

# Lely Vector

## Automatic Feeding System



## Operator Manual

en-US - English Original

5.2011.8607.0 D





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## List of Included Amendments

Issue Date (yy/mm)	Revision	Chapter(s)	Remarks
2024/11	D	2.4.2.4	Changed: Safety Bumper, not clear difference between solid and not solid objects.
		2.2.2	Changed: Mixing and Feeding Robot Safety Instructions (Operator not allowed in mixing bin)
		2.4.2.9	Changed: Knife Guards
		3.1, 3.2	Changed: Specifications Vector and Requirements Smartphone
		4.2.7.1	Added: Bridge crane (BC B2)
		5.1.6.2	Changed: Switch off the Mixing and Feeding Robot with the Key (MFR 2)
		5.1.6.3	Removed: Switch off the Mixing and Feeding Robot with the Key (MFR 1)
		6	Added: Safety warnings in different maintenance chapters.
		6.2.7	Removed: Install or Replace Mixer Knives
		7	Added: Safety warnings in different troubleshooting chapters.
		8.2	Added: WEEE
			Changed: IPE profile to I-beam
			Changed: T4C to Horizon
2023/11	C	-	Changed: Applicability, added Bridge Crane 2
			Removed: Double fixed rail
			Added: Declarations of conformity Bridge Crane 2
2022/03	B	4, 5, 6	Added: Software version 3.0, WebUI, the user interface to control the software on the Power Distribution Box (PDB) and combined routes.
		2.4.3.1	Changed: Distance between emergency buttons from 12 to 24 m (79 ft).
		5.5.1	Changed: Picture how to cut bales.
		5.7	Changed: feed type to feedstuff and procedure in T4C.
		9	Added: UKCA Declarations of conformity.
2021/02	A	2 - 5	Replaced: Type of safety fence.
2020/09	–		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 Vector system.

The information in this manual is for operators.



Study and understand this information thoroughly before you operate the Vector. Failure to do so could result in damage to equipment or personal injury (see Signal Icons on page 2-1). Please consult your local Lely service provider 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 Vector 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 1 Phase (MFR M2)	5.2011.0054.1
Mixing and Feeding Robot 3 Phase (MFR M2)	5.2011.0055.1
Mixing and Feeding Robot 1 Phase (short feed mixer) (MFR M2)	5.2011.0056.1
Mixing and Feeding Robot 3 Phase (short feed mixer) (MFR M2)	5.2011.0057.1
Feed grabber (FG F2)	5.3004.0000.1
Fixed Rail (single)	5.2013.0800.1
Bridge crane (BC B1)	5.2013.0210.1
Bridge crane (BC B2)	5.2013.1110.0
Power Distribution Box 3 PhN 400/230 VAC	5.2011.0532.0
Power Distribution Box 2 Ph 240 VAC SP	5.2011.1174.0

This manual is applicable for software version 3.0 or higher.

## Standard Torque Loading of Parts

All the nuts, bolts and screws used on the system 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

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 switch.
- Mixing and Feeding Robot: on the centre of the rear frame above the battery tray.
- Feed Grabber: on the frame above the control box
- Bridge Crane: on the wheel frame.
- Fixed Rail: on the frame above the bend.
- 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 numbers of the part of the Vector when you contact your local Lely service provider or order spare parts.

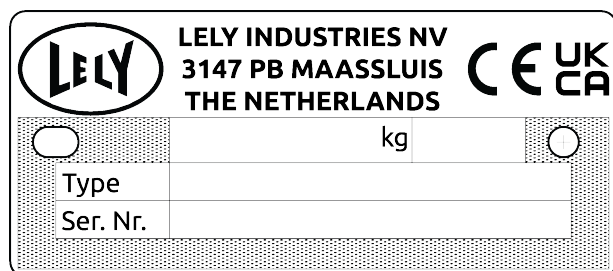


Figure 1. Example type and serial number plate

A decal with the serial number and bar code is attached inside every control box.

Type plate on the power distribution box is a decal and looks a bit different:

- The serial number starts with the revision letter (or “-” in case of the first version), year, week nr and following number. These number are made by the manufacturer. Lely has a different serial numbering.

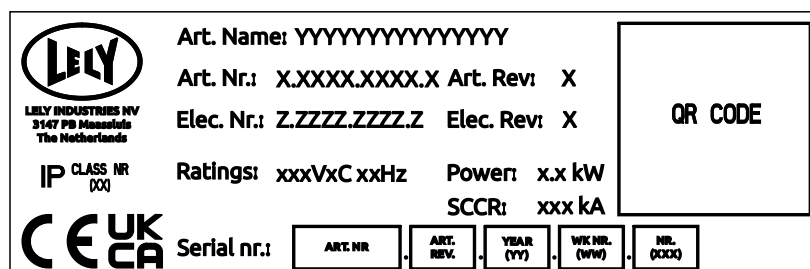


Figure 2. Decal on the PDB

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## Personnel Requirements

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***Risk of accident from insufficiently qualified personnel.  
Unqualified personnel working in the working area of the Mixing and Feeding Robot  
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 of the Mixing and Feeding Robot.***
  - ***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 in the area where the Mixing and Feeding Robot operates.***
-

# Table of Contents

<b>1</b>	<b>Lely Vector</b>	<b>1-1</b>
1.1	Intended use	1-1
<b>2</b>	<b>Safety</b>	<b>2-1</b>
2.1	Signal Icons	2-1
2.2	Safety Instructions	2-2
2.2.1	Vector system safety instructions	2-2
2.2.2	Mixing and Feeding Robot Safety Instructions	2-3
2.2.3	Cut Resistant Clothing	2-4
2.2.4	Bridge crane, fixed rail and feed grabber safety instructions	2-5
2.3	Safety decals	2-6
2.3.1	Safety Decals on the Mixing and Feeding Robot	2-6
2.3.2	Safety Decals on the Feed Grabber	2-8
2.3.3	Safety Decals on the Cranes	2-9
2.3.4	Safety Decals on the Control Boxes	2-9
2.3.5	Safety Decals in and near the Feed Kitchen and Barn	2-10
2.3.6	Safety Decals of the Tower Silo	2-11
2.3.7	Safety Decals on the Route	2-11
2.3.8	Installation of Safety Decals	2-12
2.3.9	Maintenance of Safety Decals	2-12
2.4	Safety Devices	2-12
2.4.1	Feed Grabber	2-12
2.4.1.1	Handles to manually open the Grabber in case of Emergency	2-12
2.4.1.2	Emergency Stop Button	2-14
2.4.2	Mixing and Feeding Robot	2-15
2.4.2.1	Emergency Stop Button	2-15
2.4.2.2	Pause Button	2-15
2.4.2.3	Acoustic Warning Device	2-17
2.4.2.4	Safety bumper	2-18
2.4.2.5	Safety Key	2-18
2.4.2.6	Magnets	2-19
2.4.2.7	High Voltage Switch in the PCB Box	2-20
2.4.2.8	Flashing Light (Optional)	2-21
2.4.2.9	Knife guards	2-21
2.4.2.10	Software Controlled Protection	2-23
2.4.3	In and Near the Feed Kitchen	2-24
2.4.3.1	Emergency Stop Button	2-24
2.4.3.2	Emergency Stop Button on Console	2-25
2.4.3.3	Signal Lights	2-25
2.4.3.4	Safety Switch on Access Doors to the Feed Kitchen	2-27
2.4.3.5	Safety door	2-28
2.4.3.6	Safety Fence	2-29
2.4.3.7	Safety Switch on Kitchen Fill Door	2-29
2.5	Safety Zones	2-29
2.5.1	General Safety Zones	2-29
2.5.2	Red Zone - High Risk Zone	2-30
2.5.3	Yellow Zone - Medium Risk Zone	2-30

2.5.4	Green Zone - Low Risk Zone .....	2-31
2.5.5	Safety and Safety Distances on Routes .....	2-32
<b>3</b>	<b>Specifications .....</b>	<b>3-1</b>
3.1	Specifications Vector .....	3-1
3.2	Requirements Smartphone .....	3-2
3.3	Dimensions and Weight Mixing and Feeding Robot .....	3-3
<b>4</b>	<b>Description .....</b>	<b>4-1</b>
4.1	General Description .....	4-1
4.2	Component Description .....	4-2
4.2.1	Mixing and Feeding Robot .....	4-2
4.2.2	Obstacle Detection Sensors (Optional) .....	4-4
4.2.3	Charger .....	4-6
4.2.4	Console and Signal Lights .....	4-7
4.2.5	Power Distribution Box .....	4-7
4.2.6	Feed grabber (FG F2) .....	4-8
4.2.7	Cranes and Fixed Rail .....	4-9
4.2.7.1	Bridge crane (BC B2) .....	4-9
4.2.7.2	Bridge crane (BC B1) .....	4-10
4.2.7.3	Single Fixed Rail .....	4-11
4.2.8	Additives Dispenser (frequency pulse) .....	4-11
4.2.9	External Concentrates (frequency weight) .....	4-13
4.2.10	Digital Output .....	4-14
4.2.11	Safety fence (Optional) .....	4-14
4.2.12	Automatic (barn) door control (optional) .....	4-14
4.2.13	Software .....	4-15
4.3	Operation .....	4-16
4.3.1	Feed Loading and Mixing Process .....	4-17
4.3.2	Feeding, Measuring and Feed Pushing .....	4-17
4.3.3	Drive to the Feed Loading Point and Connect to the Charger .....	4-18
<b>5</b>	<b>Operating Instructions .....</b>	<b>5-1</b>
5.1	Start Up and Stop .....	5-1
5.1.1	Put the Feed Kitchen in Operation .....	5-1
5.1.2	Put the Mixing and Feeding Robot In Operation .....	5-2
5.1.3	Take the Feed Kitchen Out of Operation in the Filling Mode .....	5-4
5.1.3.1	Put the feed kitchen in the filling mode with the console .....	5-4
5.1.3.2	Put the Feed Kitchen in the Filling Mode with the Smartphone .....	5-4
5.1.3.3	Put the Feed Kitchen in the Filling Mode with the WebUI .....	5-5
5.1.4	Take the Mixing and Feeding Robot Out of Operation .....	5-5
5.1.5	Put Feed Kitchen Devices In and Out of Operation .....	5-6
5.1.5.1	Put the Feed Controller (PDB) In and Out of Operation .....	5-6
5.1.5.2	Put the Feed Grabber In Operation .....	5-7
5.1.5.3	Take the Feed Grabber Out of Operation .....	5-7
5.1.5.4	Put the Bridge Crane In Operation .....	5-8
5.1.5.5	Take the Bridge Crane Out of Operation .....	5-8
5.1.6	Shut Down the Vector and Disconnect from the Power .....	5-9
5.1.6.1	Shut Down the Vector and Disconnect from the Power .....	5-9



5.1.6.2	Switch off the Mixing and Feeding Robot with the Key (MFR 2)	5-11
5.1.6.3	Switch off the Main Switch on the Mixing and Feeding Robot near the Battery	5-12
5.1.7	Connect the Vector to the Power	5-14
5.1.7.1	Connect the Vector to the Power and Start Up	5-14
5.1.7.2	Switch on the Main Switch on the Mixing and Feeding Robot	5-14
5.1.7.3	Switch on the Mixing and Feeding Robot with the Key	5-14
5.2	Connect to Device Software with a Smartphone	5-15
5.2.1	Install or Update the App on Your Smartphone	5-15
5.2.2	Connect the Smartphone to Device Software	5-15
5.3	Start the WebUI	5-16
5.4	Reset after an Alarm or Emergency Stop	5-18
5.4.1	View the Alarm List on the Web Page	5-18
5.4.2	Reset the System After an Alarm	5-18
5.4.3	Restart the System after an Alarm	5-20
5.4.4	Reset alarms on the MODalarm	5-23
5.4.5	Reset an Alarm on the Mixing and Feeding Robot and Continue Route	5-24
5.4.6	Reset the Emergency Stop Button on the Mixing and Feeding Robot	5-25
5.4.7	Reset an Emergency Stop Button in or near the Feed Kitchen	5-26
5.5	Fill the Kitchen	5-27
5.5.1	Fill the Feed Kitchen	5-27
5.5.2	Change the Preferred Storage Place	5-27
5.5.3	Fill the Additives Dispenser (freq. pulse)	5-29
5.5.4	Enter the Feed Kitchen	5-30
5.5.5	Open the Safety Fence Net	5-30
5.5.6	Close the Safety Fence Net	5-30
5.6	Start a Feed or Scan Task Manually	5-31
5.6.1	Start a Feed Task Manually with the WebUI	5-31
5.6.2	Start a Feed Task Manually with the Smartphone	5-33
5.6.3	Start a Scan Task Manually with the WebUI	5-33
5.6.4	Start a Scan Task Manually with the Smartphone	5-33
5.7	Change the Feedstuff in a Feed Storage Place	5-34
5.8	Drive the Mixing and Feeding Robot	5-34
5.8.1	Drive the Mixing and Feeding Robot Manually	5-34
5.8.2	Connect the Mixing and Feeding Robot Manually to the Charger	5-35
5.8.3	Lower the Skirt to Clear the Route of Snow	5-35
5.9	Set the Automatic (Barn) Door Control	5-37
5.10	Change Feed in the Digital Output	5-38
<b>6</b>	<b>Maintenance Procedures</b>	<b>6-1</b>
6.1	Preventive Maintenance Schedule Farmer	6-1
6.2	Mixing and Feeding Robot	6-2
6.2.1	Clean and Inspect the Feed Loading Location	6-3
6.2.2	Clean the Dosing Roll and Position Sensor	6-3
6.2.3	Clean the Magnets	6-6

6.2.4	Clean the Feed Height Sensor .....	6-7
6.2.5	Clean the Ultrasonic Sensors .....	6-10
6.2.6	Examine the mixing auger knives .....	6-11
6.2.7	Clean the Mixing and Feeding Robot .....	6-13
6.2.8	Examine and Correct the Metal Strips .....	6-15
6.2.9	Examine the Reports in the Mixing and Feeding Robot Software .....	6-17
6.2.10	Empty the Mixing Bin and Tare the Load cells .....	6-17
6.3	Feed Grabber .....	6-19
6.3.1	Clean the Feed Height Sensor .....	6-19
6.3.2	Clean the Jaws of the Feed Grabber .....	6-21
6.4	General Feed Kitchen .....	6-23
6.4.1	Examine the Stock .....	6-23
6.4.2	Examine the Feeding .....	6-23
6.4.3	Clean the Drop Pipe of the Additives Dispenser(s) (frequency pulse) .....	6-23
6.4.4	Clean the I-beams of the Bridge Crane .....	6-25
6.4.5	Clean the Control Boxes .....	6-26
6.4.6	Calibrate the Additives Dispenser (frequency pulse) .....	6-27
<b>7</b>	<b>Troubleshooting .....</b>	<b>7-1</b>
7.1	Restart the System after an Alarm .....	7-1
7.2	Troubleshooting Table .....	7-3
7.3	Make sure the Battery is Charging Correctly .....	7-17
7.4	Release a jammed mixing auger .....	7-18
7.5	Release a jammed dosing roll .....	7-19
7.6	Release a jammed feed door .....	7-20
7.7	Reset the PCB of the Mixing and Feeding Robot .....	7-21
7.8	Pull a Broken Mixing and Feeding Robot Out of the Way .....	7-22
7.9	Reset the Feed Grabber .....	7-23
7.10	Reinstall the Chain After Activation of the Safety Handle .....	7-23
<b>8</b>	<b>Disposal .....</b>	<b>8-1</b>
8.1	Disposal .....	8-1
8.2	WEEE .....	8-1
<b>9</b>	<b>Declarations of Conformity .....</b>	<b>9-1</b>

# 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 or fixed rail 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 app which is used to control the MFR, barn door, 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.

## 1.1 Intended use



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

YOU are responsible for the SAFE operation and maintenance of your Vector system. YOU must make sure that you and anyone else who is going to operate, maintain or work in the vicinity of the devices know 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 devices obeys the safety precautions. Do not risk injury or death by ignoring good safety practices.

- Owners must train operators before they operate the Vector 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 Vector 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.



***The hazards in the danger zone and working 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 work area. Unauthorized persons are therefore at risk of serious or fatal injury.***

- ***Keep unauthorized persons away from the danger zone and work area.***
- ***If in doubt, approach unauthorized persons and ask them to leave the danger zone and work area.***
- ***Stop work as long as unauthorized persons are within the 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 2-10).
- 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.
- 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 by using the Vector step ladder.



- Only operate the Mixing and Feeding Robot in a marked track.
- Never have the mixing bin loaded with more than 600 kg (1323 lb), this causes a longer braking distance and wear on the wheels and other parts.
- Only manually operate the mixing and feeding robot in an area with a slope less than 5% inclination.
- 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.
- Disconnect and isolate the electrical power supply with the safety key before you do work on the mixing and feeding robot (see Switch off the Mixing and Feeding Robot with the Key (MFR 2) on page 5-11), if work is done under the skirt, switch off the main switch on the batteries (see Switch off the Main Switch on the Mixing and Feeding Robot near the Battery on page 5-12).
- Keep tools and metal parts away from the battery to prevent a short circuit.
- Do NOT use a high pressure cleaner when you clean the mixing and feeding robot. Keep covers and doors closed while cleaning the robot.
- Make sure all covers are installed correctly when maintenance work is completed.
- Do NOT touch the motors until they are cooled down.
- Only use water and optionally mild soap to clean the exterior of the MFR. Do NOT use aggressive cleaning agents.

### 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	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	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.

Symbol	Applies to	Information about level of protection, class and design
	Trousers EN 381–5  Overall EN 381–5	Chainsaw trousers according to EN 381–5: <ul style="list-style-type: none"> <li>• All classes are sufficient, class 0 (16 m/s) to 3 (28 m/s).</li> <li>• Design C is mandatory, this design has protection all around.</li> </ul>
	Jacket EN 381–11	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 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. Only allowed for inspections.
- Do NOT use a high pressure cleaner when you clean the bridge crane, fixed rail and 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.

## 2.3 Safety decals

### 2.3.1 Safety Decals on the Mixing and Feeding Robot

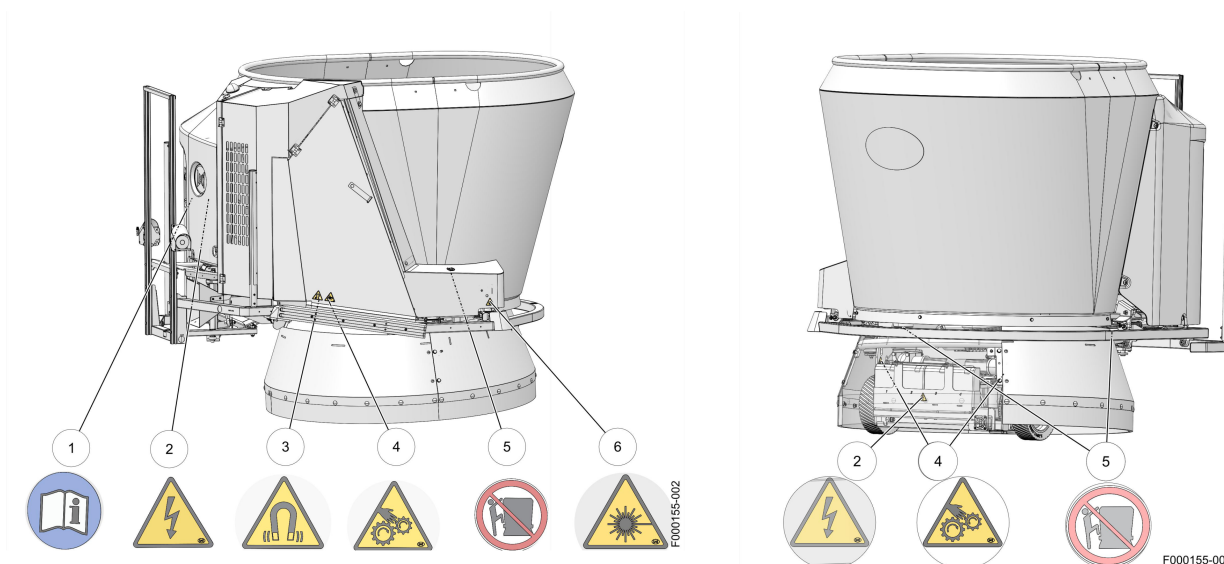






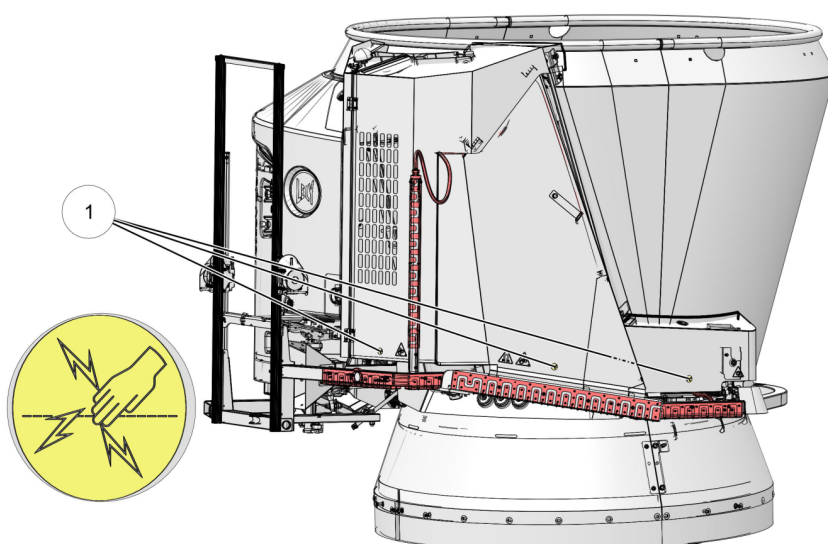


Figure 3. Location of the safety decals

Key	Decal	Explanation
1		<b>Caution: Read manual</b> Failure to follow operation instructions could result in death or serious injury. Read the manual.
2		<b>Caution: Electrocution hazard</b> Risk of electrocution. Switch off the power before doing maintenance, adjustment or repair.
3		<b>Warning: Magnetic fields</b> Do not work near the magnets if you have a cardiac pacemaker or other implant that can be impaired by magnetic fields.
4		<b>Danger: Rotating parts</b> 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


Key	Decal	Explanation
5		<b>Caution: Do not climb / Keep off bumper</b> Risk of serious injury and product damage. Do not climb in, or on the vehicle and keep off the bumper.
6		<b>Caution: Laser light hazard</b> Risk of being blinded. Do not stare into the beam.

### Optional

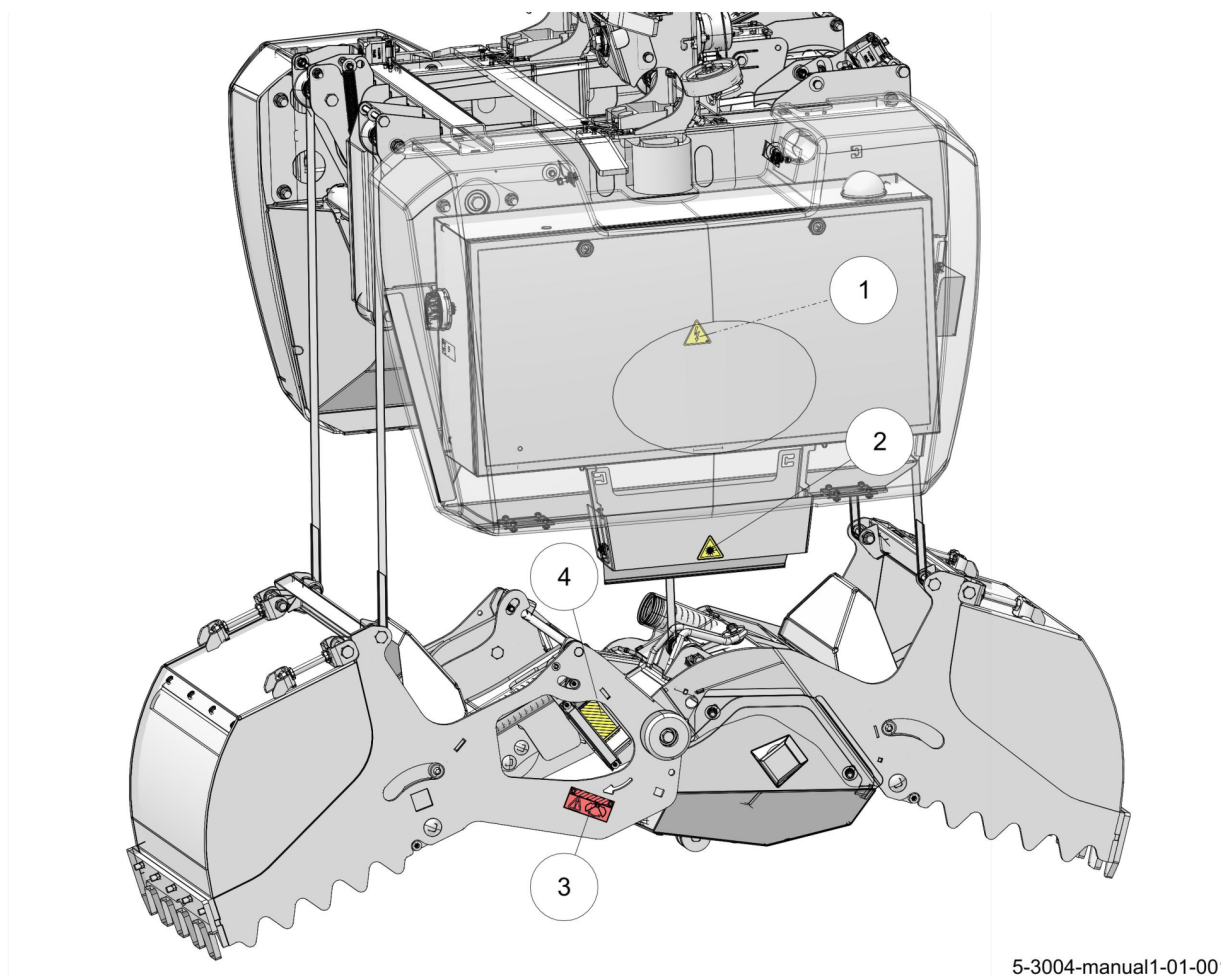


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Figure 4. Electric shock device

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



## 2.3.2 Safety Decals on the Feed Grabber





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Figure 5. Locations of decals on the Feed Grabber


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

Key	Decal	Explanation
3		<b>Safety handles</b> 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		<b>Safety handle stripes</b> This decal indicates the position of the safety handles.




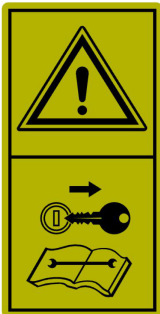
### 2.3.3 Safety Decals on the Cranes

Location	Decal	Explanation
On the rail		<b>WLL 0.15 T</b> The WLL (work load limit) of the Feed Grabber 0.15 T (150 kg (330 lb)).
Location of the service point On the I-beam of a Bridge Crane or a Fixed Rail		<b>WLL 1.5 T</b> The WLL (work load limit) is 1.5 T (1500 kg (3307 lb)). The Mixing and Feeding Robot can be lifted at this point for maintenance.

### 2.3.4 Safety Decals on the Control Boxes

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

### 2.3.5 Safety Decals in and near the Feed Kitchen and Barn

Location	Decal	Explanation
At the entrance of the barn or at the entrance of the farmyard where the Mixing and Feeding Robot moves	 A rectangular decal with a green top section containing a white triangle with an exclamation mark and the word 'CAUTION' in white. The bottom section is white with a yellow triangle containing a black silhouette of a robot on wheels. To the right of the triangle, the text reads: 'UNMANNED MOVING VEHICLES' and 'Enter at your own risk!'.	<b>Caution: Unmanned moving vehicles</b> 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 and may cause injuries.
At the entrance of the area where the Mixing and Feeding Robot moves	 A rectangular decal with a yellow top section containing a black triangle with an exclamation mark and the word 'CAUTION' in black. The bottom section is white with a red circle containing a black silhouette of a hand with a red prohibition sign over it. To the right of the circle, the text reads: 'RESTRICTED AREA', 'Unmanned moving vehicles!', and 'Authorised personnel only.'.	<b>Caution - Restricted area</b> 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.
At the entrance of the Feed Kitchen	 A rectangular decal with a red top section containing a white triangle with an exclamation mark and the word 'DANGER' in white. The bottom section is white with a red circle containing a black silhouette of a hand with a red prohibition sign over it. To the right of the circle, the text reads: 'KEEP OUT', 'CONFINED SPACE', 'Unmanned moving vehicles!', and 'Do not enter before all systems are shut down.'.	<b>Danger - No Admittance because of unmanned moving vehicles</b> Persons are only permitted to enter the area when all systems are shut down. Ignoring this warning may cause critical injuries or death.
On the knife guard holders near the power distribution box	 A yellow rectangular decal divided into two sections. The top section contains a black triangle with a white exclamation mark. The bottom section contains a black silhouette of a key with a red prohibition sign over it, and a black silhouette of a book with a red prohibition sign over it.	<b>Warning</b> Switch off the Mixing and Feeding Robot with the key and remove the key before you do work on the Mixing and Feeding Robot.

### 2.3.6 Safety Decals of the Tower Silo

Location	Decal	Explanation
Near the power switch on every tower silo or other device operated with Digital Output		<p><b>Lock instructions tower silo</b></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>

### 2.3.7 Safety Decals on the Route

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

### 2.3.8 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.

### 2.3.9 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 Feed Grabber

#### 2.4.1.1 Handles to manually open the Grabber in case of Emergency



***Sudden release of jaws.***

***Risk of personal injury.***

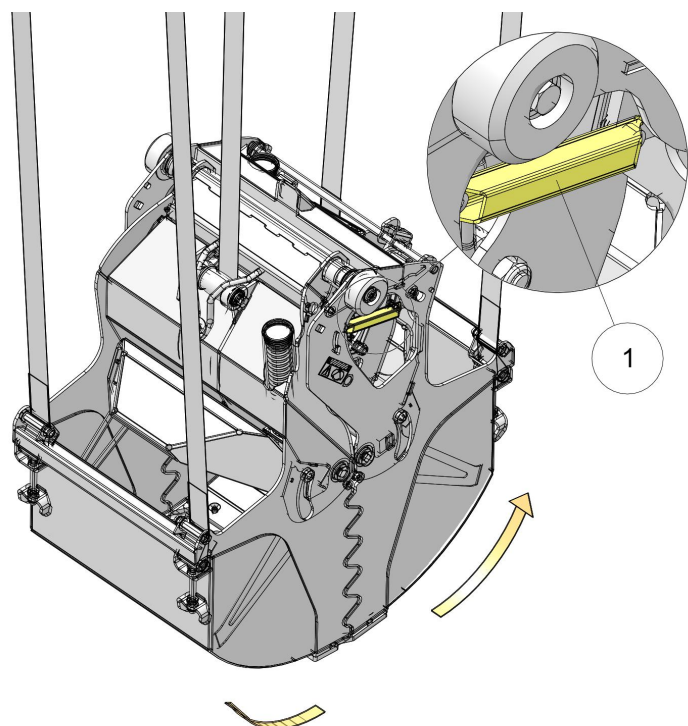
***Only use the handles in case of an emergency. Stand as far away from the jaws of the grabber as possible to prevent getting hit by a released jaw.***



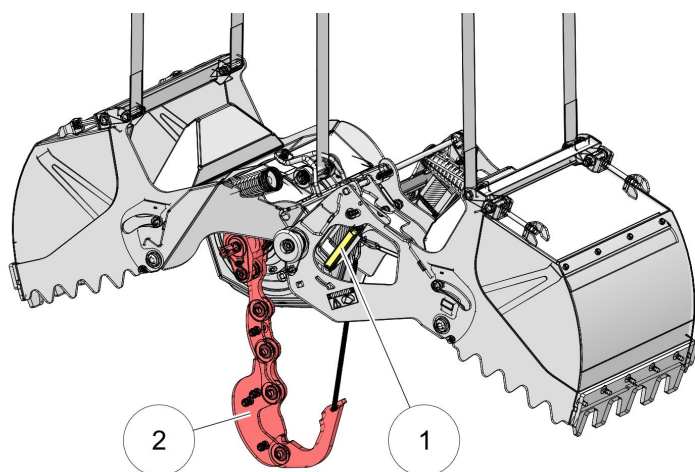
Only open the grabber in case of an emergency because the chain will fall out and it takes some time to reinstall the chain.

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) (see figure 6 on page 2-13).
3. The chain (2) will fall and the jaws of the grabber will open.
4. Reinstall the chain.
5. Put the feed kitchen into operation.



