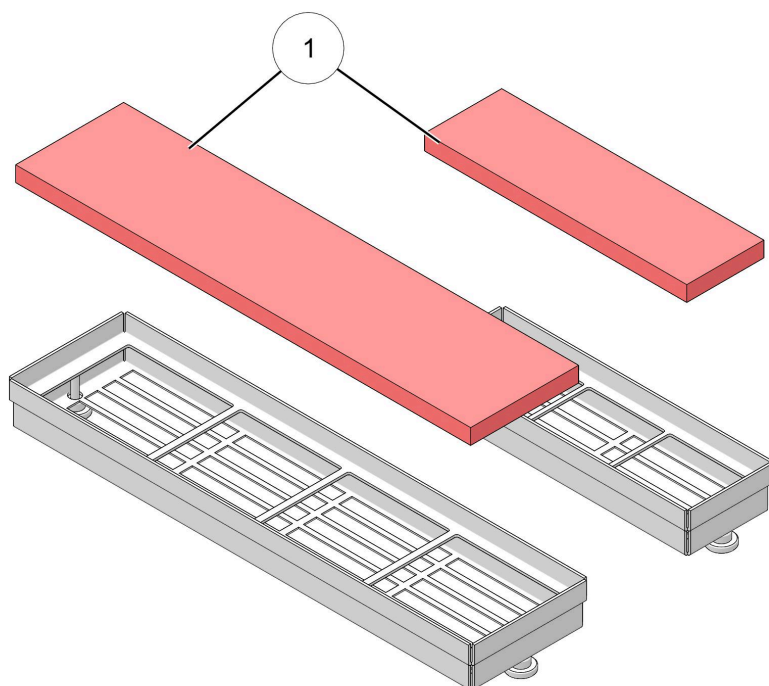
1. If the MFR is at the feed loading location:
 1. Manually drive the MFR away from the feed loading location (see Drive the MFR manually on page 5-61).
 2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
 3. If necessary repeat step 1-2 for the second MFR.
2. Put the feed kitchen in the filling mode with the console (see page 5-46).

3. Remove the nuts (1) and the two filter covers.



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4. Remove the filters (1) from the filter cover.
5. Clean the filters.



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6. Insert the filters in the filter cover.

7. Install the two filter covers with the nuts.
8. Put the feed kitchen in operation (see page 5-44).
9. If necessary:
 1. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
 2. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).
 3. Repeat step 1-2 for the second MFR.



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7 Troubleshooting

If there is an alarm, follow the instructions in the paragraph Use the WebUI to accept alarms and continue operation (see page 5-82).

This chapter has a troubleshooting table for the different machines in the Vector system. And some instructions for specific problems with the MFR and feed grabber.

For problems with grabbing feed due to feed type settings more information can be found in the Horizon manual.

7.1 Troubleshooting table

NOTICE

Contact your local Lely service provider if a specific alarm occurs repeatedly or if you need assistance with solutions and preventive measures.

Explanation of the fields in the troubleshooting table:

ID number of the alarm shown on the webUI and the alarm message		
A possible cause of the alarm	Solution:	Preventive measure:
More information about the cause of the alarm	Measures to take solve the alarm and continue operation	General measure to take to prevent this alarm in the future.
1608 Kitchen empty:		
The kitchen or storage place of one of the feed types is empty	Solution:	Preventive measure:
One or more feed storage locations is empty in the feed kitchen. Keep in mind that a certain cleaning level can prevent to empty the storage place completely.	Fill the kitchen storage places (see Fill the feed kitchen on page 5-54) or set the cleaning level in Horizon. Keep in mind that changing the cleaning level can change the capacity of the system.	Fill all kitchen storage places completely and examine the stock of other feed types. It is recommended to fully fill storage places, not partially. Also, refill the kitchen after the Vector system has been out of operation (due to an alarm or maintenance).
Storage places are not set to filled again	Solution:	Preventive measure:
Normally, all storage places are marked as filled after using the filling mode. If the filling mode is not used for any reason, the storage places must be set to filled manually.	Set the storage places to filled again: connect with the Lely Control app to the feed controller, go to Fill kitchen > Storage places and select FILL ALL . This can also be set in Horizon.	Try to always use filling mode.

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3C51 Bumper activated (R 1 A 2)		
3E54 Bumper recovery failed (R 1 A 2)		
MFR lost its path	Solution:	Preventive measure:
<p>Often the bumper alarm is a result of driving somewhere unintended. Understanding where it should have driven can help where to look for the cause. The alarm list will give information about on which route and during what action the alarm was given. Some examples:</p> <ul style="list-style-type: none"> When it crosses the feed alley: Feed or flies influencing the ultrasonic sensor, misalignment of the ultrasonic sensor (bent backwards or up/down). 	<p>Clean the ultrasonic sensors and the area around them, examine the alignment of the sensors. Manually recover the safety bumper (see page 7-29).</p> <p>Manually drive the MFR back at the correct distance from the feed fence and parallel to the feed fence. When needed examine in the test menu if the feed fence is seen at the correct distance.</p> <p>Resume the route.</p>	<ul style="list-style-type: none"> Prevent feed from falling on the sensors during loading (use a dugout) and prevent overfilling the bin (reduce the max. load of that ration).
<ul style="list-style-type: none"> A lot of feed at the end of a feed fence can push an MFR outwards, this may influence the next route action(s) 		<ul style="list-style-type: none"> Prevent excessive build up of (rest) feed and remove the feed regularly.
<ul style="list-style-type: none"> Missed reset point <p>When a MFR hits a wall past the point where it should have stopped on a reset strip it may have started to look for the reset strip too late or it may not have recognised the strip. The difference between detecting steel and no steel must be big enough for both sensors at the same time to recognize a strip. Reset strips should be as close as possible to the driving direction and perpendicular. The angle should not exceed 30 degrees, and definitely not 45 degrees or more. If there is excessive feed on the reset strip, the MFR may be pushed to the middle and miss the strip. Wet dirt or ice on the sensors or strips can affect measurements. Misaligned sensors will also reduce reliability.</p>	<p>Manually recover the safety bumper (see page 7-29).</p> <p>Manually reverse the MFR to a position before the reset strip and resume the route. Remove feed which was buildup on top of the reset strip.</p>	<p>Contact your local Lely service provider to examine if the sensors are positioned correctly. Let them clean the inductive sensor unit and examine if there is no metal under it. Ask them to adjust the wheel diameter when the MFR is structurally to late in seeing the reset points (increase diameter) and let them improve unreliable routes (positioning and use of reset strips).</p>

Feed falling from the inside	Solution:	Preventive measure:
When feed dosed from the bin cannot fall freely on the feed alley, there can be a buildup around the dosing roll that eventually can push the whole bumper outwards.	Clear the feed under the dosing roll (see Clean the dosing roll, position sensor and dosing motor on the MFR on page 6-13) .Manually recover the safety bumper (see page 7-29). Resume the route.	Aim to cut roughage as much as possible during harvest. Make sure the knives and mix settings are optimal, consider lowering the amount of feed (dosing weight) for that location. Contact your local Lely service provider to adjust the route to allow more space for the feed to fall (drive at a larger distance from the feed fence).
Cattle	Solution:	Preventive measure:
Cows or bulls have pushed the bumper.	Manually recover the safety bumper (see page 7-29). Resume the route.	Contact your local Lely service provider to optimise routes to: <ul style="list-style-type: none"> • Minimise driving forwards toward the feed fence. • Prevent driving close past bulls e.g. • Make sure there is sufficient clearance between the MFR and the feed fence or the cattle. Consider to use the optional electric bumper protection.
High piled up feed	Solution:	Preventive measure:
When the feed is piled up, the tube of the feed height laser can get caught by feed and activate the bumper.	Try to spread the feed so the bumper does not get caught on it. Manually recover the safety bumper (see page 7-29). Resume the route.	Consider lowering the dosing weight for that feed location.
Foreign objects	Solution:	Preventive measure:
Farm implements or traffic on an outside route.	Remove the object. Manually recover the safety bumper (see page 7-29). Resume the route.	Use ODS where the routes allow it. Consider marking the route of the MFR so it is clear for visitors where not to park vehicles or store material.



Violated safety boundaries during bumper recovery	Solution:	Preventive measure:
Driven more than 0.5 m while hard bumper stop was activated.	Manually recover the safety bumper (see page 7-29). Resume the route.	-
Driven the wrong way.	Manually recover the safety bumper (see page 7-29). Resume the route.	-

3C50 Emergency button activated

Emergency button activated	Solution:	Preventive measure:
An emergency situation occurs.	<ol style="list-style-type: none"> 1. Make sure the emergency has been cleared. 2. Pull the emergency button out until it locks. 3. Press the pause button to clear the alarm. 4. Accept the generated alarm in the Lely Control Plus app. 	-

3E06 Exceeded speed limit. Measured speed left: 1 mm/s; right: 2 mm/s

Safe speed limits exceeded	Solution:	Preventive measure:
Failure of control system. Service key activated on slope, causes the MFR to roll away.	<ol style="list-style-type: none"> 1. Press the pause button to clear the alarm. 2. Accept the generated alarm in the Lely Control Plus app. 3. Continue operation. 	Contact your local Lely service provider.

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3CCC No initial Feed Flow was detected (1)		
No feed falls in the MFR from the digital output dispenser	Solution:	Preventive measure:
<p>Via a digital output a wide variety of dispensers can be controlled, ranging from a water valve to a tower silo and conveyor belt system. Settings are available to generate an alarm when problems or blockages are detected to prevent damage across different technologies. When no start of a feed flow has been detected within a set time (margin) the alarm no initial feed flow will be generated. A start of a feed flow is recognised by the MFR if there is 10 kg increase in weight or a constant flow of more than 350 g/s for 3 seconds.</p>	<p>Find the fault why the dispenser has not started to dose feed in the MFR, examine:</p> <ul style="list-style-type: none"> • If the system is powered. • If the storage is empty. • If there is a blockage of augers, loaders or a transport system. <p>Fix the fault and resume operation.</p>	<p>Contact your local Lely service provider.</p>
The dispenser has not started dumping feed in the MFR before the set start up margin	Solution:	Preventive measure:
<p>The settings Startup delay and Startup margin must both be set correctly, for filled and near empty dispensers.</p>	<p>Resume the feeding task on the MFR, but if no changes are made to the settings the alarm will occur again.</p>	<p>Contact your local Lely service provider to make adjustments in the settings, if the alarm was triggered while the dispenser was operating normally. The delay setting may be set too short. Measure the time the dispenser takes to start up and use that time as the setting for delay of that dispenser. Do not set this time too long. When a conveyor belt or chute is blocked you do not want to continue requesting that feed type endlessly and cause damage or a pile of feed in the wrong location.</p>
3DBC No initial Feed Flow was detected (1)		
See alarm 3CCC	Solution:	Preventive measure:
<p>This is the non critical version of alarm 3CCC, so the MFR will have continued without this feed type, problems and solutions are similar.</p>	-	-



160D Crane alarm		
Problem	Solution:	Preventive measure:
The bridge crane has an alarm, this alarm is generated on the feed grabber		
The feed grabber notifies messages and alarms of the bridge crane. First the crane alarm needs to be solved before the feed grabber can be put back in operation.	Connect the smartphone to the bridge crane and see which alarm is active, resolve the problem and put the bridge crane back in operation. Only then log into the feed grabber, accept the crane alarm and resume operation of the feed grabber.	If the bridge crane alarm is often caused by slip, you can prevent this alarm by regularly cleaning the I-beams. Clean these beams before the season of fog and condensation starts (for example during fall and spring, when cold steel and warm air can be expected). In a very dusty kitchen consider to install the optional brush set on the bridge crane.

3E62 Grab request not accepted by FG within 5 minutes		
Problem	Solution:	Preventive measure:
Feed grabber grab request time out		
Feed grabber grab request not accepted within five minutes. A reliable communication is necessary.	Examine the wifi connection to the PDB and LDN addresses of the PDB and feed grabber. Contact your local Lely service provider to examine the reliability and path of the bluetooth communication between the PDB and feed grabber. This can be done with the map option in your phone app (Lely Control), this option shows how the connection is made and how strong the signals are between the nodes.	Contact your local Lely service provider.

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Feed grabber out of operation	Solution:	Preventive measure:
<p>The MFR has sent a task to the feed grabber, but the feed grabber did not accept the task within five minutes to execute it. The feed grabber may be out of operation because it has not started up (no power) or auto start has failed. The feed grabber can not start automatically when the grabber is closed. This may occur this can happen when the power supply is unexpectedly taken away from the feed grabber. This can happen with unauthorised kitchen access, power failure or an emergency stop. Another reason is when you forget to put the feed grabber back in operation after changing the priority of feed blocks in the kitchen menu.</p>	<p>Before resuming the MFR first make sure the feed grabber is in operation. Connect the smartphone to the feed grabber, if it is not possible to log in, it may not have power yet. Examine if the play button on the kitchen console is still blinking and if so push it. When the feed grabber can be accessed, put it in operation. When the grabber is closed holding feed (which will have prevented automatic startup) the grabber will drop the feed during the start up to look for the reset magnets. If you do not want that in that location first manually drive the feed grabber to the location where it is convenient to drop the feed, preferably above a storage place of the same feed type. When the feed grabber is back in operation, connect the smartphone to the MFR and let it resume its task. The request for the feed grabber will be sent again and the feed grabber will immediately execute that task.</p>	<p>Use the setting Max kitchen time in Horizon to receive an alarm when the kitchen is not put in operation after filling of the kitchen.</p>

3E63 Feedgrabber tries to dump unknown feedtype		
Unknown feed type	Solution:	Preventive measure:
<p>The feed type is not known by the MFR. The MFR was manually interrupted during feed loading.</p>	<p>If task of the MFR is interrupted to start a new task, make sure the feed grabber is assigned the same task.</p>	<p>Contact your local Lely service provider.</p>



3E64 Grab request accepted but no feed dumped within 15 minutes

Feed grabber accepted request but no feed dumped	Solution:	Preventive measure:
Grab request accepted, but no feed was dumped after 15 minutes.	Examine if the feed grabber has performed a successful grab and is waiting for permission to dump. Then examine the WiFi connection between the MFR and the PDB with the service menu in the Lely Control Plus app. Also, examine the bluetooth communication between the PDB and feed grabber with the map option in the Lely Control app.	Contact your local Lely service provider.

3E65 FG fails to dump within 5 minutes

Feed grabber dump time out	Solution:	Preventive measure:
Feed grabber is allowed to dump, but fails to do so within five minutes.	Examine if the feed grabber has performed a successful dump. Then examine the WiFi connection between the MFR and the PDB with the service menu in the Lely Control Plus app. Also, examine the bluetooth communication between the PDB and feed grabber with the map option in the Lely Control app.	Contact your local Lely service provider.

3E58 No mains power during feed loading

No mains available on the MFR when it is loading feed (mixing)	Solution:	Preventive measure:
<p>When a task is started and during loading of the feed, the MFR checks if there is main power available to turn the mixing auger. When the main power is lost for 60 seconds during feed loading the alarm is raised. The absence of power can be attributed to several potential causes, including:</p> <ul style="list-style-type: none"> • Power is present at the charge pole, but not in the MFR • No power on the charge pole 	Examine if the MFR is properly engaged with the charge pole, reconnect it if necessary.	Contact your local Lely service provider to examine if the connectors on the charge pole and/or on the MFR are worn.

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A703 MFR too long in loading state (<P1> minutes)		
Wrong time setting	Solution:	Preventive measure:
It takes longer than the set time to fill the MFR bin. It is possible that the set time is timed during a full kitchen but once the kitchen becomes half empty it takes more time.	Fill up the bin with the largest ration, time it and add half of the time to it. Set this value for the setting Max MFR load time .	Contact your local Lely service provider.
Bad grabbing performance	Solution:	Preventive measure:
The feed grabber needs too many retries before a good grab is taken, which causes the loading time to exceed.	<p>Find out which feed type causes this alarm by watching the Lely Control screen of the feed grabber during operation. There are two types: retries on weight estimation and retries on grabber opening. Once the cause of the delay is identified, examine the placement of the feed block or bale and the corresponding feed grabber settings in Horizon. Make sure:</p> <ul style="list-style-type: none"> • The feed blocks are placed in the center of their storage location. • There are no overhanging blocks. • To prevent slopes created by the feed grabber when grabbing loose products like corn or beet pulp. 	Place feed blocks or bales in the middle of the kitchen storage places. Discuss Horizon feed type settings of the feed grabber with the FMS department of the local Lely service provider.
The feed grabber is not in operation	Solution:	Preventive measure:
The delay is caused when the feed grabber is out of operation or in an alarm state.	Clear the alarm and put the feed grabber in operation again.	-
Grabber grabs structurally too high because of fine dirt on the glass of the feed height laser	Solution:	Preventive measure:
Fine dust or fly droppings on the glass will affect the measurement slightly, causing the feed grabber to grab too high or even in the air.	Clean the feed height laser on the feed grabber (see page 6-28).	Regularly clean the glass with a soft cloth and/or wet cloth. Especially in a dusty kitchen.

3C03 No reset point detected (R 1 A 2)		
MFR already past the reset strip before it starts looking for it	Solution:	Preventive measure:
<p>The MFR will only search for reset points in the last part of the route action. If the action has been started in the wrong position or the wheel diameter is set incorrectly, the MFR may have travelled further already than it assumes.</p> <p>If route actions have been changed recently all related actions may not have been adjusted.</p>	<p>Reverse the MFR manually to a point just before the reset strip and resume the route (see Continue a route from a known route action on page 5-66).</p>	<p>Contact your local Lely service provider to adjust (increase) the wheel diameter when the MFR always looks too late for the reset points. When it only looks too late on one action let the technician reduce the length of that route action.</p>
MFR is in alarm before reaching the reset strip	Solution:	Preventive measure:
<p>The MFR assumes it is further on the route than it actually is. Excessive slip while driving the route action is a possible cause. Or the length of the route action has been altered or affected because of other changes in the route.</p> <p>A wheel diameter that is set too high will also cause this type of problem.</p>	<p>Manually drive the MFR to a position just before the reset strip and resume the route (see Continue a route from a known route action on page 5-66).</p>	<p>Contact your local Lely service provider. Improve the conditions for the MFR (clean surface, examine the condition/tread of wheels).</p> <p>Ask the technician to adjust the wheel diameter:</p> <ul style="list-style-type: none"> • When the MFR always looks too early for the reset points: decrease the wheel diameter. • When the MFR only looks too early on one route action: increase the length of that route action.
3E57 MFR lost strip (R 1 A 2)		
Unexpected reset point	Solution:	Preventive measure:
<p>This alarm is triggered when the MFR is following a steel strip and the steel unexpectedly is not detected anymore, like finding an actual reset point (gap in the strip) but at the wrong position. This can be caused by a wrong wheel diameter setting (MFR assumes it has not travelled as far as it already did).</p> <p>Or it can happen when the MFR was put on a wrong position in the route after other issues (MFR assumes it follows a different strip).</p>	<p>Manually drive the MFR to a position some distance before the reset point and resume route (see Continue a route from a known route action on page 5-66).</p>	<p>Contact your local Lely service provider to make adjustments. When an MFR is too late in slowing down before a reset point or finds reset points before expecting it, the wheel diameter is probably set too high or the route action is shorter than the specified length in the route.</p>

MFR lost its path during following a strip	Solution:	Preventive measure:
<p>When following the strip the MFR responds immediately when it is not centred on the strip anymore, this enables the MFR to react fast enough when following a bend.</p> <p>If the sensors are too close to the strip the MFR will respond much later.</p> <p>Also if there is some play in the chains the response of the MFR is late.</p> <p>Slip or sideways force (gravity when driving on a slope or a castor wheel not turning freely) will make matters worse.</p> <p>Feed caught under the MFR is also a possible cause.</p>	<p>Manually put the MFR back on the strip and resume the route (see Continue a route from a known route action on page 5-66). Examine if the MFR is free to turn left and right, remove feed from underneath the skirt if present.</p>	<p>Contact your local Lely service provider. While following a strip the MFR should drive straight, behaviour like being drunk is an indication the sensors may need adjustment or the chains need tensioning.</p>

3E32 Reset strip not found (R 1 A 2 expected 3cm, driven 4cm)		
MFR cannot find the strip while turning	Solution:	Preventive measure:
<p>For example during a route action to turn until a strip is found. If the MFR is unable to detect the strip fast enough this alarm will be generated.</p>	<p>Examine if the MFR is free to turn and turns in the correct position on the route. If necessary manually drive the MFR to the correct point to turn where it is sure to find the strip and resume the route (see Continue a route from a known route action on page 5-66).</p>	<p>Contact your local Lely service provider to make sure the actions preceding this turn have a clear reset point and no chance of slip or interference so the MFR will turn in the correct position.</p>

The next action is to start to follow a strip which the MFR is unable to find within a reasonable distance	Solution:	Preventive measure:
<p>The MFR can pick up a strip at a small angle easily and start following it. A reason for not finding the strip can be:</p> <ul style="list-style-type: none"> • Distance to the strip is too long. • The strip is missed because the MFR is not facing the right direction at the start. • The MFR has an offset to its normal path. 	<p>Put the robot on a known position and resume the route from there (see Continue a route from a known route action on page 5-66). Examine the route for reasons of slipping.</p>	<p>Contact your local Lely service provider. Ask the Lely technician to make a more reliable route by combining strip following and reset points to increase certainty of positioning of the MFR. Make sure the strips are in the correct position where the MFR starts to look for them.</p>

Inductive sensors are incorrect	Solution:	Preventive measure:
The inductive sensor placement may be incorrect, causing poor strip detection. Additionally, inductive sensors may be dirty or wet, the sensor height may be incorrect, or metallic debris may be present underneath the sensor.	Contact your local Lely service provider.	-

3E33 End of strip not found (R 1 A 2 expected 3cm, driven 4cm)

MFR cannot find the end of the strip	Solution:	Preventive measure:
The route may have been manually (re)started from the wrong route action. This could result in insufficient distance covered due to slipping. The MFR may have passed the reset point before the end-of-strip detection began (0.5 m before the expected end of action) due to an incorrectly programmed route or an earlier start in the previous segment.	Put the robot on a known position and resume the route from there (see Continue a route from a known route action on page 5-66). Examine the route for reasons of slipping.	Contact your local Lely service provider.

Inductive sensors are incorrect	Solution:	Preventive measure:
The inductive sensor placement may be incorrect, causing poor strip detection. Additionally, inductive sensors may be dirty or wet, the sensor height may be incorrect, or metallic debris may be present underneath the sensor.	Contact your local Lely service provider.	-

3CCD Feed Flow under threshold was detected (1)		
Flow of feed is below the expected flow for a certain period of time	Solution:	Preventive measure:
The feed flow has been under the set percentage of the normal flow during the set time.	Find the fault of the interrupted feed flow in the dispenser, examine if there is a pipe clogged, or the feed is blocked. Resume the task of the MFR after the dispenser operation has been restored.	When water is used, the use of water elsewhere on the farm can lower the pressure enough to trigger this alarm. Consider using a buffer tank that will dispense with a steady (and large) flow when needed. If the installed buffer tank turns out to be too small, consider putting this feed type twice in the ration, and dose it on two separate times.
Incorrect settings	Solution:	Preventive measure:
Settings are available to raise an alarm when blockages are detected to prevent damage across different technologies. The alarm for flow below the threshold is triggered when the current flow drops below a set percentage of the normal flow (based on historical data) for a specified period of time.	Contact your local Lely service provider to adjust the settings. Reset the alarm and resume operation.	-
1603 X position not reached within <xx> minutes		
It takes the feed grabber too long to drive to the intended position	Solution:	Preventive measure:
The feed grabber is allowed a maximum time of five minutes to get from the starting position to the desired position. If the speed is too low or the position cannot be reached this maximum time is exceeded.	Remove obstacles and examine if feed hanging underneath the grabber prevents a normal forward motion.	Contact your local Lely service provider. If feed underneath the grabber is causing the time-out, optimise the grabber settings (less grab depth etc.), prevent that feed gets caught behind fences or edges of the MFR (smooth dugout). Make sure that the most frequently used feed types are not placed in positions with the longest driving time in the kitchen.

3E5E Communication timeout barndoor (1)		
Communication problem control box of the door	Solution:	Preventive measure:
The barn door is off or the antenna of the barn door does not reach the MFR.	Connect the Lely Control Plus app with the barn door control. If you cannot connect with the user interface to the barn door, or it does not respond to commands with the app. Restart the door control box by switching the main power switch to off and switch it on again. After a few minutes the communication comes online again.	Contact your local Lely service provider.
Communication problem MFR	Solution:	Preventive measure:
The communication part of the MFR has an error and can therefore not communicate with the door.	Connect the Lely Control Plus app with the barn door control and examine the bluetooth signal strength with the service menu. Take the MFR out and in operation again to trigger the communication. Connect the Lely Control Plus app with the MFR to see if it is possible to open the barn door via the MFR (see Test the automatic barn door on page 7-48).	Contact your local Lely service provider.
3E5F Barndoor 1 is unable to open		
Barn door motor is broken	Solution:	Preventive measure:
Broken motor.	Connect the Lely Control Plus app with the barn door and MFR to see if it is possible to open the barn door via the barn door and the MFR (see Test the automatic barn door on page 7-48). If there is no movement in the door, contact your local Lely service provider to replace the motor.	-
Power loss control box of the door	Solution:	Preventive measure:
The barn door cannot be controlled by the control box because there is no power on the box.	Contact your local Lely service provider.	-



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Broken sensor	Solution:	Preventive measure:
The door control box is not able to change the state of the door because the open/close sensor does not work properly.	Examine if the light on the open position sensor is on when the door has reached the open position. Adjust the door and or the sensor until the light comes on. Resume the route of the MFR.	Contact your local Lely service provider to replace the sensor. Make sure the metal plate on the door is big enough to be sensed under all circumstances (for example wind moving the door).

Automatic door does not work	Solution:	Preventive measure:
The control of the barn door itself is not working and the Lely barn door control box is therefore not able to open the door.	Restart the control box of the external supplier and try to open the door afterwards.	Contact your local Lely service provider.

3E31 Obstacle detected. Left: 1; Right: 2. Check 'Obstacle sensor' in service menu for more information.

Something in front of the MFR	Solution:	Preventive measure:
Something in front of the MFR.	Remove the obstacle in front of the MFR.	Keep the routes of the MFR clear of obstacles.

Dirt on the sensor	Solution:	Preventive measure:
Dirt on the sensor	Clean the sensor (see Clean and test the obstacle detection sensors on page 6-10).	Clean the sensor regularly.

Broken sensor	Solution:	Preventive measure:
Broken sensor.	Contact your local Lely service provider to replace the sensor.	

3E39 Critically low battery charge (current = 1, critical = 2). MFR is shut down to preserve energy. Manually reboot the MFR to reactivate.

Batteries are almost empty	Solution:	Preventive measure:
The MFR may remain stuck away from the charge pole for an extended period, and/or the batteries may discharge too quickly. To save battery capacity the MFR is shut off automatically.	Restart the MFR (see page 7-19). Drive the MFR manually to the charge pole and put it back in operation, see Charge the MFR when it has a low battery (see page 7-16).	Contact your local Lely service provider.

3E3A Did not reach charge pole (R 1 A 2 expected 3cm, driven 4cm)		
The MFR did not reach the charge pole	Solution:	Preventive measure:
The MFR may not have driven far enough due to slipping or may be slipping against the charge pole without reaching the threshold for current increase. It may not have reached the charge pole due to incorrect route programming. The route may have been manually (re) started from the wrong route action, or the robot may be on the incorrect strip.	Put the robot on a known position and resume the route from there. Examine for reasons of slipping or deviation from the route. Use Charge pole drive to drive the MFR in the charge pole.	Contact your local Lely service provider.
3E3D The payload in the bin has exceeded the maximum allowable weight limit of 1000 kg. Autonomous operation is not allowed until the weight is reduced. Manual control is possible at limited speed.		
Maximum bin weight exceeded	Solution:	Preventive measure:
The load cells indicate that the maximum allowable weight in the MFR bin (1000 kg) has been exceeded. In this case, to stop within the bumper stroke at maximum speed cannot be guaranteed. Alternatively, the load cells may be damaged or incorrectly calibrated, or something may be pressing on the bin from above.	Manual control is available at limited speed. Use the Lely Control Plus app to drive the MFR to a suitable location, and use the manual feed-dosing feature to remove the excess payload from the bin (see Manually dose feed from the MFR on page 5-64). If there is no payload or you believe the load cell readings are incorrect, contact your local Lely service provider.	-

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7.2 Charge the MFR when it has a low battery

NOTICE

Prevent the MFR from having less than 20% power. If this occurs regularly contact your Lely service provider.

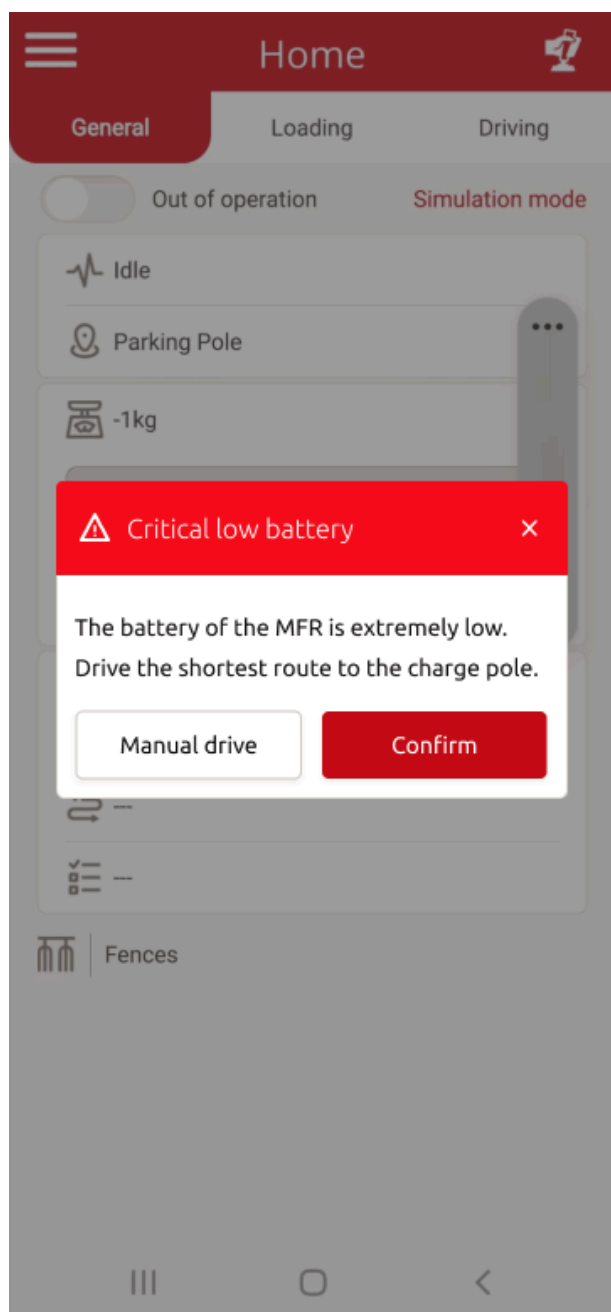


NOTICE

The procedure below could only be performed if the MFR still has some remaining battery capacity. If the MFR will not turn on and has 0% battery capacity, contact your Lely service provider.

1. If the MFR has power less than 20%, a five minute timer starts, do the following:
 1. Open and connect the Lely Control Plus app to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2) to cancel the timer.
 2. Connect the MFR manually to the charge pole (see page 5-63).

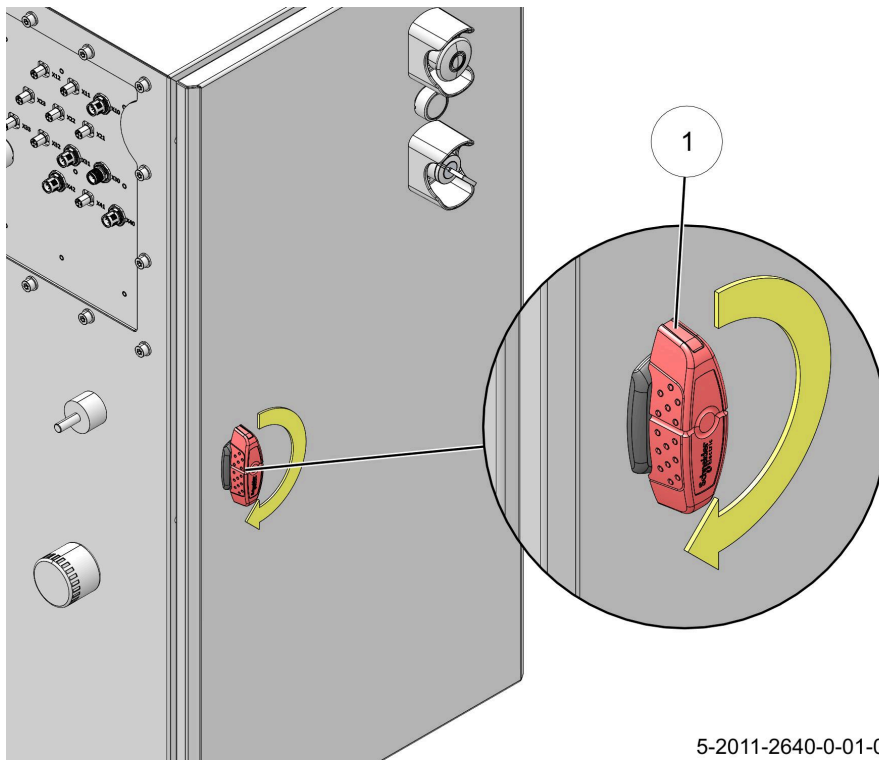
2. When the five minute timer runs out, the robot will switch itself off (power save mode), do the following:
 1. Restart the MFR (see page 7-19).
 2. An alarm is shown on the Lely Control Plus app if the power of the MFR is still less than 20%.



3. Connect the MFR manually to the charge pole (see page 5-63).
4. Charge the MFR to a minimum of 80%.

7.3 Restart the MFR

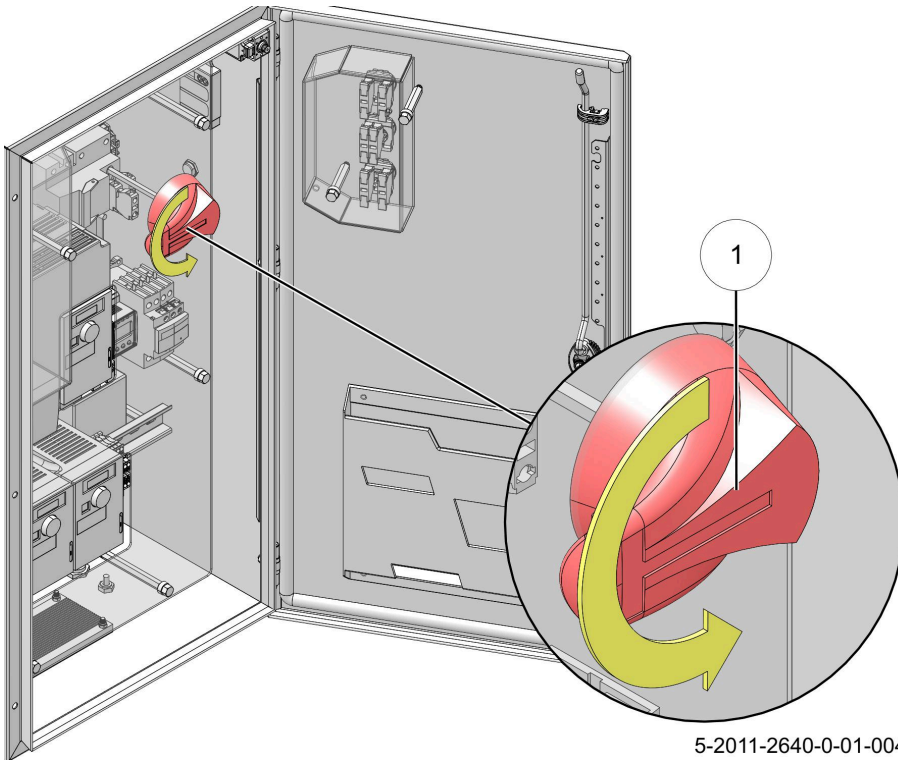
1. If the MFR is connected to the charge pole:
 1. Manually drive the MFR backwards to disconnect it (see Drive the MFR manually on page 5-61).
 2. Manually drive the MFR to a clean, dry and level location without weather influences (see Drive the MFR manually on page 5-61).
 3. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
 4. Remove the power box main cover (see Remove or install the power box main cover on page 5-40).
 5. Rotate the doorknob (1) clockwise to open the power box door.