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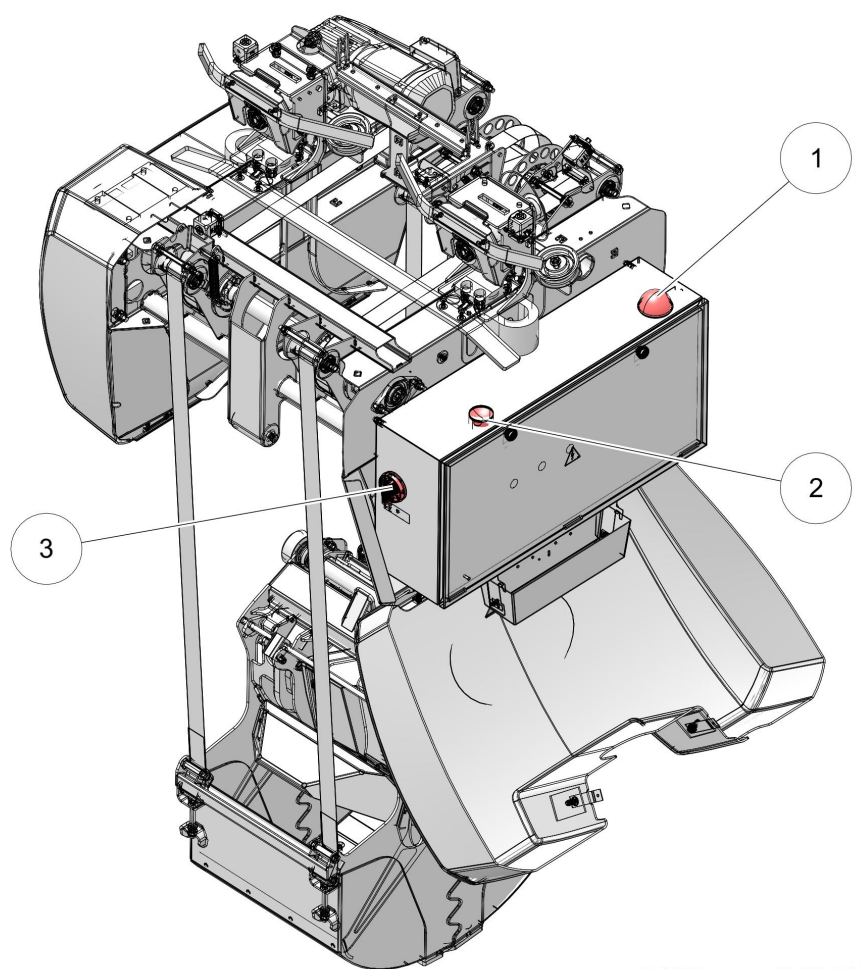


5-3004-manual4-02-001

*Figure 6. Feed grabber safety handle*

KEY: 1. Safety handle - 2. Chain

### 2.4.1.2 Emergency Stop Button



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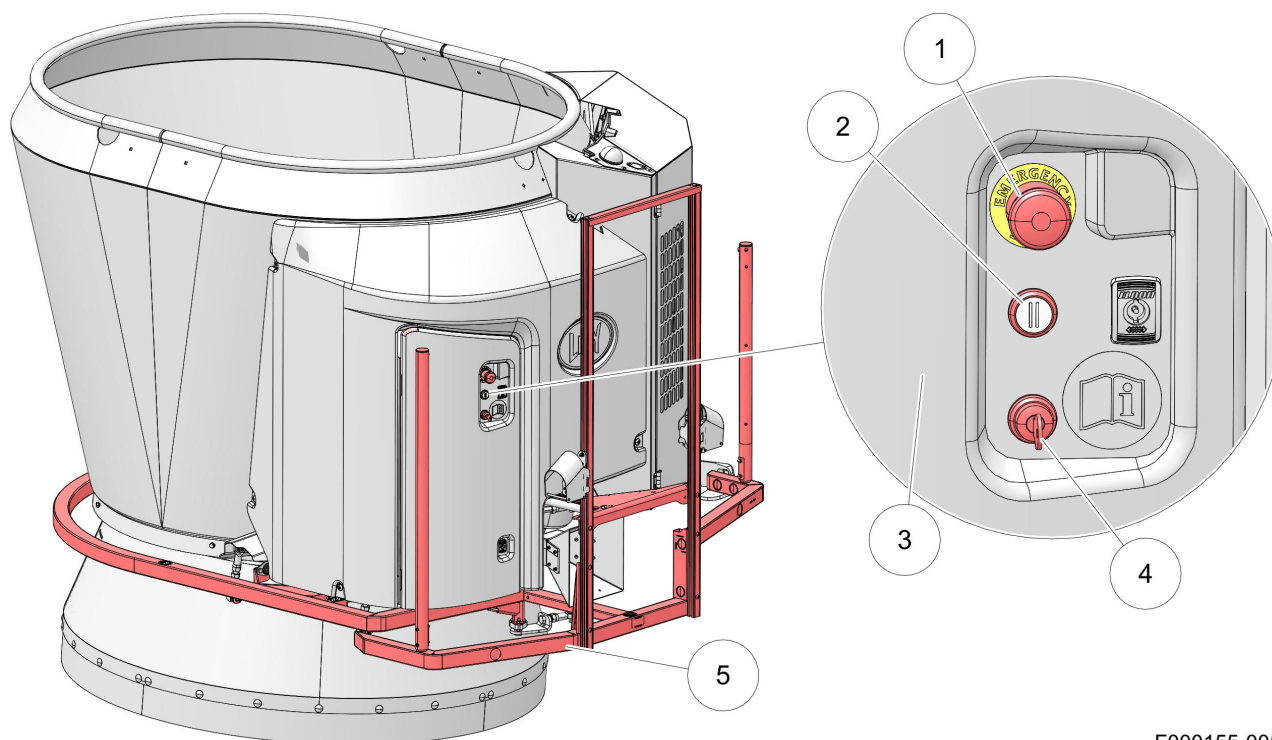
Figure 7. Emergency stop and main switch

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

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

## 2.4.2 Mixing and Feeding Robot

### 2.4.2.1 Emergency Stop Button



F000155-005

Figure 8. Location of the safety devices on the Mixing and Feeding Robot

KEY: 1. Emergency stop button - 2. Pause button - 3. Acoustic warning device - 4. Safety key - 5. Bumper with stop function

An emergency stop button (1) is installed on the front of the control box of the Mixing and Feeding Robot.

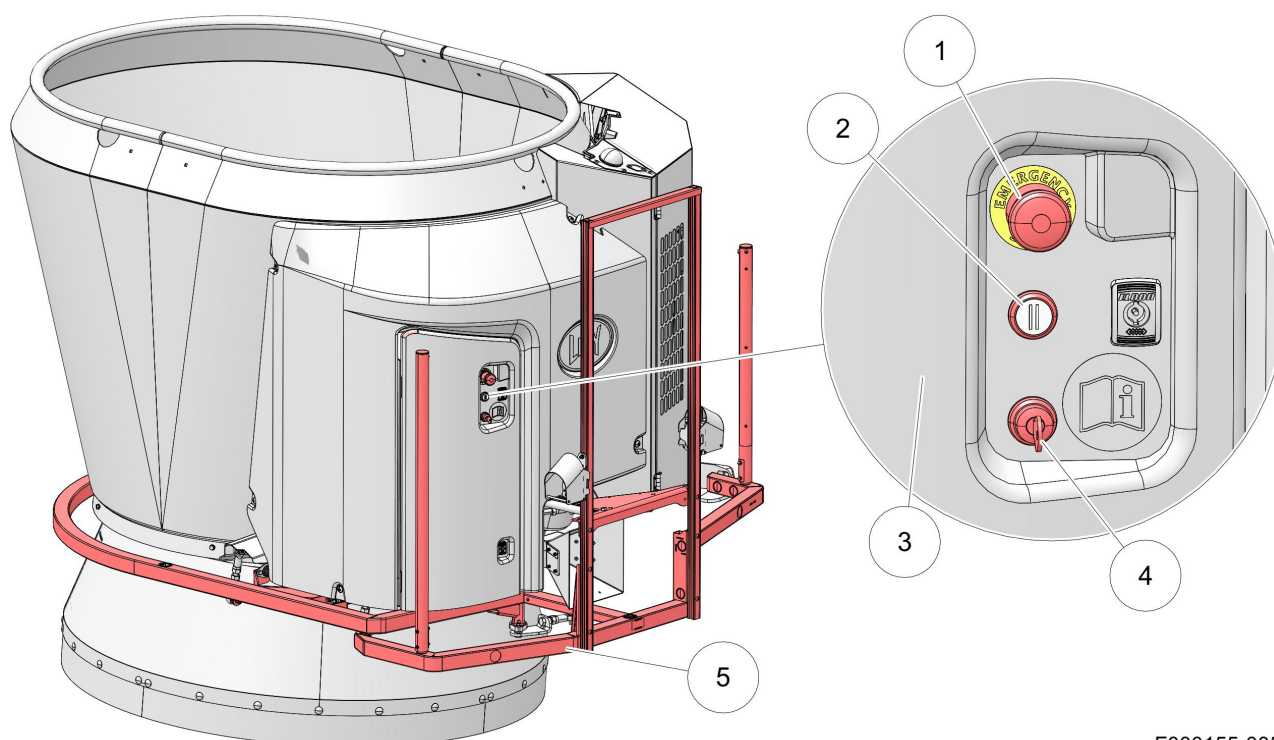
When the button is pushed, the Feeding Robot immediately stops operation.

To reset the emergency stop button, turn the button clockwise and pull it out until it locks. The generated alarm must be reset on the software and the pause button (2) must be pushed twice.

### 2.4.2.2 Pause Button

A pause button (2) (see figure 9 on page 2-16) is installed next to the emergency stop button on the front of the control box of the Mixing and Feeding Robot.

When the button is pushed, the Feeding Robot immediately stops operation. This can be used when the route is blocked. After the obstacle is removed, the pause button must be pushed again and the Mixing and Feeding Robot will continue operation.



F000155-005

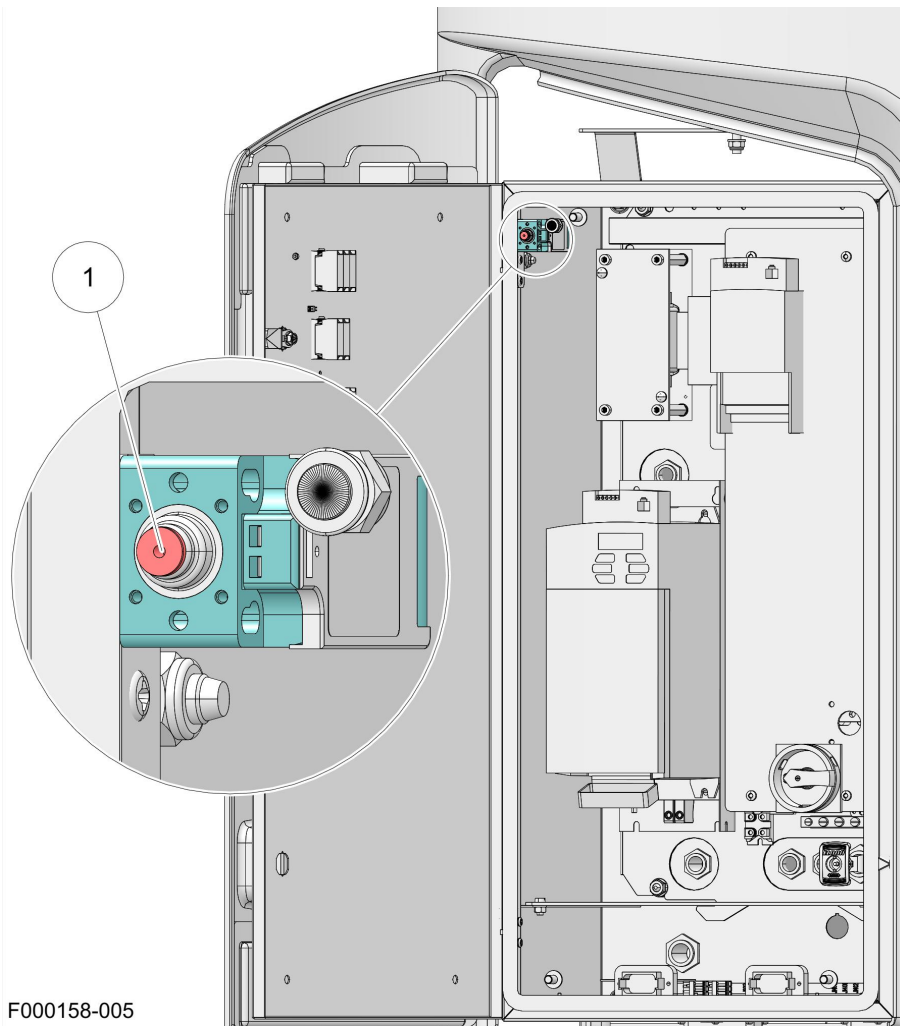
*Figure 9. Location of the safety devices on the Mixing and Feeding Robot*

KEY: 1. Emergency stop button - 2. Pause button - 3. Acoustic warning device - 4. Safety key - 5. Bumper with stop function

The pause button must also be used to:

- Reset an alarm on the Mixing and Feeding Robot.
- Confirm that the hazard zone surrounding the Mixing and Feeding Robot is obstacle-free before manual operation in the test menu with the smartphone is possible.

The button (1) (see figure 10 on page 2-17) on the door of the PCB box has the same function as the pause button. When the door is opened, the button is released and the Mixing and Feeding Robot immediately stops operation. This makes sure the Mixing and Feeding Robot can only operate when the door of the PCB box is closed.



F000158-005

Figure 10. Button on the door of the PCB box

KEY: 1. Button

### 2.4.2.3 Acoustic Warning Device

An acoustic warning device (3) (see figure 8 on page 2-15) alerts persons and animals when the vehicle starts to move or moves.

- Before the Feeding Robot leaves the charging station a long beep is sound.
- During the route short term beeps are sound.
- During driving on a narrow alley.
- During driving backward.

The acoustic warning device is on the back of the PCB box.

#### 2.4.2.4 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 (5) (see figure 8 on page 2-15) makes sure the mixing and feeding robot stops when it hits an object that is at least 45 cm (17.7 in) above floor level. The reaction of the mixing and feeding robot depends on the object type and the route action:

- If the Mixing and Feeding Robot collides with a solid object (the object will not move when the MFR pushes against it: e.g., a tractor), it will reverse until there is no longer contact. After a few seconds, the robot will attempt to resume its route. If it collides with the object again, it will repeat the process, reversing until contact is broken. The robot will attempt this several times before stopping and triggering an alarm.
- If the Mixing and Feeding Robot collides with a non-solid object (the object will move when the MFR pushes against it), or if the bumper is pushed by a person or animal, the robot will pause for a few seconds before attempting to continue. During feeding, the robot will slightly rotate away from the feed fence. If the collision detector is triggered multiple times within a 50 cm (19.6 in) distance, the robot will stop and generate an alarm. The alarm is triggered after 5 activations of the collision detector during feeding, and after 3 activations during other route actions.

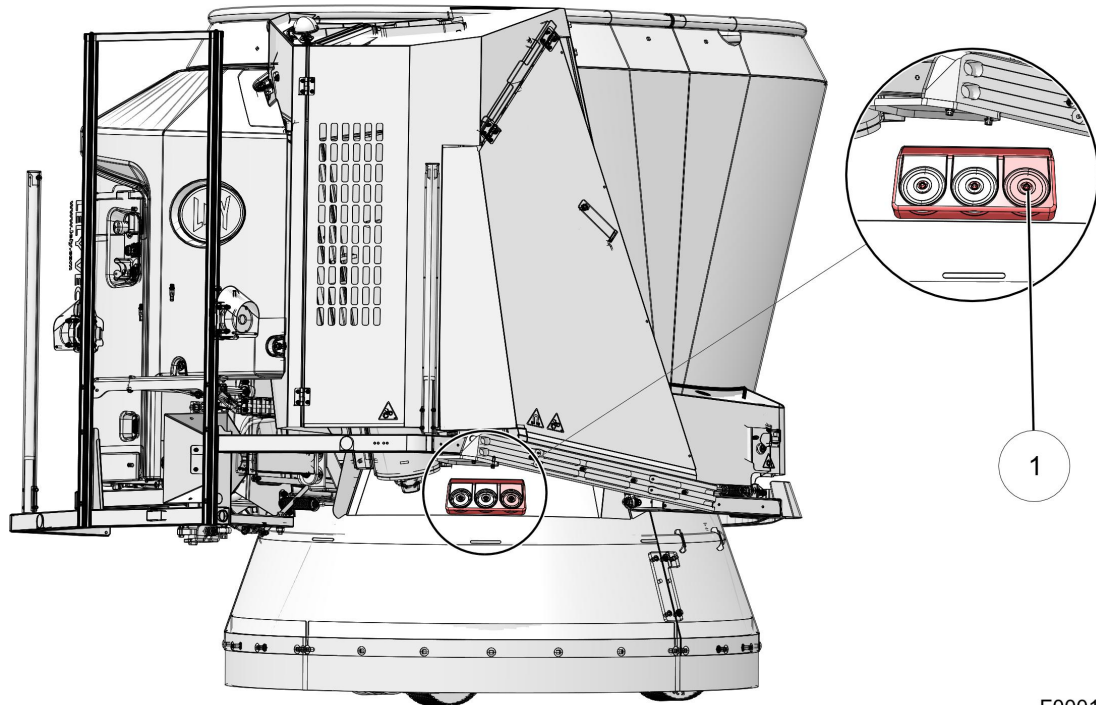
#### 2.4.2.5 Safety Key

A safety key (4) (see figure 8 on page 2-15) is installed on the front of the control box of the Mixing and Feeding Robot.

When the safety key is switched to the OFF position, the Feeding Robot immediately stops operation. The key operates the same circuit as the emergency button, the same alarm will be generated.

The safety key must be removed before maintenance is done.

## 2.4.2.6 Magnets



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*Figure 11. Magnets*

Three very strong magnets (1) are installed in a plastic holder 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.

### 2.4.2.7 High Voltage Switch in the PCB Box

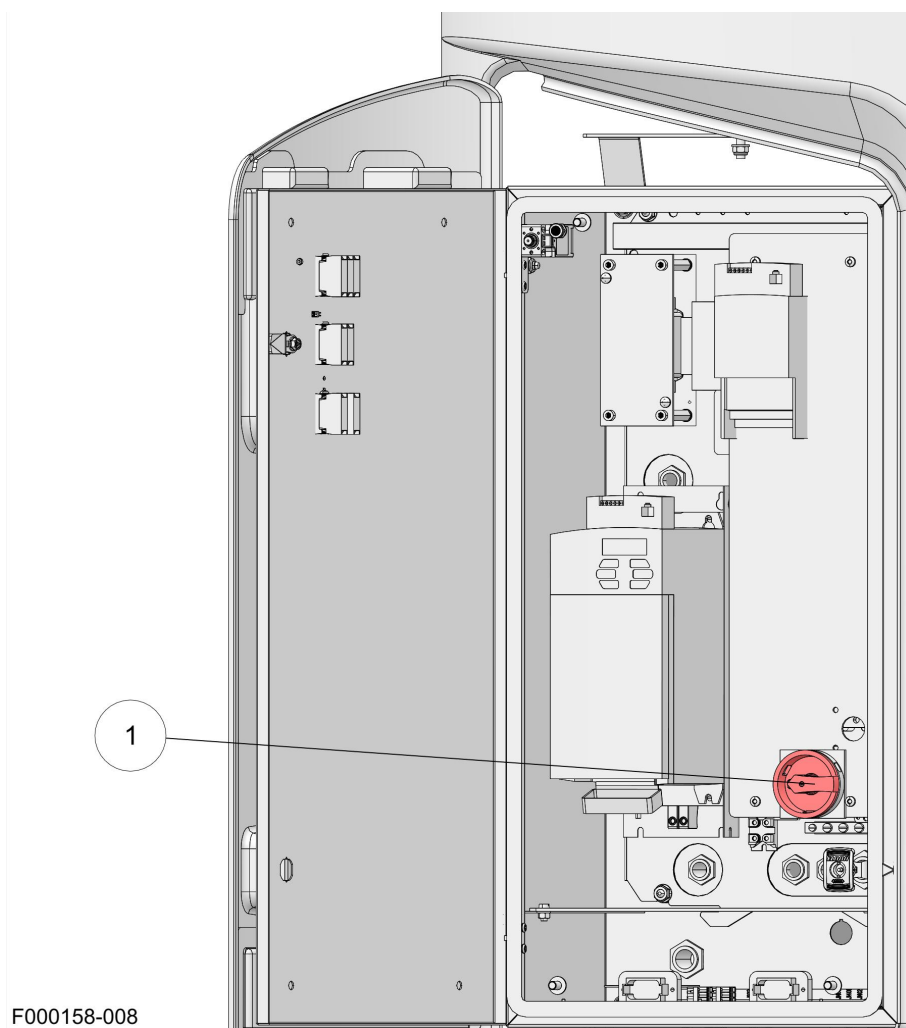


Figure 12. PCB box

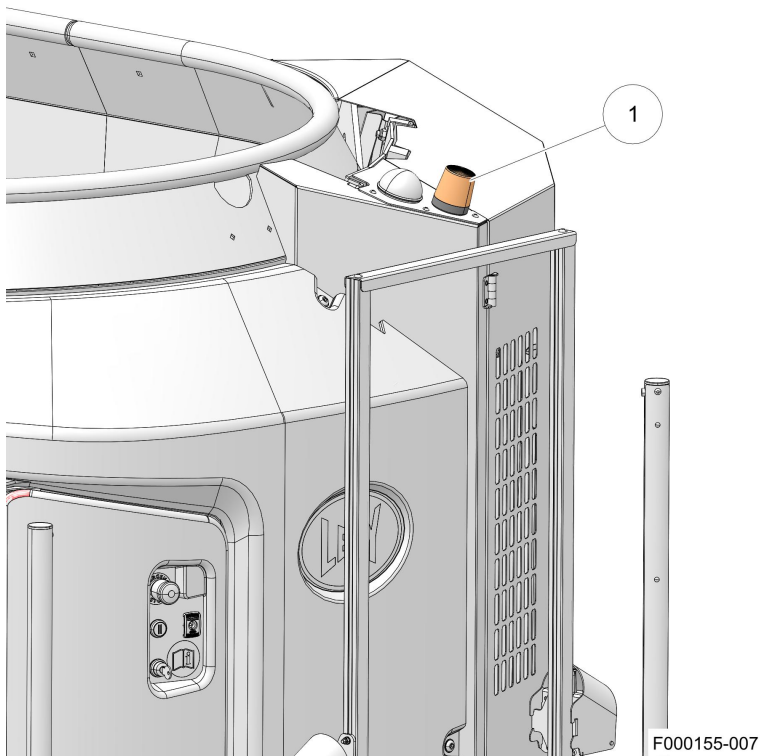
KEY: 1. Isolation switch for high voltage

The isolation switch (1) isolates the 325 VDC from the DC/DC converter to the power box and the connection between the grid and the power box. When the switch is set to off:

- All high voltage is cut off (for filters, diodes etc).
- It is now safe for lely technicians to do maintenance on the high voltage parts.

The PCBs are still on because the battery is not interrupted.

### 2.4.2.8 Flashing Light (Optional)



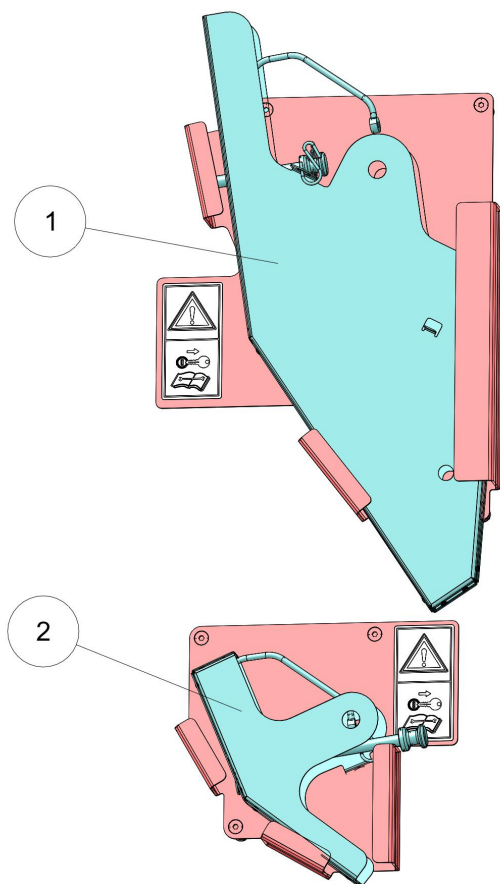
*Figure 13. Flashing light*

A flashing light (1) on the Mixing and Feeding Robot alerts persons and animals when the Mixing and Feeding Robot drives in narrow alleys.

At the feed loading point the flashing light alerts persons when a digital output is started.

### 2.4.2.9 Knife guards

The knife guards (1–2) are kept in the holders on the wall near the PDB.



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Figure 14. Location knife guards near PDB

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

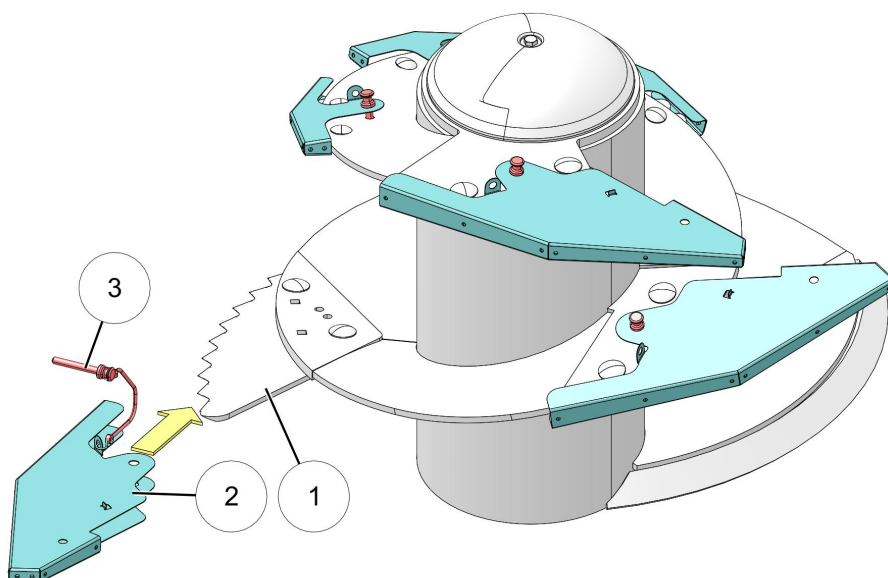


**Sharp rotating knives.**

**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 15 on page 2-23). Always contact your local Lely service provider to replace the mixing auger knives or for other work in the mixing bin.



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Figure 15. Knife guards installed on the mixing auger knives

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

#### 2.4.2.10 Software Controlled Protection

##### Driving in Narrow Alleys

On narrow alleys when there is less than 0.50 m (1.6 ft) on one or two sides of the Mixing and Feeding Robot the option **Zone narrow alley** is set. On this part of the route the software makes sure:

- The Mixing and Feeding Robot sounds an alarm and sends light signals and waits for a time period before entering the narrow alley. This gives people and animals the chance to go out of the alley.
- Loud beeps sound during driving in the narrow alley.
- A flashing light signals during driving in the narrow alley.

##### Battery Overcharge Protection

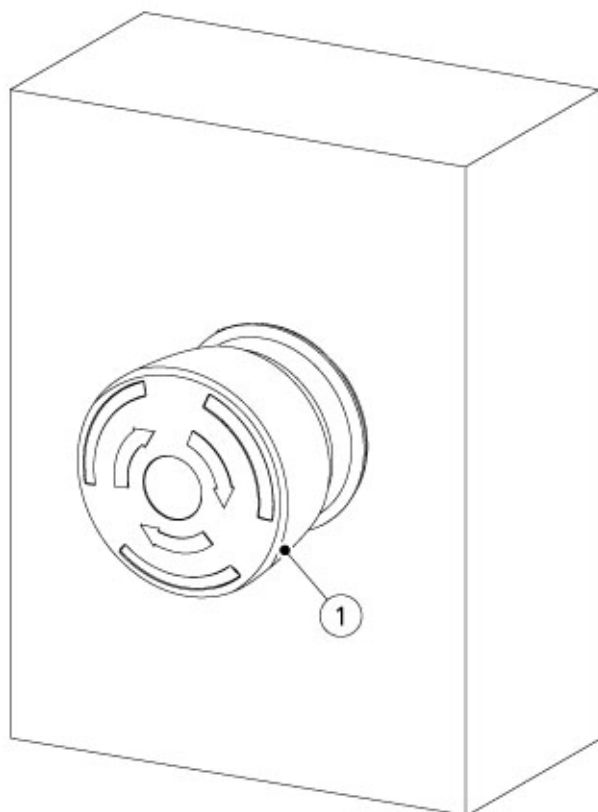
The operational software of the Mixing and Feeding Robot controls the charge system. This allows to keep the Mixing and Feeding Robot connected to the charging station during charging, even if the battery is fully charged. The software prevents overcharging the battery and keeps it fully charged until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

##### Distance to Stop After not Finding the Next Reference Point

On the route to the groups and back to the charger, the Mixing and Feeding Robot drives until it finds the next fence, wall or strip. Due to skid or malfunction, there is a small chance the Feeding Robot does not find its next reference point. If the reference point is not found the robot stops after a certain distance. This distance is depending on the type and the length of the route action the Mixing and Feeding Robot was driving.

## 2.4.3 In and Near the Feed Kitchen

### 2.4.3.1 Emergency Stop Button



*Figure 16. Emergency stop button*

KEY: 1. Emergency stop button

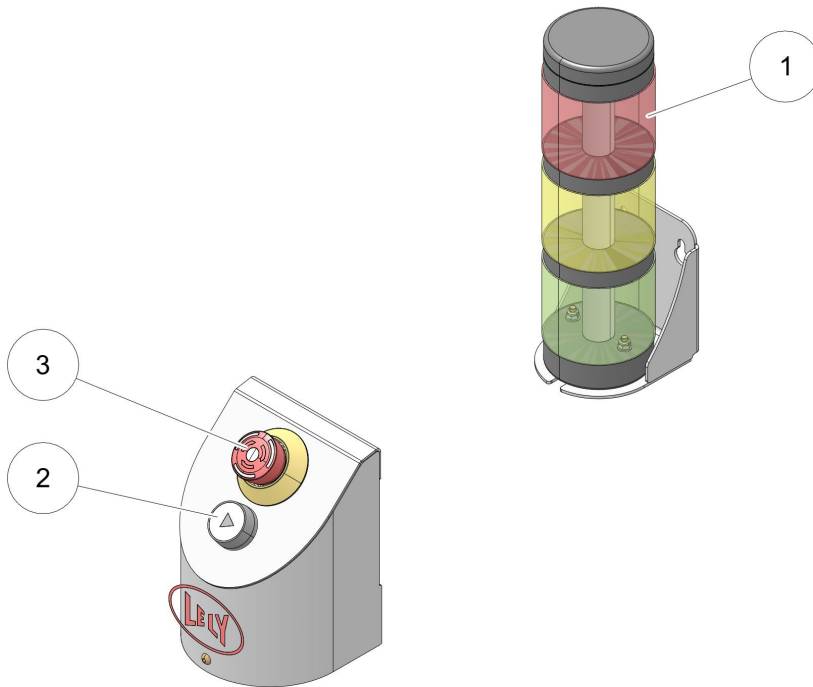
An emergency stop button (1) is installed at the entrance of the feed kitchen and on every side from which the feed kitchen is visible. On long sides on every 24 m (79 ft) an extra emergency stop button must be installed.

When the button is pushed, the Feed Grabber, Bridge Crane and safety fence immediately stop operation.

Be aware that the Mixing and Feeding Robot will not stop operation, it could stop mixing for a few seconds and then start mixing again. If the Mixing and Feeding Robot stops driving depends on if it is in Bluetooth range from the power distribution box and if the route action is in the AGS zone.

To reset the emergency stop button see the operating instructions (see Reset an Emergency Stop Button in or near the Feed Kitchen on page 5-26).

### 2.4.3.2 Emergency Stop Button on Console



F000138-001


Figure 17. Console

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

An emergency button (3) is installed on the front of the console. It functions similar to the other emergency stops in the feed kitchen.

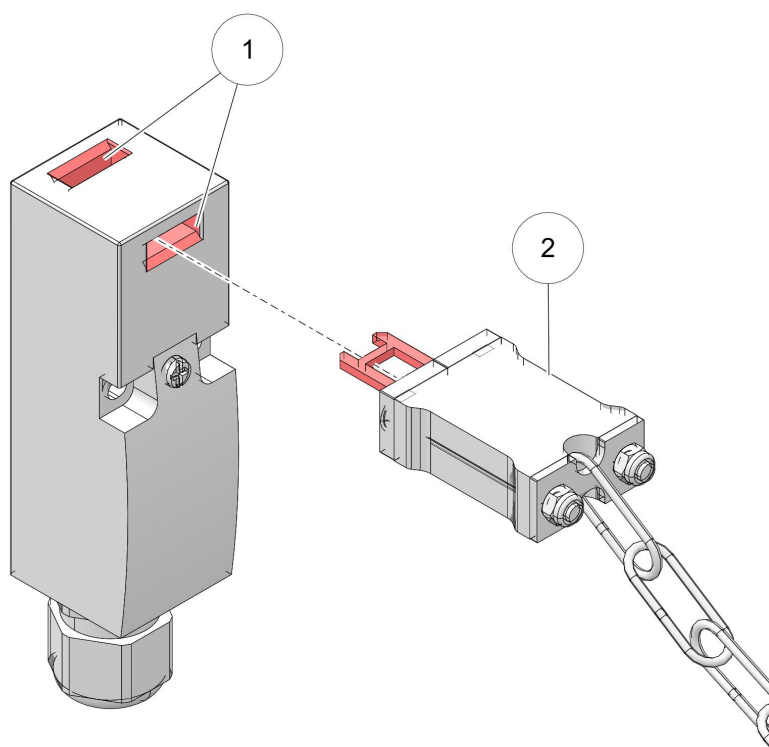
### 2.4.3.3 Signal Lights

The signal lights (1) (see figure 17 on page 2-25) 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 or Service 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 18. 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.