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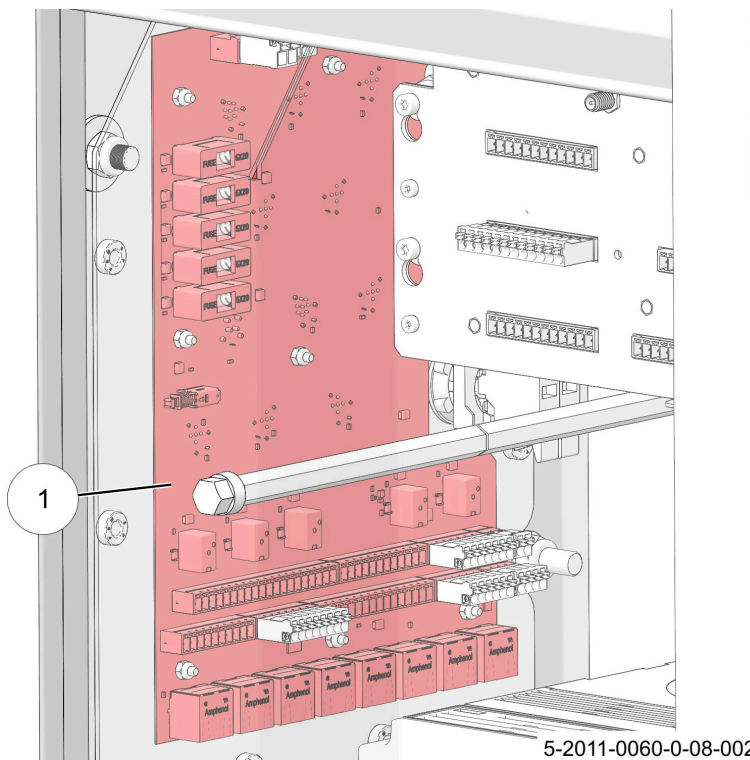
5-2011-2640-0-01-003

6. Switch OFF the high voltage switch (1).



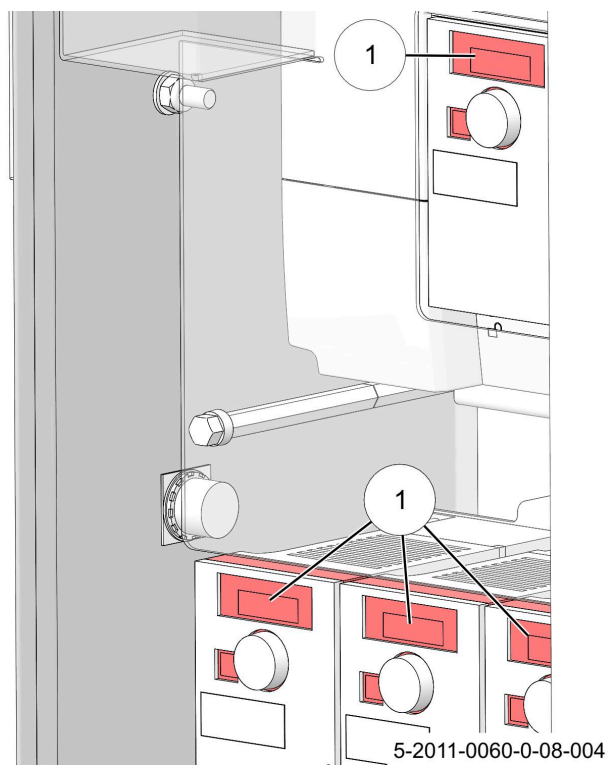
5-2011-2640-0-01-004

7. Examine if the battery indicator D10 (1) on the PCB in the power box is off.



5-2011-0060-0-08-002

8. Examine if the frequency drives (1) are switched off.

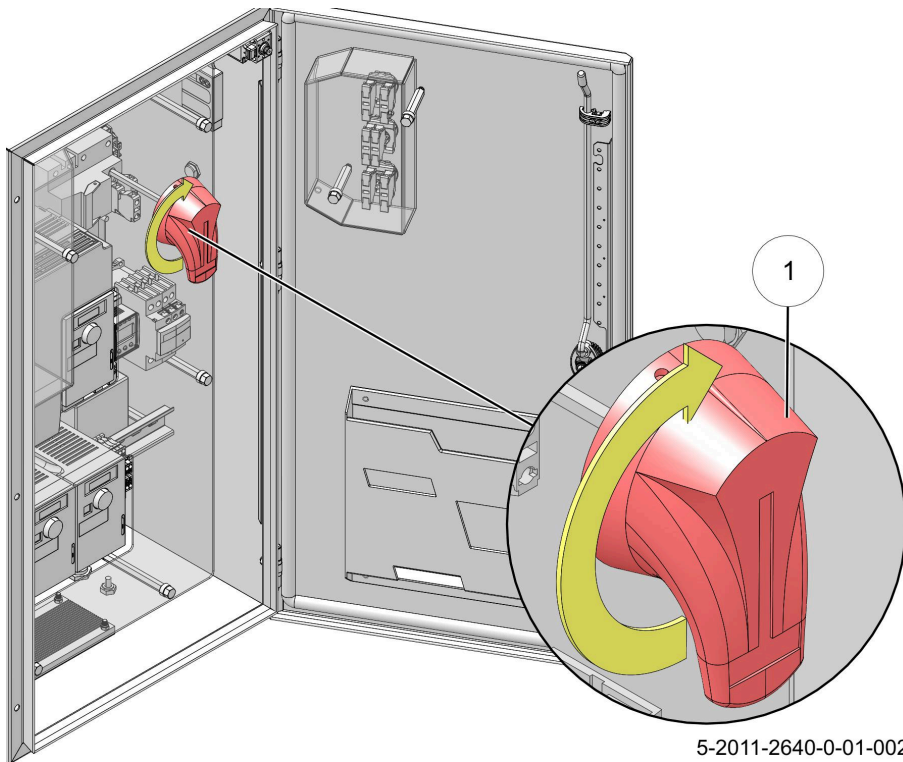


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NOTICE

Wait for 10 seconds before you turn on the MFR.

9. Switch ON the high voltage switch (1).

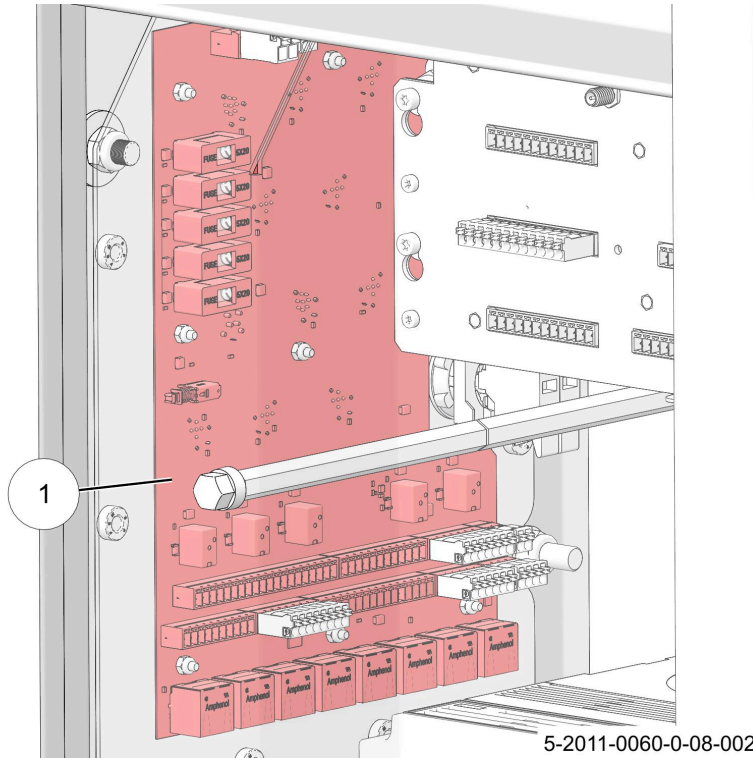


NOTICE

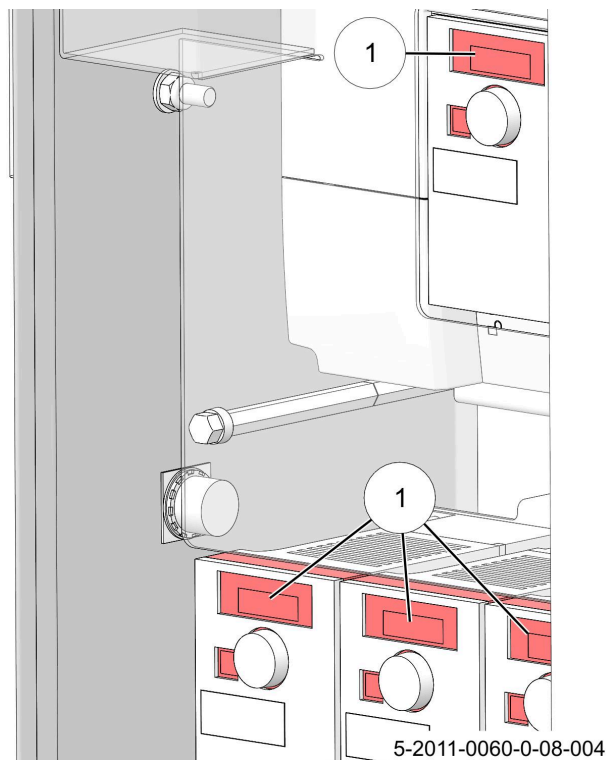
The MFR needs about two minutes to start up and prepare the system for use. Wait two minutes before connecting with the Lely Control Plus app to the MFR.

10. The MFR initiates the startup procedure:

1. Examine if the battery indicator D10 (1) on the PCB is on, this indicates that the batteries are able to supply power.



2. Examine if the frequency drives (1) are switched on. This may take a few minutes.

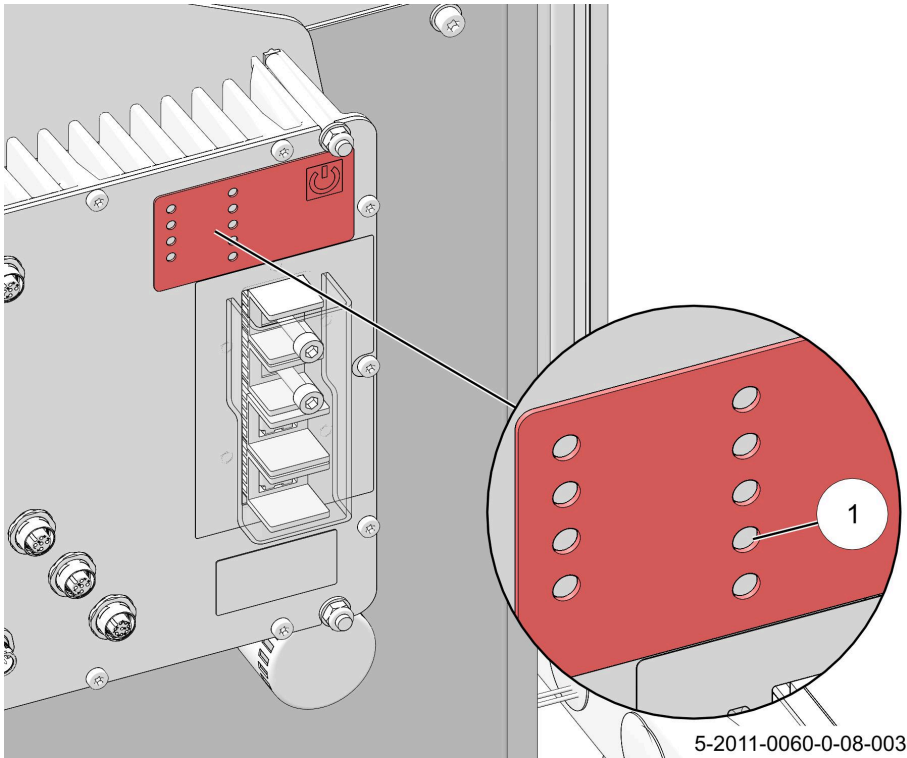


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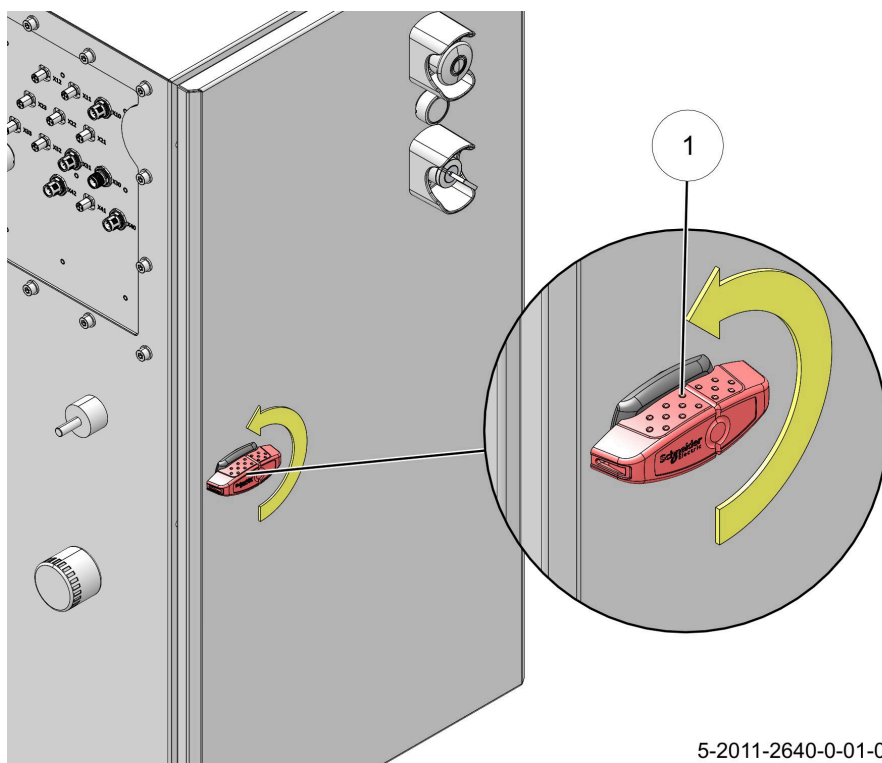
3. Examine if the safety LED (1) on the VIOB is lid green. This may take a few minutes.



When the safety LED (1) on the VIOB is lid green, you can connect with the Lely Control Plus app to the MFR and get an interface.

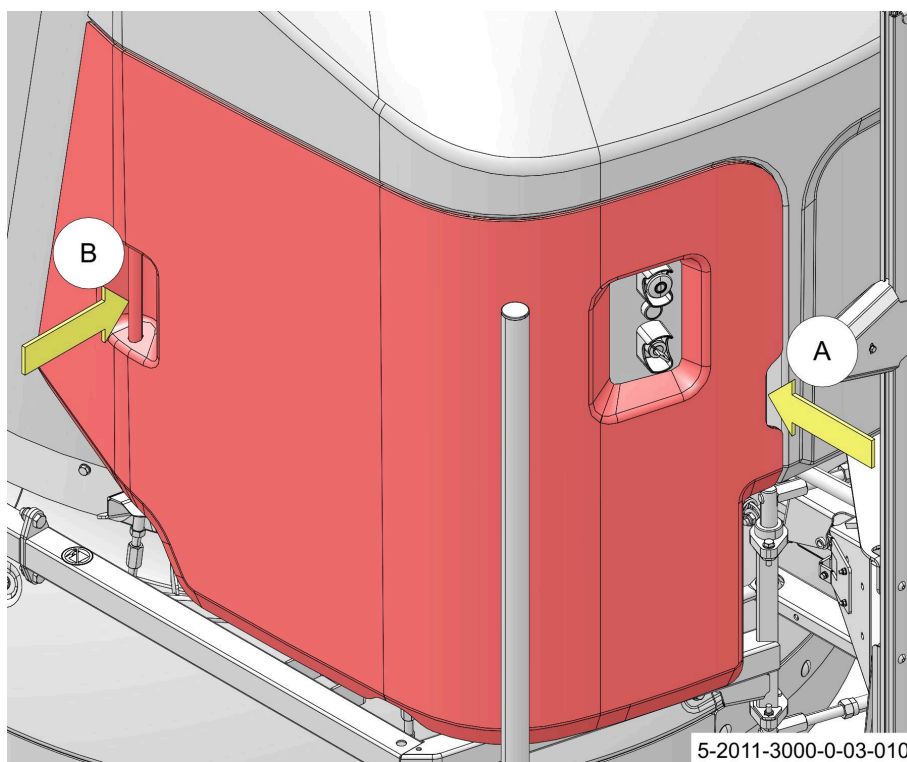


11. Rotate the doorknob (1) counter clockwise to close the power box door.



5-2011-2640-0-01-013

12. Push (A - B) and install the power box main cover on the MFR.



5-2011-3000-0-03-010

13. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).

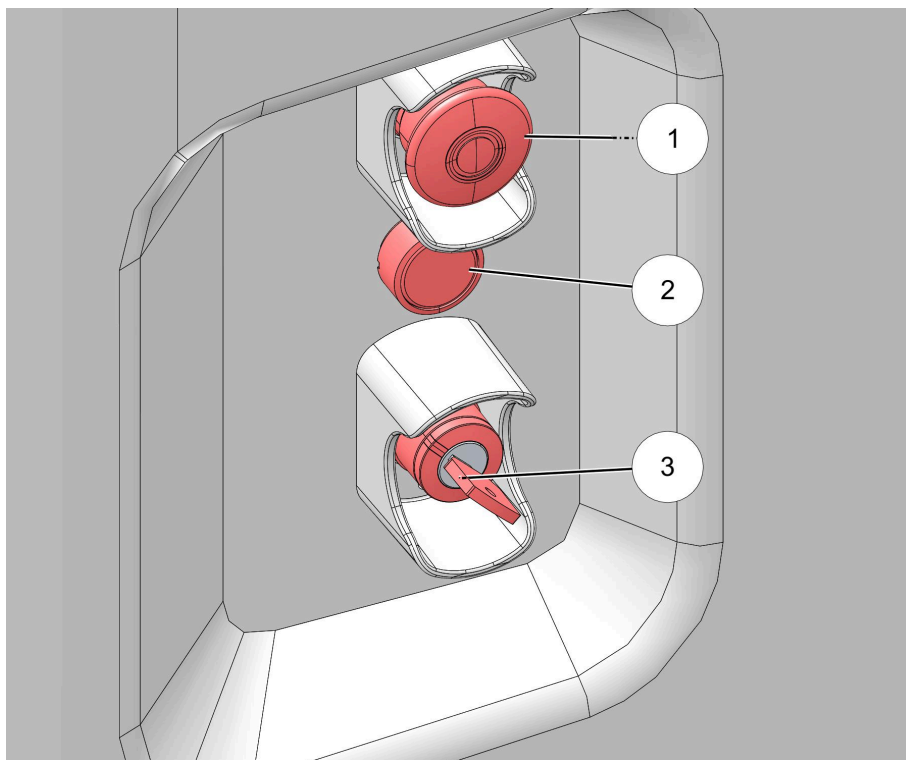
14. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

7.4 Restart the safety device of the MFR

NOTICE

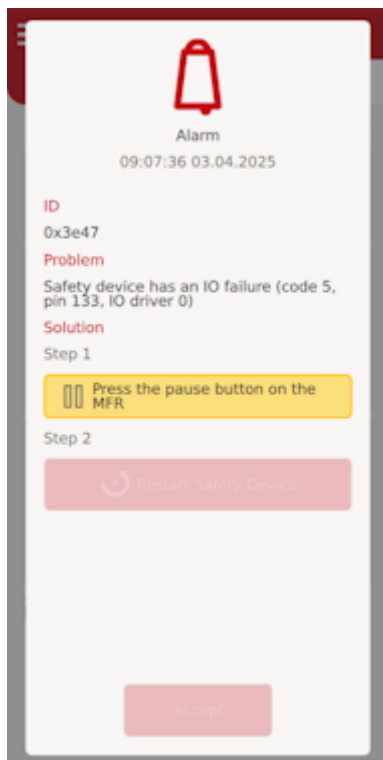
If instructed by the Lely service provider, follow the restart procedure below to restart the safety device and clear the safety system alarm.

1. Push the pause button (2) to confirm it is safe to proceed operation.



KEY: 1. Emergency button - 2. Pause button - 3. Service key

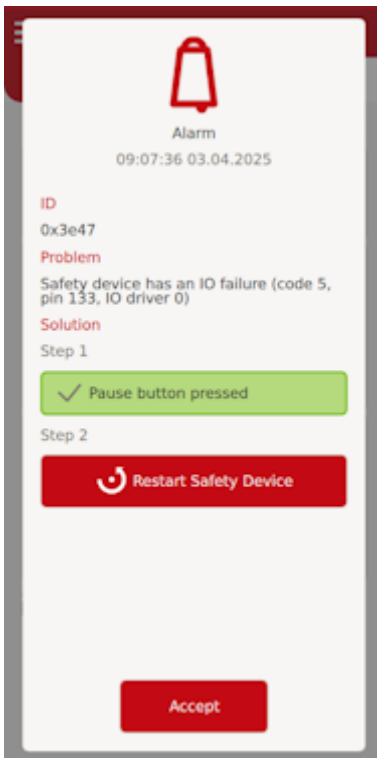
2. Open the Lely Control Plus app and connect to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2).



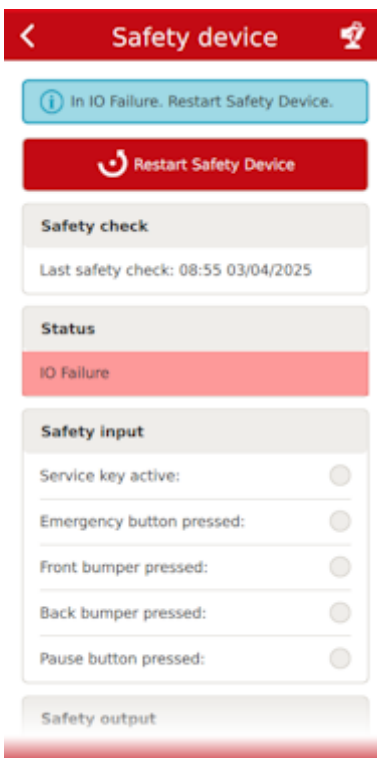
5.2011.8636.0 B

3. Read the alarm message in the popup screen. Call your local Lely service provider for help.
4. Resolve the alarm, if necessary go to the chapter Troubleshooting to see what actions should be taken to remove the cause of the alarm.

5. Push the pause button (2).

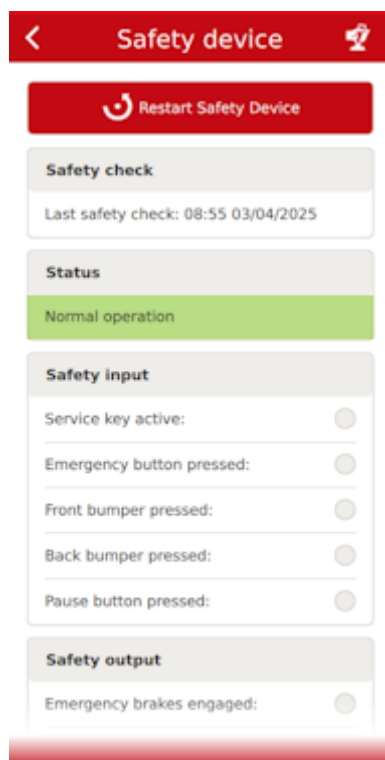


6. Tap **Restart Safety Device**.



7. Wait until the safety device has restarted. Examine if the status of the safety device is in **Normal operation**.

When the safety device is in normal operation, the safety system fault is cleared, allowing the control system to restart the motors and actuators.



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8. If the safety device does not restart with the Lely control plus app or the status of the safety device stays in an error state, call your local Lely service provider.
9. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

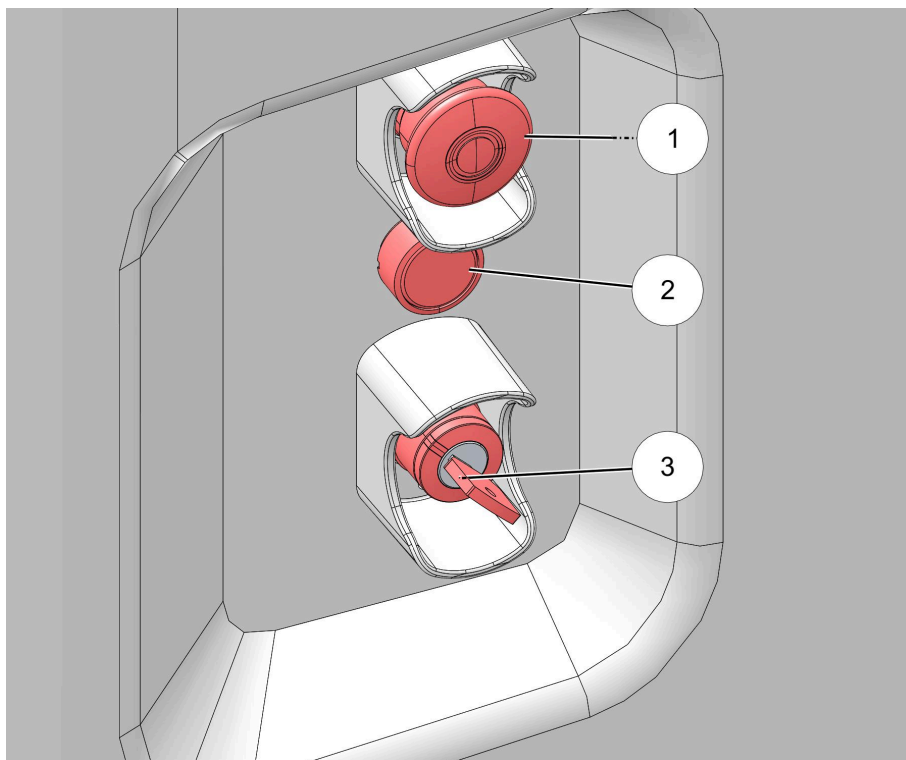
7.5 Manually recover the safety bumper

NOTICE

Contact your local Lely service provider if the safety bumper needs to be recovered regularly.

1. Examine what triggered the bumper alarm, make sure there are no persons or animals pressed against the bumper of the MFR before you continue to recover the safety bumper.

2. Push the pause button (2) to confirm it is safe to proceed operation.



KEY: 1. Emergency button - 2. Pause button - 3. Service key

3. (see Connect the Lely Control Plus app to the machine on page 5-2) .
4. Tap **Accept** to confirm the alarm message.

NOTICE

A maximum of 0.5 m can be driven with the bumper pressed.

5. (see Drive the MFR manually on page 5-61) .
6. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

7.6 Release a jammed mixing auger

**DANGER**

**Sharp rotating knives.
Risk of severe injury or death.
Never enter the mixing bin and keep hands and feet clear.
Only trained Lely technicians are permitted to enter the
mixing bin.**

**WARNING**


*Crushing due to moving parts.
Risk of being crushed.
Keep hands, feet, hair and clothing away from all moving parts due to
crushing.*



Do this procedure when the mixing auger is jammed for example because there is too much feed with long fibres in one place.

1. Open the Lely Control Plus app and connect to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2).
2. Take the MFR out of operation using the smartphone (see page 5-47).


3. Turn the mixing auger:

1. On the home screen tap .
2. Tap **Service > Motors > Mixer**.

NOTICE



To avoid damage to the motor or frequency regulator, do not turn the mixing auger motor faster than with a frequency of 50 Hz.

- 
3. Tap rotation to -50 Hz. and change the mixing auger

4. Tap and hold  **Hold to run** to start the mixing auger for a few seconds.

5. Release  **Hold to run.**

- 
6. Tap rotation to 50 Hz. and change the mixing auger

7. Tap and hold  **Hold to run** to start the mixing auger for a few seconds until it is turning smoothly. Release  **Hold to run.**

8. If the mixing auger does not turn go to the next step (step 4).

4. Remove feed from the mixing bin:



Use the Vector step ladder to do this procedure.

1. Empty the mixing bin (see Manually dose feed from the MFR on page 5-64).
 2. Manually drive the MFR to a clean, dry and level location (see Drive the MFR manually on page 5-61).
 3. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
 4. Switch OFF the power to the MFR with the high voltage switch (see page 5-17).
 5. Put the Vector step ladder next to the MFR.
 6. Climb on the step ladder service platform.
 7. Remove all feed from the mixing bin with a pitchfork. Do not climb into the mixing bin and keep hands and feet clear.
 8. Climb out of the Vector step ladder.
 9. Remove the Vector step ladder.
 10. Switch ON the power to the MFR with the high voltage switch (see page 5-25).
 11. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
 12. When all feed has been removed from the mixing bin and the weight has a negative value, tare the load cells (see Tare the load cells on page 6-25).
5. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

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7.7 Release a jammed dosing roll



**Sharp rotating knives.
Risk of severe injury or death.
Never enter the mixing bin and keep hands and feet clear.
Only trained Lely technicians are permitted to enter the mixing bin.**



**Crushing due to moving parts.
Risk of being crushed.
Make sure the MFR and its immediate surroundings are void of persons
and animals. Stand clear from the MFR during this procedure.**



Do this procedure when the dosing roll is jammed because there is too much feed with long fibres around the dosing roll.

1. Open the Lely Control Plus app and connect to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2).
2. Take the MFR out of operation using the smartphone (see page 5-47).




3. Go to  menu overview.

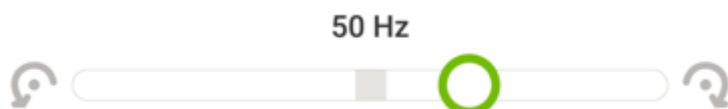
4. Open the feed door:

1. Tap **Service > Motors > Dosing roller**.



2. Tap and hold  **Open** to completely open the feed door.

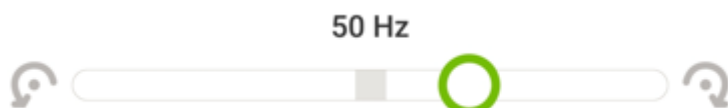
5. Turn the dosing roll in the opposite direction:



1. Tap Hz. and change the rotation to -50

2. Tap and hold **Hold to run** to start the dosing roll for a few seconds.

3. Release **Hold to run.**



4. Tap Hz. and change the rotation to 50

5. Tap and hold **Hold to run** to start the dosing roll for a few seconds until it is turning

smoothly. Release **Hold to run.**

6. Clean the dosing roll if the dosing roll does not turn smoothly.

6. Close the feed door:

1. Make sure there is a green indicator at **At closing position**, if not: tap **Closing position**.

2. Wait for the indicator to become green.

3. Tap and hold **Close.**

7. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

7.8 Release a jammed feed door

DANGER

**Sharp rotating knives.
Risk of severe injury or death.
Never enter the mixing bin and keep hands and feet clear.
Only trained Lely technicians are permitted to enter the mixing bin.**

⚠ WARNING

*Sharp knives and edges.
Risk of being cut by sharp knives or edges.
Wear gloves with a cut resistance according to the standards mentioned in the paragraph 'Cut resistant clothing' (see Cut resistant clothing on page 2-5).*

⚠ WARNING

*Crushing due to moving parts.
Risk of being crushed.
Keep hands, feet, hair and clothing away from all moving parts due to crushing.*



Do this procedure when the feed door is jammed because feed is stuck.

1. Manually drive the MFR to a clean, dry and level location (see Drive the MFR manually on page 5-61).

2. Go to  menu overview.

3. Open the feed door:

1. Tap **Service > Motors > Feed door**.



2. Tap and hold **Open** to completely open the feed door.

3. If the feed door does not open with the Lely Control Plus app go to step 4.

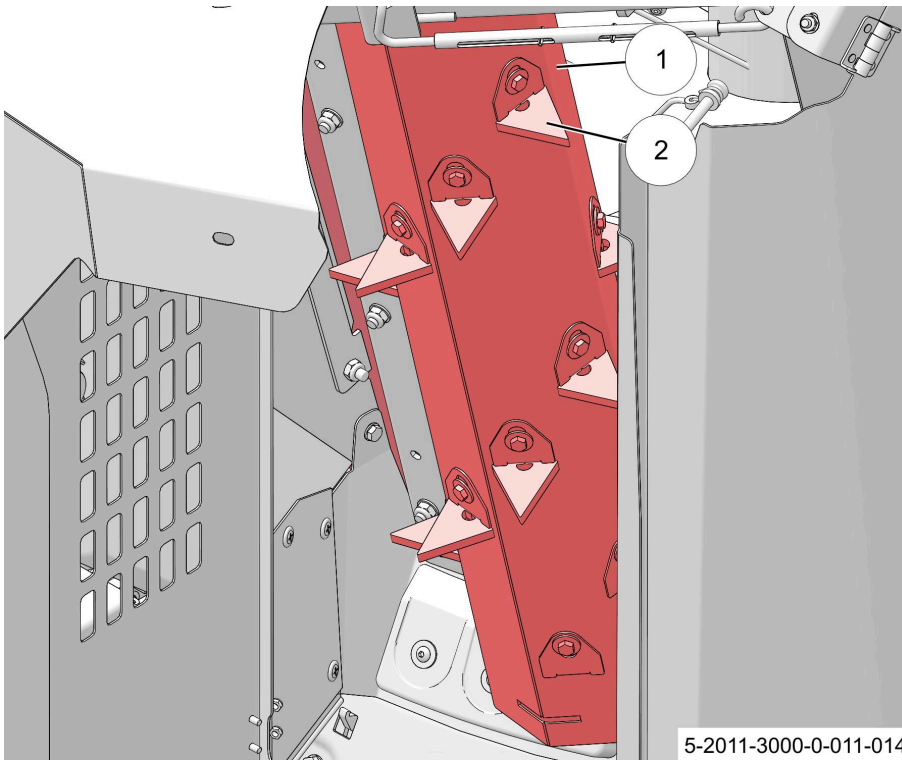
4. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).

5. Open the maintenance door (see Open or close the maintenance door on page 5-33).

NOTICE

Do not use sharp objects to clean the dosing roll and teeth.

6. Carefully remove all feed remains from the dosing roll (1) and teeth (2).



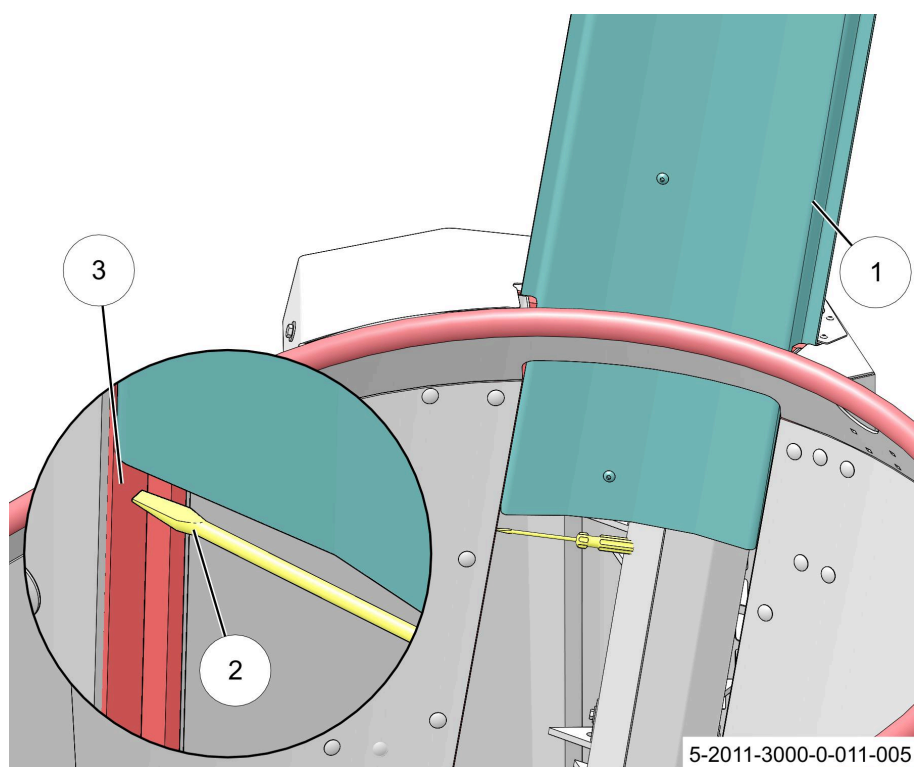
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7. Clean the door guiding of the feed door:



Use the Vector step ladder to do this procedure.

1. Put the Vector step ladder next to the MFR.
2. Climb on the step ladder service platform.
3. Clean the door guiding (3) on both sides of the feed door (1). Do not climb into the mixing bin and keep hands and feet away from the knives.
4. Use a screwdriver (2) to remove all feed remains from the door guiding.



5. Climb out of the Vector step ladder.
6. Remove the Vector step ladder.
8. Close the maintenance door (see Open or close the maintenance door on page 5-33).
9. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).

10. Close the feed door:

1. Tap **Service > Motors > Feed door**.
2. Make sure there is a green indicator at **Dosing roller at closing position**, if not: tap **Move dosing roller to closing position** and wait for the green indicator.



3. Tap and hold **Close** to close the feed door and wait until it is fully closed.

11. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).

7.9 Reinstall the feed grabber chain after activation of the safety handle



**Crushing due to moving parts.
Risk of being crushed.
Keep hands, feet, hair and clothing away from all moving parts due to crushing.**





**Unexpected movement of the machine.
Risk of being crushed.
Take the MFRs out of operation and turn them off with the service key if no emergency zone settings or kitchen point settings have been set and are active.**


NOTICE





A no go zone is an area in the feed kitchen with a wall or equipment over which the feed grabber must never drive. If there is a no go zone in your feed kitchen, first drive the feed grabber away from the no go zone before you drive the bridge crane.

1. If necessary manually drive the MFR away from the feed loading point (see Drive the MFR manually on page 5-61).
2. Turn and remove the service key to switch off the power to the motors and actuators (see page 5-16).
3. If there is a second MFR repeat step 1-2 for the second MFR.

4. Position the bridge crane:
 1. Take the bridge crane out of operation (see page 5-54).
 2. Go to **Manual operation** > **Driving** to drive the bridge crane to the Y position of the feed loading point.
 5. Position the feed grabber:
 1. Take the feed grabber out of operation (see page 5-53).
 2. Connect the smartphone to the feed grabber.
 3. Go to **Testing** > **Test Drive Motor**.
 4. Use the buttons  **BACKWARD** or  **FORWARD** to drive the feed grabber to the feed loading point.
-

NOTICE

Use the button  to go to the previous menu.

5. Go to the page **Testing > Test grabber**.
6. Go to **Go To Position**.
7. Use the buttons  **OPEN** and  **CLOSE** to open or close the grabber.
Open the grabber to a percentage between 120 and 130%.
8. Go to the page **Testing > Test Lift Motor**.
9. Go to **Go To Position**.
10. Use the buttons  **UP** and  **DOWN** to position the grabber.
11. Position the grabber so, that the distance between the teeth and the floor is about 1 m (3.3 ft) (A)
(see figure 106 on page 7-41).