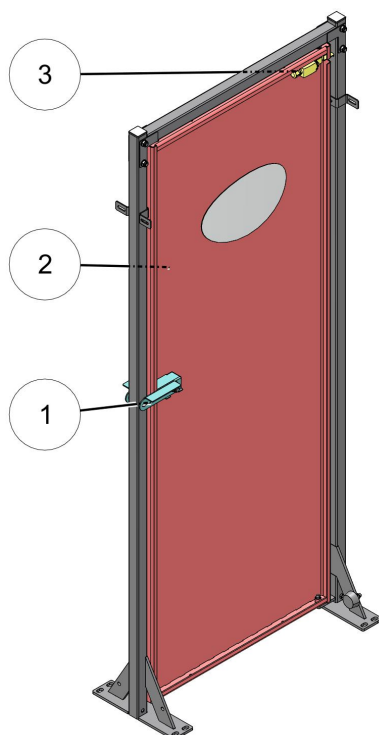
When the access door is opened unauthorized, the control switch switches and the operation of the feed grabber, bridge crane and safety fence immediately stop.

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



5-2011-1170-0-01-07

Figure 19. 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 lock is tilted unauthorized, the feed grabber, bridge crane and safety fence 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, Bridge Crane and safety fence immediately stop operation.

Be aware that the Mixing and Feeding Robot 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 power distribution box indicates the risk zones on the farm.

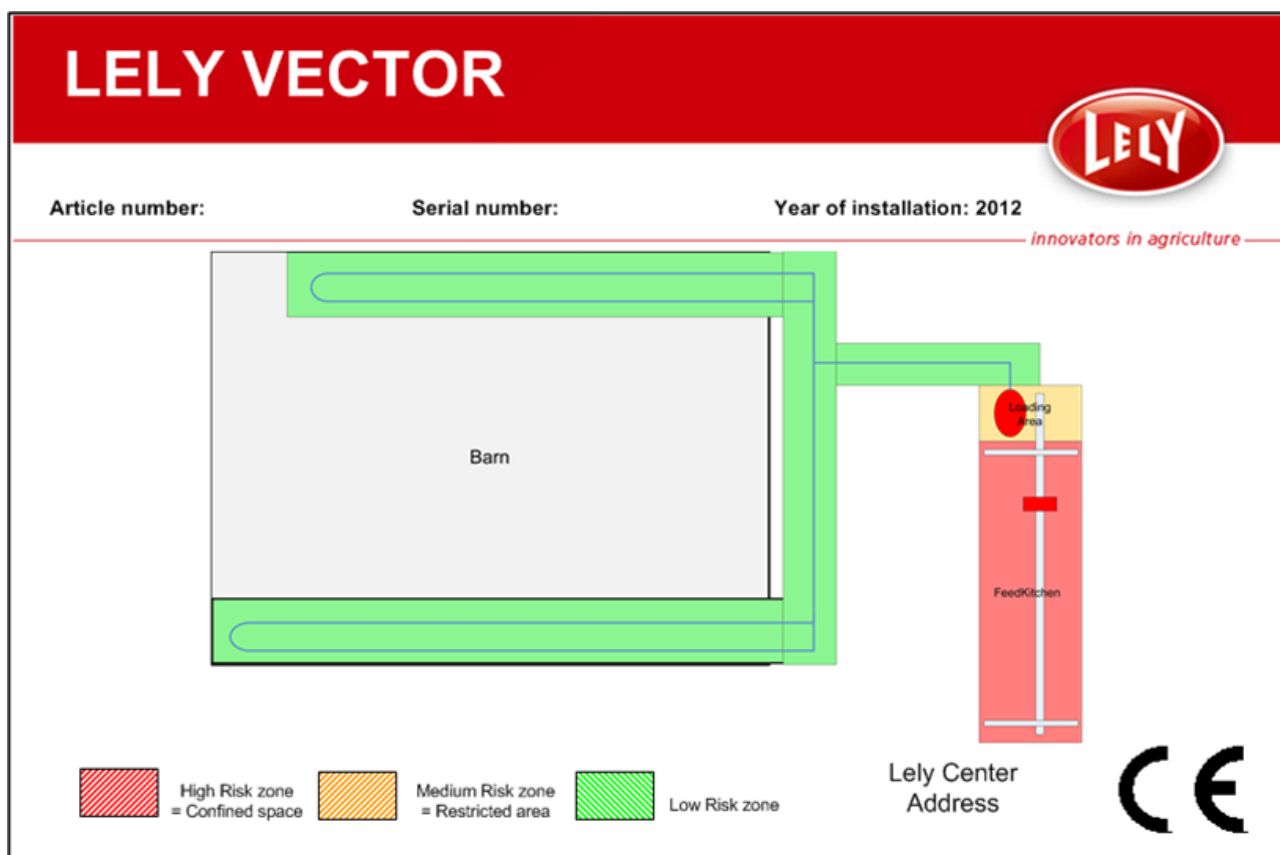


Figure 20. Example of Vector type plate

### 2.5.2 Red Zone - High Risk Zone

The feed kitchen is marked on the Vector type plate 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:



### 2.5.3 Yellow Zone - Medium Risk Zone

The feed loading zone and small passages are marked on the Vector type plate (see figure 20 on page 2-30) as a yellow zone. In this zone persons (or animals) risk being trapped by the Mixing and Feeding Robot. In that case the Mixing and Feeding Robot is stopped when:

- The emergency stop is pushed on the Mixing and Feeding Robot.
- The bumper is hit.

To mark the yellow zone the following marking is painted on the floor where the Mixing and Feeding Robot drives:



To mark the yellow zone in the feed loading point area, besides the marking on the floor, the following decal is attached at the entrance of the area:



Unauthorized persons are not admitted in this yellow zone because of the moving Mixing and Feeding Robot.

To mark the yellow zone in a narrow alley, besides the marking on the floor, the following decal is attached at the entrance of the narrow alley:



## 2.5.4 Green Zone - Low Risk Zone

The routes where the Mixing and Feeding Robot drives are marked on the Vector type plate as a green zone, except for the small passages see yellow zone (see Yellow Zone - Medium Risk Zone on page 2-30).

To mark the green zone the following decal is attached at the entrance(s) of the area where the Mixing and Feeding Robot drives:



## 2.5.5 Safety and Safety Distances on Routes

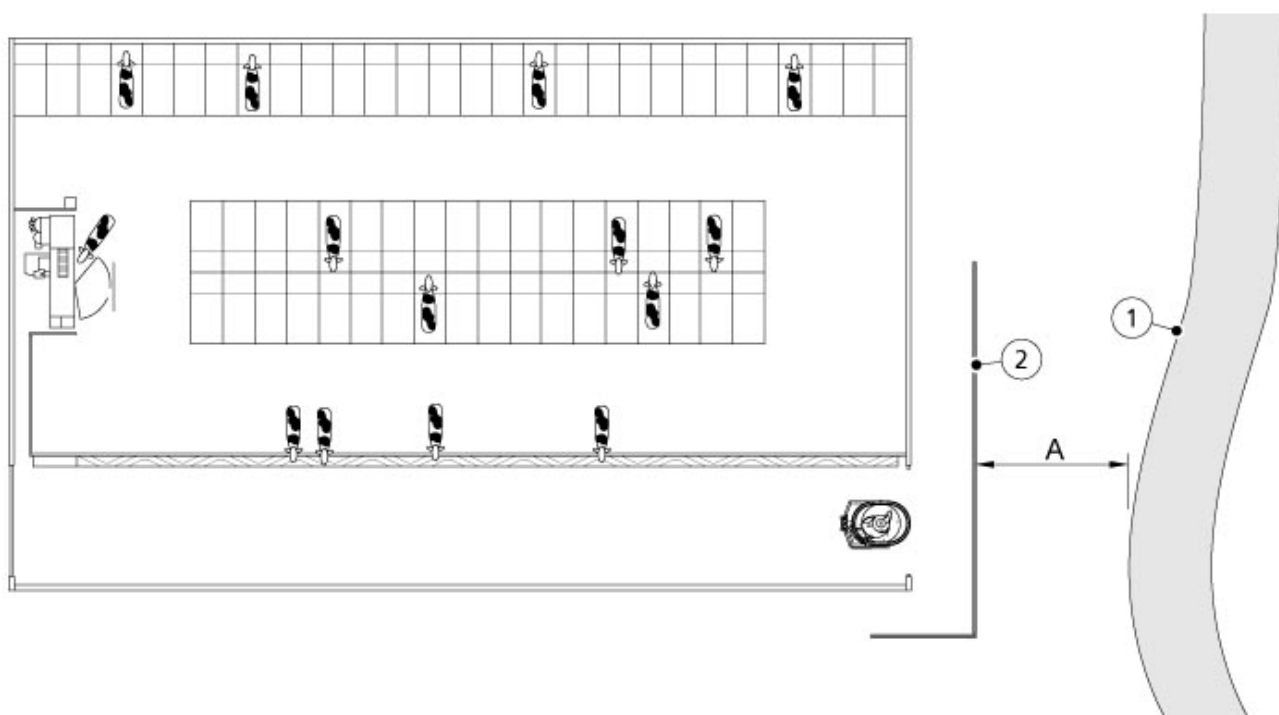


Figure 21. Distance outside a barn

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

- 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 Feeding Robot drives from the barn to the strip. This prevents the Mixing and Feeding Robot 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 Mixing and Feeding Robot from ending up on a public road or in a ditch. This is mandatory if a distance of 5 m is not possible.
- 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 Mixing and Feeding Robot outside between the barn(s) and feed loading point must be as short as possible.
- The routes of the Mixing and Feeding Robot outside the barn must have sufficient lighting to avoid collisions in the dark.

- The route of the Mixing and Feeding Robot may not cross or access a public road or area.
- The route of the Mixing and Feeding Robot outside the barn must impede the traffic on the farm as little as possible.
- If the route of the Mixing and Feeding Robot is under an accessible attic or stairway (see figure 22 on page 2-33), these must have a railing (1) installed (according to NEN-EN-ISO 14122). This prevents people from falling into the Mixing and Feeding Robot.

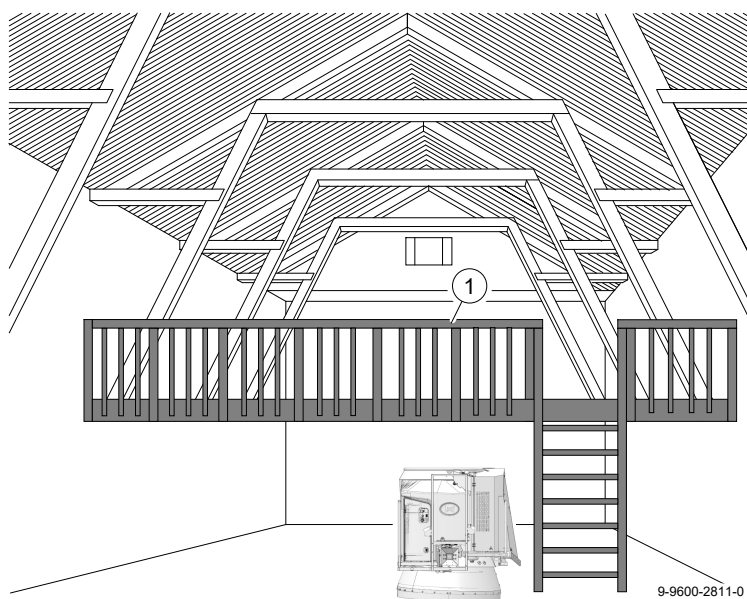


Figure 22. Stairway and attic

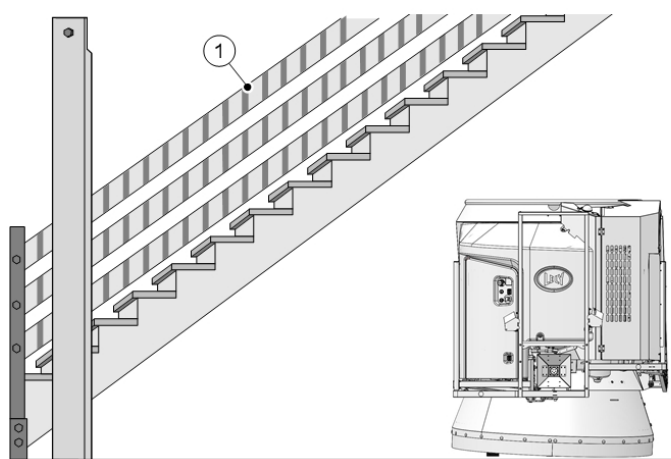


Figure 23. Stairway and attic

KEY: 1. Railing



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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 MFR	−10 - +30 °C (14 - 86 °F)
Minimum temperature with a winter set on the Mixing and Feeding Robot	−20 °C (−4 °F) incidental lower temperatures up to −30 °C (−22 °F) are possible but can shorten the lifetime
Minimum temperature feed kitchen without heating cable in the rail	5 °C (41 °F)
Ambient temperature feed grabber, bridge crane, Dispensers (frequency pulse)	−20 - +40 °C (−4 - 104 °F)
Humidity Vector machines	5 - 95% non-condensing

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	200 cm (6.6 ft) (block must be stable) 180 cm (5.9 ft) to use weight estimation
	Max. depth	105 cm (3.4 ft)

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Requirements roughage		
Loose products from a bin (potatoes, pulp)	Max. depth	150 cm (4.9 ft)
Bales (only when cut)	Max. depth	120 cm (3.9 ft)
Capacity MFR		
Capacity mixing bin		150 - 600 kg (330 - 1323 lb)
Volume mixing bin		2 m <sup>3</sup> (70 ft <sup>3</sup> )
Feed pushing capacity at the feed fence	Max. feed height	60 cm (23.6 in)
	Max. feed width	72 cm (29.5 in)
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"> <li>• Hygroscopic (like salt that absorbs water)</li> <li>• Fat (2% - 15%) with large or medium size parts (more than 35% is larger than 120 micron)</li> <li>• Chalk based with large or medium size parts (more than 25% is larger than 120 micron)</li> </ul>
Maximum weight to dose		6.5 kg (14.3 lb)
Maximum advised weight to dose		5 kg (11 lb)
Operational conditions	Temperature	0 - +30 °C (32 to 86 °F)
	Humidity	5 - 70 %
External concentrates and digital output		
Minimum weight to dose		5 kg (11 lb)
Operational conditions	Temperature	0 - +30 °C (32 to 86 °F)
	Humidity	5 - 70 %

## 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 WiFi or 3G network must be available.
- Storage: SD card (internal or external).
- Smartphone must have at least 10 MB free storage.

#### Wireless router

- WiFi access: according to 802.11 a/b/g standard.
- Connection speed (wired connection): minimum 54 Mbits.

#### Alternative for router

- Connection to 3G/4G network.

### 3.3 Dimensions and Weight Mixing and Feeding Robot

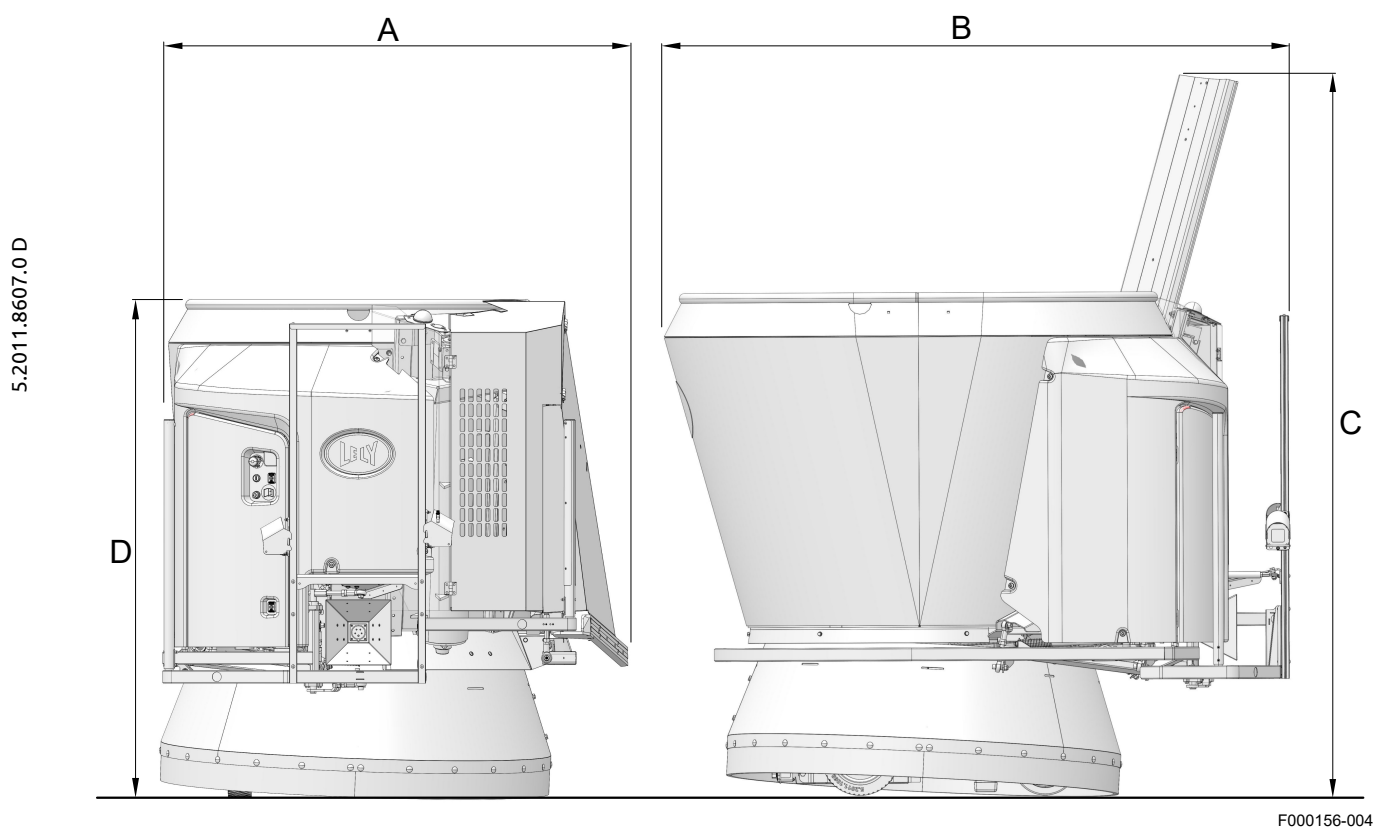


Figure 24. Dimensions Mixing and Feeding Robot

#### KEY:

- A: 1.650 m (64.96 in)
- B: 2.406 m (94.72 in)
- C: 2.80 m (110 in) (or lower with a limited door\*)
- D: 1.930 m (75.98 in)

- Empty weight: 1275 kg (2810 lb)
- Max loaded weight: 1875 kg (4134 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.

## 4 Description

### 4.1 General Description

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 Mixing and Feeding Robot. 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 main parts are:

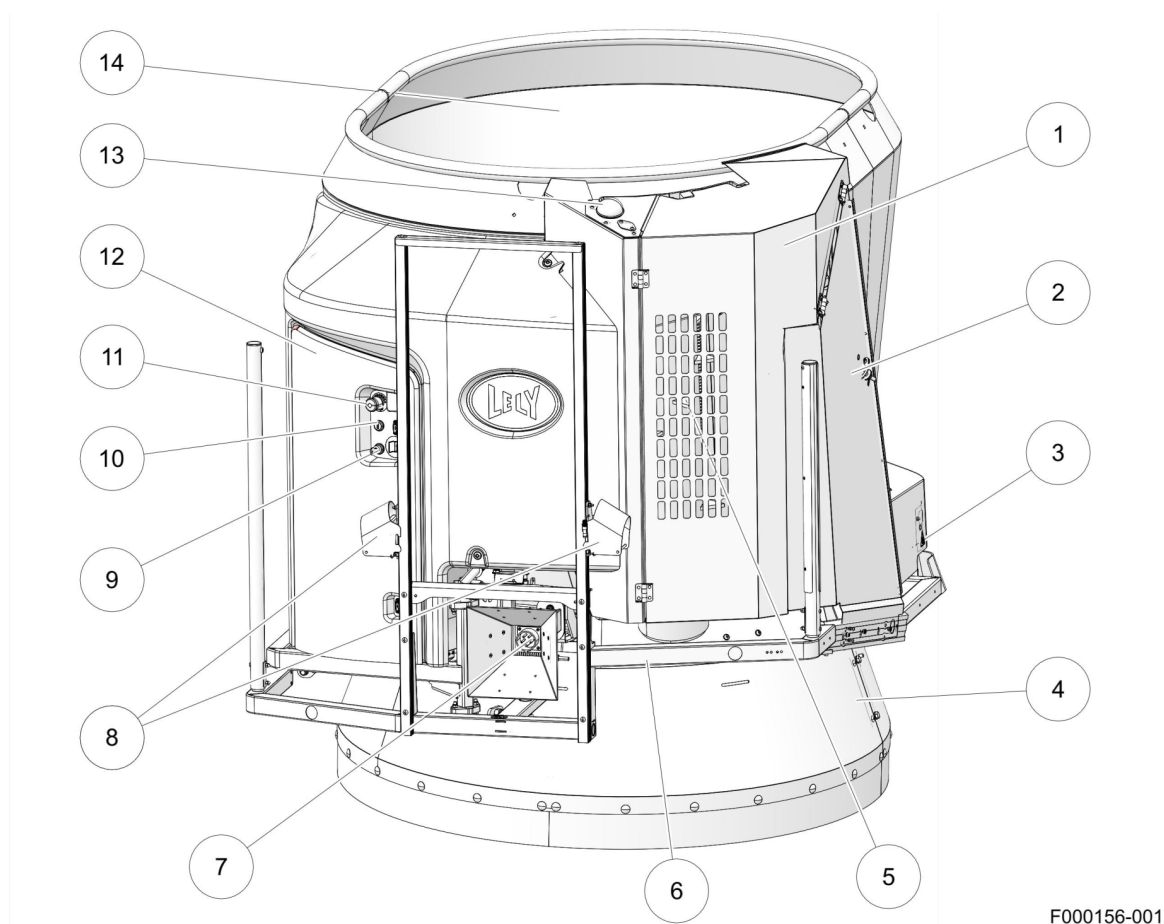
- One or two Mixing and Feeding Robots and chargers.
- Power distribution box.
- Console.
- Signal lights.

Optional parts are:

- Feed Grabber.
- One of the following transport systems for the Feed Grabber:
  - Bridge Crane.
  - Fixed Rail.
- If no Feed Grabber is present, a (tower) silo or conveyor belt that adds roughage (not Lely parts).
- Safety fence.
- Additives dispenser (frequency pulse).
- Concentrate augers (frequency weight).
- Automatic barn door.

## 4.2 Component Description

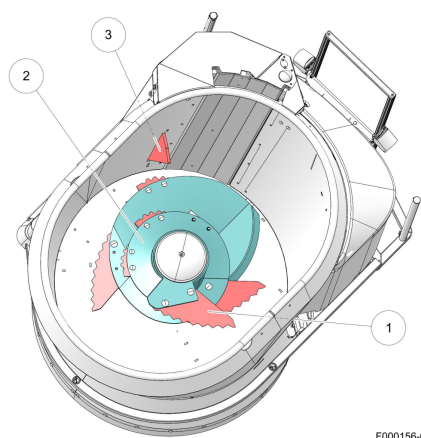
### 4.2.1 Mixing and Feeding Robot



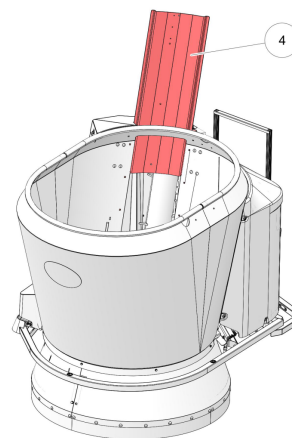
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Figure 25. Mixing and Feeding Robot

KEY: 1. Maintenance door - 2. Inspection cover - 3. Feed height sensor - 4. Skirt - 5. Dosing roll - 6. Bumper - 7. Charge plug - 8. Ultrasonic sensors - 9. Safety key - 10. Pause button - 11. Emergency button - 12. PCB box - 13. Antenna - 14. Mixing bin



F000156-003



F000156-002

*Figure 26. Mixer and feed door*

KEY: 1. Mixer knife - 2. Mixer - 3. Counter knife - 4. Feed door

The Mixing and Feeding Robot has the following motors:

- Feed door motor.
- Drive motor left wheel.
- Drive motor right wheel.
- Actuator to lift the skirt.
- Actuator to insert the counter knife inside the mixing bin.
- Mixer motor.
- Dosing roll motor.

The Mixing and Feeding Robot has the following sensors:

- Two inductive sensors at the bottom between the wheels to detect (and follow) metal strips on the floor.
- Ultrasonic sensors to detect the distance to the feed fence or wall.
- Laser measurement to detect the feed height.
- Gyroscope on the PCB to detect the direction of motion.
- Reed contacts to detect the position of the safety bumper (when the bumper hits an objects the bumper is pushed out of its original location).
- Proximity switch (position sensor) to detect the dosing roll standby position.
- Voltage detection to detect the voltage on the charger.
- Three load cells to determine the weight in the mixing bin.
- Encoders on the driving motors to determine the travelled distance and calculate the speed.
- Encoder on the door motor to detect the position of the feed door.
- Encoder on the actuator to lift the skirt to detect the position of the skirt.
- Encoder on the actuator to insert the counter knife to detect the position of the counter knife.

## Optional

The following options can be installed on the Mixing and Feeding Robot:

- Winter set, prevents the gears from getting stuck if the charger is in an environment with a temperature below -15° C (5° F).
- Shock device, to prevent the animals from touching the bumper too often and stop the Mixing and Feeding Robot.
- Flashing light (see figure 13 on page 2-21).
- Door push set, to push open a door without activation of the bumper.
- Wheel weights, to improve the grip of the wheels and prevent skid.
- Obstacle detection, to detect large objects and stop driving before the Mixing and Feeding Robot bumps into the object.

### 4.2.2 Obstacle Detection Sensors (Optional)



Obstacle detection sensors are designed to avoid material damage only and are not intended as a safety system.

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Obstacle detection sensors only operate on the route actions where they are activated.

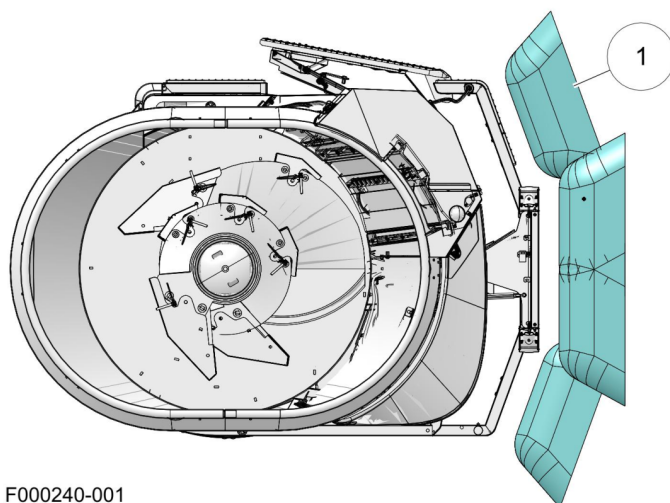
The active obstacle detection sensors can detect large objects of at least 70 cm (28 in) high at a distance of 40 cm (16 in). When an object is detected the Mixing and Feeding Robot stops immediately. On a smartphone connected to the Mixing and Feeding Robot on the page **Work** the current state of the robot then shows **Obstacle**.

If the obstacle is still present after 6 minutes, a critical alarm is generated: **Obstacle detected**

Only when the Mixing and Feeding Robot is close enough to the power distribution box and connected via bluetooth, you will receive this alarm via the MODalarm.

If the obstacle is removed, the Mixing and Feeding Robot will continue its route after a delay of 5 seconds.

If a door push set is installed on the Mixing and Feeding Robot, the detection distance is set to 70 cm (28 in).

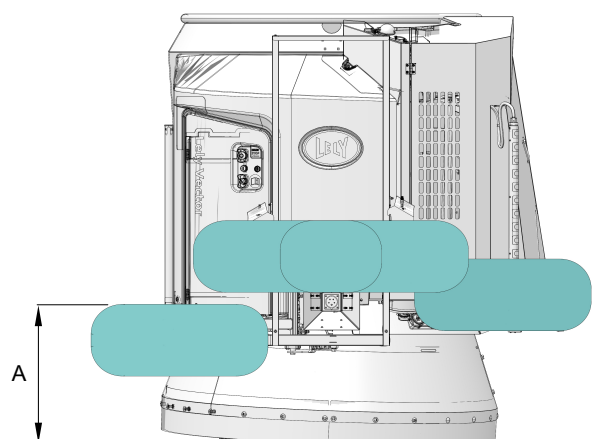


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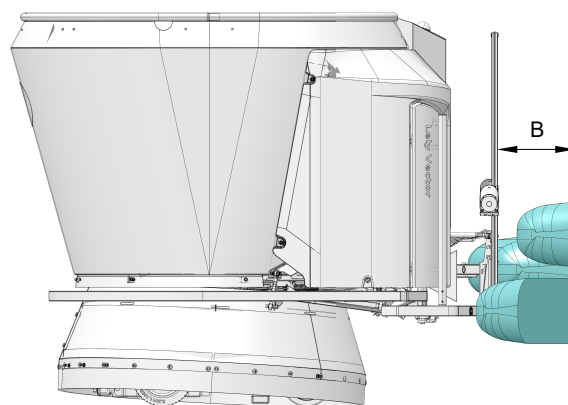
*Figure 27. Top view obstacle detection range*

KEY: 1. Detection area

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F000240-003

*Figure 28. Distances obstacle detection*

KEY:  
A: 70 cm (28 in)  
B: 40 cm (16 in)

### 4.2.3 Charger

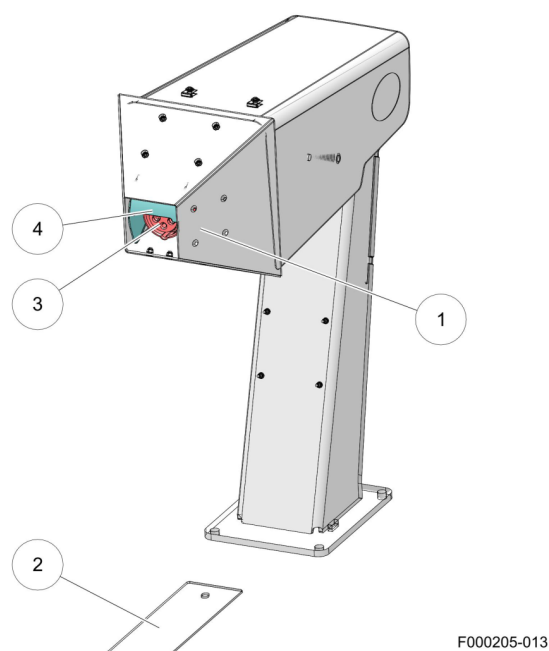


Figure 29. Charger

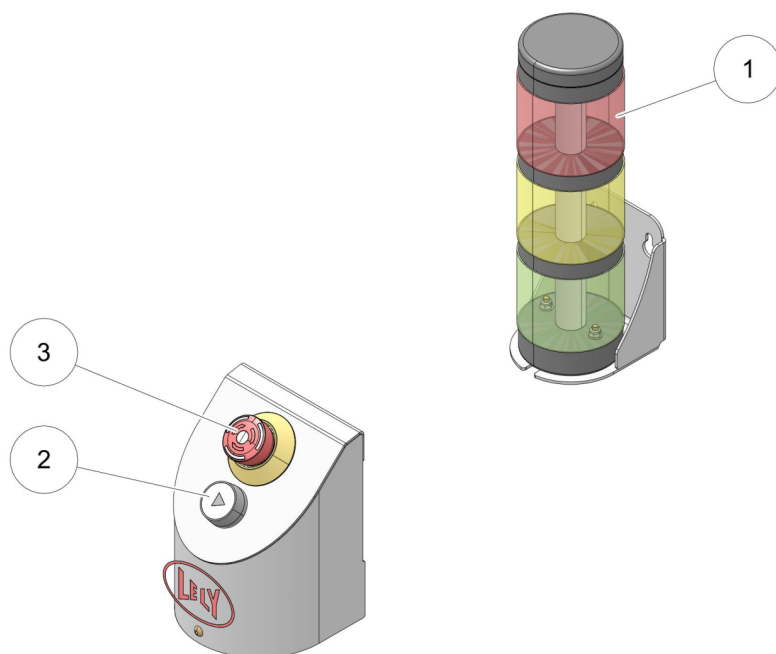
KEY: 1. Socket guide - 2. Metal strip - 3. Rotating cover - 4. Charge socket

The charger is installed under the feed loading point in the feed kitchen. The charger charges the batteries of the Mixing and Feeding Robot.

At approximately 75 cm (29.5 in) from the charger, the Mixing and Feeding Robot drives slowly to the charger. When the Feeding Robot pushes against the socket guide (1), the socket cover (3) is pulled away exposing the socket. The plug from the Feeding Robot connects to the socket (4) and the Feeding Robot stops driving. The batteries are charged until they are fully charged, or until the Mixing and Feeding Robot must do a feed or scan task.

A second charger for a second Mixing and Feeding Robot is installed at the parking position near the feed kitchen. To be able to determine that it is the second charger, there must be no metal strip under the Mixing and Feeding Robot when it is in the second charger.

## 4.2.4 Console and Signal Lights



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Figure 30. Console and signal lights

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

The start button (2) 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 2-25).

## 4.2.5 Power Distribution Box

The power distribution box is a large control box in the feed kitchen. It distributes power to:

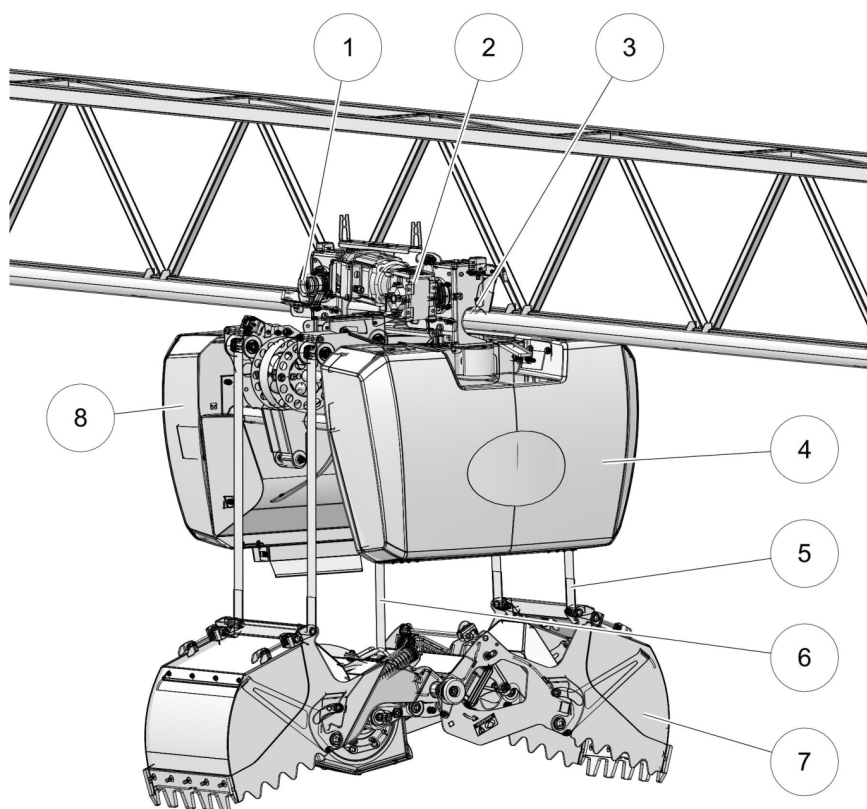
- Charger(s).
- Bridge Crane and Feed Grabber (optional).
- Control box Additives dispenser (frequency pulse) (optional).
- Control box External concentrates (frequency weight) (optional).
- Safety fence (optional).

The power distribution box is connected to the Horizon PC or the farms network connected to the Horizon PC.

The power distribution box can give an on/off signal to a digital output (Optional) to start/stop a (tower) silo or conveyor belt.

On the PCB in the power distribution box runs the Feed Controller software.

## 4.2.6 Feed grabber (FG F2)



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Figure 31. 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.

## 4.2.7 Cranes and Fixed Rail

The feed grabber drives along a rail or two rails that can be a part of a crane. There are three types:

- Bridge crane (BC B2).
- Bridge crane (BC B1).
- Single Fixed Rail.

### 4.2.7.1 Bridge crane (BC B2)

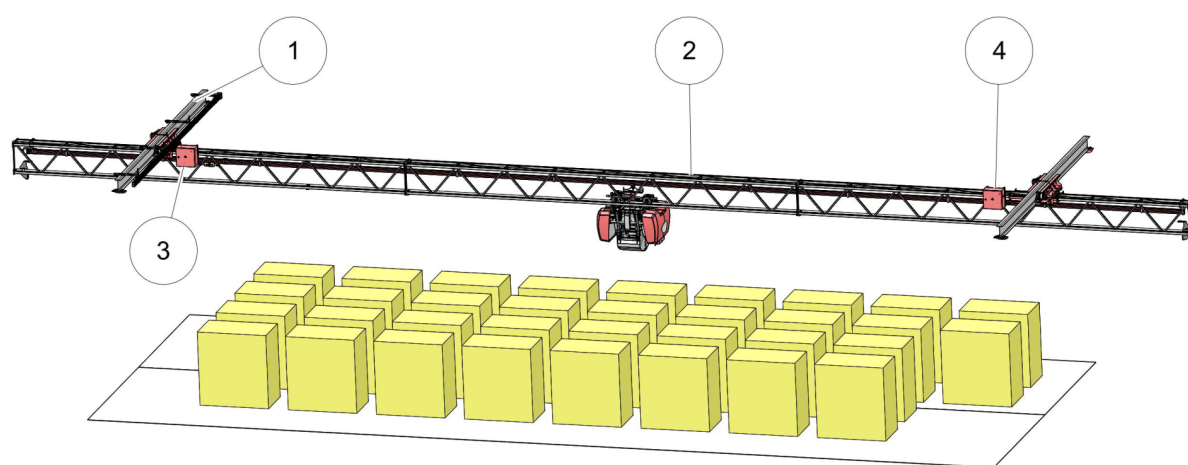
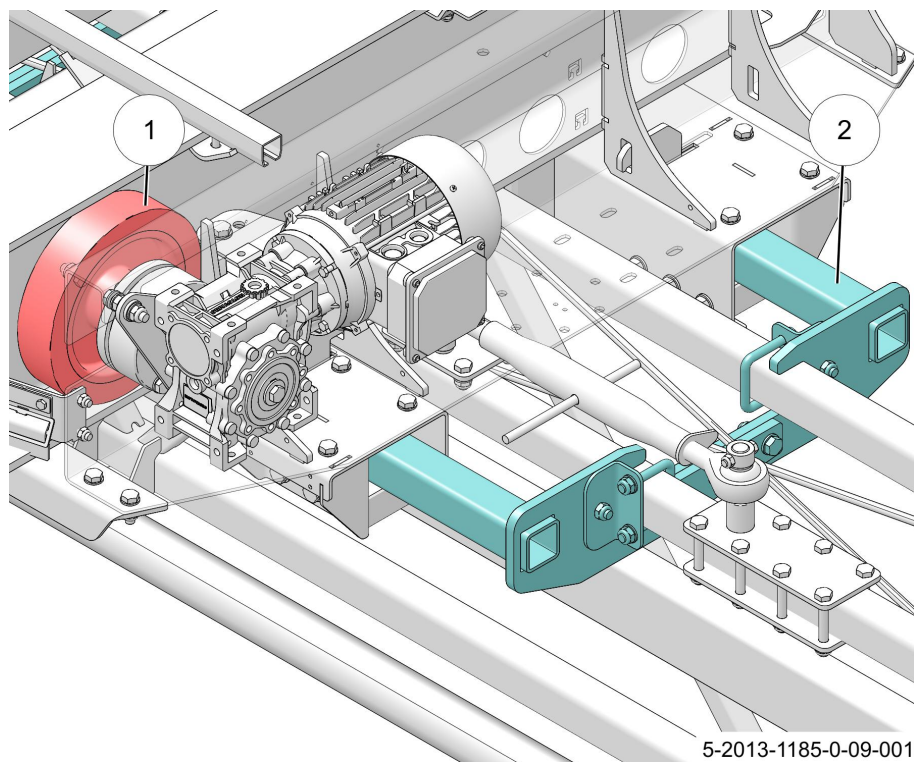


Figure 32. Bridge crane (BC B2)

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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#### 4.2.7.2 Bridge crane (BC B1)

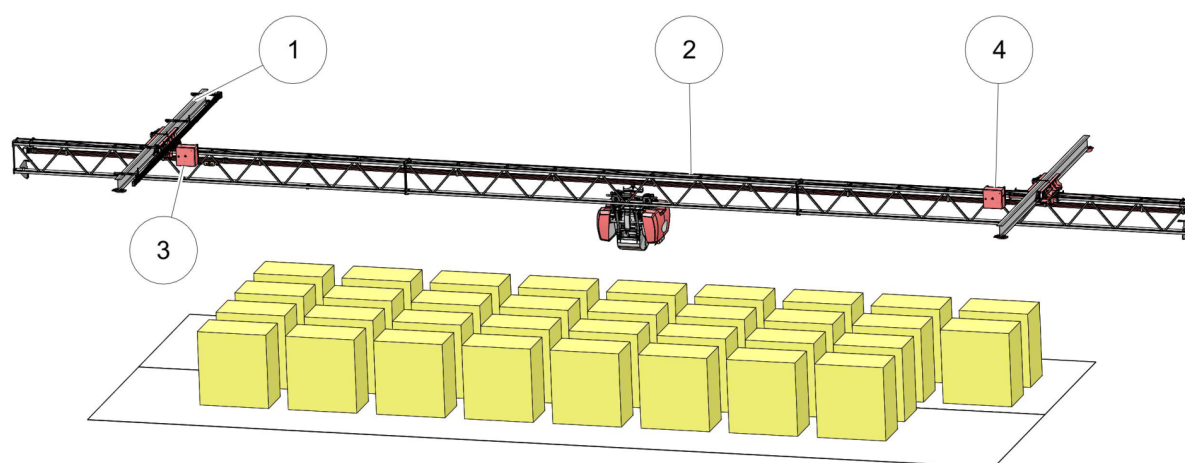


Figure 33. Bridge crane (BC B1)

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).

#### 4.2.7.3 Single Fixed Rail

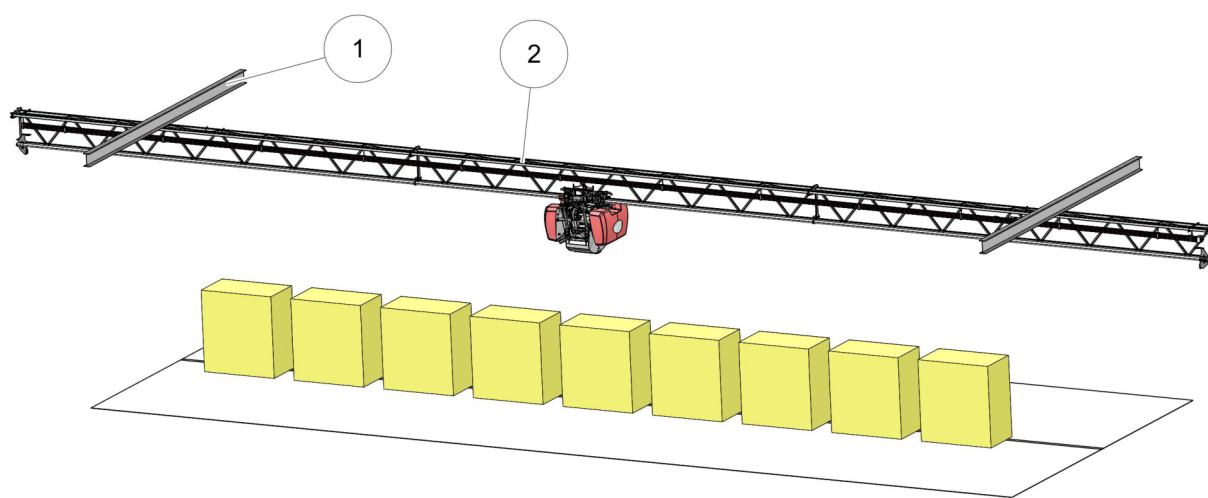


Figure 34. Single fixed rail

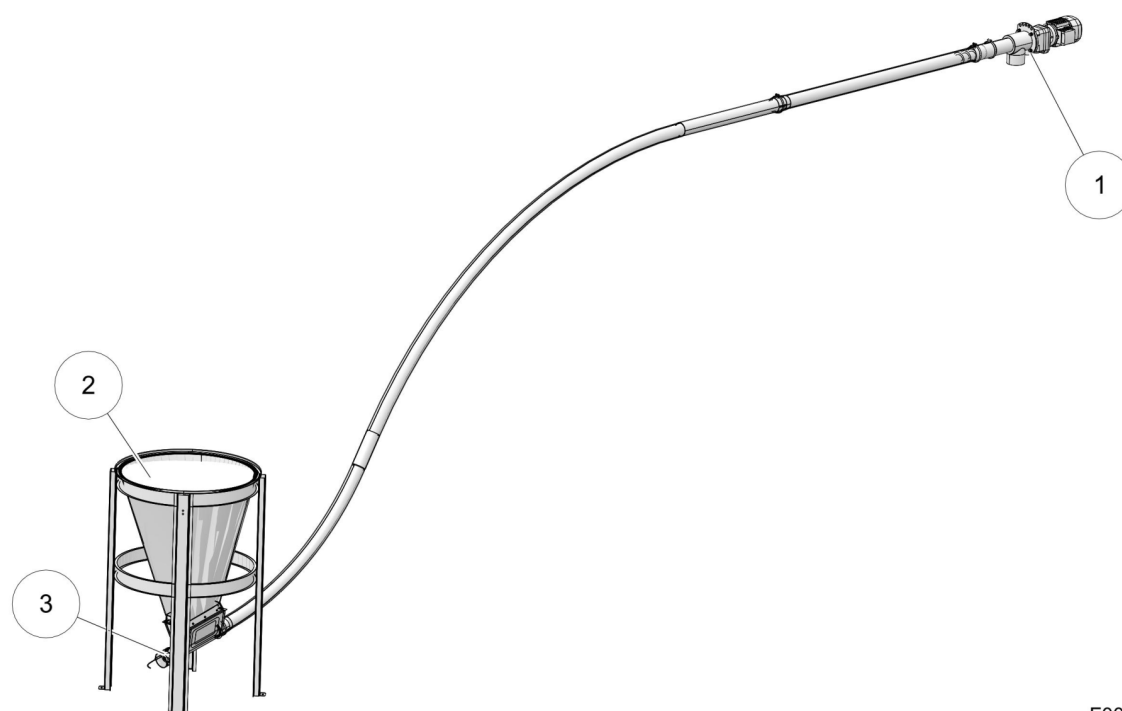
KEY: 1. I-beam - 2. Lattice girder with rail

#### 4.2.8 Additives Dispenser (frequency pulse)

Two types of additives dispensers are available:

- Conventional additives dispenser (a vibrating motor is optional for one dispenser).
- Dispenser with stir motor.

## Conventional Additives Dispenser (frequency pulse)



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Figure 35. Conventional Dispenser

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

- 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**.

## Additives Dispenser with Stir Motor (frequency pulse)

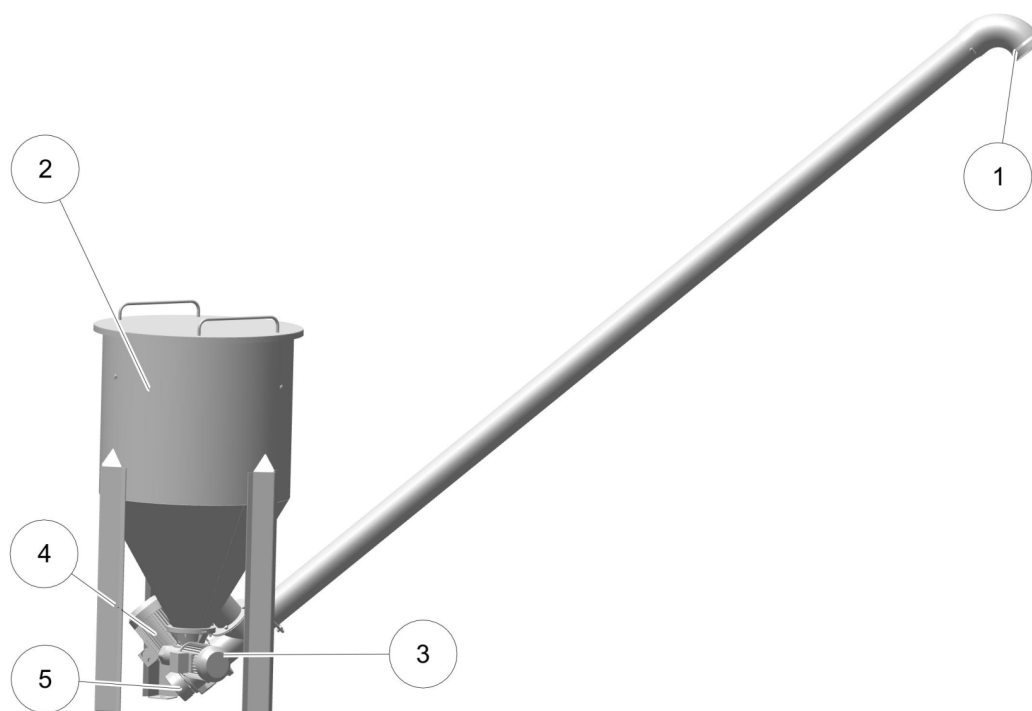


Figure 36. Dispenser with Stir Motor

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

- 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**.

### 4.2.9 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 Mixing and Feeding Robot has measured the set weight. The runtime is protected by a maximum runtime, this is the expected runtime plus 30%.

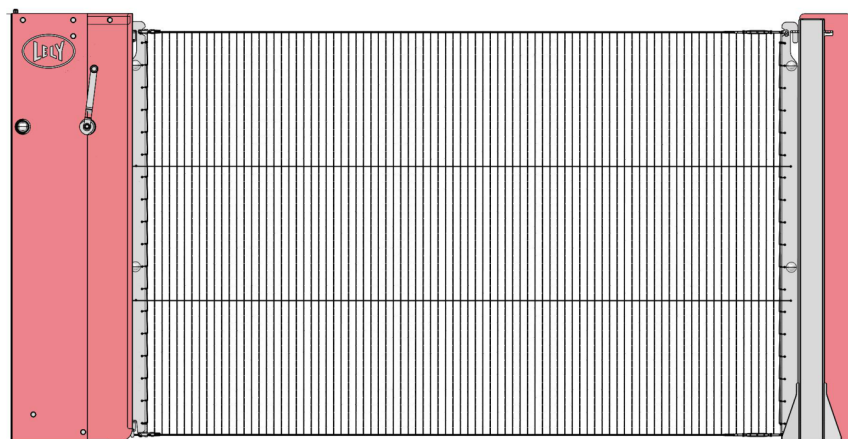
The Mixing and Feeding Robot weighs the concentrates during loading. In the software this is called **FreqCon Weight**.

#### 4.2.10 Digital Output

The power distribution box 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**.

#### 4.2.11 Safety fence (Optional)



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Figure 37. 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.

#### 4.2.12 Automatic (barn) door control (optional)

A small 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).

### 4.2.13 Software

The feeding management of the Vector system is set on the Horizon management software that runs on the PC connected to the Vector system. Settings for the Feed Grabber, locations and fences, feeding, rations, routes and kitchen are made in Horizon. When a setting is changed, the settings are sent to the Vector. The Feed Controller software that runs on the power distribution box starts feed and scan tasks with these settings. After each feeding task the feed result is sent to Horizon.

If the Horizon software stops working or when the connection to the Vector is lost, the Vector continues operation with the last received settings. Data for Horizon (feed results) is stored and sent as soon as the connection is restored.

Several devices of the Vector have their own specific software running. The devices communicate with each other via bluetooth. The software can be operated with a smartphone with an android operating system. The following software can be operated:

- The Feed Controller.
- The Mixing and Feeding Robot.
- The Feed Grabber (if applicable).
- The Bridge Crane (if applicable).
- The automatic (barn) door software (if applicable).

The Feed Controller software can also be operated with the WebUI. With this easy-to-use webpage you can monitor and control the software that runs on the power distribution box and thus monitor the Vector system remote via the internet. The WebUI is a web page that can be displayed in a browser on a laptop or PC that is connected to the Horizon network. This connection can be via a cable or wifi.

### WebUI

The webpage displays information and has several buttons. The buttons (4) (see figure 38 on page 4-16) 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.

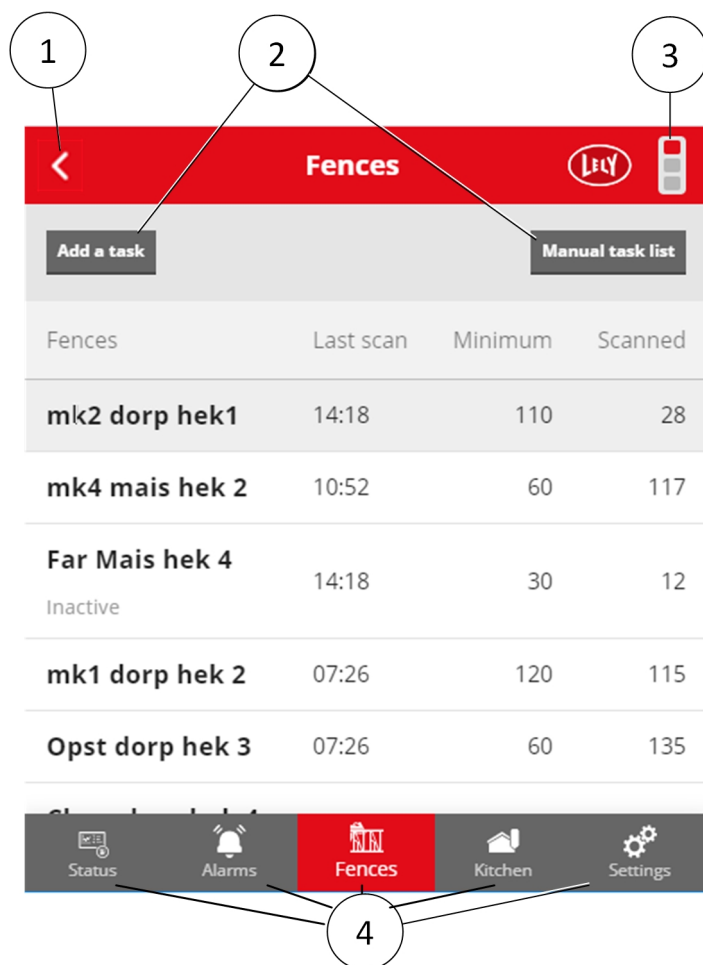


Figure 38. WebUI example of a page

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

## 4.3 Operation

The major processes of the Vector are:

- Feed loading and mixing process.
- Feeding, measuring and feed pushing process.

The Mixing and Feeding Robot 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 rations that specifies the ratio of every feed type that needs to be supplied are linked to locations. To supply the feed at the correct frequency and to determine the priority between groups of animals several settings must be specified in Horizon.

Depending on the setting of the scan time, for example every hour, the Mixing and Feeding Robot drives the route in the barn along the feed fence and measures the feed height on every location in the barn. If the animals on one location need to be fed according to the settings and calculations, the feed loading and mixing process starts. If the animals on two or more locations must be fed, the Feed Controller

determines which feed group must be fed first. If possible when they have the same ration and do not need a full bin the locations are fed during the same feed task.



If there are more routes to the same feed fence make sure you set the shortest scan time for the shortest route in Horizon. When set like that, the feed fence will be scanned with the short route which is more efficient.

---

### 4.3.1 Feed Loading and Mixing Process

The feed loading and mixing process starts when the Mixing and Feeding Robot is connected to the charger under the feed loading point.

#### If a Feed Grabber is present

Depending on the ration settings, the Feed Grabber moves to the first feed type of the ration, on the storage location with the highest priority. If the feed kitchen has a Bridge Crane, the Crane starts moving with the Feed Grabber to the first location.

All feed types are stored in the feed kitchen in specific storage locations (blocks). The Feed Grabber measures the height of the feed and grabs the feed. The Feed Grabber estimates the weight of the feed and if the amount is too much, the Feed Grabber grabs again. Then the Feed Grabber moves to the Mixing and Feeding Robot, and if applicable the Bridge Crane moves. The Feed Grabber drives to the feed loading point and the grabber will open and the feed falls in the mixing bin. The mixer starts mixing. The mixer knives and a counter knife help to mix the feed types. The Mixing and Feeding Robot weighs how much feed is loaded. 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 in the ration. The feed types will be loaded until the set amount of each feed type is loaded.

An extra mixing time (in between mixing) can be set to improve the mixing during loading.

During this process other types of feed can be added:

- 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.

After all feed types and additives are loaded, the mixing continues for a set time (post mixing).

#### If roughage is loaded from a (Tower) silo

Roughage can be loaded from one or more (tower) silos or conveyor belts using a digital output signal. Also other feed types can be added with additives dispensers (frequency pulse) or concentrate augers (frequency weight). The Mixing and Feeding Robot mixes the feed during loading and after all feed types are loaded.

### 4.3.2 Feeding, Measuring and Feed Pushing

#### Drive from the feed loading point to the feed alley in the barn

When the mixing bin is loaded and mixed, the Mixing and Feeding Robot starts the route to the location of the animals on the feed fence. The Feeding Robot first drives backwards from the charger and turns to

the direction of the feed alley. Outdoors the Feeding Robot must follow the metal strip on the floor using the inductive sensors. During driving the skirt is usually lifted.

### Measuring and feed pushing

Inside the barn the Mixing and Feeding Robot lowers the skirt. The Mixing and Feeding Robot starts to drive and uses the ultrasonic sensor to keep at a fixed distance from the fence. The Mixing and Feeding Robot drives to the location of animals that need to be fed and on the route:

- The skirt rotates and pushes feed toward the fence of all locations with animals.
- The laser measures the height of the feed of other locations with animals.

### Feeding

The Mixing and Feeding Robot stops when it arrives at the (first) location on the feed fence of the animals that need to be fed. The feed door opens. When the door is completely open:

- The dosing roll starts to dose the feed.
- The mixer starts turning.
- The Feeding Robot starts to drive.

During dosing the Feeding Robot pushes the feed toward the fence and measures the height of the feed.

At the end of the location the mixing bin is empty and the dosing roll spins fast to dose the last feed remains, after that it stops rotating. The Mixing and Feeding Robot stops driving and the feed door closes. After the feed door is closed, the Mixing and Feeding Robot continues the route in the barn. On the way to finish the route the Mixing and Feeding Robot will again measure and push the feed of other locations with animals.

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

- The Mixing and Feeding Robot can drive with an open feed door from one location to the next (fences are in the same feeding section).
- The feed request for one fence is lower than the ration limit (calculations are made to combine feed tasks for two or more fences).

### 4.3.3 Drive to the Feed Loading Point and Connect to the Charger

When the Feeding Robot drives away from the feed fence the skirt is usually lifted. The Feeding Robot uses the inductive sensors to find the metal strips on the floor and to follow them toward the charger. On the way to the charger there are one or more reset points where the metal strip is interrupted for a short distance.



The AGS zone is a zone near the feed kitchen (on the Vector type plate usually marked yellow), just before the Mixing and Feeding Robot enters the feed kitchen. In the AGS zone the Mixing and Feeding Robot asks permission before it starts to drive the next route action. This makes sure the Feeding Robot only enters and moves in the area near the feed kitchen when it is safe. In the AGS zone the Feeding Robot must be able to communicate via Bluetooth with the power distribution box.

---

## Without AGS settings

When no AGS settings are set (ask your Lely technician), the Mixing and Feeding Robot will drive to the charger and connect.



*Unmanned moving vehicle*

*Risk of being crushed.*

*Be aware that in case of an emergency stop in the feed kitchen the Mixing and Feeding Robot will still drive to the charger and connect. To avoid this manually push the emergency stop on the Mixing and Feeding Robot.*

---



*Unmanned moving vehicle*

*Risk of being crushed.*

*To achieve maximum safety, AGS settings must be used.*

---

## With AGS settings

The Feeding Robot waits before driving to the feed loading point if:

- It is not safe, because the emergency stop button is activated or the safety fence gate or kitchen door is opened.
- The feed kitchen is being filled.

If all is safe the Mixing and Feeding Robot connects to the charger.

If there are two chargers, the Feed Controller decides where the Mixing and Feeding Robot must go.



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## 5 Operating Instructions

### 5.1 Start Up and Stop

#### 5.1.1 Put the Feed Kitchen in Operation



***Unexpected movement of machines.***

***Risk of serious injury.***

***Make sure the feed kitchen is void of persons, animals, machines or anything other than roughage.***

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) (see figure 39 on page 5-2), 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.



If the orange light stays on after waiting 2 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 Mixing and Feeding Robot(s), Feed Controller, Feed Grabber, Bridge Crane. Connect your smartphone to each device and check.



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.

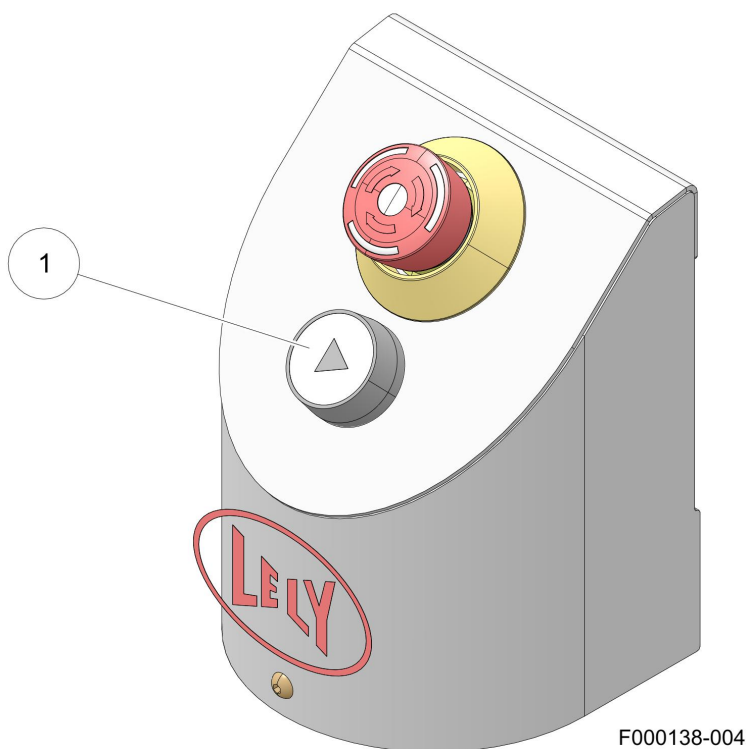


Figure 39. Start button on console

### 5.1.2 Put the Mixing and Feeding Robot In Operation



**Unexpected movement of vehicle.**

**Risk of personal injury.**

**Make sure the Mixing and Feeding Robot and the immediate vicinity is void of persons and animals. Only operate the Mixing and Feeding Robot with the smartphone when it is in your line of sight.**

#### Using the pause button



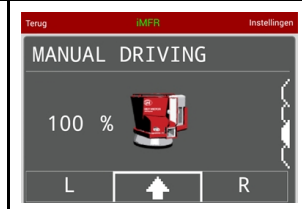
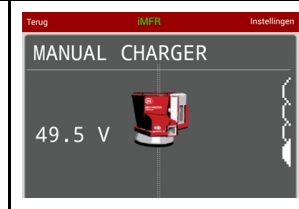
1. When the Mixing and Feeding Robot was taken out of operation with the pause button: Push the pause button (2) (see figure 41 on page 5-5).  
The Mixing and Feeding Robot will continue operation.

#### Using the smartphone

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.

2. Connect the Mixing and Feeding Robot manually to the charger:

1. Go to the page **Work**.

			
<p><b>Tab Work</b></p> <p>Information about the current state</p>	<p><b>Tab Work information</b></p> <p>Information about the feed or scan task</p>	<p><b>Tab MANUAL DRIVING</b></p> <p>Buttons for manual driving</p>	<p><b>Tab MANUAL CHARGER</b></p> <p>Drive and connect to the charger</p>

2. Manually drive (see Drive the Mixing and Feeding Robot Manually on page 5-34) the Mixing and Feeding Robot close to the charger and make sure the Feeding Robot is on the strip with the charger plug toward the charger.

1. When the following message appears on your display: **SAFETY WARNING Manual operation is permitted only with a clear overview of the vehicle. Confirm?**

2. Confirm if you have a clear overview of the Mixing and Feeding Robot.

3. Push the button  (one or more times) to go to the tab **MANUAL CHARGER**.

4. Push  to start driving slowly to the charger, the Feeding Robot will stop when a resistance is detected and connect to the charger.

3. Go to the page **Work** on the first tab.

4. Push the button  to:

- Start the Mixing and Feeding Robot when it was out of operation (**Off**).

## 5.1.3 Take the Feed Kitchen Out of Operation in the Filling Mode

### 5.1.3.1 Put the feed kitchen in the filling mode with the console

1. Push the start button (1).

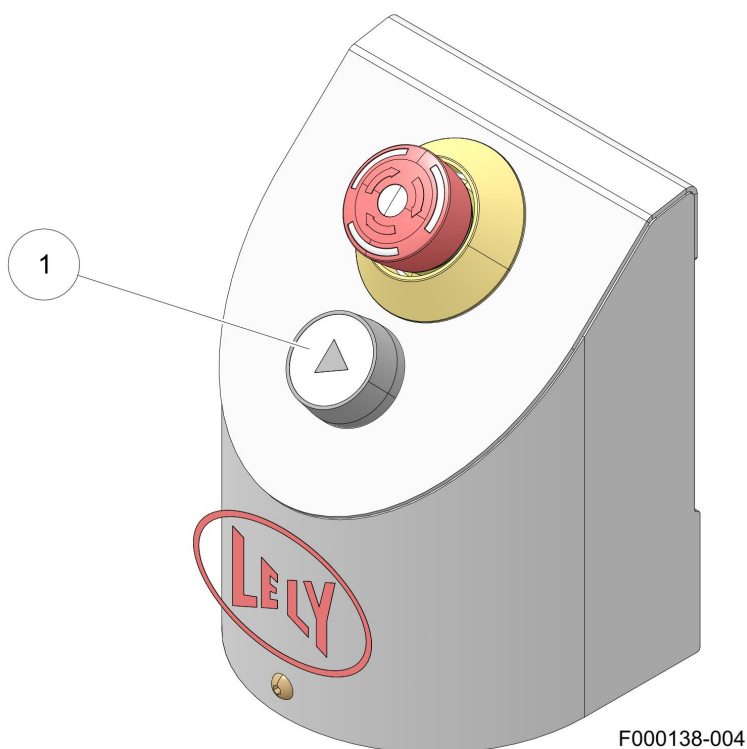



Figure 40. Start button on console

2. The signal lights start blinking green and orange. The feed grabber will be parked.
3. Wait until the signal light is blinking green. It is then safe to enter and fill the feed kitchen.

### 5.1.3.2 Put the Feed Kitchen in the Filling Mode with the Smartphone



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. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Feed Controller.
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 enter and fill the feed kitchen.

### 5.1.3.3 Put the Feed Kitchen in the Filling Mode with the WebUI

1. Start the WebUI (see page 5-16).



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 enter and fill the feed kitchen.

### 5.1.4 Take the Mixing and Feeding Robot Out of Operation

You can take the Mixing and Feeding Robot out of operation with the pause button or with the smartphone.