5.2011.8636.0 B

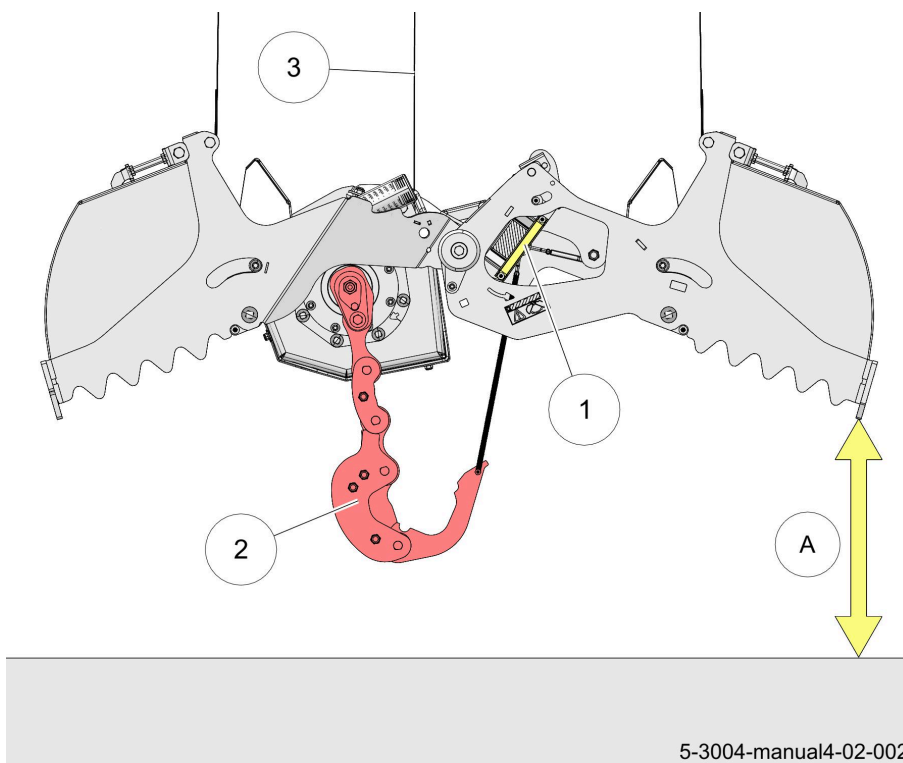


Figure 106. Lower the grabber to the correct distance from the floor

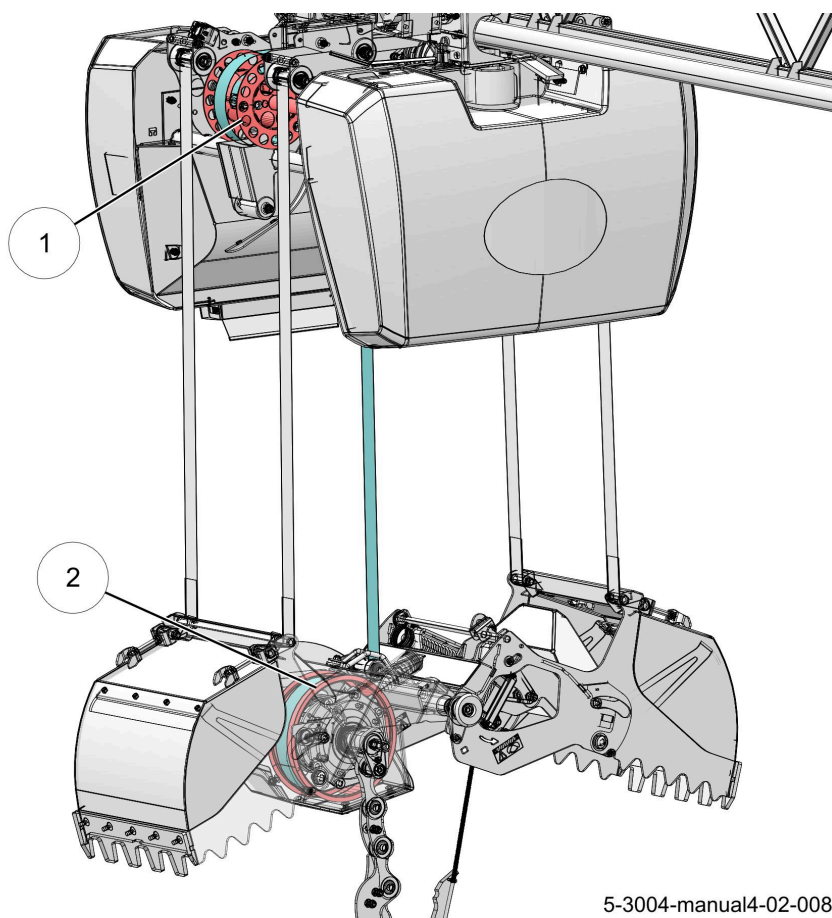
KEY: 1. Safety handle - 2. Chain - 3. Closing belt
A: Distance to the floor

6. Reinstall the chain:

NOTICE

There are two closing belt drums, one in the top (1) (see figure 107 on page 7-42) and one in the grabber (2). Before each step of the procedure with drums, make sure you know which drum is involved.

1. Unroll the closing belt (3) from the drum in the top (1). Guide the closing belt by hand to prevent it from getting stuck.



5-3004-manual4-02-008

Figure 107. Closing belt drums

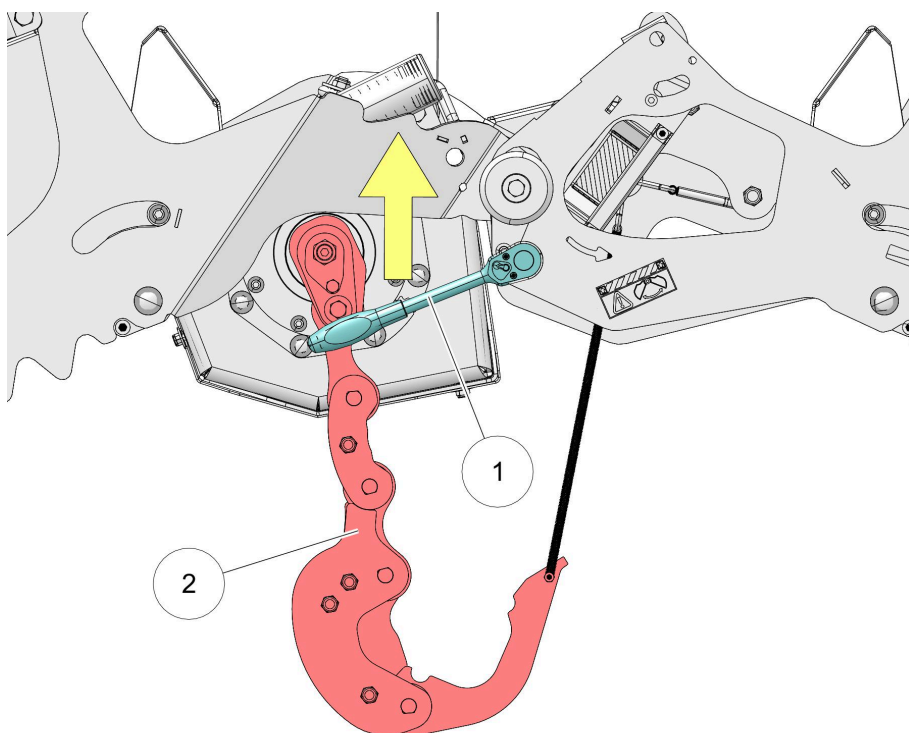
KEY: 1. Closing belt drum in the top - 2. Closing belt drum in the grabber

2. Install a metal block to lock the position of the grabber:
 1. Install a socket wrench (1) (0.5 in) (see figure 108 on page 7-43) (no socket attached) in the square hole on the grabber.
 2. Use the socket wrench to lift the grabber.

⚠ WARNING

**Warning, risk of being crushed.
Risk of severe injury.
Slowly close the grabber to secure the position of the metal block.**

3. To lock the position of the jaws, install a metal block (2) with a thickness of 10–20 mm underneath the limitation bracket (1) (see figure 109 on page 7-44). Use for example a hammer head with the correct thickness as a metal block.

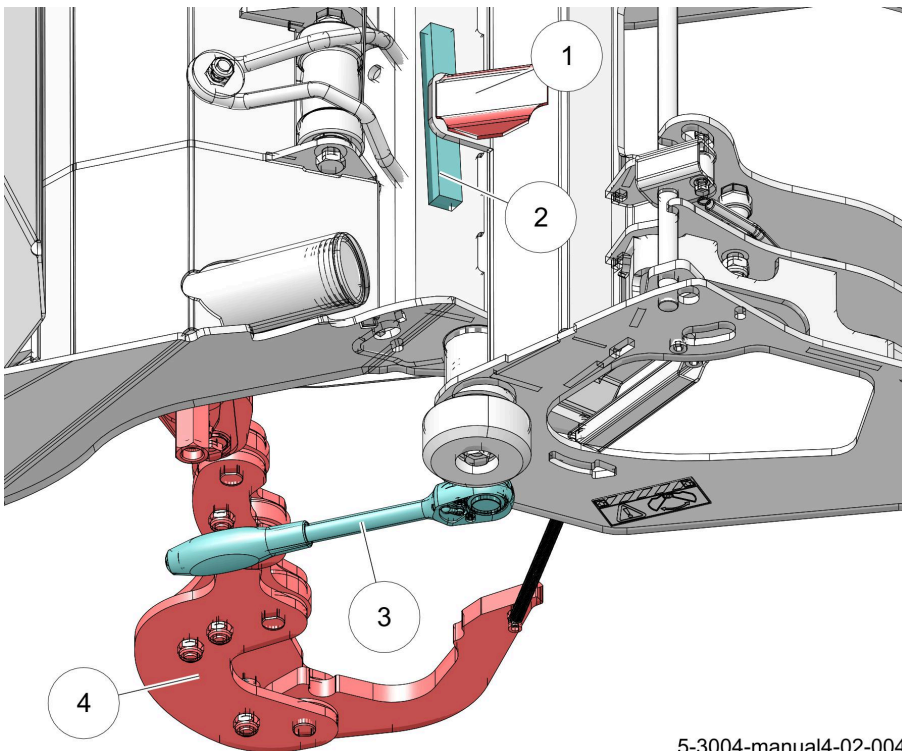


5.2011.8636.0 B

5-3004-manual4-02-003

Figure 108. Manually lift the grabber with a socket wrench

KEY: 1. Socket wrench - 2. Chain

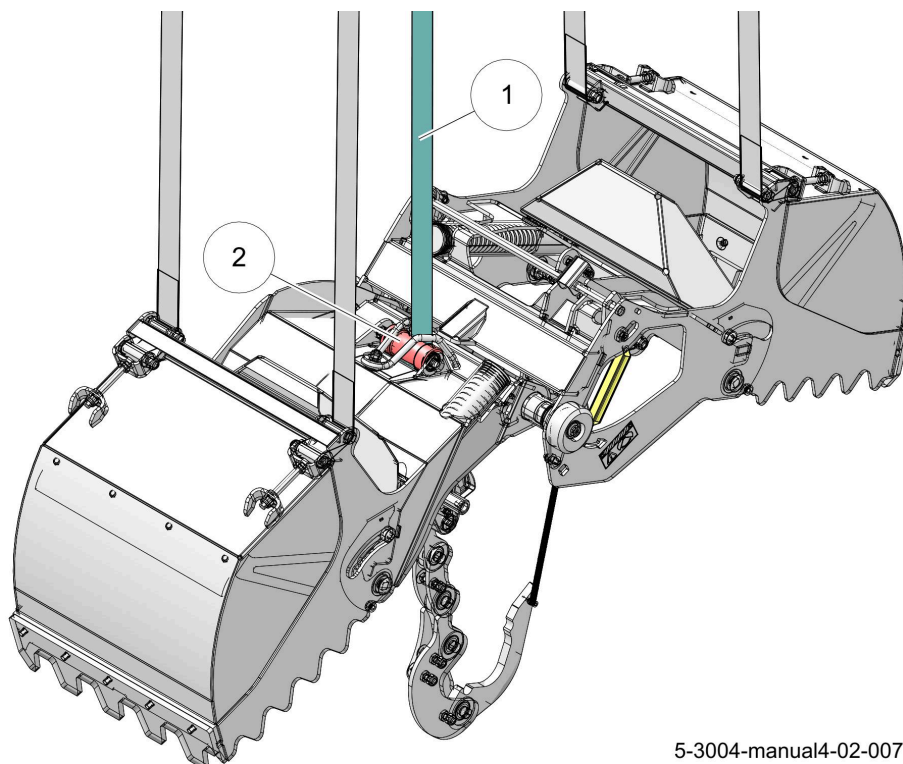


5-3004-manual4-02-004

Figure 109. Position a metal block underneath the limitation bracket

KEY: 1. Limitation bracket - 2. Metal block (or hammer head) 10 - 20 mm thick - 3. Socket wrench - 4. Chain

3. Remove the socket wrench (3).
4. Guide the closing belt (1) (see figure 110 on page 7-45) carefully into its position. Guide the belt over the guide wheel (2) and prevent the belt from twisting or getting stuck. Also guide the closing belt when you roll it on the drum in the grabber during the next step.

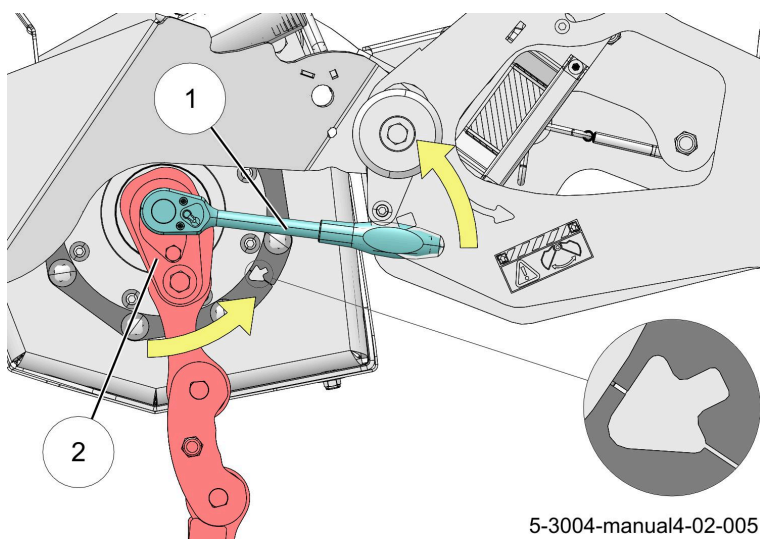


5-3004-manual4-02-007

Figure 110. Closing belt and guide wheel

KEY: 1. Closing belt - 2. Guide wheel

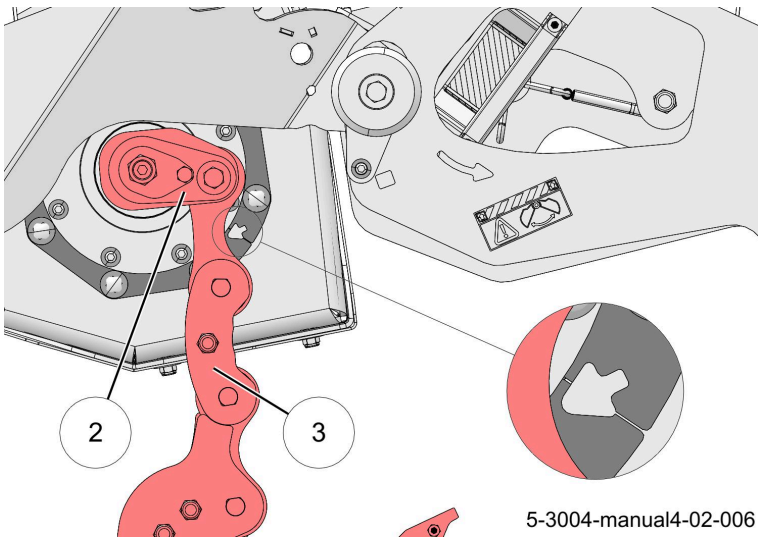
5. Use a socket wrench (24 mm) (1) to turn the crank in its correct position. This can be a quarter of a turn or more than a complete turn. During turning the closing belt drum in the grabber turns 6 times as fast and you must guide the closing belt over the guide wheel when it rolls up. The crank (2) is in the correct position when the middle of the shackle (3) is at the position of the arrow indicator (see figure 111 on page 7-45).



5-3004-manual4-02-005

Figure 111. Put the crank in its correct position

KEY: 1. Socket wrench - 2. Crank

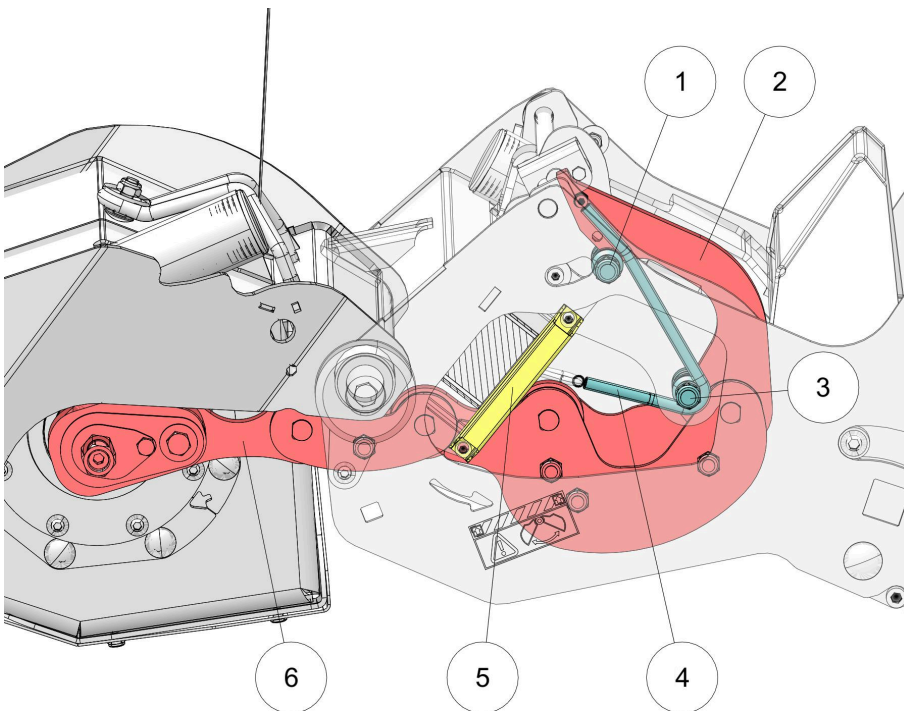


5-3004-manual4-02-006

Figure 112. Position the end link

KEY: 2. Crank - 3. Shackle -

6. Position the end link (2) in the groove of the lower pin (3).



5-3004-manual1-01-007

Figure 113. Chain in its correct position

KEY: 1. Top pin - 2. End link - 3. Lower pin - 4. Spring - 5. Safety handle - 6. Chain

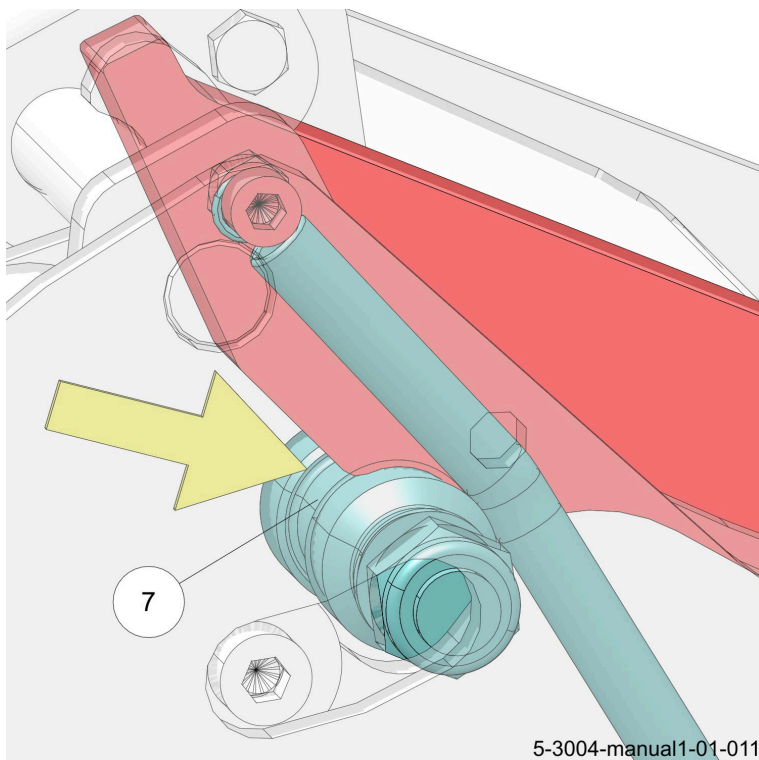



Figure 114. Put the end link over the groove of the top pin

KEY: 7. Top pin groove -

7. While pushing the activation handle (5) downwards, put the end link (2) over the groove of the top pin (1).

⚠ WARNING

**Warning, risk of being crushed.
Risk of severe injury.
Slowly close the grabber to secure the position of the metal block.**

7. Remove the metal block (2) (see figure 109 on page 7-44).
8. Connect the smartphone to the feed grabber.
9. Go to **Testing > Test grabber**.
10. Use the buttons to open and close the grabber. Close the grabber to 0% and open it to 60%. Examine if the grabber opens and closes properly.
The closing belt automatically rolls up on the drum in the top during closing.
11. Connect the smartphone to the feed grabber.
12. Make sure the grabber is still open for 60 - 65%.
13. Go to **Testing > Test Lift Motor**.
14. Tap  **UP** to lift the grabber all the way up.