#### Using the pause button

1. Push the pause button (2).

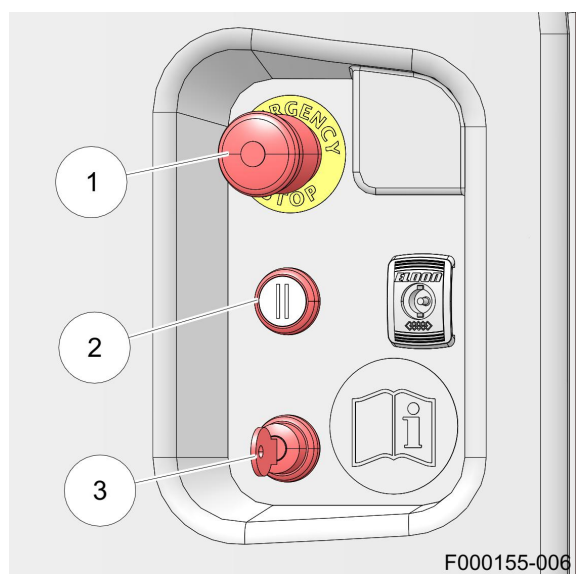


Figure 41. Pause button

KEY: 1. Emergency stop button - 2. Pause button - 3. Safety key

#### Using the smartphone

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
2. Go to the page **Work**.
3. Push the button **START STOP** to:
  - Stop the Mixing and Feeding Robot when it was in operation (**On**).

## 5.1.5 Put Feed Kitchen Devices In and Out of Operation

### 5.1.5.1 Put the Feed Controller (PDB) In and Out of Operation

#### Use the WebUI or the Smartphone

You can either use the WebUI or the smartphone to put the feed controller in or out of operation.

#### Take the Feed Controller Out of Operation with the WebUI

1. Start the WebUI (see page 5-16).



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

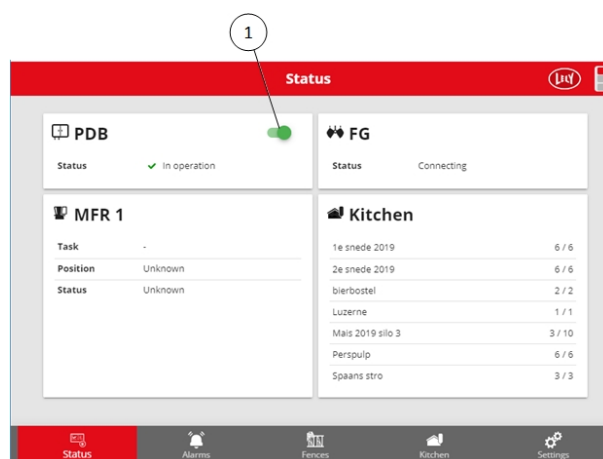


Figure 42. Status screen

KEY: 1. Switch to put the PDB with the feed controller software in or out of operation

#### Take the Feed Controller out of Operation with the Smartphone

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Feed Controller.
2. Go to the page **Work**.  
The page displays the current status (**On**).
3. Push **START STOP**.  
The Feed Controller is switched to **Off**.


#### Put the Feed Controller In Operation with the WebUI

1. Start the WebUI (see page 5-16).





2. Push the button **Status**.
3. Click on the switch (1) (see figure 42 on page 5-6), the colour of the switch changes from grey to green.

### Put the Feed Controller in Operation with the Smartphone

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Feed Controller.
2. Go to the page **Work**.  
The page displays the current status (**Off**).
3. Push .  
The Feed Controller is switched to **On**.

### 5.1.5.2 Put the Feed Grabber In Operation

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Feed Grabber.
2. Select the page **Operation**,  
The page displays the current status.
3. Push the button .
4. If you want to go on with the present task, select **Resume Operation** and push the button .

It may be necessary to let the Mixing and Feeding Robot send the task to grab again if the Feed Grabber had accepted the task when it went out of operation.  
To make the Mixing and Feeding Robot resend the task:


1. Connect the smartphone to the Mixing and Feeding Robot.
2. Take the Mixing and Feeding Robot out of operation using the smartphone (see Take the Mixing and Feeding Robot Out of Operation on page 5-5).
3. Put the Mixing and Feeding Robot in operation and select Yes, to resume the task.  
The Feed Grabber will receive the task once more and resume operation.



5. If you want to restart the program, select **Restart Operation** and push the button .



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.

### 5.1.5.3 Take the Feed Grabber Out of Operation

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Feed Grabber.
2. Select the page **Operation**,  
The page displays the current status.
3. 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 .

#### 5.1.5.4 Put the Bridge Crane In Operation



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

---


1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Bridge Crane.
2. Select the page **Put in operation**  
The page displays the current status.
3. Push the button .



The Bridge Crane will automatically drive to detect the reset magnets after it receives the first task from the Feed Grabber.

---

#### 5.1.5.5 Take the Bridge Crane Out of Operation

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Bridge Crane.
2. Select the page **Put in operation**  
The page displays the current status.
3. Push the button ,  
The page **Bridge crane** is displayed.

## 5.1.6 Shut Down the Vector and Disconnect from the Power

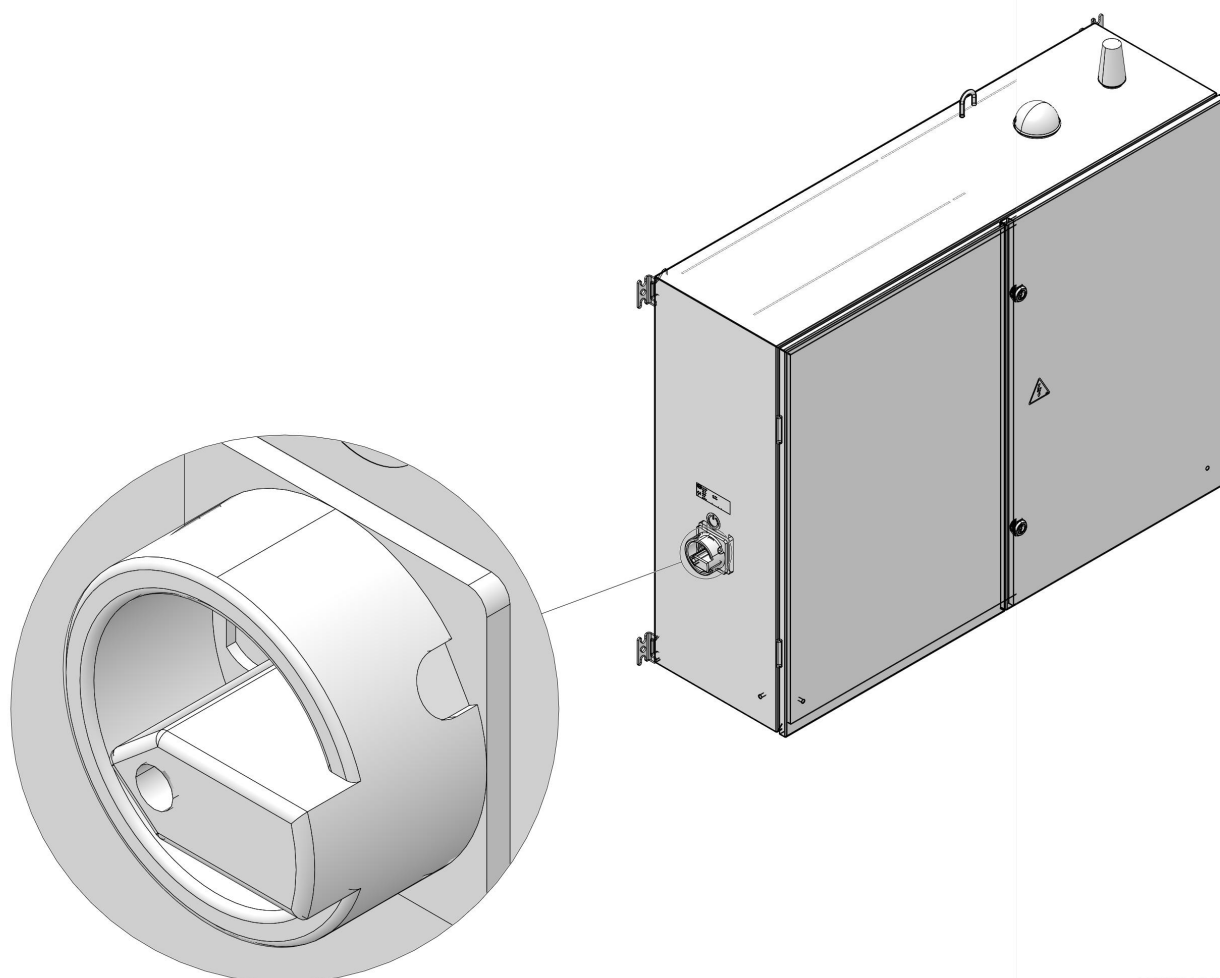
### 5.1.6.1 Shut Down the Vector and Disconnect from the Power



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.

---

1. Set the main switch to Off (see figure 43 on page 5-10) on the power distribution box.
2. Open the power distribution box and disconnect the connector (1) (see figure 44 on page 5-11) to disconnect the backup battery (2).
3. If the Feeding Robot is connected to the charger, manually drive the Feeding Robot backward to disconnect from the charger.
4. If a second Feeding Robot is connected to the additional charger, manually drive the Feeding Robot backward to disconnect from the charger.
5. Switch off the Mixing and Feeding Robot with the key (see figure 45 on page 5-12).
6. Remove the skirt piece and switch off the main switch of the Mixing and Feeding Robot (see figure 46 on page 5-13).
7. To prevent the tires from getting flat, put support blocks under the Mixing and Feeding Robot.



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*Figure 43. Main switch on the power distribution box*

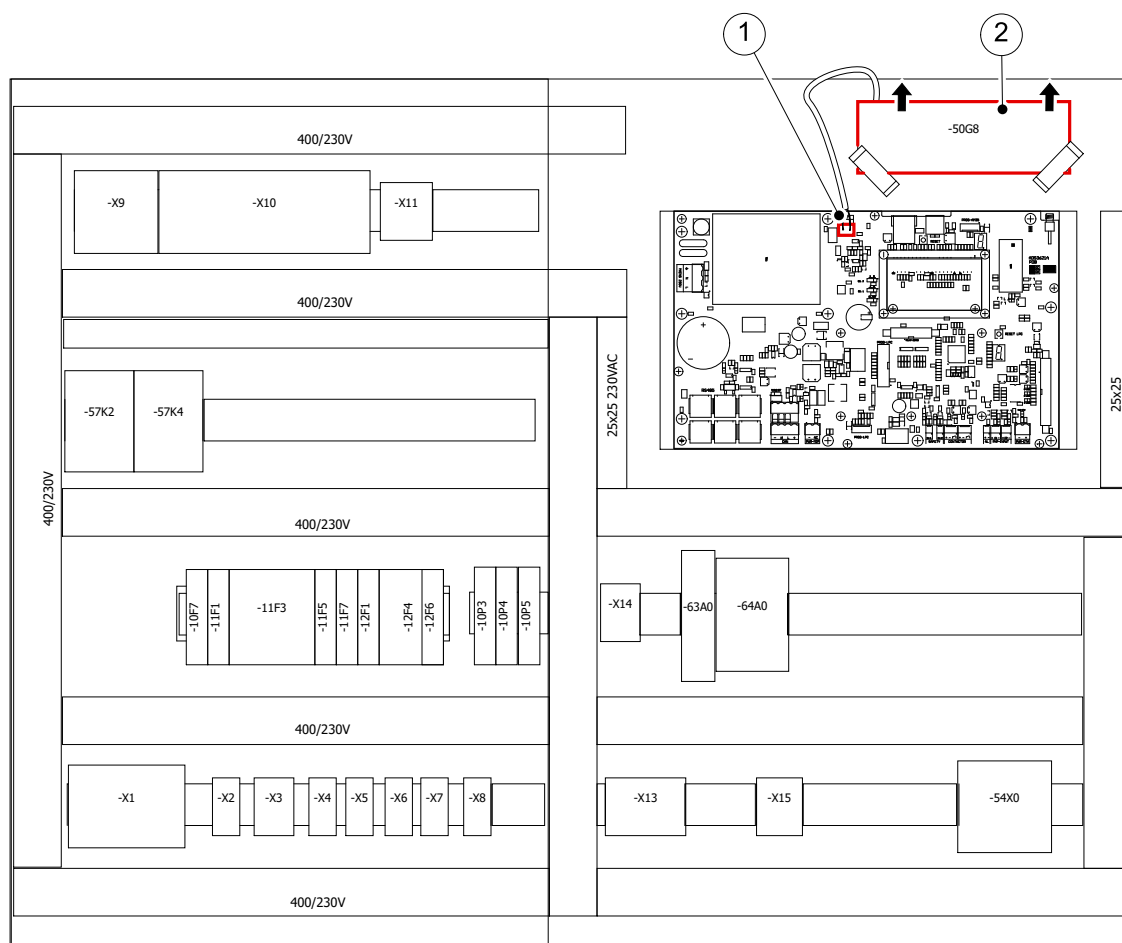


Figure 44. Disconnect the battery in the power distribution box

KEY: 1. Connector - 2. Battery

### 5.1.6.2 Switch off the Mixing and Feeding Robot with the Key (MFR 2)



**Risk of electric shock.**

**Risk of personal injury.**

***This procedure only switches off the power to the motors. The power on the PCB and the batteries remains. Follow the maintenance instructions in this manual and when indicated, remove the skirt piece and switch off the main switch on the battery of the Mixing and Feeding Robot (see Switch off the Main Switch on the Mixing and Feeding Robot near the Battery on page 5-12) before you start to do maintenance.***



To prevent an alarm message, push the pause button before you turn the safety key.

1. Turn the safety key (3) (see figure 45 on page 5-12) in the **OFF** position, remove it and keep the key with you.  
The Mixing and Feeding Robot generates an alarm: **Emergency button**.

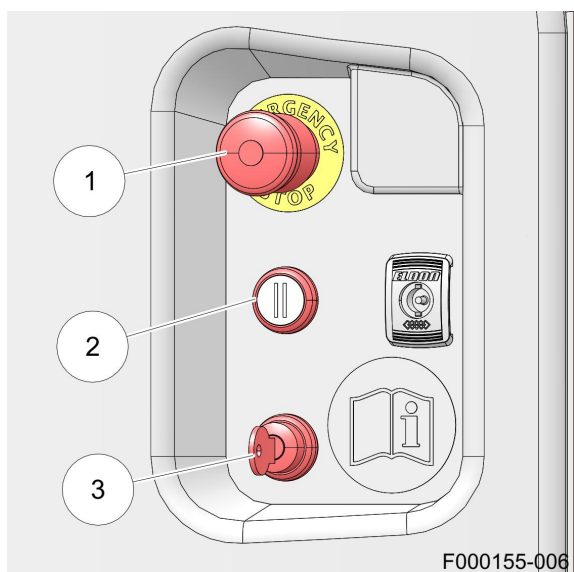


Figure 45. Safety key

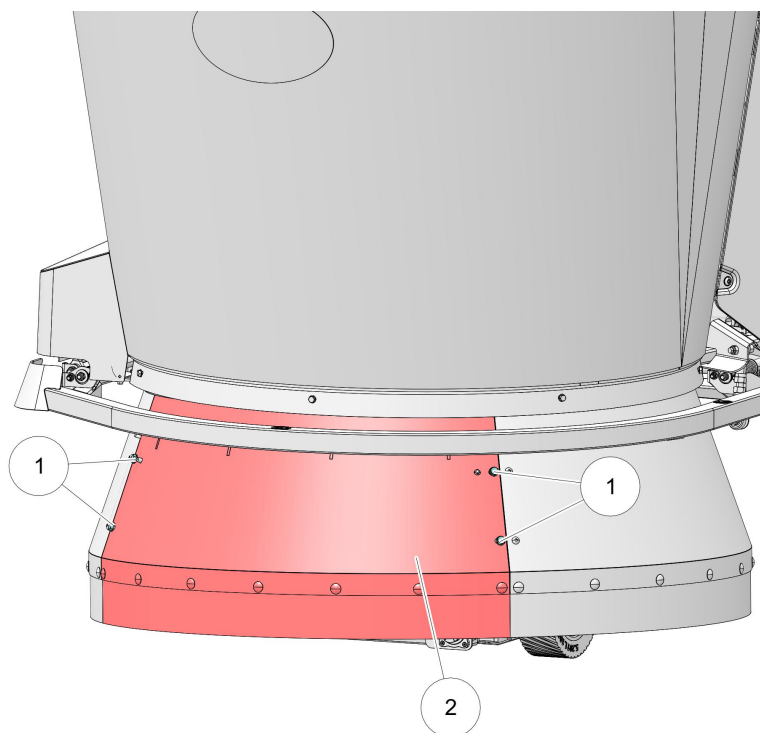
KEY: 1. Emergency stop button - 2. Pause button - 3. Safety key

### 5.1.6.3 Switch off the Main Switch on the Mixing and Feeding Robot near the Battery



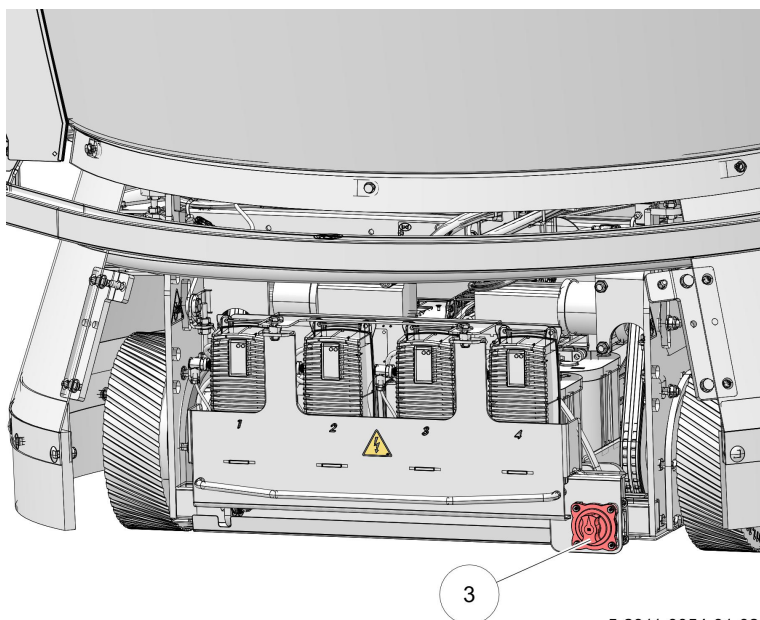
If you have some experience with the main switch, you can set the switch to Off without first removing the skirt piece.

1. Push the pause button (2) (see figure 45 on page 5-12) to make sure the Mixing and Feeding Robot does not drive.
2. Rotate the skirt until the skirt piece is on the back of the Mixing and Feeding Robot.
3. Remove the bolts (1) (see figure 46 on page 5-13) and the skirt piece (2).
4. Turn the main switch (3) to the OFF position.
5. Install the skirt piece (2) with the bolts (1).



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*Figure 46. Main switch Mixing and Feeding Robot*



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KEY: 1. Bolts - 2. Skirt piece - 3. Main switch

## 5.1.7 Connect the Vector to the Power


### 5.1.7.1 Connect the Vector to the Power and Start Up

1. Open the power distribution box and make sure the backup battery (2) is connected with connector (1) (see figure 44 on page 5-11).
2. Set the power supply switch (see figure 43 on page 5-10) in the position "1" on the power distribution box.
3. Switch on the main switch near the battery on the Mixing and Feeding Robot (see Switch on the Main Switch on the Mixing and Feeding Robot on page 5-14).
4. Switch on the Mixing and Feeding Robot with the key (see Switch on the Mixing and Feeding Robot with the Key on page 5-14).
5. Put all devices in operation:
  1. Put the Feed Grabber in Operation (see Put the Feed Grabber In Operation on page 5-7).
  2. If present put the Bridge Crane in operation (see Put the Bridge Crane In Operation on page 5-8).
  3. Put the Mixing and Feeding Robot in operation (see Put the Mixing and Feeding Robot In Operation on page 5-2).
6. Put the feed kitchen in operation (see Put the Feed Kitchen in Operation on page 5-1).

### 5.1.7.2 Switch on the Main Switch on the Mixing and Feeding Robot

1. Rotate the skirt until the skirt piece is on the back of the Mixing and Feeding Robot.
2. Remove the bolts (1) (see figure 46 on page 5-13) and the skirt piece (2).
3. Turn the main switch (3) of the Mixing and Feeding Robot to the **On** position.
4. Install the skirt piece (2) with the bolts (1).

### 5.1.7.3 Switch on the Mixing and Feeding Robot with the Key


1. Insert the safety key (3) (see figure 45 on page 5-12) and turn it to the **ON** position.
2. Connect the smartphone to the Mixing and Feeding Robot.
3. Read the alarm message.
4. Push  to reset the alarm.
5. If the safety key on Mixing and Feeding Robot was turned during driving a route, the following message appears:  
**Pausebutton must be pressed and released to accept alarm**
  1. Push the Pause button (2).
  2. Push the Pause button again to release the button.

## 5.2 Connect to Device Software with a Smartphone

### 5.2.1 Install or Update the App on Your Smartphone

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



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.
7. Enter the **System Id** (usually 160, in rare situations 161 if another Vector system is nearby).
8. Enter the **Password**.



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

---

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



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

---

### 5.2.2 Connect the Smartphone to Device Software



***Unexpected movement of device.  
Risk of personal injury.  
Only operate the device with the smartphone when it is in your line of sight.***

---

1. Make sure the App is installed (see Install or Update the App on Your Smartphone on page 5-15) on your smartphone.

2. Make sure you are near the device and you can see the device (power distribution box, Feeding Robot, Feed Grabber, Bridge Crane or control box of the Automatic (barn) door) before you start the software.

3. Start the App.

If Bluetooth was not in operation the following question appears:

**The application tries to switch on Bluetooth, continue?**

1. Push **Yes**.

4. Push the line: **Search for devices**

The devices near the smartphone will be found,  
if one or more devices are not found, repeat this step.

5. Select the device 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.

## 5.3 Start the WebUI



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 webbrowser, 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 Power Distribution Box 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.

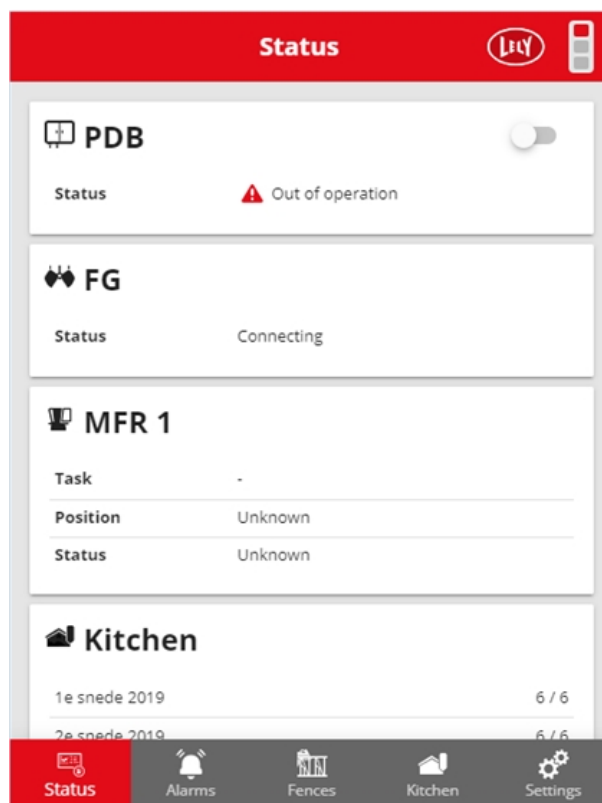







Figure 47. Webpage: Status page

When started on a PC the webpage shows the status page.

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.







## 5.4 Reset after an Alarm or Emergency Stop

### 5.4.1 View the Alarm List on the Web Page

1. Start the Horizon PC that is connected to the Vector.
2. Start an internet browser, for example Windows Internet Explorer.
3. Type the Web page address: 10.4.1.85.
4. The Web page has two tabs:
  - The tab Version shows the software versions of the software that runs on the power distribution box (PDB) and on all devices of the Vector. In some occasions refresh the page (push F5) to view all software versions.
  - The tab Alarms shows the last 100 alarms.

### 5.4.2 Reset the System After an Alarm

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Feed Controller.
2. If there is an alarm on the Feed Controller it is shown on the display.
3. Read the alarm message, if necessary go to chapter Troubleshooting to see what actions should be taken to remove the cause of the alarm.
4. Push  to confirm the alarm message.
5. If there is an alarm on another device go to the page **Alarms > Active alarms**.
6. Check on which device the alarm is generated.
7. Push  . If necessary go to chapter Troubleshooting to see what actions should be taken to remove the cause of the alarm.

8. If the alarm is on the Mixing and Feeding Robot, Feed Grabber or Bridge Crane:
  1. Connect the smartphone to the software of the device.
  2. Read the alarm message, if necessary go to chapter Troubleshooting to see what actions should be taken to remove the cause of the alarm.
  3. Push  to confirm the alarm message.
9. If the Mixing and Feeding Robot gives the alarm that the automatic (barn) door is in error state:
  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 of the door as follows:
    - Close the door if it was opened
    - Open the door if it was closedIf this does not work, reboot the system by switching the power OFF for a few seconds and ON again.
  4. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
  5. Push  to confirm the alarm message.
  6. Test the operation of the automatic (barn) door when operated from the Mixing and feeding Robot as follows:
    1. Manually drive the Mixing and Feeding Robot to the automatic door until it is within Bluetooth range.
    2. Go to the page **Test > Auto. door**.
    3. Push the button   to open the door, or   to close the door.  
If this does not work you can test if it is possible to open and close the door with the barn door software:
      1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Automatic (barn) door
      2. Go to the page **Testing**
      3. Push the buttons Open or Close.
      4. If this does not work ask your Lely service technician for advice.

10. If an alarm goes ON at the additives dispenser (frequency pulse):

1. Make sure the bin is not empty and the transport pipe is not clogged up.
2. Connect the smartphone to the Feed Controller.
3. Go to the page **Alarms > Active alarms**.
4. Push the button **ACCEPT**.
5. Test the additive dispenser (frequency pulse), go to the page **Service > FreqCon Pulse > Test FreqCon Pulse**

1. Push .  
A window appears with the number of the dispenser.
2. Push the white box that displays the number, set the number and push OK.
3. Push and .  
A window appears with the weight.
4. Push the white box that displays the weight, set the weight and push OK.
5. Push .  
The set additive dispenser (frequency pulse) will operate and dose the set weight of the additive.

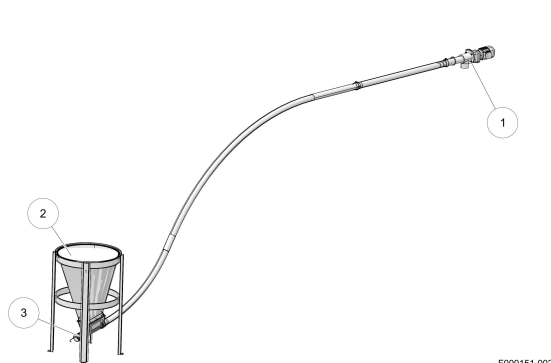


Figure 48. Conventional dispenser

KEY: 3. Sensor -

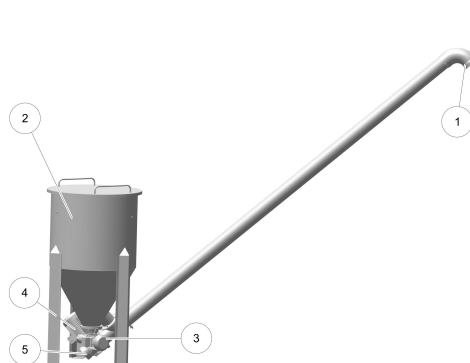


Figure 49. Dispenser with stir motor

KEY: 5. sensor -

During operation check if the light of the sensor (3) (see figure 48 on page 5-20) or (5) (see figure 49 on page 5-20) 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 6-27).

11. If necessary reset the MODalarm (see Reset alarms on the MODalarm on page 5-23) or the alarm on CRS.

### 5.4.3 Restart the System after an Alarm

You can either use the WebUI or the smartphone to reset alarms on the Feed Controller software.

#### Restart the System with the WebUI

1. Start the WebUI (see page 5-16).





2. Push 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 Troubleshooting to see what actions should be taken to remove the alarm.
5. If there is an accept button behind the alarm message, push **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**.


Depending on the location of the alarm see:

- If the alarm is on the Mixing and Feeding Robot, Feed Grabber or Bridge Crane: (see page 5-21)
- If the Mixing and Feeding Robot gives the alarm that the automatic (barn) door is in error state: (see page 5-21)
- If the alarm is on the additives dispenser (frequency pulse) (see page 5-22)

### Restart the system with the smartphone




1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Feed Controller.
2. If there is an alarm on the Feed Controller it is shown on the display.
3. Read the alarm message, if necessary go to chapter Troubleshooting to see what actions should be taken to remove the cause of the alarm.
4. Push  to confirm the alarm message.
5. If there is an alarm on another device go to the page **Alarms > Active alarms**.
6. Check on which device the alarm is generated.
7. Push . If necessary go to chapter Troubleshooting to see what actions should be taken to remove the cause of the alarm.

### If the alarm is on the Mixing and Feeding Robot, Feed Grabber or Bridge Crane:


1. Start the Lely control app and connect the smartphone to the software of the device.
2. Read the alarm message, if necessary go to chapter Troubleshooting to see what actions should be taken to remove the cause of the alarm.
3. Push  to confirm the alarm message.

### If the Mixing and Feeding Robot gives the alarm that the automatic (barn) door is in error state:




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 of the door as follows:

4. If the Mixing and Feeding Robot gives the alarm that the automatic (barn) door is in error state:
  1. Close the door if it was opened
  2. Open the door if it was closed
  3. If this does not work, reboot the system by switching the power OFF for a few seconds and ON again.
5. Start the Lely control app and connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
6. Push  to confirm the alarm message.
7. Test the operation of the automatic (barn) door when operated from the Mixing and feeding Robot as follows:
  1. Manually drive the Mixing and Feeding Robot to the automatic door until it is within Bluetooth range.
  2. Go to the page **Test > Auto. door.**
  3. Push the button  to open the door, or  to close the door.  
If this does not work you can test if it is possible to open and close the door with the barn door software:  
Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Automatic (barn) door.
  4. Go to the page **Testing.**
  5. Push the button **Open** or **Close.**
  6. If this does not work ask your Lely service technician for advice.

#### **If the alarm is on the additives dispenser (frequency pulse)**

1. Make sure the bin is not empty and the transport pipe is not clogged up.
2. Connect the smartphone to the Feed Controller.
3. Go to the page **Alarms > Active alarms.**
4. Push the button  **ACCEPT.**


## 5. Test the additive dispenser (frequency pulse), go to the page **Service > FreqCon Pulse > Test FreqCon Pulse**

1. Push .  
A window appears with the number of the dispenser.
2. Push the white box that displays the number, set the number and push OK.
3. Push  and .  
A window appears with the weight.
4. Push the white box that displays the weight, set the weight and push OK.



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

---

5. Push .  
The set additive dispenser (frequency pulse) will operate and dose the set weight of the additive.  
During operation check if the light of the sensor 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 6-27).


### If necessary reset the MOD alarm

1. If necessary reset the MODalarm (see Reset alarms on the MODalarm on page 5-23).

## 5.4.4 Reset alarms on the MODalarm

The MODalarms can be reset on the smartphone in the feed controller (PDB) in the (Lely Control app) or on the connected 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



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.

#### 5.4.5 Reset an Alarm on the Mixing and Feeding Robot and Continue Route



When an unfinished task is still present when the Mixing and Feeding Robot is put into operation a question appears if you want to finish the task, which means if you want to continue to do that task.

- Use Yes, if you stopped during a feed task and want the Mixing and Feeding Robot to continue where it stopped. If it was waiting for the Feed Grabber to dump feed in the mixing bin, the Mixing and Feeding Robot 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 Mixing and Feeding Robot. 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.


5.2011.8607.0 D




***Unexpected movement of vehicle.***

***Risk of personal injury.***

***Make sure the Mixing and Feeding Robot and the immediate vicinity is void of persons and animals. Only operate the Mixing and Feeding Robot with the smartphone when it is in your line of sight.***

1. Connect the smartphone to the Mixing and Feeding Robot.
2. Read the alarm message, if necessary see chapter Troubleshooting to see what actions should be taken to remove the cause of the alarm.
3. Push  to confirm the alarm message.

4. A question appears: **Continue with**  
Select:

- **Yes**, to let the Feeding Robot continue the route.
- **No**, to stop the route. You must manually drive the Mixing and Feeding Robot to the charger and put it in operation (see Put the Mixing and Feeding Robot In Operation on page 5-2).
- **MANUAL DRIVING**, to drive the Feeding Robot manually to a location on the route.
  1. The following message appears on your display: **SAFETY WARNING Manual operation is permitted only with a clear overview of the vehicle. Confirm?**
  2. Confirm if you have a clear overview of the Mixing and Feeding Robot.
  3. Drive the robot manually to the location where the Feeding Robot interrupted the route.
  4. Push button .
  5. Select **Yes** to continue the route.
  6. Push pause button (2) (see figure 45 on page 5-12) twice.
  7. If the Feeding Robot now generates an alarm because the reset point or strip can not be found but the reset point or strip is very near by, repeat this procedure.
- 5. If necessary reset the MODalarm (see Reset alarms on the MODalarm on page 5-23) or the alarm on CRS.


#### 5.4.6 Reset the Emergency Stop Button on the Mixing and Feeding Robot



**Unexpected movement of vehicle.**


**Risk of personal injury.**

**Make sure the Mixing and Feeding Robot and the immediate vicinity is void of persons and animals. Only operate the Mixing and Feeding Robot with the smartphone when it is in your line of sight.**

1. Make sure the Mixing and Feeding Robot and the immediate vicinity is void of persons and animals.
2. Turn the emergency stop button (1) (see figure 45 on page 5-12) clockwise and pull it out until it locks.
3. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
4. Read the alarm message.
5. Push  to confirm the alarm message.

6. A question appears: **Continue with current route?**

Select:

- **Yes**, to let the Feeding Robot continue the route
- **No**, to stop the route. You must manually drive the Mixing and Feeding Robot to the charger and put it in operation (see Put the Mixing and Feeding Robot In Operation on page 5-2)
- **MANUAL DRIVING**, to drive the Feeding Robot manually to a location on the route.
  1. The following message appears on your display: **SAFETY WARNING Manual operation is permitted only with a clear overview of the vehicle. Confirm?**
  2. Confirm if you have a clear overview of the Mixing and Feeding Robot.
  3. Drive the robot manually to the location where the Feeding Robot interrupted the route.
  4. Push button .
  5. Select **Yes** to continue the route.
  6. Push pause button (2) (see figure 45 on page 5-12) twice.
  7. If the Feeding Robot now generates an alarm because the reset point or strip can not be found but the reset point or strip is very near by, repeat this procedure.
- 7. If necessary reset the MODalarm (see Reset alarms on the MODalarm on page 5-23) or the alarm on CRS.

#### 5.4.7 Reset an Emergency Stop Button in or near the Feed Kitchen



**Unexpected movement of machines.**

**Risk of serious injury.**

**Make sure the feed kitchen is void of persons, animals, machines or anything other than roughage.**

1. Pull the emergency stop button out until it locks.
2. Make sure the feed kitchen is void of persons, animals, machines or anything other than roughage.
3. Make sure the safety fence is closed.
4. Make sure all gates and feed kitchen doors are closed.
5. If necessary reset the MODalarm (see Reset alarms on the MODalarm on page 5-23) or the alarm on CRS.
6. On the console push start (1) (see figure 39 on page 5-2).  
The start button starts blinking and the system tests if all gates are closed and emergency stop buttons are in safe position.
7. Wait until the light in the start button is continuously on.  
If necessary manually put the feed Grabber and/or Bridge Crane in operation.
8. On the console push start again.

## 5.5 Fill the Kitchen

### 5.5.1 Fill the Feed Kitchen

1. Put the Feed Kitchen in the filling mode.
2. Remove the safety fence (if applicable) or open the kitchen door.
3. Clean the feed kitchen and 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.
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) (see figure 50 on page 5-27) 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.
8. Put the feed kitchen in operation (see Put the Feed Kitchen in Operation on page 5-1).
9. Wait until the Feed Grabber is started and has found the reset magnet.

When the Feed Kitchen goes in operation after the filling mode, all storage locations are set to filled.

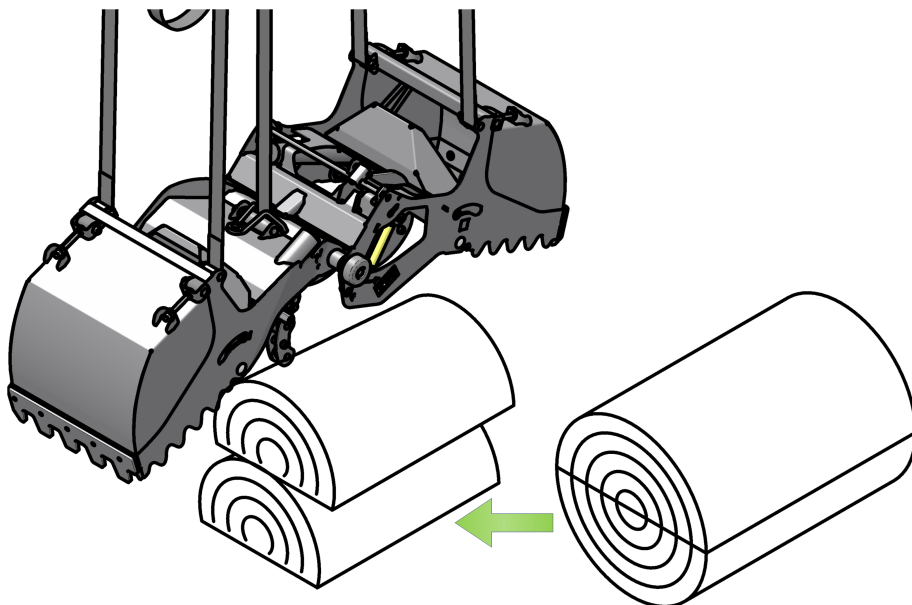


Figure 50. Example of cutting round bales

### 5.5.2 Change the Preferred Storage Place

If you want a feed block to be used up first but it is not in the preferred feed storage place, you can change the preferred storage place. This may occur if you pushed the feed block to the next storage place because it was easier to fill the feed kitchen. To change the preferred storage place you can either use one of these methods:

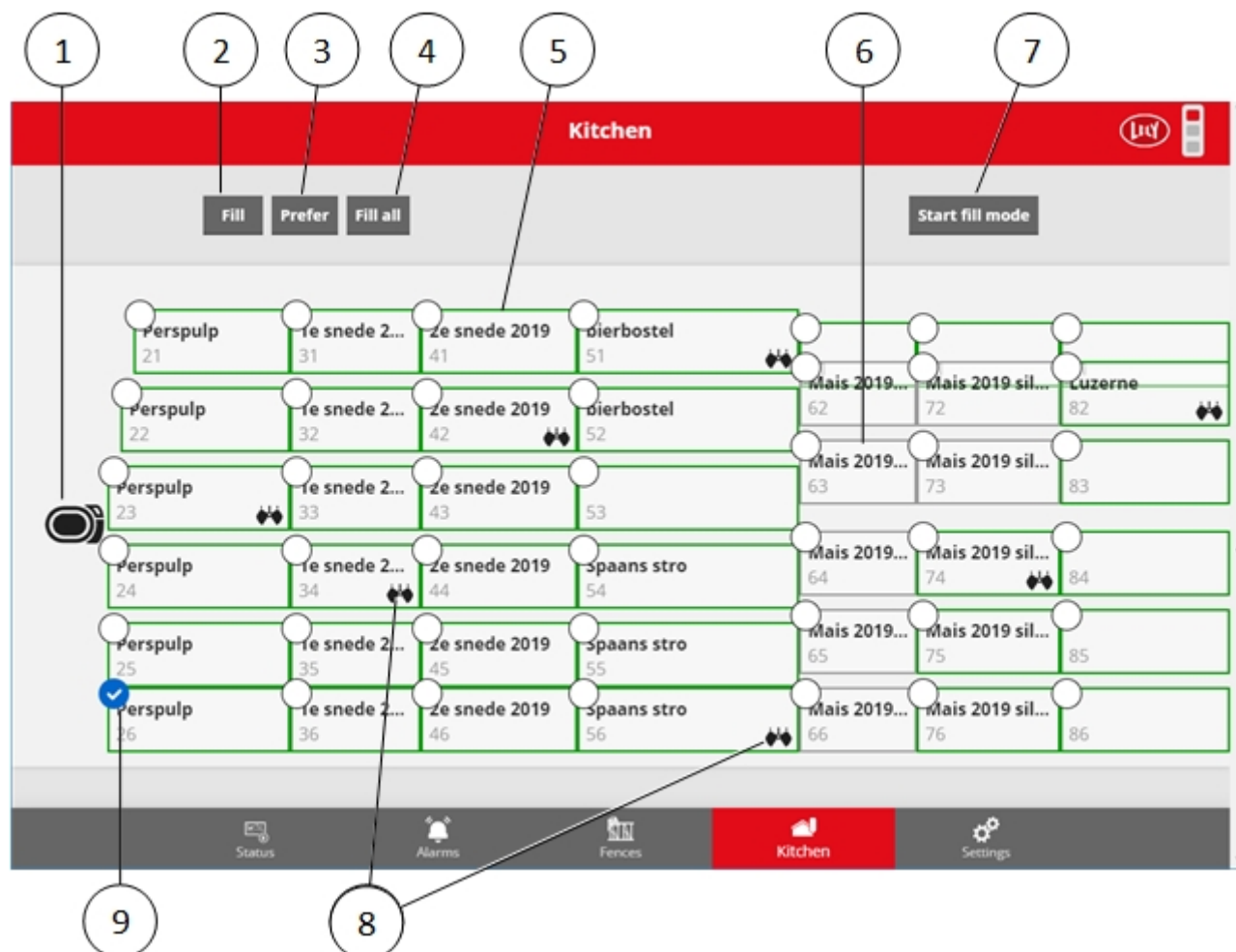
1. Use the WebUI

2. Use the smartphone

### Change the preferred storage place with the WebUI

1. Start the WebUI (see page 5-16).

2. Push the button  **Kitchen**.



5.2011.8607.0 D


Figure 51. 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

3. Click on the feed storage place.


When a block is selected a check mark appears .

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

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

The preferred block can also be set in Horizon on the tab of the Feed Kitchen.

### Change the preferred storage place with the Smartphone




1. Connect the smartphone to the Feed Controller.
2. Select the page **Feed kitchen** > **Storage places**.
3. Select the feed storage place.
4. Push button  **Prefer**  
Per feed type only one feed storage place can be the preferred one.

### 5.5.3 Fill the Additives Dispenser (freq. pulse)

1. Remove the lid from the dispenser.
2. Fill the dispenser with a certain amount of minerals or other additives.
3. Close the lid.
4. Calibrate the additives dispenser if a new type of additive is used Calibrate the Additives Dispenser (frequency pulse) (see page 6-27). Otherwise calibrate the additives dispenser every month.

### Fill the auger

If the auger was empty, fill the auger:

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Feed Controller.
2. Take the Feed Controller out of Operation.
3. Go to the page **Service** > **FreqCon Pulse** > **Test FreqCon Pulse**.
4. Push   
A window appears with the number of the dispenser.
5. Push the white box that displays the number, set the number and push OK.
6. Push button  **PREFILL** to start the motor and fill the pipe.
7. Wait until additives fall from the drop pipe and the auger is filled.
8. Push button  **PREFILL** to stop the motor.
9. Put the Feed Controller in operation.

## 5.5.4 Enter the Feed Kitchen



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 fence 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**.

### 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 5-4).
2. Open the door or gate of the feed kitchen.

### Activate the Feed Kitchen

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

## 5.5.5 Open the Safety Fence Net

1. Take the Feed Kitchen out of Operation (see procedure).
2. Turn the winch (2) to release the tension on the net. Turn until the net connector (4) no longer moves.
3. Use the handles (3) to lift and unhook the net.
4. Drag the net to the side and prevent that vehicles drive over the net.

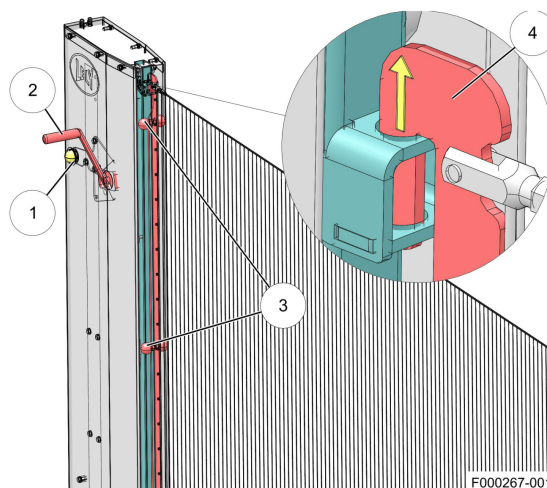


Figure 52. Open the safety net

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

## 5.5.6 Close the Safety Fence Net

1. Use the handles (3) (see figure 52 on page 5-30) to lift and hook the net connector (4) to the tensioner pole.
2. Turn the winch (2) to put tension on the net. Turn until the light (1) is off and stop turning. You can now put the feed kitchen in operation.



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.

If for any reason the tension on the net 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 net until the light goes off.

It is possible to put the Vector 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 net	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

## 5.6 Start a Feed or Scan Task Manually

After all Vector setting are made in Horizon for automatic operation, it is also possible to start manual tasks with the Feed Controller software.

Horizon settings necessary for the Vector 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.

### 5.6.1 Start a Feed Task Manually with the WebUI

1. Start the WebUI (see page 5-16).



2. Push the button **Fences**.
3. Push the button **Add a task** (1).

Fences	Last scan	Minimum	Scanned
mk2 dorp hek1	14:18	110	28
mk4 mais hek 2	10:52	60	117
Far Mais hek 4	14:18	30	12
Inactive			
mk1 dorp hek 2	07:26	120	115
Opst dorp hek 3	07:26	60	135

Figure 53. Page Fences

KEY: 1. Button add a task - 2. Button to view the manually set tasks - 3. Scan information of the fence

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. Push the button **Add feed task** (3). All tasks are shown in the order of execution.

Fences	Last scan	Minimum	Scanned
<input type="radio"/> mk4 mais hek 2	10:52	60	117
<input checked="" type="radio"/> mk2 mais hek 3	10:52	110	211
<input type="radio"/> Sep mais hek 1	10:52	20	202

Figure 54. 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 Mixing and Feeding Robot is in operation and connected to the charger under the feed loading point, the PDB (Feed Controller) is in operation and the feed kitchen is 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.

### 5.6.2 Start a Feed Task Manually with the Smartphone

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Feed Controller.
2. Go to the page **Manual tasks**.
3. Push button  **Feed**.
4. If more than 1 route is available:  
Use the buttons  and  and push  **Select** to select a route.  
A page appears with the fences with animals on the route.
5. Use the buttons  and  and push  **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 feedsection on the route with the same ration.  
The fences that can not be combined have - - signs behind them.
7. When all fences are added, push  **Done**  
All tasks are shown in the order of execution.


The tasks start when the Mixing and Feeding Robot is in operation and connected to the charger 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.

### 5.6.3 Start a Scan Task Manually with the WebUI


1. Start the WebUI (see page 5-16).



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






The tasks start when the Mixing and Feeding Robot is in operation and connected to the charger under the feed loading point, the PDB (Feed Controller) is in operation and the feed kitchen is 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.

### 5.6.4 Start a Scan Task Manually with the Smartphone

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Feed Controller.
2. Go to the page **Manual tasks**.

3. Push button  **Scan**.
4. If more than 1 route is available:  
Use the buttons  and  and push  **Select** to select a route.  
The manual task is shown on the page.
5. Push  **Done**  
All tasks are shown in the order of execution.

The tasks start when the Mixing and Feeding Robot is in operation and is connected to the charger 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.

## 5.7 Change the Feedstuff in a Feed Storage Place

1. Put the feed kitchen in the fill mode with the console or the smartphone connected to the Feed Controller.
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:
  - If necessary add the new feedstuff to the library
  - On the feed kitchen page click the storage place/block which needs to be changed, and select via the drop down menu the new feedstuff.
  - Remove the old feedstuff from the rations
  - Add the new feedstuff to the rations
  - 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.










## 5.8 Drive the Mixing and Feeding Robot

### 5.8.1 Drive the Mixing and Feeding Robot 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. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.

2. Go to the page **Work**.
3. Push the button  two times to go to the tab **MANUAL DRIVING**.
4. The following message appears on your display: **SAFETY WARNING Manual operation is permitted only with a clear overview of the vehicle. Confirm?**
5. Confirm if you have a clear overview of the Mixing and Feeding Robot.
6. Activate:
  -  [L] to turn right
  -  [R] to turn left
  - [L] and [R] to go straight on
7. Push   to change the direction, if necessary.
8. Use the buttons  and  to adjust the speed, a percentage of the maximum driving speed is displayed.
9. Push  to start, hold it.
10. Release  to stop.

## 5.8.2 Connect the Mixing and Feeding Robot Manually to the Charger



**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.**

To connect the Mixing and Feeding Robot manually to the charger use the page **Work** and see the explanation of the third tab **MANUAL CHARGER** (see Put the Mixing and Feeding Robot In Operation on page 5-2).

## 5.8.3 Lower the Skirt to Clear the Route of Snow



Do not use de-icing salt on the route, only use it when there is no other option. This may cause corrosion and damage the Mixing and Feeding Robot. It is best to use sand.

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

To lower the skirt on the routes outside the barn do the following:

1. Start the WebUI (see page 5-16).



2. Push the button **Settings**.

3. Go to the page **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. Click on the switch at the beginning of the line **Skirt down**, and switch this setting ON, the



switch is now red:

7. Push the button **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 5 – 7 for all route actions outside the barn.

9. Repeat step 4 – 8 for all routes.

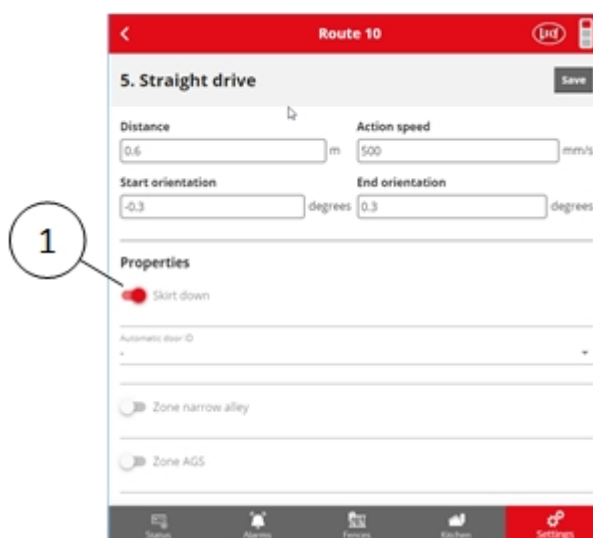


Figure 55. Route detail action page

KEY: 1. Skirt down switch


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 set the switch to OFF, the



switch must be grey



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

## 5.9 Set the Automatic (Barn) Door Control

### Door settings on the MFR software

To use the automatic (barn) door the function of the automatic door must be set to On, on the Mixing and Feeding Robot.

1. Go the page **Settings > Auto. door active**.
2. Select On.

### Set the Automatic (Barn) Door to Automatic Control

1. Turn the switch on the Lely door control box to automatic.  
When the Mixing and Feeding Robot wants to pass: the software will open the door and send a message to the Feeding Robot that the door is open when the Lely switch senses that the door is open.
2. Release or activate the door control, see the manual of the supplier of your automatic door.

### Set the Automatic (Barn) Door Continuously Open



If the automatic door must be opened continuously, you must first open the door manually. After that the Lely automatic door must be set to manual with the switch see procedure below.

1. Manually set the automatic door continuously open, see the manual of the supplier of your automatic door.
2. Turn the switch on the Lely door control box to manual.  
The software will no longer monitor the Lely door switch, but sends a message to the Mixing and Feeding Robot that the door is open when the Feeding Robot wants to pass.



To prevent communication alarms with the door, you can also disable the door in the software of the Mixing and Feeding Robot, on the page **Settings > Auto. door active**.

## 5.10 Change 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 type of feed, 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 flow, but that can be different from the actual flow. Make sure that the ration is safe to feed to the animals for example if too much is loaded by the digital output. 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 message, you must ask your Lely technician to adjust the settings.

## 6 Maintenance Procedures



**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 table shows the preventive maintenance schedule for the Vector. Preventive maintenance must obey all applicable local regulations.



The frequencies of the tasks shown in the table are the minimum frequencies recommended.

Table 1. Maintenance

Task	Day
Examine the stock (see Examine the Stock on page 6-23)	1
Sweep the feed kitchen and remove spilled feed	1
Correct the number of animals in the group see Horizon	1
Examine the Feeding, see reports Horizon	1
Fill the feed kitchen (see Fill the Feed Kitchen on page 5-27)	3 (or more often)
Clean and Inspect the Feed Loading location (see Clean and Inspect the Feed Loading Location on page 6-3)	7
Examine and repair the metal strips (see Examine and Correct the Metal Strips on page 6-15)	7
Clean the feed height sensor on the Mixing and Feeding Robot	7
Clean the ultrasonic sensor (see Clean the Ultrasonic Sensors on page 6-10)	14
Clean the feed height sensor on the Feed Grabber	14

Table 1 Maintenance (cont'd.)

Task	Day
Clean the pipe to the drop pipe of the additives dispenser (frequency pulse) (Option) (see Clean the Drop Pipe of the Additives Dispenser(s) (frequency pulse) on page 6-23)	14
Clean the position sensor of the dosing roll (see Clean the Dosing Roll and Position Sensor on page 6-3)	14
Examine the reports on the Mixing and Feeding Robot Software (see Examine the Reports in the Mixing and Feeding Robot Software on page 6-17)	14
Clean the magnet on the Mixing and Feeding Robot (see Clean the Magnets on page 6-6)	14

Table 2. Maintenance during the year

Task	months
Calibrate the additive dispenser(s) (frequency pulse)(Option) (see Calibrate the Additives Dispenser (frequency pulse) on page 6-27)	1
Examine the mixer knives (see Examine the mixing auger knives on page 6-11)	1
Clean the jaws of the Feed Grabber (see procedure)	1
Clean the I-beam of the Bridge Crane (see Clean the I-beams of the Bridge Crane on page 6-25)	4
Clean the control boxes (see Clean the Control Boxes on page 6-26)	6
Make sure an authorized person approves the Bridge Crane, Feed Grabber and the Lely Vector stepladder yearly	12

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## 6.2 Mixing and Feeding Robot



**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.**



Do not lubricate the nipples on the ball bearings of the dosing roll and the feed door. The Mixing and Feeding Robot has ball bearings on the dosing roll and the feed door with lubrication nipples, but they must not be lubricated.

## 6.2.1 Clean and Inspect the Feed Loading Location



**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. Clean the area near the feed loading position and charger.
2. When the Mixing and Feeding Robot is at the feed loading point, make sure the weight measurement is not influenced and make sure:
  1. The Mixing and Feeding Robot does not lean against any object.
  2. No auger pipes, damaged fences, dugout or other objects lean on the Mixing and Feeding Robot.
3. Clean the floor and the strips that prevent the Mixing and Feeding Robot from rolling backwards out of the charger.

## 6.2.2 Clean the Dosing Roll and Position Sensor



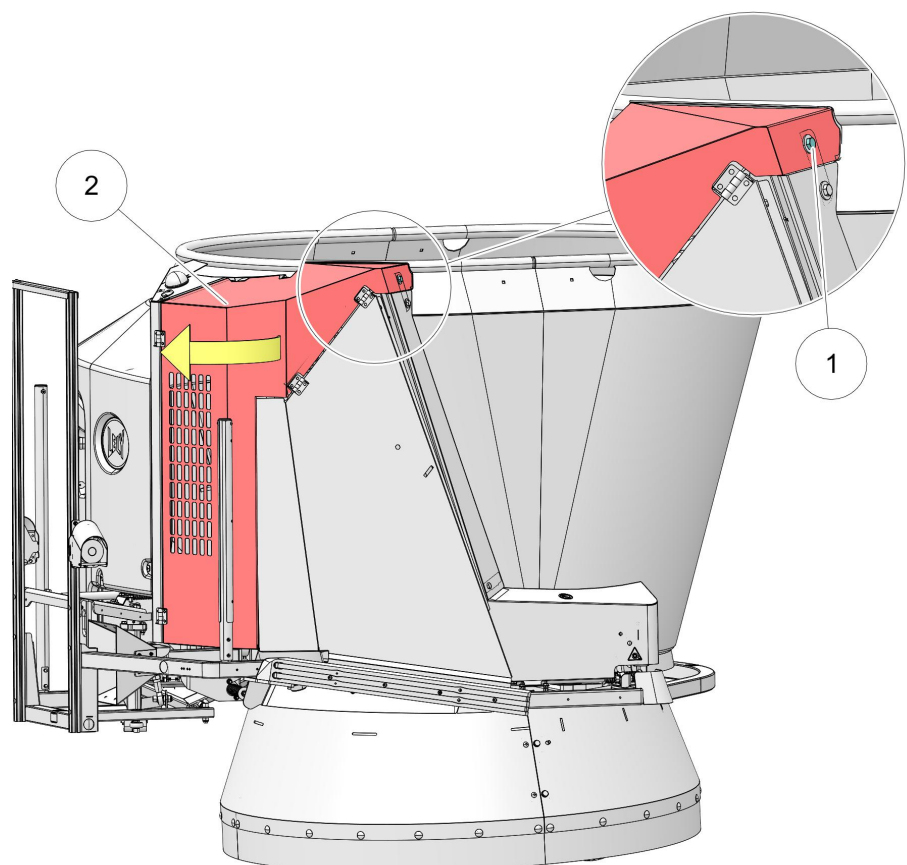
**Electric shock.**  
**Risk of severe injury or death.**  
**Do not use a high pressure cleaner to clean the machine.**  
**Keep doors of the electrical cabinets closed while cleaning the machine.**



**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 2-4).**

## Preparation

1. Switch off the Mixing and Feeding Robot with the key and remove the key (see Switch off the Mixing and Feeding Robot with the Key (MFR 2) on page 5-11).
2. Remove the bolt (1) and open the maintenance door (2) (see figure 56 on page 6-4).



F000156-007

Figure 56. Open the maintenance door

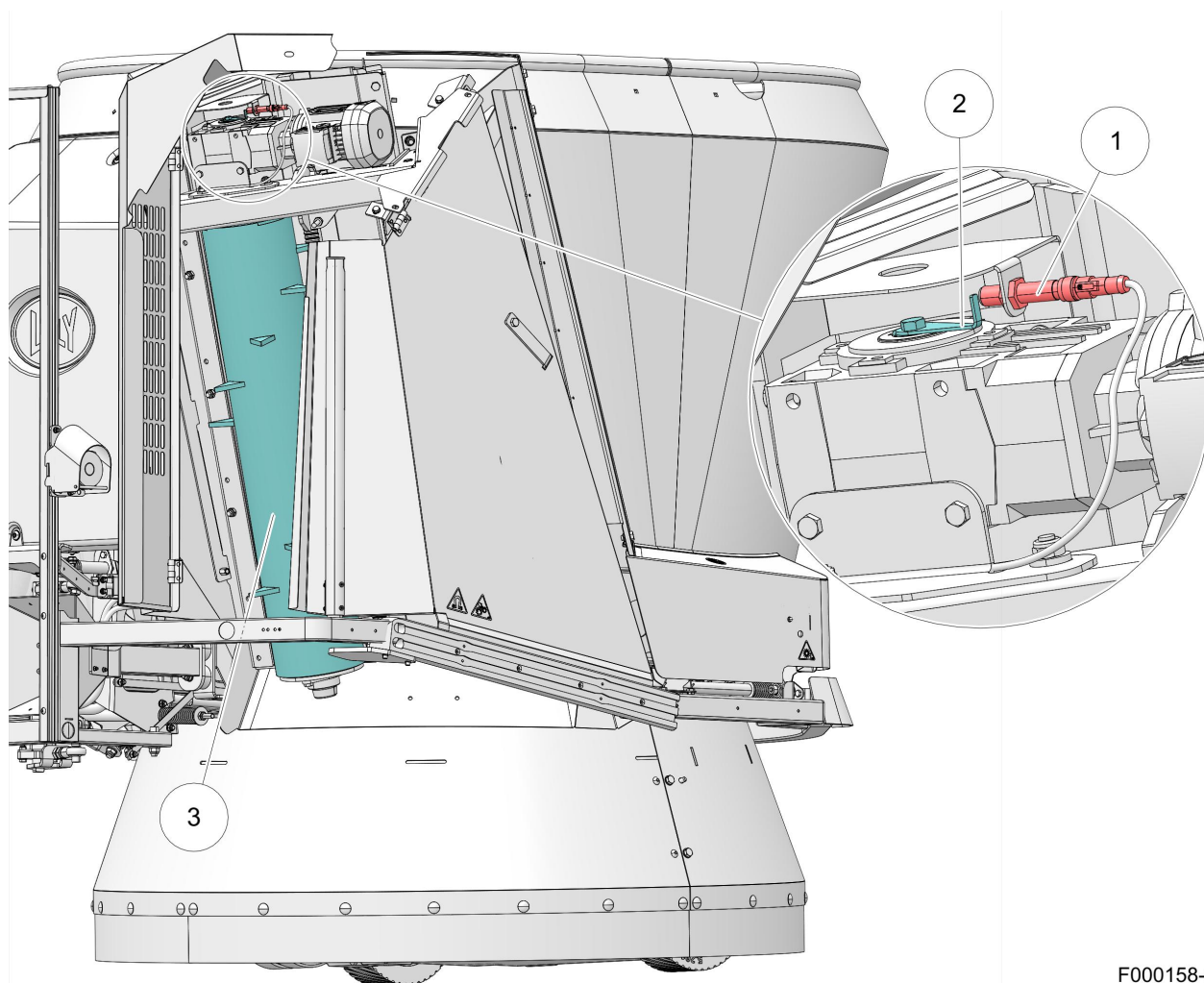
KEY: 1. Bolt - 2. Maintenance door

## Clean



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

1. Carefully remove all feed remains from the dosing roll (3) (see figure 57 on page 6-5).
2. Remove all dirt and fibers between the position sensor (1) and the metal arm (2) on the dosing roll.
3. Remove all dirt in the top area and between the motors.
4. Every two or three months use compressed air to blow all dirt from the motor of the dosing roll and the motor of the feed door.



F000158-003

Figure 57. Dosing roll and position sensor

KEY: 1. Position sensor - 2. Metal arm - 3. Dosing roll

### Close-up

1. Close the door and install the bolt.
2. Switch on the Mixing and Feeding Robot with the key (see Switch on the Mixing and Feeding Robot with the Key on page 5-14).

### 6.2.3 Clean the Magnets



**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.**



**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.**



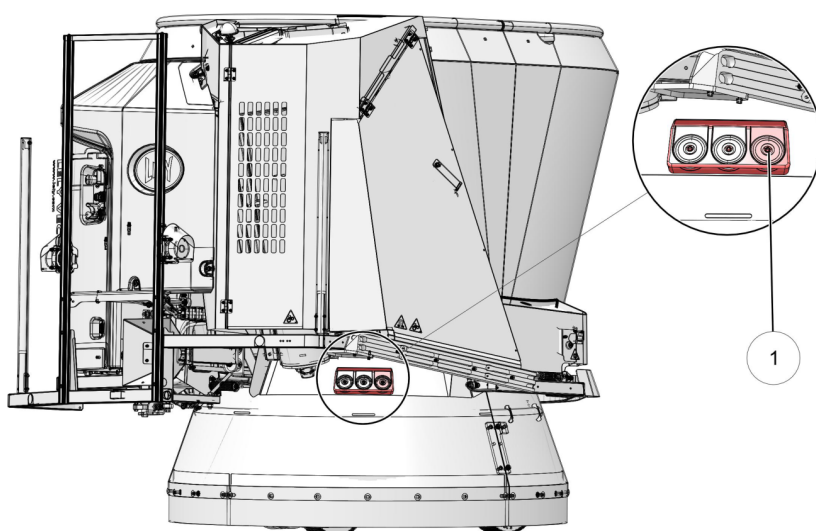
**May contain sharp objects.**  
**Risk of being cut by sharp metal objects.**  
**Wear gloves with a cut resistance according to the standards mentioned in the paragraph 'Cut resistant clothing' (see Cut Resistant Clothing on page 2-4).**

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### Preparation

1. Push the pause button (see figure 41 on page 5-5) once to take the Mixing and Feeding Robot out of operation.

## Clean



F000190-001

Figure 58. Magnets

1. Push all metal parts upwards and remove them from the magnets (1) (see figure 58 on page 6-7).

## Close-up

1. Push the pause button once to put the Mixing and Feeding Robot in operation.

## 6.2.4 Clean the Feed Height Sensor



**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.**

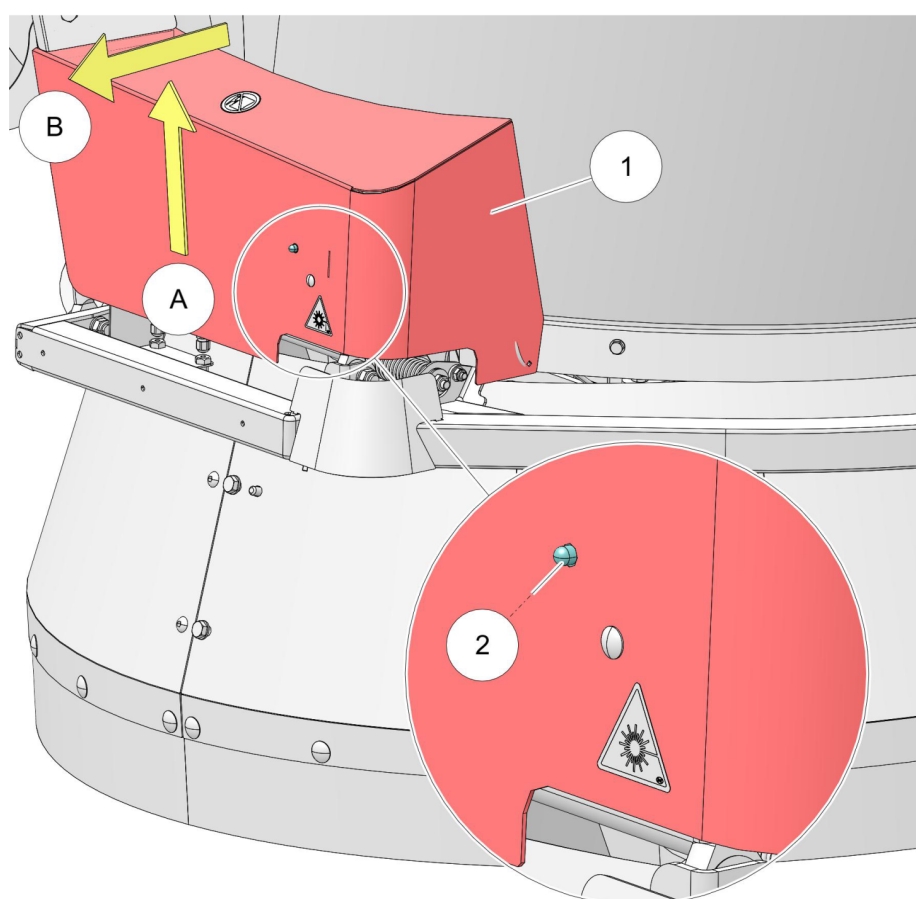




*Laser light.  
Risk of getting blind.  
Do not stare into the beam.*

### Preparation

1. Take the Mixing and Feeding Robot out of operation (see Take the Mixing and Feeding Robot Out of Operation on page 5-5).
2. Push the button (2) (see figure 59 on page 6-8) on the laser cover (1) to release the lock, lift (A) and pull (B) the laser cover.