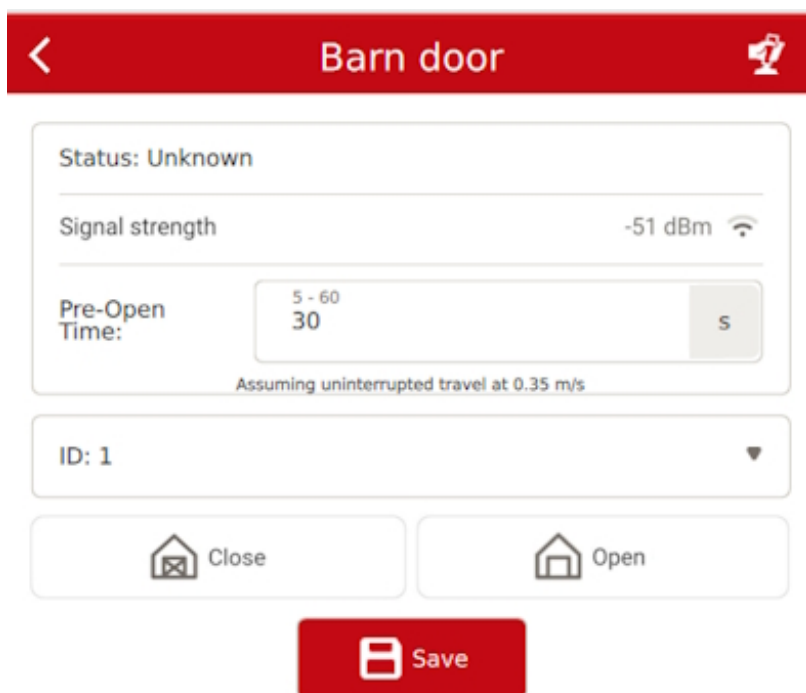
15. Put the feed grabber in operation (see page 5-51).
16. Put the bridge crane in operation (see page 5-51).
17. Turn ON the power to the motors and actuators of the MFR with the service key (see page 5-29).
18. Put the MFR in operation with the smartphone (see page 5-47) or Continue a route from a known route action (see page 5-66).
19. If there is a second MFR repeat step 17-18 for the second MFR.



7.10 Test the automatic barn door

1. Open the Lely Control Plus app and connect to the MFR (see Connect the Lely Control Plus app to the machine on page 5-2).
2. Manually drive the MFR to the automatic barn door until it is within close range (see Drive the MFR manually on page 5-61).

3. Go to  home screen.

4. Tap **Service > Other > Barn door**.



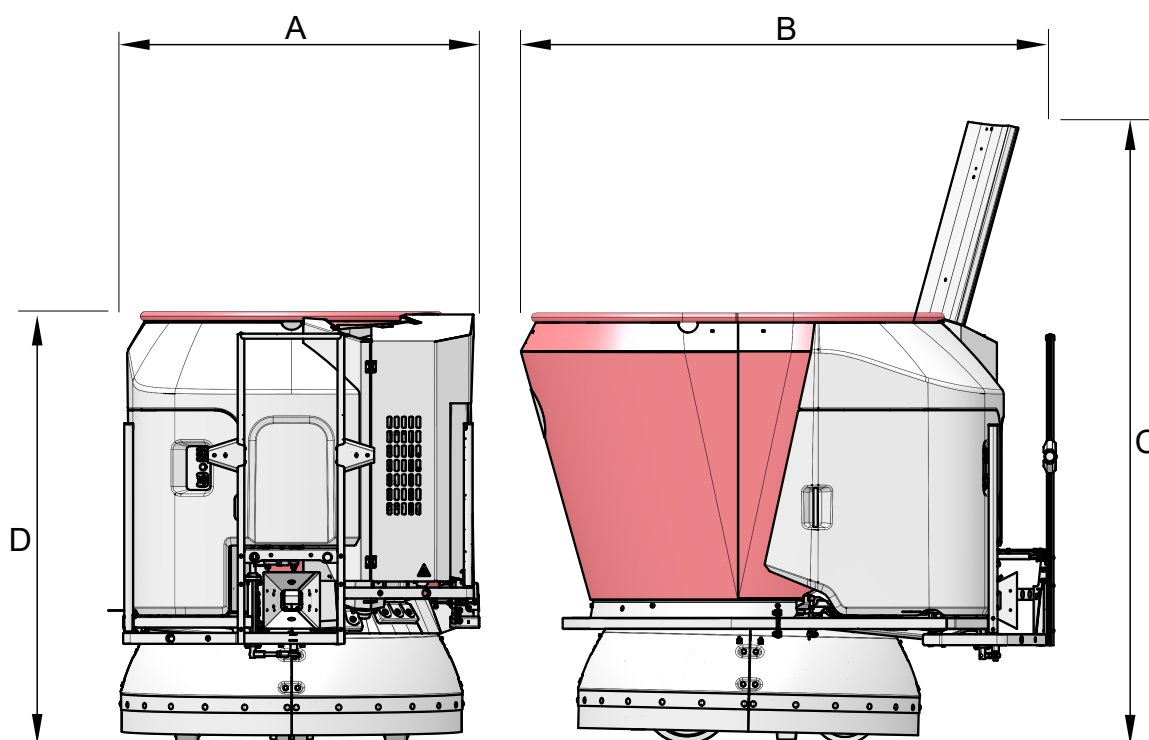
5. Tap **ID** to select which barn door needs to be tested.
6. Tap  **Open** and test if the door opens after the set Pre-Open Time.
7. Tap  **Close** and test if the door closes.

8 Diagrams

8.1 Product dimensions

8.1.1 MFR

5.2011.8636.0 B



KEY:

A: 1.601 m (63.03 in)

B: 2.416 m (95.12 in)

C: 2.801 m (110 in) (or lower with a limited door*)

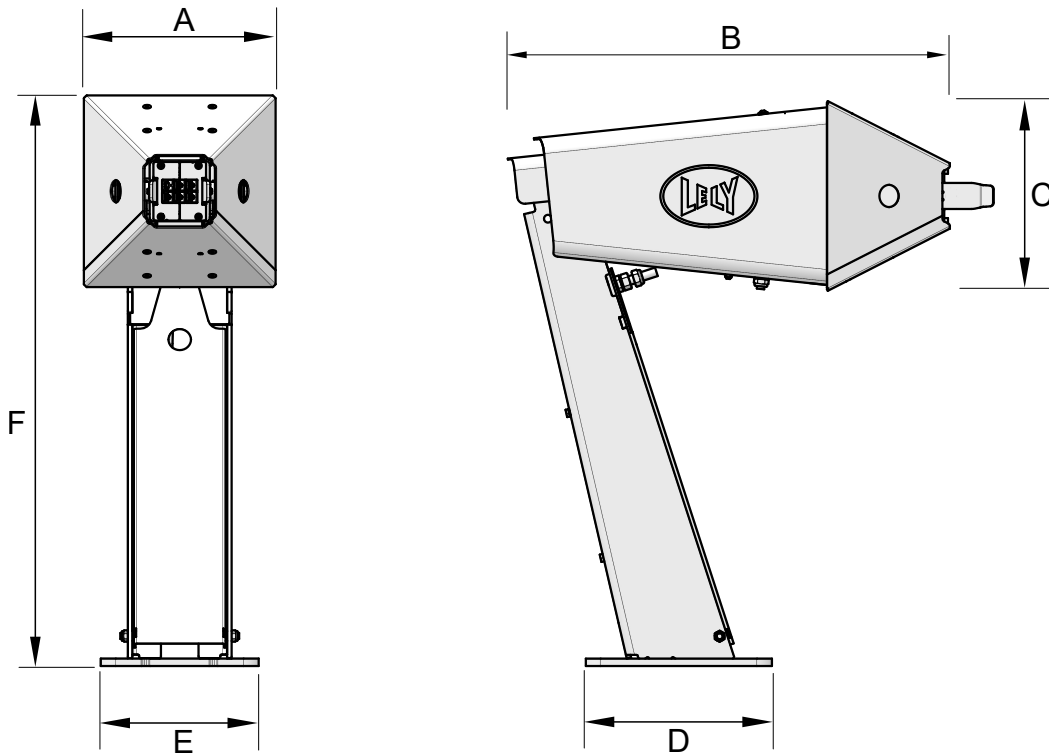
D: 1.944 m (76.53 in)

- Empty weight: 1425 kg (3141.6 lb)
- Max loaded weight: 2275 kg (5015.5 lb)

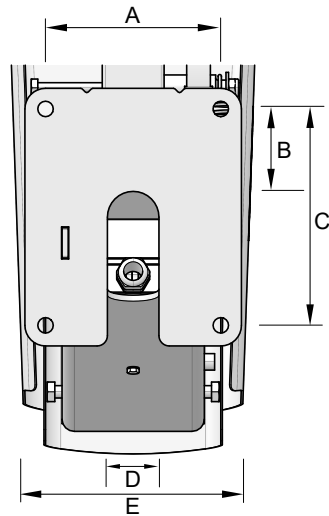
* A door limitation can be used in barns with low ceilings, but only when special suitable feed must be distributed on all feed locations. For example a ration with a lot of hay can not be distributed when the door height is limited.

A door limitation is also advised when only feed with a very fine structure is fed, for example to beef cattle. In this case the door limitation prevents the feed from dosing too fast.

8.1.2 Charge pole



KEY:
 A: 25.5 cm (10 in)
 B: 59.4 cm (23.38 in)
 C: 25.5 cm (10 in)
 D: 25.0 cm (9.84 in)
 E: 21.0 cm (8.26 in)
 F: 75.9 cm (29.88 in)

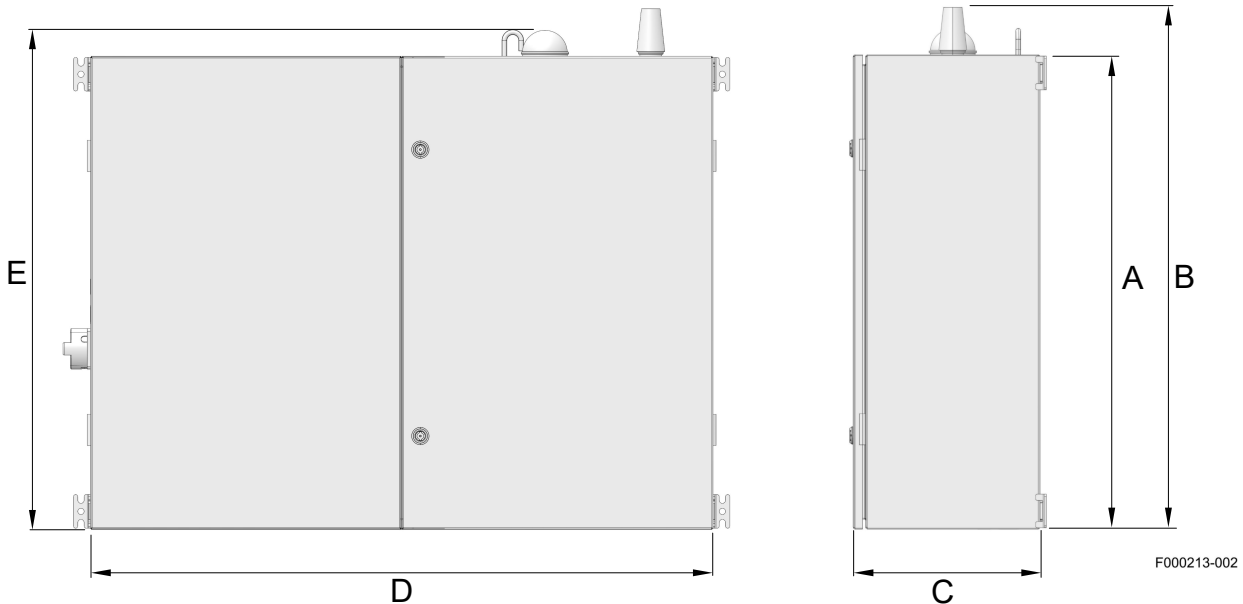


KEY:
 A: 170 mm (6.69 in)
 B: 80 mm (3.15 in)
 C: 210 mm (8.27 in)
 D: 50 mm (1.97 in)
 E: 210 mm (8.27 in)

- Weight: 31.1 kg (68.56 lb)

5.2011.8636.0 B

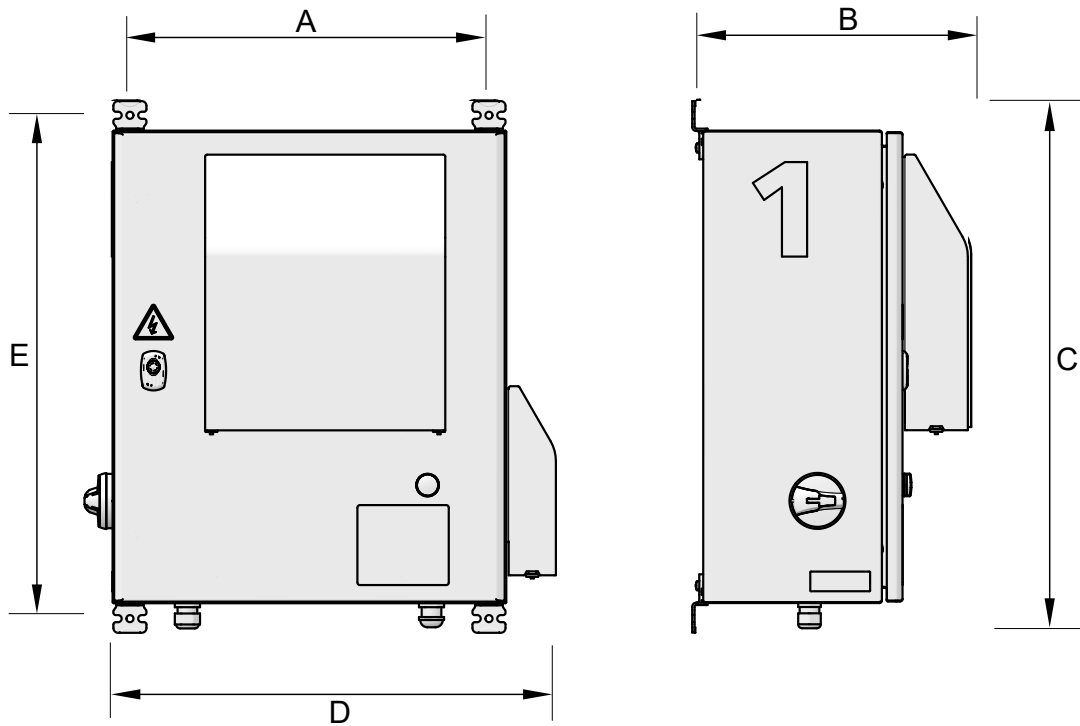
8.1.3 PDB



KEY:
 A: 76.0 cm (29.9 in)
 B: 84 cm (33 in)
 C: 30.0 cm (11.8 in)
 D: 100.0 cm (39.4 in)
 E: 80.0 cm (31.5 in)

- 64 kg (141 lb).

8.1.4 PSU



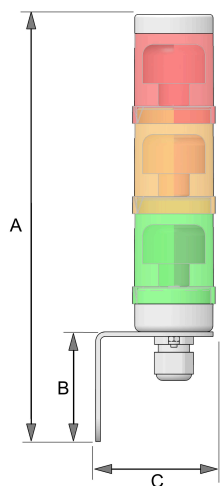
<p>KEY:</p> <p>A: 45.6 cm (17.9 in)</p> <p>B: 35 cm (13.8 in)</p> <p>C: 67.5 cm (26.6 in)</p> <p>D: 56.2 cm (22.1 in)</p> <p>E: 63.9 cm (25.2 in)</p>

- Weight PSU: 37 kg (81.57 lb).
- Weight secondary PSU: 24.3 kg (53.57 lb).

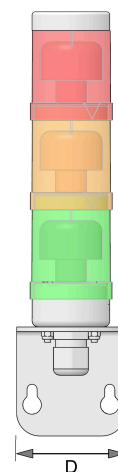
5.2011.8636.0 B

8.1.5 Signal lights and console

Signal lights



5-2011-4194-0-01-003_2D



5-2011-4194-0-01-002_2D

KEY:

A: 27.2 cm (10.7 in)

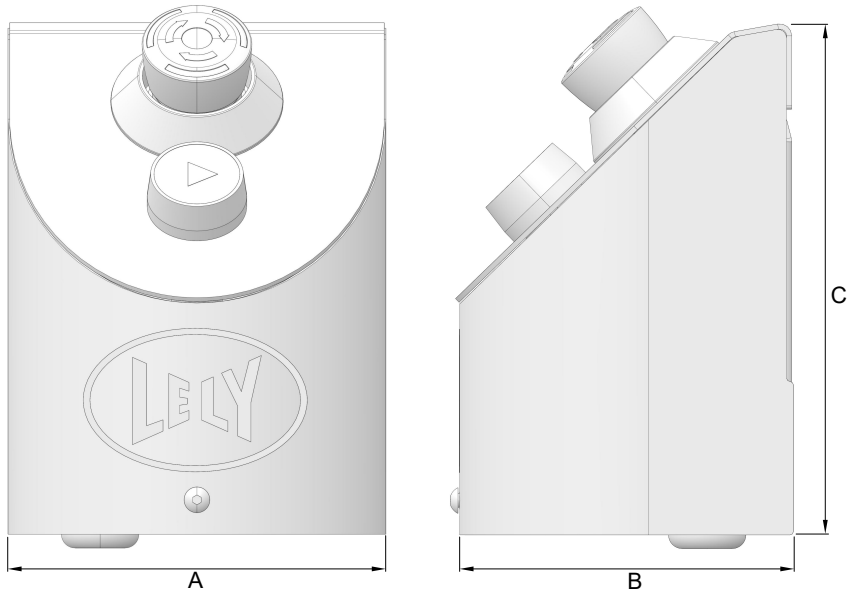
B: 7.0 cm (2.75 in)

C: 7.6 cm (2.99 in)

D: 7.0 cm (2.75 in)

5.2011.8636.0 B

Console



F000138-006

KEY:
A: 11 cm (4.3 in)
B: 10 cm (3.9 in)
C: 15 cm (5.9 in)

5.2011.8636.0 B

9 Disposal

9.1 Disposal

Disposing this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

Decommissioning and disassembly of the product can be dangerous and must be done only by qualified recycling organizations. All components must be disposed in compliance with the local rules and regulations.

Lubricants and fluids must be disposed correctly to prevent pollution of the environment. Read the safety data sheets of the used lubricants and fluids for correct disposal. All lubricants, chemicals and fluids must be disposed in compliance with the local rules and regulations.



Disposal to sewer of cleaning water with concentrated chemicals may cause damage to health and the environment and must always be prevented.

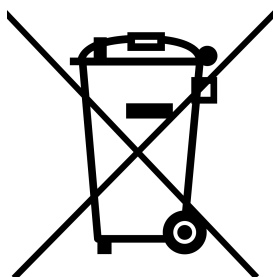
Contact your local authority or local Lely service provider for further details.

9.2 Disposal of the battery

If the battery is replaced, the Lely technician will leave the old battery at your farm. The old battery will be collected by a specialized waste disposal company that can handle and dispose the 24V Li-ion rechargeable battery. Ask your Lely service provider for information about the time of collection.

Please store the end-of-life battery according to local legislation and protect it from rain, snow and overheating from the sun until it is collected.

9.3 WEEE



This symbol [crossed-out wheel bin WEEE Annex IV] indicates separate collection of electrical waste and electronic equipment in the European countries. We are committed to being a good corporate citizen. As part of that commitment, we strive to maintain an environmentally conscious manufacturing operation



In accordance with the European Union WEEE (Waste Electrical and Electronic Equipment) Directive 2012/19/EC, we would like to notify you that this product might contain regulated materials, which upon disposal, according to the WEEE directive, require special reuse and recycling processing.