F000156-011

*Figure 59. Open the laser cover*

KEY: 1. Laser cover - 2. Button

## Clean

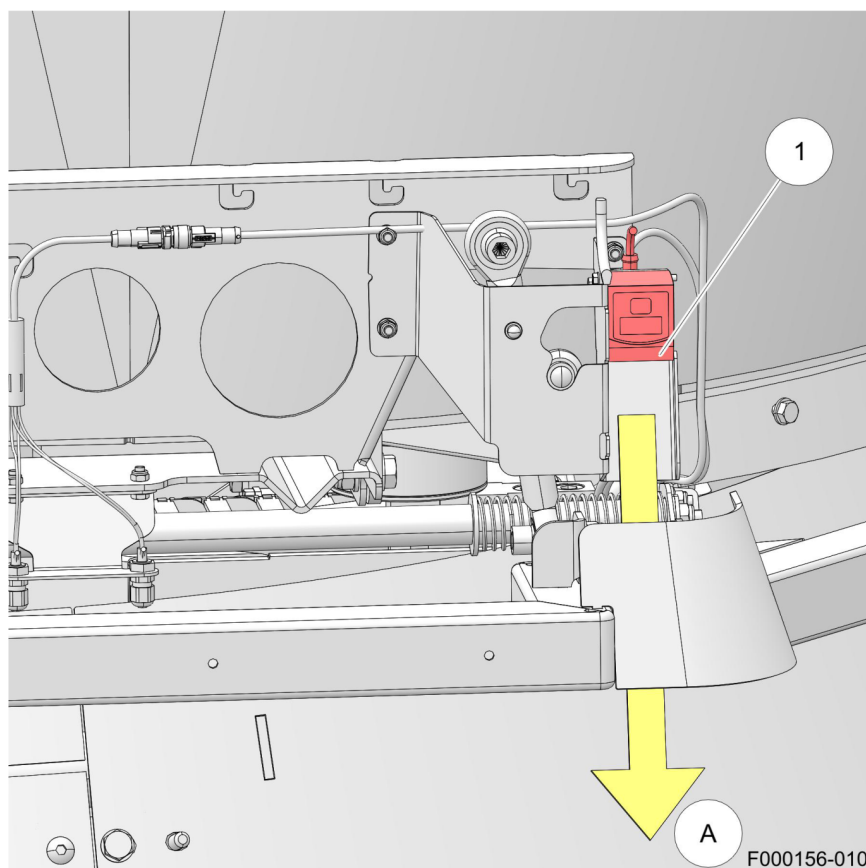


Figure 60. Clean the laser

KEY: 1. Feed height sensor

1. Use a small brush or cloth to remove all dirt and cobwebs under the laser (A) of the feed height sensor (1) (see figure 60 on page 6-9).
2. Use a wet cloth to clean fly droppings and dirt from the glass.

## Close-up

1. Install the laser cover.
2. Put the Mixing and Feeding Robot in operation (see Put the Mixing and Feeding Robot In Operation on page 5-2).

## 6.2.5 Clean the Ultrasonic Sensors



**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.**



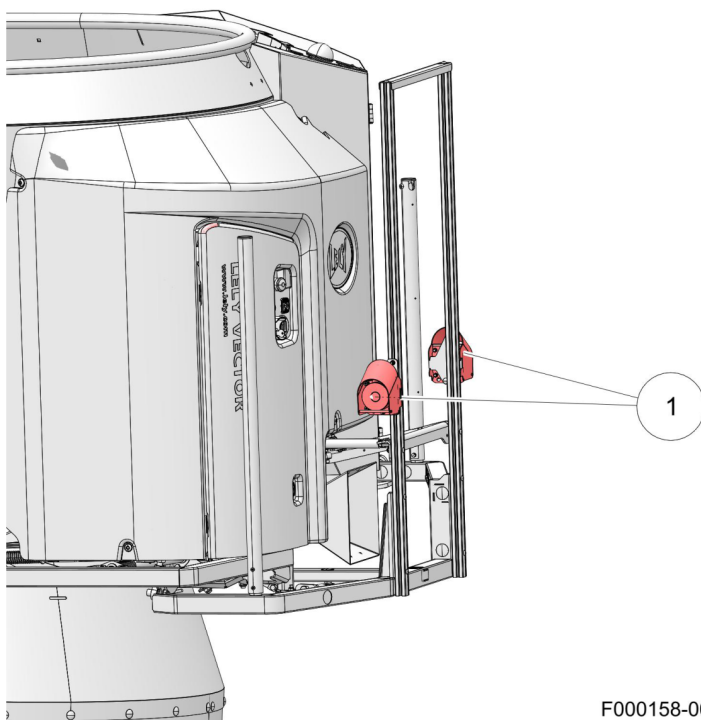
Do not use sharp objects to clean the ultrasonic sensors.

### Preparation

1. Take the Mixing and Feeding Robot out of operation (see Take the Mixing and Feeding Robot Out of Operation on page 5-5).

### Clean

1. Use a wet cloth to remove all dirt from the ultrasonic sensors (1) (see figure 61 on page 6-11).



F000158-007

Figure 61. Ultrasonic sensors

KEY: 1. Ultrasonic sensors

### Close-up

1. Put the Mixing and Feeding Robot in operation (see Put the Mixing and Feeding Robot In Operation on page 5-2).

## 6.2.6 Examine the mixing auger knives



**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.**



**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 stepladder 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.
4. Switch off the MFR with the key, remove the key and take it with you (see Switch off the Mixing and Feeding Robot with the Key (MFR 2) on page 5-11).
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).

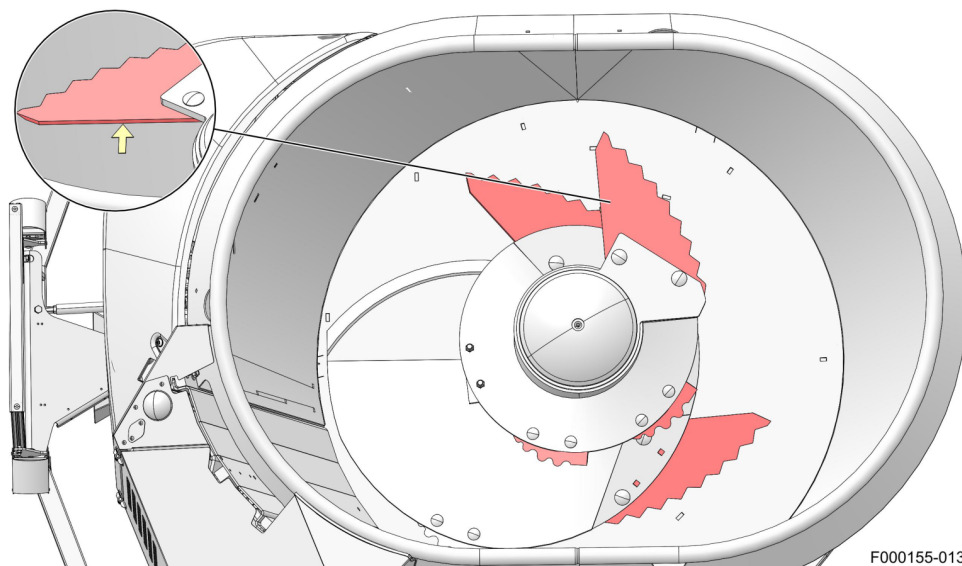


Figure 62. Examine the mixer knives

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. Switch on the Mixing and Feeding Robot with the key (see Switch on the Mixing and Feeding Robot with the Key on page 5-14).

## 6.2.7 Clean the Mixing and Feeding Robot



**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.**





**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.**



**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.

## Preparation

1. Manually drive (see Drive the Mixing and Feeding Robot Manually on page 5-34) the Mixing and Feeding Robot to a clean and level place.

## Empty the mixing bin

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
2. Open the feed door on the page **Test > Testing motors > Feed door**.
3. Push the button .
4. Push  until the feed door is closed.

## Clean

1. Switch off the Mixing and Feeding Robot with the key and remove the key (see Switch off the Mixing and Feeding Robot with the Key (MFR 2) on page 5-11).
2. Use a pitch fork to remove all feed, do not climb into the mixing bin.
3. Clean the outside of the Mixing and Feeding Robot with a wet brush.
4. Clean the inside of the mixing bin with a wet brush or a high pressure cleaner.




The inside and outside of the Mixing and Feeding Robot can also be cleaned with pressurized air.

### Close-up

1. Switch on the Mixing and Feeding Robot with the key.
2. Manually drive and connect the Mixing and Feeding Robot to the charger (see Connect the Mixing and Feeding Robot Manually to the Charger on page 5-35).

### Tare the loadcells

If all feed was removed from the mixing bin and the weight is now a negative value, you must tare the load cells.

1. Go to the page **Settings > Tare loadcell**.
2. Make sure the mixing bin is not moving.
3. Push the button  **TAR**.  
The weight is a few kg.
4. After a feed task is done and the usual remains are in the mixing bin, repeat step 1 - 3 to tar the mixing bin.

## 6.2.8 Examine and Correct the Metal Strips



A metal strip that is not properly attached to the floor and points upwards on one side can severely damage the rubber protection on the inductive sensors.



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

### Examine

1. Examine if all metal strips are installed correctly to the floor.
2. If necessary determine if you must:
  - Turn the strip, and drill new holes in the floor.
  - Replace the metal strip.
3. Do the appropriate procedure below.



Do not use an impact wrench.

If the old strip was shortened, make sure the new strip is shortened at the same length.

If an extra hole was made in the old strip at 35 mm (1.4 in) from the cut part, make a hole with a diameter of 11 mm (0.43 in) in the new strip at the same location.

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 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.

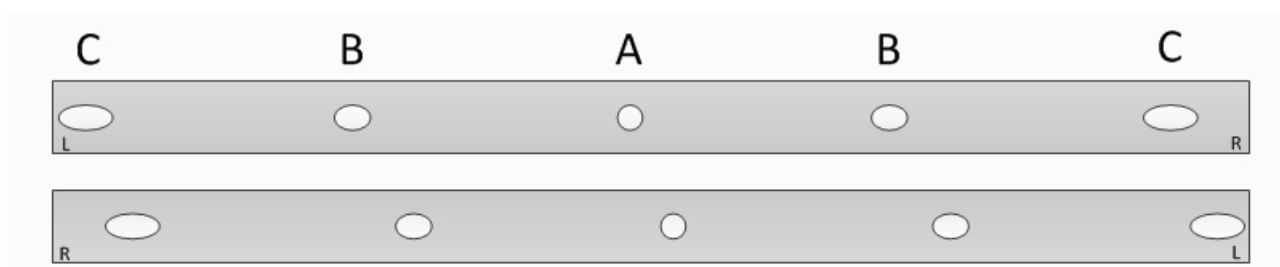


Figure 63. Metal strips

**KEY:**

- A: Round hole
- B: Slotted hole
- C: Slotted hole

L = left; R = Right

### Turn the strip

1. Remove the screws and turn the strip (left side becomes the right side).
2. Drill the holes with a 10 mm drill and >65 mm deep, drill in the in the new center (A) of the strip and in the center of the slotted holes (B) and (C).
3. Clean the floor and holes from drilling waste.
4. Turn the screw (BT 6x65) a bit in the duo plug.
5. Use a hammer to insert the plug and screw through the metal strip. Make sure the top of the plug is level with the concrete.
6. 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.

### Replace the metal strip

1. Remove the screws, plugs and old metal strip.
2. Put the new strip on the floor, make sure the Mixing and Feeding Robot will find the metal strip on the exact same position as the old one.
3. If possible use the old holes.

4. Turn the screw (BT 6x65) a bit in the duo plug.
5. Use a hammer to insert the plug and screw through the metal strip. Make sure the top of the plug is level with the concrete.
6. 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.

### 6.2.9 Examine the Reports in the Mixing and Feeding Robot Software

1. Connect the smart phone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
2. Go to the page **Alarms > Report list**
3. Read the messages of the last few days. If some messages occur more often than should be expected, try to solve the issue or contact your Lely service technician for advise. Examples are messages concerning batteries or a silo.

### 6.2.10 Empty the Mixing Bin and Tare the Load cells



***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.***





Because the mixing bin will never be completely empty after feeding at the end of a location it is best to tare with the amount of feed in the mixing bin that always stays in. Do this procedure when the mixing bin is filled too much and the measured feed weight is zero.

#### Preparation

1. Manually drive (see Drive the Mixing and Feeding Robot Manually on page 5-34) the Mixing and Feeding Robot to a feed fence.

#### Empty the mixing bin



1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
2. Open the feed door on the page **Test > Testing motors > Feed door**.

3. Push  to select the direction and  to start or stop the motor.
4. Start the dosing roll in the correct direction on the page **Test > Testing motors > Dosing roller**.
5. Push  to select the correct turning direction, and  to start or stop the motor.
6. Start the mixer in the correct direction on the page **Test > Testing motors > Mixer**.




To avoid damage to the motor or frequency regulator, do not turn the mixer motor faster than with a frequency of 50 Hz.

---

7. Push  to select the correct turning direction, and  to start or stop the motor.
8. Manually drive along the feed fence.
9. When no more feed comes from the mixing bin:
  1. Stop driving.
  2. Stop the mixer on the page **Test > Testing motors > Mixer**.
  3. Stop the dosing roll on the page **Test > Testing motors > Dosing roller**.
  4. Close the feed door on the page **Test > Testing motors > Feed door**.

Push the button  to select the direction push  until the feed door is closed.

### Tare the loadcells

1. Go to the page **Settings > Tare loadcell**.
2. Make sure the mixing bin is not moving.
3. Push the button  **TAR**.

### Close-up

1. Manually drive and connect the Mixing and Feeding Robot to the charger (see Connect the Mixing and Feeding Robot Manually to the Charger on page 5-35).

## 6.3 Feed Grabber

### 6.3.1 Clean the Feed Height Sensor



**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.**



**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.**



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



**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.

### Preparation

1. Take the Feed Grabber out of operation (see Put the Feed Grabber In Operation on page 5-7).
2. Drive the Feed Grabber to the service location.

### Clean

1. Use a cloth or soft brush to remove all feed, dirt and cobwebs from:
  - The cover (1) (see figure 64 on page 6-20) and the feed height sensor (2).
  - Under or in the field of vision of the laser.
2. Use a wet cloth to remove fly droppings and dirt from the glass of the laser.

### Close-up

1. Put the Feed Grabber in operation (see Put the Feed Grabber In Operation on page 5-7).

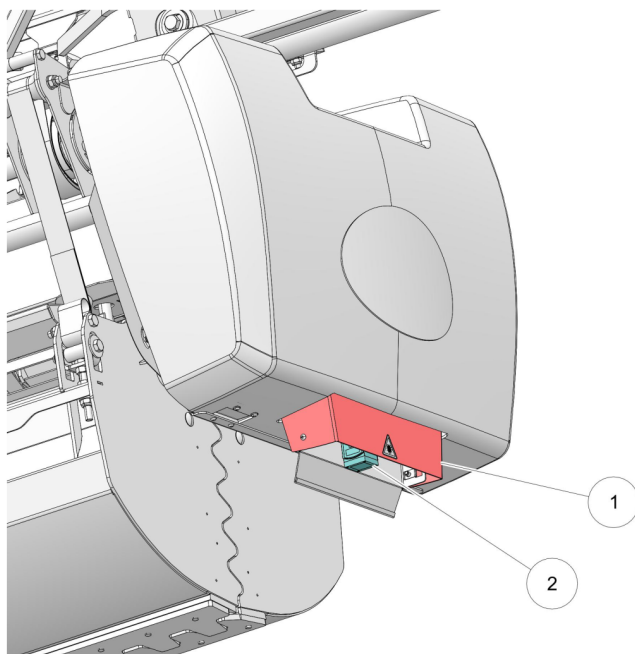


Figure 64. Feed height sensor

KEY: 1. Cover - 2. Laser

### 6.3.2 Clean the Jaws of the Feed Grabber



**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.**



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

#### Preparation

1. Connect the smartphone to the Mixing and Feeding Robot.
2. Manually drive the Mixing and Feeding Robot away from the feed loading point.
3. Push the pause button and switch off the Mixing and Feeding Robot with the key (see procedure).
4. If there are 2 Mixing and Feeding Robots, push the pause button on the second Mixing and Feeding Robot and switch off the Mixing and Feeding Robot with the key.

#### Position the Feed Grabber

1. Take the Feed Grabber out of operation (see procedure).







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.

2. If there is a Bridge Crane present:
  1. Connect the smartphone to the Bridge Crane.
  2. Take the Bridge Crane out of operation (see procedure).
  3. Go to the page **Manual operation > Driving**.
  4. Drive the Bridge Crane to the Y position of the feed loading point.
3. Connect the smartphone to the Feed Grabber.
4. Go to the page **Testing > Test Drive Motor**.

5. Use the buttons  **BACKWARD** or  **FORWARD** to drive the Feed Grabber to the feed loading point.

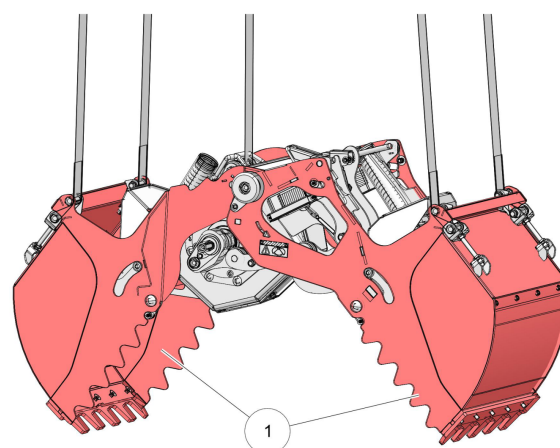


Use the button  to go to the previous menu.

6. Go to the page **Testing > Test Grabber**.
7. Use the buttons  **OPEN** and  **CLOSE** to open or close the grabber  
Open the grabber to a percentage between 60 and 65%.
8. Go to the page **Testing > Test Lift Motor**.
9. Push the button  **DOWN** to lower the grabber to a height where you can easily clean the jaws.

### Clean the grabber

1. Use a (wall) scraper or putty knife to remove all feed remains from the jaws (1). Clean the inside and outside of the jaws.




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Figure 65. Clean the jaws

KEY: 1. Jaws

### Close up

1. Connect the smartphone to the Feed Grabber.
2. Make sure the grabber is still open for 60 – 65%.
3. Go to the page **Testing > Test Lift Motor**.
4. Push the button  **UP** to lift the grabber all the way up.
5. Put the Feed Grabber in operation (see procedure).
6. If present, put the Bridge Crane in operation (see procedure).

7. Switch on the Mixing and Feeding Robot with the Key (see procedure), if present switch on the second Mixing and Feeding Robot.

## 6.4 General Feed Kitchen

### 6.4.1 Examine the Stock

1. Examine the stock of all the feed types, roughage, additives and concentrates.
2. If necessary:
  1. Fill the feed kitchen (see Fill the Feed Kitchen on page 5-27).
  2. Fill the additives dispenser (frequency pulse) (see Fill the Additives Dispenser (freq. pulse) on page 5-29).
  3. Fill the concentrates silo (frequency weight).

### 6.4.2 Examine the Feeding

1. Examine the feed distributed at the feed fence and see if it is well mixed and cut.  
If necessary examine the knives in the Mixing and Feeding Robot or adjust settings in Horizon.  
Ask Lely FMS for more advise about feeding.
2. Examine the feeding in the Horizon reports.  
If necessary adjust the settings in Horizon for example:
  - Proportions in a ration
  - Scan interval
  - In between and post mixing times
  - Loading order
  - Dosing weight

### 6.4.3 Clean the Drop Pipe of the Additives Dispenser(s) (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.**

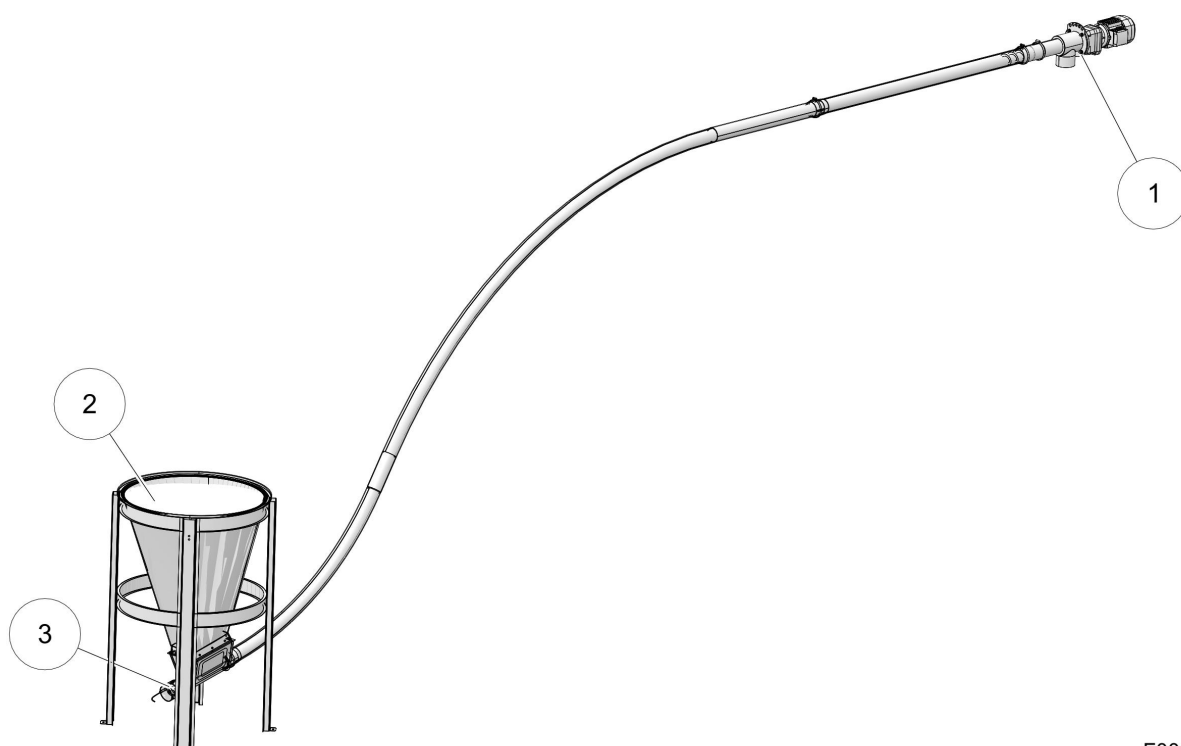
**Take the MFRs out of operation and turn them off with the service key if no emergency zone settings or kitchen point settings have been set and are active.**

### Preparation

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
2. If necessary Manually drive (see Drive the Mixing and Feeding Robot Manually on page 5-34) the Mixing and Feeding Robot away from the drop pipe.
3. Switch off the Mixing and Feeding Robot with the key (see Switch off the Mixing and Feeding Robot with the Key (MFR 2) on page 5-11).
4. If there are 2 Mixing and Feeding Robots, make sure the Mixing and Feeding Robot is not blocking the return way of the other Mixing and Feeding Robot.

### Clean

1. Use a stick to remove feed from the inside of the drop pipe (1) of the additives dispenser(s) (frequency pulse).



F000151-002

Figure 66. Clean the drop pipe of the additives dispenser (frequency pulse)

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

### Close-up

1. Switch on the Mixing and Feeding Robot with the key (see Switch on the Mixing and Feeding Robot with the Key on page 5-14).
2. Manually drive and connect the Mixing and Feeding Robot to the charger (see Connect the Mixing and Feeding Robot Manually to the Charger on page 5-35).
3. Put the Mixing and Feeding Robot in operation (see Put the Mixing and Feeding Robot In Operation on page 5-2).

## 6.4.4 Clean the I-beams of the Bridge Crane



**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.**



**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.**



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.

### Preparation

1. Take the Feed Kitchen out of Operation (see Put the feed kitchen in the filling mode with the console on page 5-4).
2. Put the Vector stepladder under the I-beam.

### Clean

1. Climb on the Vector stepladder.
2. Use a dry brush to clean the I-beam.
3. Climb down and move the ladder to the next part of the I-beam.
4. Repeat step 1 - 4 until both I-beams are clean.

### Close-up

1. Remove the Vector stepladder from the feed kitchen.
2. Put the feed kitchen in operation (see Put the Feed Kitchen in Operation on page 5-1).

## 6.4.5 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.**



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**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.**



To prevent corrosion all control boxes that are covered by or have contact with minerals and concentrates must be cleaned regularly.



Clean the master and slave control box of the Bridge Crane during the procedure Clean the I-beam (see Clean the I-beams of the Bridge Crane on page 6-25) and use the Lely step ladder.

1. Use a wet cloth to clean all control boxes in the green and yellow zone.

#### 6.4.6 Calibrate the Additives Dispenser (frequency pulse)

Calibrate the additives dispenser (frequency pulse):

- When you start with a new type of additive.
- After the weather or humidity has changed.
- When you notice a change in the coarseness of a new badge.
- Once a month.

#### Tools



1. Bucket for 3 to 6 kg (6.6 to 13 lb).
2. Scale with an accuracy in grams.

#### Preparation

1. Take the Feed Kitchen out of Operation (see Put the feed kitchen in the filling mode with the console on page 5-4).
2. To make sure the Mixing and Feeding Robot does not return during calibration, switch off the Mixing and Feeding Robot with the key (see Switch off the Mixing and Feeding Robot with the Key (MFR 2) on page 5-11).

#### Calibrate

1. 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 (freq. pulse) on page 5-29).
2. Hold a clean bucket under the drop pipe.
3. Connect the smartphone to the Feed Controller.
4. Go to the page **Service > FreqCon Pulse > Test FreqCon Pulse**.
5. Select **Calibrate bin**.
6. Select **Bin** and set the number of the bin you want to calibrate.

7. 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
8. Push the button  to start calibration.
9. Wait until the spring auger has made 60 turns and stops.
10. Tare the bucket and weigh the additive in the bucket.
11. A text box is displayed **Enter calibration weight:**.
12. Enter the weight of the additive.
13. An info screen shows the calibrated gram per pulse and time per pulse. If **gr/pulse** is zero and a message **calibration failed** 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 your 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.
14. Push the button  to exit the info screen.



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.

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### Close-up

1. Put the feed kitchen in operation (see Put the Feed Kitchen in Operation on page 5-1).

## 7 Troubleshooting

If there is an alarm, view the alarms in the web page (see View the Alarm List on the Web Page on page 5-18). This chapter has a troubleshooting table with some specific problems for the Mixing and Feeding Robot and for the Feed Grabber.

For problems with grabbing feed due to feed type settings more information can be found in the Horizon manual.

### 7.1 Restart the System after an Alarm

You can either use the WebUI or the smartphone to reset alarms on the Feed Controller software.

#### Restart the System with the WebUI

1. Start the WebUI (see page 5-16).





2. Push 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 Troubleshooting to see what actions should be taken to remove the alarm.
5. If there is an accept button behind the alarm message, push **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**.


Depending on the location of the alarm see:

- If the alarm is on the Mixing and Feeding Robot, Feed Grabber or Bridge Crane: (see page 7-2)
- If the Mixing and Feeding Robot gives the alarm that the automatic (barn) door is in error state: (see page 7-2)
- If the alarm is on the additives dispenser (frequency pulse) (see page 7-2)




#### Restart the system with the smartphone

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Feed Controller.
2. If there is an alarm on the Feed Controller it is shown on the display.
3. Read the alarm message, if necessary go to chapter Troubleshooting to see what actions should be taken to remove the cause of the alarm.
4. Push  to confirm the alarm message.
5. If there is an alarm on another device go to the page **Alarms > Active alarms**.
6. Check on which device the alarm is generated.
7. Push . If necessary go to chapter Troubleshooting to see what actions should be taken to remove the cause of the alarm.


### If the alarm is on the Mixing and Feeding Robot, Feed Grabber or Bridge Crane:

1. Start the Lely control app and connect the smartphone to the software of the device.
2. Read the alarm message, if necessary go to chapter Troubleshooting to see what actions should be taken to remove the cause of the alarm.
3. Push  to confirm the alarm message.




### If the Mixing and Feeding Robot gives the alarm that the automatic (barn) door is in error state:

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 of the door as follows:
4. If the Mixing and Feeding Robot gives the alarm that the automatic (barn) door is in error state:
  1. Close the door if it was opened
  2. Open the door if it was closed
  3. If this does not work, reboot the system by switching the power OFF for a few seconds and ON again.
5. Start the Lely control app and connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
6. Push  to confirm the alarm message.
7. Test the operation of the automatic (barn) door when operated from the Mixing and feeding Robot as follows:
  1. Manually drive the Mixing and Feeding Robot to the automatic door until it is within Bluetooth range.
  2. Go to the page **Test > Auto. door.**
  3. Push the button  to open the door, or  to close the door.  
If this does not work you can test if it is possible to open and close the door with the barn door software:  
Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Automatic (barn) door.
  4. Go to the page **Testing.**
  5. Push the button **Open** or **Close.**
  6. If this does not work ask your Lely service technician for advice.

### If the alarm is on the additives dispenser (frequency pulse)


1. Make sure the bin is not empty and the transport pipe is not clogged up.
2. Connect the smartphone to the Feed Controller.
3. Go to the page **Alarms > Active alarms.**
4. Push the button  **ACCEPT.**

## 5. Test the additive dispenser (frequency pulse), go to the page **Service > FreqCon Pulse > Test FreqCon Pulse**

1. Push .  
A window appears with the number of the dispenser.
2. Push the white box that displays the number, set the number and push OK.
3. Push  and .  
A window appears with the weight.
4. Push the white box that displays the weight, set the weight and push OK.



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

5. Push .  
The set additive dispenser (frequency pulse) will operate and dose the set weight of the additive.  
During operation check if the light of the sensor 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 6-27).

### If necessary reset the MOD alarm

1. If necessary reset the MODalarm (see Reset alarms on the MODalarm on page 5-23).

## 7.2 Troubleshooting Table

Explanation of the fields in the troubleshooting table:

Number of the alarm shown on the webpage and 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.

MFR = abbreviation of Mixing and Feeding Robot in the following tables.

1608 Kitchen empty (<P1>)		
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 and/or set the cleaning level. Keep in mind that changing the cleaning level can change the capacity of the system.	Fill the kitchen storage places and also check the stock of the other feed types. It is advisable to fill all the storage places in the kitchen completely and not fill it partially. Also fill the kitchen when the Vector system has been out of operation for a while (alarm or maintenance).
Storage places are not set to filled again	Solution:	Preventive measure:
In normal situations all storage places are set to filled again after using the filling mode, but if for some reason the filling mode is not used, than the filling places must be set to filled manually.	Set the storage places to filled again: connect the smartphone to the Feed Controller, go to <b>Fill kitchen &gt; Storage places</b> and select <b>FILL ALL</b> . This can also be set in Horizon.	Use the filling mode as much as possible.
3C64 Bumper activated (R <P1> A <P2>)		
Unstable bumper	Solution:	Preventive measure:
When one of the bumper springs is already under tension (a bent spring, bumper does not hang straight) the bumper is rapidly losing its stable center point. This will make the bumper more sensitive for cattle and feed to activate it.	Feel if there is a distinct neutral point when moving the bumper, if this is absent check for bent springs or attachment points that are not supported by a spring (where the bumper is floating and not resting on the spring).	Contact your Lely Center to replace springs and/or adjust bumper attachment points.
MFR lost its path	Solution:	Preventive measure:
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: <ul style="list-style-type: none"> <li>When it crosses the feed alley: Feed or flies influencing the ultrasound sensor, misalignment of the</li> </ul>	Clean the ultrasound sensors and the area around them, check the alignment of the sensors. Manually drive the MFR back at the correct distance from the feed fence and parallel to the feed fence. When needed check in the test menu if the feed fence is seen at the correct distance. Resume the route.	<ul style="list-style-type: none"> <li>Prevent feed from falling on the sensors during loading (use a dugout ) and prevent overfilling the bin (reduce the max load of that ration).</li> </ul>

ultrasound sensor (bent backwards or up/down).		
<ul style="list-style-type: none"> <li>A lot of feed at the end of a feed fence can push an MFR outwards, this may influence the next route action(s)</li> </ul>		<ul style="list-style-type: none"> <li>Prevent excessive build up of (rest) feed. Stop the dosing earlier (only done by service technicians) or remove the feed regularly.</li> </ul>
<ul style="list-style-type: none"> <li>Missed reset point</li> </ul> <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 and perpendicular to the driving direction. Preferably not more than 30 degree but certainly not at a 45 degree angle or bigger. If there is a lot of feed on top of the reset strip it could be that the MFR is pushed to the middle and miss the strip. Wet dirt or ice on the sensors or strips influences the measurement. Misalignment of the sensors will make them unreliable.</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. Clean the inductive sensor unit and make sure there is no metal under it.</p>	<p>Clean the sensor unit, make sure the height adjustment of sensor bracket is correct. Ask your Lely Center to check if sensors are positioned correctly in their bag (not pushed upward). 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:
<p>When feed dosed from the bin cannot fall freely on the feed alley, there can be a buildup around the dosing roller that eventually can push the whole bumper outwards.</p>	<p>Clear the feed under the dosing roller (see Clean the Dosing Roll and Position Sensor on page 6-3) and resume the route.</p>	<p>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, Consider to ask your Lely Center to adjust the route to allow more space for the feed to fall (drive at a larger distance from the feed fence).</p>

Cattle	Solution:	Preventive measure:
Cows or bulls have pushed the bumper.	Resume the route.	<p>Ask Lely Center to optimise routes to:</p> <ul style="list-style-type: none"> <li>• Minimise driving forwards toward the feed fence</li> <li>• Prevent driving close past bulls etc</li> <li>• Make sure there is sufficient clearance between the MFR and the feed fence or the cattle</li> </ul> <p>Consider using the optional electric bumper protection.</p>
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 and 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 and resume the route	Consider marking the route of the MFR so it is clear for visitors where not park vehicles or store material.
3CCC No initial Feed Flow was detected (<P1>)		
No feed falls in the MFR from the digital output dispenser	Solution:	Preventive measure:
<p>Via a digital output (relay circuit board on PDB circuit board) a wide variety of dispensers can be controlled, ranging from a water valve to a tower silo and conveyor belt system. To cater for all these different technologies there are settings to generate an alarm when problems or blockages are assumed and to prevent damage. When no start of a feed flow has been detected within a set time (margin) the alarm no initial feed flow will be generated. (Info: A start of a feed flow is recognised by the MFR if there is 10 kgs increase in weight or a constant flow of more than 350g/s for 3 seconds.)</p>	<p>Find the fault why the dispenser has not started to dose feed in the MFR, check:</p> <ul style="list-style-type: none"> <li>• If the system is powered</li> <li>• If the storage is empty</li> <li>• If there is a blockage of augers, loaders or transport system</li> </ul> <p>Fix the fault and resume the feeding task on the MFR.</p>	

The dispenser has not started dumping feed in the MFR before the set start up margin	Solution:	Preventive measure:
The settings <b>Startup delay</b> and <b>Startup margin</b> must both be set correctly, for filled and near empty dispensers.	Resume feeding task on MFR, but if no changes are made to the settings the alarm will occur again.	Ask your Lely Center 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, because the alarm is there for a reason. 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.