For this reason, Lely Industries N.V. has arranged that this product can be recycled at the local recycling/disposal companies to collect and recycle this product at no cost to you.

Additional local legislation may apply.

NOTICE

Please note, only this product itself falls under the WEEE Directive. When disposing of packaging and other related shipping materials we encourage you to recycle these items through the normal channels.

10 Declarations of Conformity

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EC Declaration of Conformity

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CERTIFICADO DE CONFORMIDAD CEE
DECLARAÇÃO DE CONFORMIDADE CE
DEKLARASJON EU MASKINDIREKTIV
VAATIMUSTENMUKAISUUSVAKUUTUS
EU-KONFORMITETSEKTLÆRING
EG-FÖRSÄKRAN OM ÖVERENSSTÄMMELSE
CB – SAMRÆMISYFIRLÝSING



ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ Ε.Ε.
DECLARATION DE CONFORMITE CE
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ES-PROHLÁŠENÍ O SHODĚ
DEKLARACJA ZGODNOŚCI WE
ES – PREHLÁSENIE O ZHODE
VASTAVUS EU DIREKTIIVIDELE
ES ΑΤΙΤΙΚΤΙΕΣ ΔΕΚΛΑΡΑΚΙΑ
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EG - POTVRDA O SUKLADNOSTI
ES IZJAVA O SKLADNOSTI

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fabricante
producent
valmistaja
produsent
tillverkare
framleiðandi

Lely Industries N.V.
Cornelis van der Lelylaan 1 • 3147 PB Maassluis • The Netherlands
tel. +31 (0)88 - 12 28 221 • fax +31 (0)88 - 12 28 222
www.lely.com

Εμείς, ο κατασκευαστής
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gyártó
výrobce
producent
výrobca
tootja
gamintojas
производитель
proizvodac
naziv proizvajalca

verklaren geheel onder eigen verantwoordelijkheid dat de machine:
herewith declare, on our own responsibility, that the machinery:
erklärt hiermit eigenverantwortlich, dass die Maschine:
déclarons que les machines désignées ci-après :

productbeschrijving

description of product
Produktbezeichnung
description du produit
descrizione del prodotto
nombre del producto
designação de produto
produktnavn
tuotenimi
produktnavn
produktnamn
vörulýsing

Lely Vector Mixing and Feeding Robot

περιγραφή του προϊόντος
descrisiunea produsului
termék megnevezése
označení produktu
opis produktu
označenie výrobku
toote kirjeldus
gaminio aprašymas
наименование изделия
naziv proizvoda

typenummer

model number
Typnummer
numéro de modèle
numero di modello
modelo
número do modelo
modelnummer
mallinnumero
modellnummer
gerðarnúmer

5.2011.0060.0
with safety software version 2.1.5

αριθμός μοντέλου
numărul modelului
tipus száma
numer modelu
typové číslo
tüübi number
modelio numeris
номер модели
broj modela
številka artikla

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auxquelles la présente déclaration se rapporte, sont conformes aux dispositions de la ou des directives suivantes:

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de acuerdo con las directivas
de acordo com a directiva
oplylder følgende direktiver
täyttää seuraavien direktiivien vaatimukset
opplýder følgende direktiver
upplýllir följandi direktiv
upplýllir eftirlifandi stöðla
πληροί τις προδιαγραφές

Machine Directive 2006/42/EC
Low voltage Directive 2014/35/EC
Electromagnetic Compatibility Directive 2014/30/EC
Radio Equipment Directive 2014/53/EU

conform cu directivele
rendelkezeseknek megfeleloen
podle směrnice
zgodny z dyrektywą
v zhode so smernicami
direktiveide järgi
pagal direktivas
sootvetstvuet trebovaniyam direktiv
po smjernicama
v skladu z direktivo

en in overeenstemming is met de volgende normen of andere normatieve documenten :
and is in conformity with the following standard(s) or other such specifications:
und den folgenden Normen oder vergleichbaren Spezifikationen entspricht:
et aux normes et autres spécifications suivantes :

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de acuerdo con las normas
de acordo com as normas
oplylder følgende standarder
täyttää seuraavien standardien vaatimukset
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πληροί τις προδιαγραφές

EN-ISO 12100:2010, EN 60204-1:2018,
EN 61000-6-2:2016, EN 61000-6-4:2018
EN 13849-1:2023, EN 13849-2:2015, EN-ISO 3991:2025

în conformitate cu standardele
megfelel a szabványoknak
odpovídá normám
zgodny z normą
zodpovedá normám
normidele vastavus
aitlinka standartus
sootvetstvuet standartam normam
u skladu sa standardima
v skladu s standardi

handtekening en datum

signature and date
Unterschrift und Datum
signature et date
firma e data
firma y fecha
assinatura e data
underskrift og dato
allekirjoitus ja päiväys
signatur og dato
underskrift och datum
undirskrift og dagsetning

Ondertekend door:

0C1BBB17D32A4C...

Signed by:

22641B42562B472...

υπογραφή και ημερομηνία
semnătura și data
aláírás és dátum
podpis a datum
podpis i data
podpis a dátum
allkirji ja kuupäev
parašas ir data
подпись и дата
podpis i datum
podpis in datum



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verklaren geheel onder eigen verantwoordelijkheid dat de machine:

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productbeschrijving

description of product
Produktbezeichnung
description du produit
descrizione del prodotto
nombre del producto
designação de produto
produktnavn
tuotenimi
produktnavn
produktnamn
vörulysing

Lely PSU Box
Lely Secondary PSU Box

περιγραφή του προϊόντος
descoperă produsului
termék megnevezése
označení produktu
opis produktu
označenie výrobku
toote kirjeldus
gaminio aprašymas
наименование изделия
naziv proizvoda

typenummer

model number
Typnummer
numéro de modèle
numero di modello
modelo
número do modelo
modellnummer
mallinnumero
modellnummer
gerðarnúmer

5-2011-4500-0
5-2011-4570-0

αριθμός μοντέλου
numărul modelului
típus száma
number modelu
typové číslo
tüübi number
modelio numeris
номер модели
broj modela
številka artikla

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täyttää seuraavien direktiivien vaatimukset
oppyllyr følgende direktiver
uppyllyr följande direktiv
uppyllyr eftirlifrandi tilskipanir

Low voltage Directive 2014/35/EC
Electromagnetic Compatibility Directive 2014/30/EC

conform cu directivele
rendelkezeseknek megfeleleiben
podle směrnice
zgodny z dyrektywą
v zhode so smernicami
direktiivide jārģi
pagal direktivas
соответствует требованиям директив
po smjernicama
v skladu z direktivo

en in overeenstemming is met de volgende normen of andere normatieve documenten :

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und den folgenden Normen oder vergleichbaren Spezifikationen entspricht:
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täyttää seuraavien standardien vaatimukset
oppyllyr følgende standard
uppyllyr följande standarder
uppyllyr eftirlifrandi staðla
πληροί τις προδιαγραφές

EN 60204-1:2018,
EN 61000-6-2:2016, EN 61000-6-4:2018

in conformitate cu standardele
megfelel a szabványoknak
odpovídá normám
zgodny z normą
zodpovedá normám
normidele vastavus
atitinka standartus
соответствует стандартам нормам
u skladu sa standardima
v skladu s standardi

handtekening en datum

signature and date
Unterschrift und Datum
signature et date
firma e data
firma y fecha
assinatura e data
underskrift och dato
allekirjoitus ja päiväys
signatur og dato
underskrift och datum
undirskrift og dagsetning

Ondertekend door:

0C1BBB17D32A4C8...

S. Loosveld
Managing Director Feeding
Lely Industries N.V.

Signed by:

22641B42562B472...

A. Mateboer
Competence Director PD
Lely Industries N.V.

26-02-2024

5.2011.8636.0 B

EC DECLARATION OF CONFORMITY
 EG-KONFORMITÄTSERKLÄRUNG
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 CERTIFICADO DE CONFORMIDADE CE
 DECLARAÇÃO DE CONFORMIDADE CE
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 VAATIMUSTENMUKAISUUSVAKUUTUS
 EU-KONFORMITETSERKLÆRING
 EG-FÖRSÄKRAN OM ÖVERENSSTÄMMELSE
 CB – SAMRÆMISYFIRLÝSING



ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ Ε.Ε.
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 EU MEGFELELŐSÉGI NYILATKOZAT
 ES-PROHLÁŠENÍ O SHODĚ
 DEKLARACJA ZGODNOŚCI WE
 ES – PREHLÁSENIE O ZHODE
 VASTAVUS EU DIREKTIVIDELE
 ES ATITIKTIES DEKLARACIJA
 ЗАЯВЛЕНИЕ О СООТВЕТСТВИИ НОРМАМ ЕС
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 ES IZJAVA O SKLADNOSTI

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 www.lely.com

Εμείς, ο κατασκευαστής
 fabricant
 gyártó
 výrobce
 producent
 výrobca
 tootja
 gamintojas
 производитель
 proizvođač
 naziv proizvajalca

verklaren geheel onder eigen verantwoordelijkheid dat de machine:
 herewith declare, on our own responsibility, that the machinery:
 erklärt hiermit eigenverantwortlich, dass die Maschine:
 déclarons que les machines désignées ci-après :

productbeschrijving

description of product
 Produktbezeichnung
 description du produit
 descrizione del prodotto
 nombre del producto
 designação de produto
 produktnavn
 tuotenimi
 produktnavn
 produktnamn
 vörulýsing

Lely Vector Power Distribution Box

περιγραφή του προϊόντος
 descrierea produsului
 termék megnevezése
 označení produktu
 opis produktu
 označenie výrobku
 toote kirjeldus
 gaminio aprašymas
 наименование изделия
 naziv proizvoda

typenummer

model number
 Typnummer
 numéro de modèle
 numero di modello
 modelo
 número do modelo
 modelnummer
 mallinnumero
 modellnummer
 gerðarnúmer

5.2011.0532.x
 5.2011.1174.x
 5.2011.1241.x

αριθμός μοντέλου
 numărul modelului
 típus száma
 numer modelu
 typové číslo
 tüübi number
 modelo numeris
 номер модели
 broj modela
 številka artikla

waarop deze verklaring betrekking heeft, in overeenstemming is met de bepalingen van de volgende Richtlijn(en):
 which this declaration refers to, is in accordance with the conditions of the following Directive(s):
 worauf sich diese Erklärung bezieht, hergestellt ist gemäß den Bestimmungen der Richtlinie(n):
 auxquelles la présente déclaration se rapporte, sont conformes aux dispositions de la ou des directives suivantes :

è conforme alle direttive
 de acuerdo con las normas
 de acordo com a directiva
 opfylder følgende direktiver
 täyttää seuraavien direktiivien vaatimukset
 oppfyller følgende direktiver
 uppfyller följande direktiv
 uppfyllir eftirfarandi tilskipanir

Low voltage directive 2006/95/EC
 Electromagnetic compatibility 2004/108/EC

conform cu directivele
 rendelkezésekek megfelelően
 podle směrnic
 zgodny z dyrektywą
 v zhode so smernicami
 direktiivde järgi
 pagal direktyvas
 соотвествует требованиям директив
 po smjernicama
 v skladu z direktivo

en in overeenstemming is met de volgende normen of andere normatieve documenten :
 and is in conformity with the following standard(s) or other such specifications :
 und den folgenden Normen oder vergleichbaren Spezifikationen entspricht:
 et aux normes et autres spécifications suivantes :

è conforme alle norme
 de acuerdo con las normas
 de acordo com as normas
 opfylder følgende standarder
 täyttää seuraavien standardien vaatimukset
 oppfyller følgende standard
 uppfyller följande standarder
 uppfyllir eftirfarandi staðla
 πληροί τις προδιαγραφές

EN 60204-1:2006/A1:2009
 EN 61000-3-2:2014
 EN 61000-6-1:2007
 EN 61000-6-3:2007/A1:2011

în conformitate cu standardele
 megfelel a szabványoknak
 odpovídá normám
 zgodny z normą
 zodpovedá normám
 normidele vastavus
 atitinka standartus
 соотвествует стандартам нормам
 u skladu sa standardima
 v skladu s standardi

handtekening en datum

signature and date
 Unterschrift und Datum
 signature et date
 firma e data
 firma y fecha
 assinatura e data
 underskrift og dato
 allekirjoitus ja päiväs
 signatur og dato
 underskrift och datum
 undrskrift og dagsetning

S. Loosveld
 Director Product Development
 Lely Industries N.V.

J.W. Rodenburg
 Manager Product Safety & Compliance
 Lely Industries N.V.

20-1-2015

5.2011.8504.9

EC DECLARATION OF CONFORMITY
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description of product
 Produktbezeichnung
 description du produit
 descrizione del prodotto
 nombre del producto
 designação de produto
 produktnavn
 tuotenimi
 produktnavn
 produktnamn
 vörulýsing

Lely Vector Feed Grabber

περιγραφή του προϊόντος
 descrierea produsului
 termék megnevezése
 označení produktu
 opis produktu
 označenie výrobku
 toote kirjeldus
 gaminio aprašymas
 наименование изделия
 naziv proizvoda

typenummer

model number
 Typnummer
 numéro de modèle
 numero di modello
 modelo
 número do modelo
 modelnummer
 mallinnumero
 modellnummer
 gerðarnúmer

5.3004.000x.x
 5.3004.002x.x

αριθμός μοντέλου
 numărul modelului
 típus száma
 numer modelu
 typové číslo
 tüübi number
 modello numeris
 номер модели
 broj modela
 številka artikla

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 auxquelles la présente déclaration se rapporte, sont conformes aux dispositions de la ou des directives suivantes :

è conforme alle direttive
 de acuerdo con las directivas
 de acordo com a directiva
 opfylder følgende direktiver
 täyttää seuraavien direktiivien vaatimukset
 oppfyller følgende direktiver
 uppfyller följande direktiv
 uppfyllir eftirfarandi tilskipanir

Machinery directive 2006/42/EC
 Low voltage directive 2014/35/EU
 Electromagnetic compatibility 2014/30/EU

conform cu directivele
 rendelkezőseknek megfelelően
 podle směrnice
 zgodny z dyrektywą
 v zhode so smernicami
 direktivide järgi
 pagal direktivas
 samsvarstvistur þreðingum direktiva
 þo smjernicam
 v skladu z direktivo

en in overeenstemming is met de volgende normen of andere normatieve documenten :

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 de acuerdo con las normas
 de acordo com as normas
 opfylder følgende standarder
 täyttää seuraavien standardien vaatimukset
 oppfyller følgende standarder
 uppfyller följande standarder
 uppfyllir eftirfarandi staðla
 ηλπιού τις η ποδιουργαές

EN-ISO 12100:2010, EN 13001-1:2015
 EN 13001-2:2014, EN 13001-3-1:2012+A1:2013
 EN 15011:2011+A1:2014, EN 60204-1:2006/AC:2010
 EN-IEC 60204-32:2008

în conformitate cu standardele
 megfelel a szabványoknak
 odpovídá normám
 zgodny z normą
 zodpovedá normám
 norme dele vastavus
 atitinka standartus
 samsvarstvistur standartum normam
 u skladu sa standardima
 v skladu s standardi

handtekening en datum

signature and date
 Unterschrift und Datum
 signature et date
 firma e data
 firma y fecha
 assinatura e data
 underskrift og dato
 allkirjutus ja päiväys
 signatur og dato
 underskrift och datum
 undirskrift og dagsetning

S. Loosveld
 Director Product Development
 Lely Industries N.V.

J.W. Rodenburg
 Manager Product Safety & Compliance
 Lely Industries N.V.

un oypapή kai ημερομηνία
 semnătura și data
 aláírás és dátum
 podpis a datum
 podpis i data
 podpis a dátum
 allkirja ja kuupäev
 parásás og data
 podpis og data
 podpis i datum
 podpis i datum

4/8/2020

5.3004.8502.9B

5.2011.8636.0 B

EC DECLARATION OF CONFORMITY
 EG-KONFORMITÄTSERKLÄRUNG
 DÉCLARATION DE CONFORMITÉ AUX NORMES DE LA CE
 DICHIARAZIONE CE DI CONFORMITÀ
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 CB – SAMRÆMISYFIRLÝSING



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 fabricante
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 výrobce
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productbeschrijving

description of product
 Produktbezeichnung
 description du produit
 descrizione del prodotto
 nombre del producto
 designação de produto
 produktnavn
 tuotenimi
 produktnavn
 produktnamn
 vörulýsing

Lely Vector Bridge Crane

περιγραφή του προϊόντος
 descrierea produsului
 termék megnevezése
 označení produktu
 opis produktu
 označenie výrobku
 toote kirjeldus
 gaminio aprašymas
 наименование изделия
 naziv proizvoda

typenummer

model number
 Typnummer
 numéro de modèle
 numero di modello
 modelo
 número do modelo
 modelnummer
 mallinnumero
 modellnummer
 gerðarnúmer

5.2013.0210.x

αριθμός μοντέλου
 numărul modelului
 típus száma
 numer modelu
 typové číslo
 tüübi number
 modelo numeris
 номер модели
 broj modela
 številka artikla

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 auxquelles la présente déclaration se rapporte, sont conformes aux dispositions de la ou des directives suivantes :

è conforme alle direttive
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 opfylder følgende direktiver
 täyttää seuraavien direktiivien vaatimukset
 oppfyller følgende direktiver
 uppfyller följande direktiv
 uppfyllir eftirfarandi tilskipanir

Machinery directive 2006/42/EC
Low voltage directive 2014/35/EU
Electromagnetic compatibility 2014/30/EU

conform cu directivele
 rendelkezőseknek megfeleltetés
 podle směrnice
 zgodny z dyrektywą
 v zhode so smernicami
 direktiivde järgi
 pagal direktyvas
 соотвествует требованиям директив
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 v skladu z direktivo

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 oppfyller følgende standard
 uppfyller följande standarder
 uppfyllir eftirfarandi staðla
 πληροί τις προδιαγραφές

EN-ISO 12100:2010, EN 13001-1:2015
 EN 13001-2:2014, EN 13001-3-1:2012+A1:2013
 EN 15011:2011+A1:2014, EN 60204-1:2006/AC:2010
 EN-IEC 60204-32:2008

în conformitate cu standardele
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 Unterschrift und Datum
 signature et date
 firma e data
 firma y fecha
 assinatura e data
 underskrift og dato
 allekirjoitus ja päiväs
 signatur og dato
 underskrift och datum
 underskrift og dagsetning

S. Loosveld
 Director Product Development
 Lely Industries N.V.

J.W. Rodenburg
 Manager Product Safety & Compliance
 Lely Industries N.V.

υπογραφή και ημερομηνία
 semnătura și data
 aláírás és dátum
 podpis a datum
 podpis i data
 podpis a dátum
 allkiri ja kuupäev
 parašas ir data
 подпись и дата
 rotpis i datum
 podpis in datum

7-2-2018

5.2013.8503.9A

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 description du produit
 descrizione del prodotto
 nombre del producto
 designação de produto
 produktnavn
 tuotenimi
 produktnavn
 produktamn
 vörulýsing

Lely Vector Bridge crane 2
 including lattice girder assembly

περιγραφή του προϊόντος
 descrierea produsului
 termék megnevezése
 označení produktu
 opis produktu
 označenie výrobku
 toote kirjeldus
 gaminio aprašymas
 наименование изделия
 naziv proizvoda

typenummer

model number
 Typnummer
 numéro de modèle
 numero di modello
 modelo
 número do modelo
 modelnummer
 mallinnumero
 modellnummer
 gerðarnúmer

5.2013.1110.x
 Compatible lattice girder assembly:
 5.2013.0430.0, 5.2013.0461.0, 5.2013.0528.0,
 5-2013.0659.0, 5-2013.0669.0, 5-2013.0679.0

αριθμός μοντέλου
 numărul modelului
 típus száma
 numer modelu
 tyypové číslo
 tüübi number
 modelo numeris
 номер модели
 broj modela
 številka artikla

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 auxquelles la présente déclaration se rapporte, sont conformes aux dispositions de la ou des directives suivantes :

Machine directive 2006/42/EC
 Low voltage directive 2014/35/EC
 Electromagnetic compatibility 2014/30/EC

conform cu directivele
 rendelkezőseknek megfelelően
 podle směrnice
 zgodny z dyrektywą
 v zhode so smernicami
 direktiivde järgi
 pagal direktyvas
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EN-ISO 12100:2010, EN 60204-1:2018,
 EN 61000-6-2:2016, EN 61000-6-4:2018

în conformitate cu standardele
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 zgodny z normą
 zodpovedá normám
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 underskrift og dato
 allekirjotus ja päiväys
 signatur og dato
 underskrift och datum
 undirskrift og dagsetning

Serge Loosveld
 Managing Director Feeding
 Lely Industries N.V.

A. Mateboer
 Competence Director PD
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 aláírás és dátum
 podpis a datum
 podpis i data
 podpis a dátum
 allkirii ja kuupäev
 parašas ir data
 подпись и дата
 podpis i datum
 podpis i datum

19-02-2024

5.2011.8636.0 B

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 EG-FÖRSÄKRAN OM ÖVERENSSTÄMMELSE
 CB – SAMRÆMISYFIRLÝSING



ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ Ε.Ε.
 DECLARAȚIE DE CONFORMITATE CE
 EU MEGFELELŐSÉGI NYILATKOZAT
 ES-PROHLÁŠENÍ O SHODĚ
 DEKLARACJA ZGODNOŚCI WE
 ES – PREHLASENIE O ZHODE
 VASTAVUS EU DIREKTIVIDELE
 ES ATITIKTIES DEKLARACIJA
 ЗАЯВЛЕНИЕ О СООТВЕТСТВИИ НОРМАМ ЕС
 EG - POTVRDA O SUKLADNOSTI
 ES IZJAVA O SKLADNOSTI

Wij fabrikant

We manufacturer
 Der Hersteller
 Nous, soussignés, le fabricant
 fabbricante
 fabricante
 producent
 valmistaja
 produsent
 tiliverkare
 framleiðandi

Lely Industries N.V.
 Cornelis van der Lelylaan 1 • 3147 PA Maassluis • The Netherlands
 tel. +31 (0)88 - 12 28 221 • fax +31 (0)88 - 12 28 222
 www.lely.com

Εμείς, ο κατασκευαστής
 fabricant
 gyártó
 výrobce
 producent
 výrobca
 tootja
 gamintojas
 производитель
 proizvođač
 naziv proizvajalca

verklaren geheel onder eigen verantwoordelijkheid dat de machine:
 herewith declare, on our own responsibility, that the machinery:
 erklärt hiermit eigenverantwortlich, dass die Maschine:
 déclarons que les machines désignées ci-après :

productbeschrijving

description of product
 Produktbezeichnung
 description du produit
 descrizione del prodotto
 nombre del producto
 designação de produto
 produktnavn
 tuotenimi
 produktnavn
 produktnamn
 vörulýsing

Lely Additives Control box

περιγραφή του προϊόντος
 descrierea produsului
 termék megnevezése
 označení produktu
 opis produktu
 označenie výrobku
 toote kirjeldus
 gaminio aprašymas
 наименование изделия
 naziv proizvoda

typenummer

model number
 Typnummer
 numéro de modèle
 numero di modello
 modelo
 número do modelo
 modelnummer
 mallinnumero
 modellnummer
 gerðarnúmer

5.2011.0496.0
 5.2011.0533.0

αριθμός μοντέλου
 numărul modelului
 típus száma
 numer modelu
 typové číslo
 tüübi number
 modelo numeris
 номер модели
 broj modela
 številka artikla

waarop deze verklaring betrekking heeft, in overeenstemming is met de bepalingen van de volgende Richtlijn(en):
 which this declaration refers to, is in accordance with the conditions of the following Directive(s):
 worauf sich diese Erklärung bezieht, hergestellt ist gemäß den Bestimmungen der Richtlinie(n):
 auxquelles la présente déclaration se rapporte, sont conformes aux dispositions de la ou des directives suivantes :

è conforme alle direttive
 de acuerdo con las normas
 de acordo com a directiva
 opfylder følgende direktiver
 täyttää seuraavien direktiivien vaatimukset
 oppfyller følgende direktiver
 uppfyller följande direktiv
 uppfyllir eftirfarandi tilskipanir

Machinery directive 2006/42/EC
Low voltage directive 2006/95/EC
Electromagnetic compatibility 2004/108/EC

conform cu directivele
 rendelkezéseknél megfelelően
 podle směrnice
 zgodny z dyrektywą
 v zohod so smernicami
 direktiivde järgi
 pagai direktivas
 соотвѣтствует требованиям директив
 þó smjærnicama
 v skladu z direktivo

en in overeenstemming is met de volgende normen of andere normatieve documenten :
 and is in conformity with the following standard(s) or other such specifications :
 und den folgenden Normen oder vergleichbaren Spezifikationen entspricht:
 et aux normes et autres spécifications suivantes :

è conforme alle norme
 de acuerdo con las normas
 de acordo com as normas
 opfylder følgende standarder
 täyttää seuraavien standardien vaatimukset
 oppfyller følgende standard
 uppfyller följande standarder
 uppfyllir eftirfarandi stæðla
 πληροί τις προδιαγραφές

EN 60204-1:2006/A1:2009, EN 61000-3-2:2014
 EN 61000-3-3:2013, EN 61000-6-1:2007
 EN 61000-6-3:2007/A1:2011

în conformitate cu standardele
 megfelel a szabványoknak
 odpovídá normám
 zgodny z normą
 zopovedá normám
 normidele vastavus
 atilinka standartus
 соотвѣтствует стандартам нормам
 u skladu sa standardima
 v skladu s standardi

handtekening en datum

signature and date
 Unterschrift und Datum
 signature et date
 firma e data
 firma y fecha
 assinatura e data
 underskrift og dato
 allekirjoitus ja päiväs
 signatur og dato
 underskrift och datum
 undskrift og dagsetning

S. Loosveld
 Director Product Development
 Lely Industries N.V.

J.W. Rodenburg
 Manager Product Safety & Compliance
 Lely Industries N.V.

υπογραφή και ημερομηνία
 semnătura și data
 aláírás és dátum
 podpis a datum
 podpis i data
 podpis a dátum
 allkiri ja kuupäev
 parašas ir data
 подпись и дата
 rotpis i datum
 podpis in datum

20-1-2015

5.2011.8505.9

EC DECLARATION OF CONFORMITY
 EG-KONFORMITÄTSEKTLÄRUNG
 DÉCLARATION DE CONFORMITÉ AUX NORMES DE LA CE
 DICHIARAZIONE CE DI CONFORMITÀ
 CERTIFICADO DE CONFORMIDADE CE
 DECLARAÇÃO DE CONFORMIDADE CE
 DEKLARASJON EU MASKINDIREKTIV
 VAATIMUSTENMUKAISUUSVAKUUTUS
 EU-KONFORMITETSEKTLÆRING
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Lely External Concentrates box

περιγραφή του προϊόντος
 descrierea produsului
 termék megnevezése
 označení produktu
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 označenie výrobku
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model number
 Typnummer
 numéro de modèle
 numero di modello
 modelo
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 modelnummer
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5.2011.0534.0

αριθμός μοντέλου
 numărul modelului
 típus száma
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Low voltage directive 2006/95/EC
 Electromagnetic compatibility 2004/108/EC

conform cu directivele
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 undrskrift og dagsetning

S. Loosveld
 Director Product Development
 Lely Industries N.V.

J.W. Rodenburg
 Manager Product Safety & Compliance
 Lely Industries N.V.

20-1-2015

5.2011.8507.9

5.2011.8636.0 B



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EC Declaration of Conformity

EC DECLARATION OF CONFORMITY
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produktnamn
vörulysing

Lely Door Control Box

περιγραφή του προϊόντος
descrisiunea produsului
termék megnevezése
označení produktu
opis produktu
označenie výrobku
toote kirjeldus
gaminio aprašymas
наименование изделия
naziv proizvoda

typenummer

model number
Typnummer
numéro de modèle
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modelo
número do modelo
modellnummer
mallinnumero
modellnummer
gerðarnúmer

5.4303.0562.x

αριθμός μοντέλου
numărul modelului
típus száma
numer modelu
typové číslo
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modelio numeris
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uppfyller följande direktiv
uppfyllir eftirlifrandi tilskipanir

Low voltage Directive 2014/35/EC
Electromagnetic Compatibility Directive 2014/30/EC
Radio Equipment Directive 2014/53/EU

conform cu directivele
rendelkezeseknek megfelelsen
podle směrnice
zgodny z dyrektywą
v zhode so smernicami
direktiivide järgi
pagal direktyvas
соответствует требованиям директив
po smjernicama
v skladu z direktivo

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täyttää seuraavien standardien vaatimukset
oppyllyer følgende standarder
uppfyller följande standarder
uppfyllir eftirlifrandi staðla
πληροί τις προδιαγραφές

EN 300 328 V2.1.1, EN 60204-1:2018,
EN 61000-6-2:2016, EN 61000-6-4:2018

în conformitate cu standardele
megfelel a szabványoknak
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zgodny z normą
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normidele vastavus
atitinka standartus
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Unterschrift und Datum
signature et date
firma e data
firma y fecha
assinatura e data
underskrift og dato
allekirjoitus ja päiväs
signatur og dato
underskrift och datum
underskrift og dagsetning

Ondertekend door:

0C1BBB17D32A4C8...

S. Loosveld
Managing Director Feeding
Lely Industries N.V.

Signed by:

22641B42562B472...

A. Mateboer
Competence Director PD
Lely Industries N.V.

υπογραφή και ημερομηνία
semnătura și data
aláírás és dátum
podpis a datum
podpis i data
podpis a dátum
allkirji ja kuupäev
parašas ir data
подпись и дата
potpis i datum
podpis in datum

14-03-2025

5.2011.8636.0 B



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UKCA Declaration of Conformity

UK CA

We manufacturer

Lely Industries N.V.

Cornelis van der Lelylaan 1 • 3147 PB Maassluis • The Netherlands
tel. +31 (0)88 - 12 28 221 • fax +31 (0)88 - 12 28 222 • www.lely.com

Authorised representative in the UK:

Lely Atlantic Limited • Unit 7 Quartz Point Stonebridgeroad • Coleshill • Birmingham • B46 3JL • United Kingdom

herewith declare, on our own responsibility, that the machinery:

Description of product

Lely Vector Mixing and Feeding Robot

Model number

5.2011.0060.0

with safety software version 2.1.5

which this declaration refers to, is in accordance with the conditions of the following Directive(s):

Supply of Machinery (Safety) Regulations 2008 (UK)
Electrical Equipment (Safety) Regulations 2016 (UK)
Electromagnetic Compatibility Regulations 2016 (UK)

and is in conformity with the following standard(s) or other such specifications :

EN-ISO 12100:2010, EN 60204-1:2018,
EN 61000-6-2:2016, EN 61000-6-4:2018
EN 13849-1:2023, EN 13849-2:2015, EN-ISO 3991:2025

Signature and date

Ondertekend door:

0C1BBB17D32A4C8...

S. Loosveld
Managing Director Feeding
Lely Industries N.V.

Signed by:

22641B42562B472...

A. Mateboer
Competence Director PD
Lely Industries N.V.

26-02-2024



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UKCA Declaration of Conformity



We manufacturer

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Authorised representative in the UK:

Lely Atlantic Limited • Unit 7 Quartz Point Stonebridgeroad • Coleshill • Birmingham • B46 3JL • United Kingdom

herewith declare, on our own responsibility, that the machinery:

Description of product

Lely PSU Box
Lely Secondary PSU Box

Model number

5-2011-4500-0
5-2011-4570-0

which this declaration refers to, is in accordance with the conditions of the following Directive(s):

Electrical Equipment (Safety) Regulations 2016 (UK)
Electromagnetic Compatibility Regulations 2016 (UK)

and is in conformity with the following standard(s) or other such specifications :

EN 60204-1:2018,
EN 61000-6-2:2016, EN 61000-6-4:2018

Signature and date

Ondertekend door:

0C1BBB17D32A4C8...

S. Loosveld
Managing Director Feeding
Lely Industries N.V.

Signed by:

22641B42562B472...

A. Mateboer
Competence Director PD
Lely Industries N.V.

26-02-2024

5.2011.8636.0 B



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herewith declare, on our own responsibility, that the machinery:

Description of product

Lely Vector Power Distribution Box

Model number

5.2011.0532.x
5.2011.1174.x
5.2011.1241.x

which this declaration refers to, is in accordance with the conditions of the following Directive(s):

Electrical Equipment (Safety) Regulations 2016 (UK)
Electromagnetic Compatibility Regulations 2016 (UK)

and is in conformity with the following standard(s) or other such specifications :

EN 60204-1:2006/AC:2010
EN 61000-6-3:2007/A1:2011/AC:2012
EN 61000-3-2:2014
EN 61000-6-1:2007

Signature and date

J.W. Rodenburg
Manager Product Safety & Compliance
Lely Industries N.V.

09-Dec-21

5.2011.8504.9A

5.2011.8636.0 B



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herewith declare, on our own responsibility, that the machinery:

Description of product

Lely Vector Feed Grabber

Model number

5.3004.000x.x
5.3004.002x.x

which this declaration refers to, is in accordance with the conditions of the following Directive(s):

Supply of Machinery (Safety) Regulations 2008 (UK)
Electrical Equipment (Safety) Regulations 2016 (UK)
Electromagnetic Compatibility Regulations 2016 (UK)

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EN-ISO 12100:2010, EN 13001-1:2015
EN 13001-2:2014, EN 13001-3-1:2012+A1:2013
EN 15011:2011+A1:2014, EN 60204-1:2006/AC:2010
EN-IEC 60204-32:2008

Signature and date

J.W. Rodenburg
Manager Product Safety & Compliance
Lely Industries N.V.

09-Feb-22

5.3004.8502.9B

5.2011.8636.0 B



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Authorised representative in the UK:

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herewith declare, on our own responsibility, that the machinery:

Description of product

Lely Vector Bridge Crane

Model number

5.2013.0210.x

which this declaration refers to, is in accordance with the conditions of the following Directive(s):

Supply of Machinery (Safety) Regulations 2008 (UK)
Electrical Equipment (Safety) Regulations 2016 (UK)
Electromagnetic Compatibility Regulations 2016 (UK)

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EN-ISO 12100:2010, EN 13001-1:2015
EN 13001-2:2014, EN 13001-3-1:2012+A1:2013
EN 15011:2011+A1:2014, EN 60204-1:2006/AC:2010
EN-IEC 60204-32:2008

Signature and date

J.W. Rodenburg
Manager Product Safety & Compliance
Lely Industries N.V.

09-Dec-21

5.2013.8503.9A

5.2011.8636.0 B

UK CA

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herewith declare, on our own responsibility, that the machinery:

Description of product

Lely Vector Bridge crane 2

including lattice girder assembly

Model number

5.2013.1110.x

Compatible lattice girder assembly:

5.2013.0430.0, 5.2013.0461.0, 5.2013.0528.0,
5-2013.0659.0, 5-2013.0669.0, 5-2013.0679.0

which this declaration refers to, is in accordance with the conditions of the following Directive(s):

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Electromagnetic Compatibility Regulations 2016 (UK)

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Signature and date



Serge Loosveld
Managing Director Feeding
Lely Industries N.V.



A. Mateboer
Competence Director PD
Lely Industries N.V.

19-02-2024

5.2011.8636.0 B



UKCA Declaration of Conformity



We manufacturer

Lely Industries N.V.

Cornelis van der Lelylaan 1 • 3147 PB Maassluis • The Netherlands
tel. +31 (0)88 - 12 28 221 • fax +31 (0)88 - 12 28 222 • www.lely.com

Authorised representative in the UK:

Lely Atlantic Limited • Unit 7 Quartz Point Stonebridgeroad • Coleshill • Birmingham • B46 3JL • United Kingdom

herewith declare, on our own responsibility, that the machinery:

Description of product

Lely Additives Control box

Model number

5.2011.0496.0
5.2011.0533.0

which this declaration refers to, is in accordance with the conditions of the following Directive(s):

Supply of Machinery (Safety) Regulations 2008 (UK)
Electrical Equipment (Safety) Regulations 2016 (UK)
Electromagnetic Compatibility Regulations 2016 (UK)

and is in conformity with the following standard(s) or other such specifications :

EN 60204-1:2006/AC:2010, EN 61000-6-3:2007/A1:2011/AC:2012
EN 61000-3-2:2014, EN 61000-3-3:2013
EN 61000-6-1:2007

Signature and date

J.W. Rodenburg
Manager Product Safety & Compliance
Lely Industries N.V.

09-Dec-21

5.2011.8505.9A

5.2011.8636.0 B



UKCA Declaration of Conformity



We manufacturer

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Authorised representative in the UK:

Lely Atlantic Limited • Unit 7 Quartz Point Stonebridgeroad • Coleshill • Birmingham • B46 3JL • United Kingdom

herewith declare, on our own responsibility, that the machinery:

Description of product

Lely External Concentrates box

Model number

5.2011.0534.0

which this declaration refers to, is in accordance with the conditions of the following Directive(s):

Electrical Equipment (Safety) Regulations 2016 (UK)
Electromagnetic Compatibility Regulations 2016 (UK)

and is in conformity with the following standard(s) or other such specifications :

EN 60204-1:2006/AC:2010, EN 61000-6-3:2007/A1:2011/AC:2012
EN 61000-3-2:2014, EN 61000-3-3:2013
EN 61000-6-1:2007

Signature and date

J.W. Rodenburg
Manager Product Safety & Compliance
Lely Industries N.V.

09-Dec-21

5.2011.8507.9A

5.2011.8636.0 B



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UKCA Declaration of Conformity

UK CA

We manufacturer

Lely Industries N.V.

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tel. +31 (0)88 - 12 28 221 • fax +31 (0)88 - 12 28 222 • www.lely.com

Authorised representative in the UK:

Lely Atlantic Limited • Unit 7 Quartz Point Stonebridgeroad • Coleshill • Birmingham • B46 3JL • United Kingdom

herewith declare, on our own responsibility, that the machinery:

Description of product

Lely Door control Box

Model number

5.4303.0562.x

which this declaration refers to, is in accordance with the conditions of the following Directive(s):

Electrical Equipment (Safety) Regulations 2016 (UK)
Electromagnetic Compatibility Regulations 2016 (UK)
Radio Equipment regulations 2017 (UK)

and is in conformity with the following standard(s) or other such specifications :


EN 300 328 V2.1.1, EN 60204-1:2018,
EN 61000-6-2:2016, EN 61000-6-4:2018

Signature and date

Ondertekend door:

0C1BBB17D32A4C8...

S. Loosveld
Managing Director Feeding
Lely Industries N.V.

Signed by:

22641B42562B472...

A. Mateboer
Competence Director PD
Lely Industries N.V.

14-03-2025

Lely Industries N.V.

Cornelis van der Lelylaan 1

NL-3147 PB Maassluis

Tel +31 (0)88 - 12 28 221

Fax +31 (0)88 - 12 28 222