160D Crane alarm (<P1>)		
The Bridge Crane has an alarm, this alarm is generated on the Feed Grabber	Solution:	Preventive measure:
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.

3C7F Grab request not accepted by FG within 5 minutes		
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 5 minutes to execute it. The Feed Grabber may be out of operation because it has not started up (no power) or autostart has failed. The Feed Grabber can not start automatically when the grabber is closed, 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. Check 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>It is also possible to change priorities of storage places from the PDB user interface and from Horizon. When using that setting in the Feed Controller, you do not have to put the Feed Grabber back in operation after changing the priorities. Use the setting <b>Max kitchen time</b> to receive an alarm when the kitchen is not put in operation after filling of the kitchen.</p>
No communication between MFR and Feed Grabber	Solution:	Preventive measure:
<p>A reliable bluetooth connection between MFR and Feed Grabber is necessary.</p>	<p>Ask you Lely Center to check the reliability and path of the bluetooth communication between the MFR 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.</p>	<p>If necessary consider relocating antennas or adding nodes to the network.</p>

3DBC No initial Feed Flow was detected		
See alarm 3CCC	Solution:	Preventive measure:
This is the non critical version of alarm 3CCC, so the MFR will have continued without this feed type, problems and solutions are similar.		

3C76 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 the loading of the feed the MFR checks if there is main power available to turn the mixer. When no power is detected, this can be caused by:</p> <ul style="list-style-type: none"> <li>• Power is present at the charge pole, but not in the MFR</li> <li>• No power on the charge pole</li> </ul>	<p>Check if MFR is properly engaged with the charge pole, reconnect if necessary.</p> <p>Check if power is reaching the charge pole and if the circuit breaker of the charger in the Power Distribution Box is still on, the kitchen relay needs to be activated for this (if it is not, the white light in the play button on the kitchen console will be on or blink).</p> <p>Ask your Lely center to check if the connectors on the charge pole and/or on the MFR are worn.</p>	<p>When the MFR often loses connection during loading of feed, check the condition of the plastic strip on the floor, this prevents the MFR from rolling back. Also a pile of feed built up under the wheels can make the plastic strip useless. Regularly clean this area.</p>

3C03 No reset point detected (R <P1> A <P2>)		
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 incorrect, 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.</p>	<p>Ask your Lely Center 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 reduce the length of that route action.</p> <p>Beware: Always write down the initial values before you make changes.</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. Maybe the length of the route action has been altered or affected because of other changes in the route. A wheel diameter that is set too high will also cause this type of problem.</p>	<p>Manually drive the MFR forwards to just before the reset strip and resume the route.</p>	<p>Improve the conditions for the MFR (clean surface, check the condition/tread of wheels). Ask your Lely Center to adjust wheel diameter when necessary:</p> <ul style="list-style-type: none"> <li>• When the MFR always looks too early for the reset points: decrease wheel diameter</li> <li>• When the MFR only looks too early on one route action: increase the length of that route action.</li> </ul>
Reset strip not recognised	Solution:	Preventive measure:
<p>To recognise a reset point as such, the MFR needs to detect a big enough change in magnetic field of both inductive sensors. If the sensor already detects a field when there is no strip this will decrease the sensitivity, equally so when the sensor does not detect enough magnetic field when there is steel under it. If one sensor detects the steel long before the other sensor does, the MFR may not see it as a reset point. Reset strips should be as close as possible and perpendicular to the driving direction. Preferably not more than 30 degree but certainly not at a 45 degree angle or bigger. If there is a lot of feed on top of the reset strip it is possible that the MFR is pushed to the middle and miss the strip. Wet dirt or ice on the sensors or strips influences the measurement and Misalignment of the sensors will make them unreliable.</p>	<p>Manually put the MFR just before the reset strip and resume the route. If it does not find the reset point look in <b>Test &gt; Test sensors &gt; inductive sensors</b>. When no steel is present the ADC value should be significantly higher than 700. If it is lower the sensor(housing) may be full of conductive dirt (wet), influenced by foreign steel objects or water in the housing. When a (steel) reset strip is under the sensor the ADC value should be significantly lower than 200, preferably around 80. If it is higher the sensor may be adjusted too high, the sensor may have become dislodged in the sensor housing or defective. A reset strip should be perpendicular (as much as possible) to the driving direction to prevent a confusing signal given by the set of sensors.</p>	<p>Put reset strips perpendicular to the driving direction, clean sensors and keep them well adjusted.</p>

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 <b>Max MFR load time</b> .	Set the loading time using the rule of thumb and adjust it when necessary.
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 2 types: retries on weight estimation and retries on grabber opening. Once known which retry is causing the delay check 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"> <li>• The feed blocks are placed in the center of their storage location</li> <li>• There are no overhanging blocks</li> <li>• Slopes created by Feed Grabber grabbing in loose product like corn or beet pulp is prevented</li> </ul>	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 Lely Center.
The Feed Grabber is not in operation	Solution:	Preventive measure:
If the Feed Grabber is out of operation or in alarm state this caused the delay.	Clear the alarm and or put the Feed Grabber in operation again	
Grabber grabs structurally to high because of fine dirt on the glass of the feed height sensor	Solution:	Preventive measure:
Fine dust or fly droppings on the glass will affect the measurement slightly, causing the Feed Grabber to grab to high or even in the air.	Clean the feed height sensor on the Feed Grabber.	Regularly clean the glass with a soft cloth and/or wet cloth. Especially in a dusty kitchen.

A702 MFR too long in dosing state (<P1> minutes)		
Wrong time setting	Solution:	Preventive measure:
The MFR dosing/driving time takes longer than the set timeout time.	Drive and feed on the largest route with the largest feed location, time it and add half of the time to it. Set this time value to the setting <b>Max MFR dose time</b> .	Set the dosing time using the rule of thumb and adjust it when necessary.
Bumper is activated many times	Solution:	Preventive measure:
If the bumper of the MFR is activated many times by e.g. cows/bulls it takes too long before the MFR is back in the feed kitchen.	Add some time to the set <b>Max MFR dose time</b> .	Set the dosing time using the rule of thumb and adjust it when necessary. Consider to install the optional electric bumper protection on the MFR, for information ask the Lely Center. If possible make the feeding distance between the fence and the MFR a little bit wider.
The MFR did not return from the route	Solution:	Preventive measure:
The MFR is in alarm outside the range of the PDB bluetooth connection. It has for instance driven into an obstacle and is stuck in the route.	Solve and reset the alarm and resume the route.	Extending the range of the PDB by adding repeater nodes so the initial alarm is immediately forwarded to the farmer and rapid action can be taken.

3C66 MFR lost strip (R <P1> A <P2>)		
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). 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 reverse the MFR to a position some distance before the reset point and resume route.</p>	<p>Ask the Lely Center 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. Using Auto wheel diameter is advised but even then a route can have become corrupt over time by many changes and new actions added with different (often inaccurate diameters) over time. Adjust the wheel diameter and increase it when the MFR is structurally too late in looking for the reset points. When it only involves one action reduce the length of that action. Beware: Always write down the initial values</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 centered on the strip anymore, this enables the MFR to react fast enough when following a bend. If the sensors are too close to the strip the MFR will respond much later. Also if there is some play in the chains the response of the MFR is late. Slip or sideways force (gravity when driving on a slope or a castor wheel not turning freely) will make matters worse. Feed caught under the MFR is also a possible cause.</p>	<p>Manually put the MFR back on the strip and resume the route. Check if the MFR is free to turn left and right, remove feed from underneath the skirt if present.</p>	<p>Ask your Lely Center for advice. 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>

<b>3C65 MFR cannot find strip (R &lt;P1&gt; A &lt;P2&gt;)</b>		
MFR cannot find the strip while turning.	Solution:	Preventive measure:
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.	Check 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.	Ask your lely Center 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. Check adjustment of sensors.
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"> <li>Distance to the strip is too long.</li> <li>The strip is missed because the MFR is not facing the right direction at the start.</li> <li>The MFR has an offset to its normal path.</li> </ul>	Manually put the MFR back in a position just before it will encounter the strip it needs to follow and resume the route	Ask your 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.
<b>3CCD Feed Flow under threshold was detected (&lt;P1&gt;)</b>		
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, check 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:
Feed activated by a digital output can be dispensed using a wide variety of dispensers, ranging from a water valve to a tower silo and conveyor belt system. To cater for all these different technologies there are settings to raise an alarm when blockages are assumed and to prevent damage. The alarm of a flow below the threshold is triggered when the current flow goes below a percentage (setting) of the normal flow (historic data), during a period of time (another setting). If the fluctuation of the flow is normal and not harmful to the dispenser the percentage can be set low. If the dips in delivery can last for a longer time without the dispenser being at risk, the time before actually going in alarm can be set high.	Reset the alarm and resume operation.	Ask your Lely center that understands the dispenser to adjust the settings wisely. When an alarm is triggered, first consider if it is a rightful alarm (was there a situation that needed attention to prevent damage to the dispenser or considerable loss of capacity), if not lower the percentage and/or increase the time. There is a fine balance between generating unnecessary alarms and generating the alarm too late when there is a real problem with the dispenser.



<b>1603 X position not reached within &lt;P1&gt; minutes</b>		
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 2 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, check if maybe feed hanging underneath the grabber prevents a normal forwards motion.	If feed underneath the grabber is causing the timeout, optimise the grabber settings (less grab depth etc), prevent the feed gets caught behind fences or edges of the MFR (smooth dugout). Take into account that the feed types that are used most, should not be located on a position with the maximum driving time in the kitchen.

3C86 Barn door <P1> is unable to open		
Communication network problem	Solution:	Preventive measure:
The Bluetooth communication of the door has an error, therefore the MFR is not able to open the door. Manually open and close the door with the button to see if the door functions well. Connect the Lely Control app with the door to see if it is possible to open the door via the MFR. If this is not possible the communication is the problem.		Position the Bluetooth antenna in such a way that there is a good connection from both sides of the barn door or ask the Lely Center to position the antenna.
Communication problem control box of the door	Solution:	Preventive measure:
Connect the Lely Control app with the door to see if it is possible to open the door directly. If a connection can not be made the control box of the door could have a software malfunction.	Restart the complete 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.	
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.	Check the fuse in the main power box of the farm. The control box of the barn has a different power connection than the Vector system.	
Communication problem MFR	Solution:	Preventive measure:
The Bluetooth communication part of the MFR has an error and can therefore not communicate with the Bluetooth module of the door. Connect the lely control app with the MFR to see if it is possible to open the barn door via the MFR.	Take the MFR out and in operation again to trigger the communication. Restart the MFR with the key switch, be aware that the current route and information will be lost. Check the MFR communication by opening the barn door. Drive back to the charger and start a manual route for the just interrupted feeding task.	

Door is in error state	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.	Check 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.	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.	Reset or restart the control box of the external supplier and try to open the door afterwards with this control.	
3C0C No ultrasonic signal(<P1>)		
Dirt on sensor	Solution:	Preventive measure:
Dirt on the sensor	Clean the sensor.	Clean the sensor regularly.
Foam is worn	Solution:	Preventive measure:
Foam is worn.	Replace the foam.	
Broken sensor	Solution:	Preventive measure:
Broken sensor.	Ask the Lely Center to replace the sensor.	
Object not within the ranger	Solution:	Preventive measure:
The ultrasound sensor is bent, or parts on the route are missing or moved.	Make sure the parts on the route are unchanged. Make sure the sensor is in the correct position.	

## 7.3 Make sure the Battery is Charging Correctly

1. Make sure the Mixing and Feeding Robot is connected to the charger. If necessary connect the Mixing and Feeding Robot manually to the charger (see Connect the Mixing and Feeding Robot Manually to the Charger on page 5-35).

2. If necessary test the charging on the lely control app:
  1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
  2. Select the page **Test > Batt chargers**.  
The battery voltage (0.1 volt) and the current (mA) of each battery is displayed.
  3. Push  to go to the next page.  
The **BattStat** and **LoadPhase** are displayed for each battery. See explanation in the table below.
  4. Push  to go to the previous page.

Explanation BattStat	Explanation LoadPhase
0= Battery wait	0= Pre settings
1= Battery charge	2= Current check
2= Battery half full	3= Main charge state
3= Battery full	4= Second charge state
-1= No charge current	5= Settings
-2= Battery timeout	7= Post charge state
-3= Battery error	9= Battery full
-4= No start current	10= Charging finished
	29= Start route
	30= Charging error

The Mixing and Feeding Robot must charge for at least one hour.

## 7.4 Release a jammed mixing auger



**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.**  
**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.

### Turn the mixer in the opposite direction

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
2. Select the page **Test > Test motors > Mixer**.
3. Push .
4. Push  a few seconds until the mixer is turning.
5. Push .
6. Push  a few seconds until the mixer is turning smoothly, if the mixer does not turn, the feed must be removed.

### Remove the feed

1. Switch off the Mixing and Feeding Robot with the key (see Switch off the Mixing and Feeding Robot with the Key (MFR 2) on page 5-11).
2. Use the Vector stepladder and remove the feed from the mixing bin with a pitchfork.
3. Switch on the Mixing and Feeding Robot with the key (see Switch on the Mixing and Feeding Robot with the Key on page 5-14).

## 7.5 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.

### Turn the dosing roll in the opposite direction

1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
2. Use the password you received from your Lely technician and:  
Select the page **Test> Test motors > Dosing roller**.
3. Push .
4. Push  a few seconds until the dosing roll is turning.
5. Push .
6. Push  a few seconds until the dosing roll is turning smoothly, if the dosing roll does not turn:
  1. Clean the dosing roll (see Clean the Dosing Roll and Position Sensor on page 6-3).

## 7.6 Release a jammed feed door



**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.**





**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 2-4).**






**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. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
2. Select the page **Test**> **Test motors** > **Feed door motor**.
3. Push button  to open the door.
4. Switch off the Mixing and Feeding Robot with the key (see Switch off the Mixing and Feeding Robot with the Key (MFR 2) on page 5-11).
5. Remove the bolt (1) and open the maintenance door (2) (see figure 56 on page 6-4).
6. Carefully remove all feed remains from the dosing roll and in the opening of the door.
7. Remove all feed remains from the rail in which the door slides.
8. Close the maintenance door (2) and install the bolt (1).
9. Switch on the Mixing and Feeding Robot with the key. (see Switch on the Mixing and Feeding Robot with the Key on page 5-14)
10. Select the page **Test**> **Test motors** > **Feed door motor**
11. Push  to close the door.

## 7.7 Reset the PCB of the Mixing and Feeding Robot

1. Remove the skirt piece and switch off the battery (see Switch off the Main Switch on the Mixing and Feeding Robot near the Battery on page 5-12).
2. After 20 seconds, switch on the battery to switch on the PCB.
3. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
4. Push  to reset the alarm.
5. Push  **Yes** to calibrate the gyroscope.
6. Go to the page **Work** on the first tab.
7. Push  to start the Mixing and Feeding Robot.

## 7.8 Pull a Broken Mixing and Feeding Robot Out of the Way



Make sure the battery of the Mixing and Feeding Robot is still ON before you push or pull the Feeding Robot. When the wheels turn, electricity is generated and this must be collected in the batteries, otherwise the PCBs and other electronics will be overloaded and damaged.

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Make sure the emergency stop button is NOT pushed and the safety key is switched to ON, otherwise the electronic brake is activated during pulling.

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Do this procedure when the Mixing and Feeding Robot can not drive manually and has to be pushed or pulled out of the way.

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1. If possible lift the skirt:
  1. Connect the smartphone (see Connect the Smartphone to Device Software on page 5-15) to the Mixing and Feeding Robot.
  2. Select the **Test> Test motors > Skirt motor**.
  3. Push button  until the skirt is lifted.
2. Rotate the skirt until the skirt piece is on the front of the Mixing and Feeding Robot.
3. Remove the bolts (1) (see figure 46 on page 5-13) and the skirt piece (2).
4. Make sure the main switch (3) on the battery is switched to the "On" position.
5. Rotate the skirt until the swivel caster is visible.
 

Attach a tow rope (1) (see figure 67 on page 7-23) on the frame of the Mixing and Feeding Robot above the swivel caster, make sure the rope can not damage any sensors.
6. Attach the tow rope (horizontal) to a tractor or device that can pull 1880 kg (4144 lb), make sure the tow rope does not touch and damage parts of the Mixing and Feeding Robot.
7. Slowly pull the mixing and feeding robot out of the way, make sure you drive:
  - Maximum 10 m (33 ft) in one time, than wait 5 minutes to cool the Mixing and Feeding Robot
  - Not faster then 5 km/h (3 mile/h)

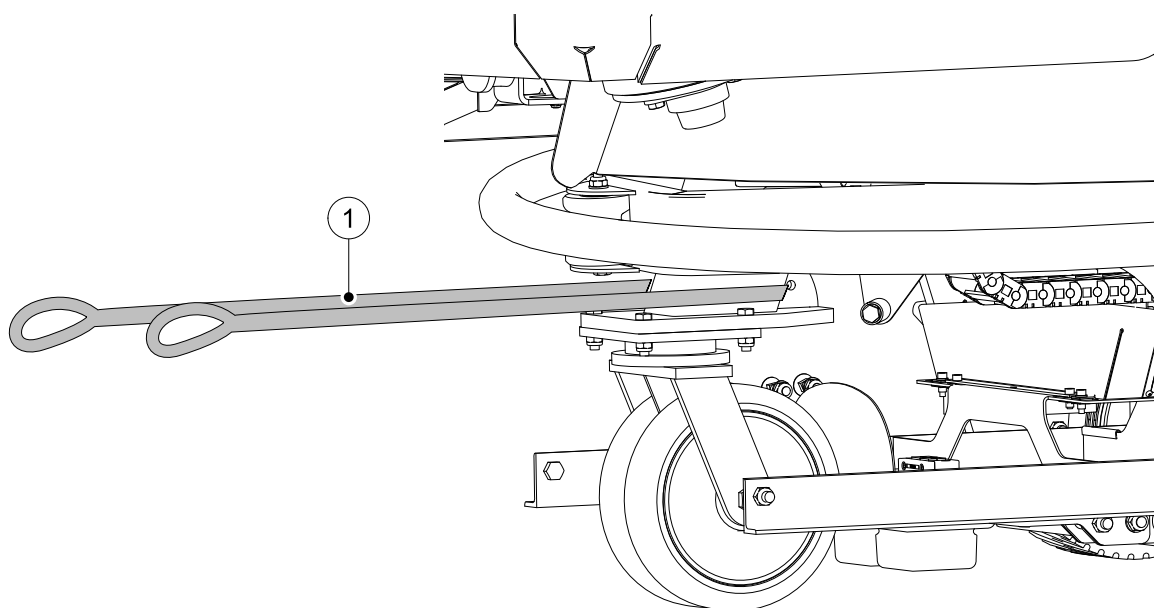


Figure 67. Tow a broken Mixing and Feeding Robot

KEY: 1. Tow rope

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## 7.9 Reset the Feed Grabber

1. Take the Feed Kitchen out of Operation (see Put the feed kitchen in the filling mode with the console on page 5-4).
2. Wait a few seconds.
3. Put the feed kitchen in operation (see Put the Feed Kitchen in Operation on page 5-1).

## 7.10 Reinstall the 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.**

## Preparation

1. Connect the smartphone to the Mixing and Feeding Robot.
2. Manually drive the Mixing and Feeding Robot away from the feed loading point.
3. Push the pause button and switch off the Mixing and Feeding Robot with the key (see procedure).
4. If there are 2 Mixing and Feeding Robots, push the pause button on the second Mixing and Feeding Robot and switch off the Mixing and Feeding Robot with the key.



## Position the Feed Grabber

1. Take the Feed Grabber out of operation (see procedure).




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.





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2. If there is a Bridge Crane present:
  1. Connect the smartphone to the Bridge Crane.
  2. Take the Bridge Crane out of operation (see procedure).
  3. Go to the page **Manual operation > Driving**.
  4. Drive the Bridge Crane to the Y position of the feed loading point.
3. Connect the smartphone to the Feed Grabber.
4. Go to the page **Testing > Test Drive Motor**.
5. Use the buttons  **BACKWARD** or  **FORWARD** to drive the Feed Grabber to the feed loading point.



Use the button  to go to the previous menu.

---

6. Go to the page **Testing > Test Grabber**.
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. Use the buttons  **UP** and  **DOWN** to position the grabber.

10. Position the grabber so, that the distance between the teeth and the floor is about 1 m (3.3 ft) (A) (see figure 68 on page 7-25).

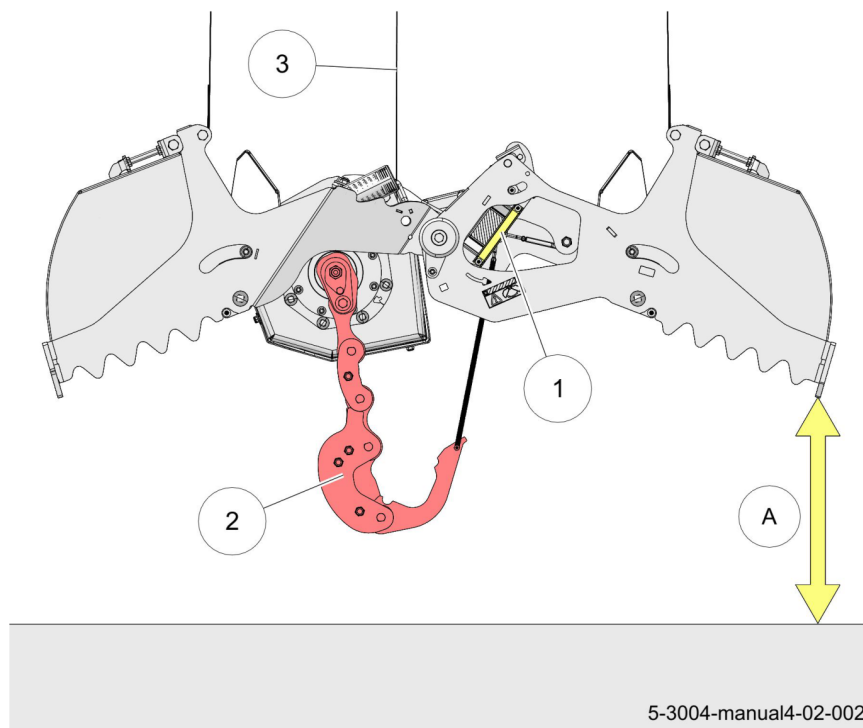


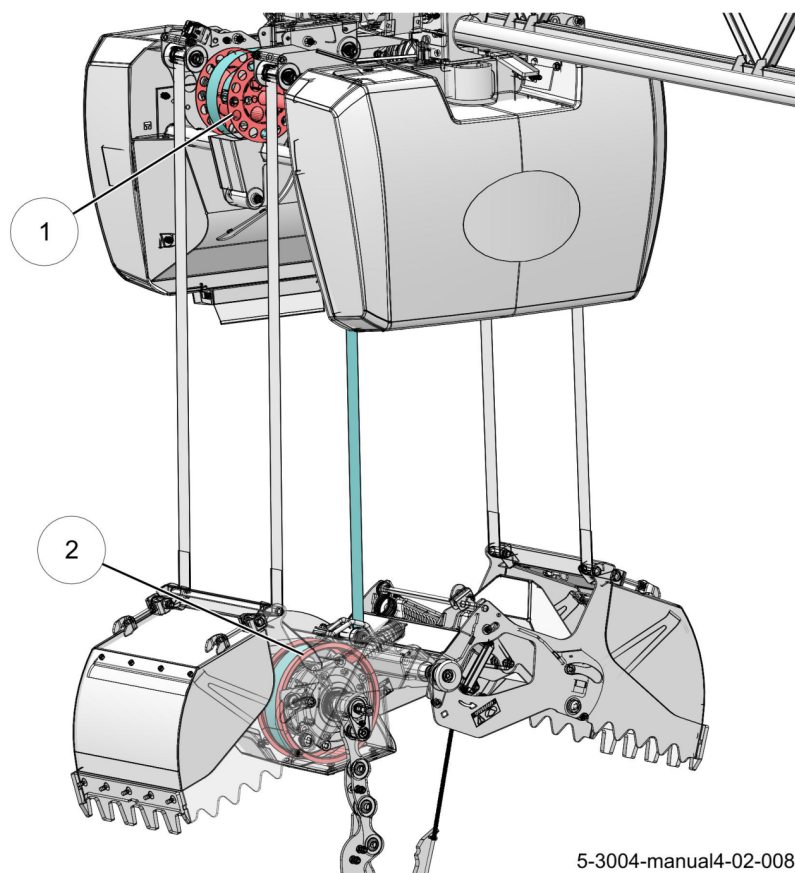
Figure 68. Lower the grabber to the correct distance from the floor

KEY: 1. Safety handle - 2. Chain - 3. Closing belt  
A: Distance to the floor

## Reinstall the chain



There are two closing belt drums, one in the top (1) (see figure 69 on page 7-26) and one in the grabber (2). Before each step of the procedure with drums, make sure you know which drum is involved.



5-3004-manual4-02-008

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*Figure 69. Closing belt drums*

KEY: 1. Closing belt drum in the top - 2. Closing belt drum in the grabber

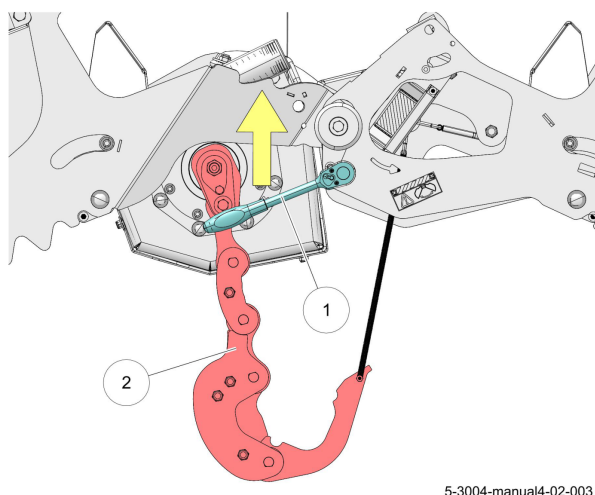
1. Unroll the closing belt (3) from the drum in the top (1). Guide the closing belt by hand to prevent it from getting stuck.

2. Install a metal block to lock the position of the grabber:
  1. Install a socket wrench (1) (0.5 in) (see figure 70 on page 7-27) (no socket attached) in the square hole on the grabber.
  2. Use the socket wrench to lift the grabber.



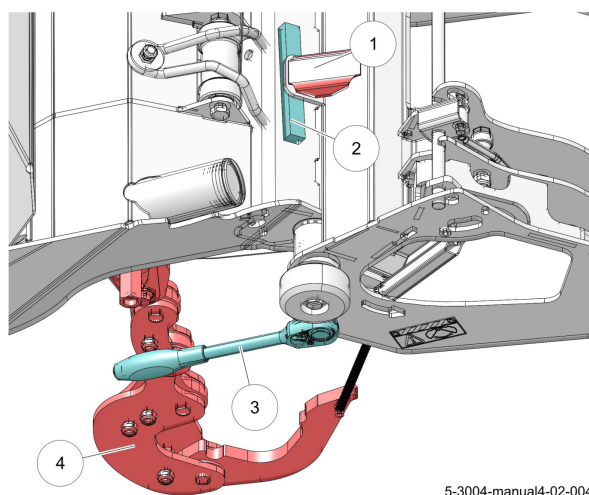
**Risk of being crushed.**  
**Slowly close the grabber to secure the position of the metal block.**

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 71 on page 7-27). Use for example a hammer head with the correct thickness as a metal block.



**Figure 70. Manually lift the grabber with a socket wrench**

KEY: 1. Socket wrench - 2. Chain

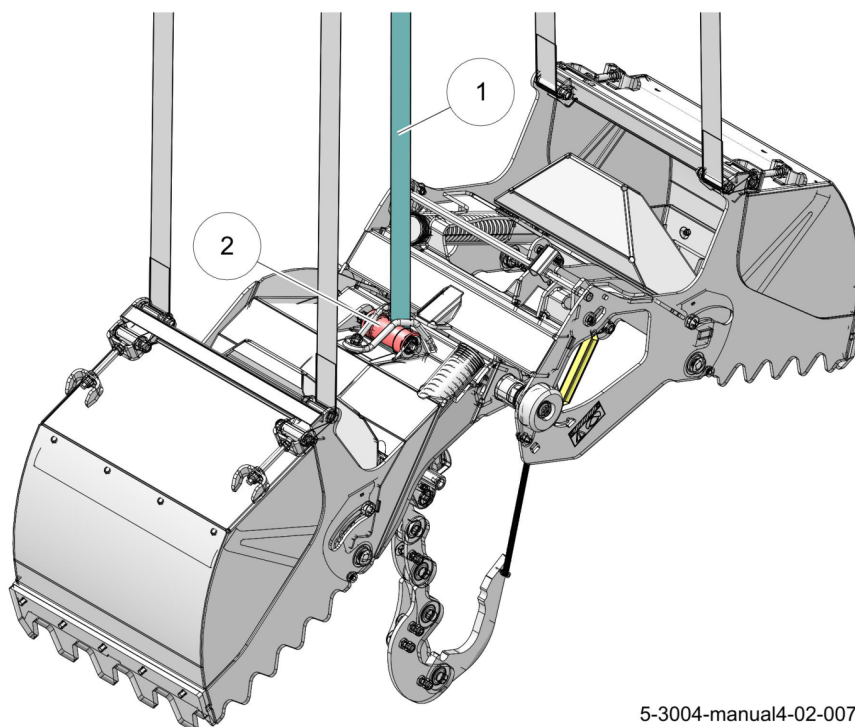


**Figure 71. Position a metal block underneath the limitation bracket**

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 72 on page 7-28) 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 72. Closing belt and guide wheel*

KEY: 1. Closing belt - 2. Guide wheel

5. Use a socket wrench (24 mm) (1) to turn the crank (2) 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 73 on page 7-29).

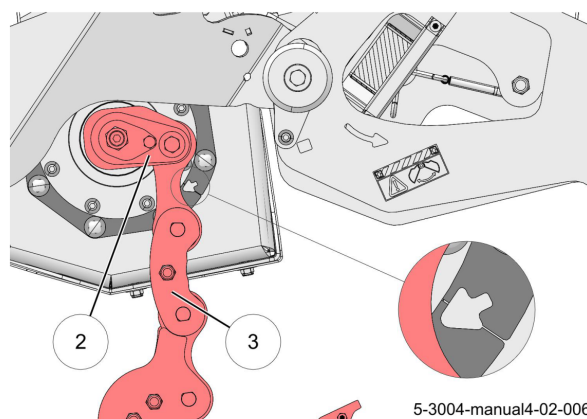
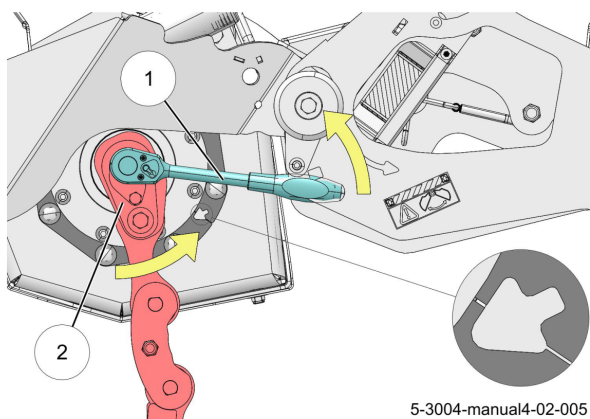
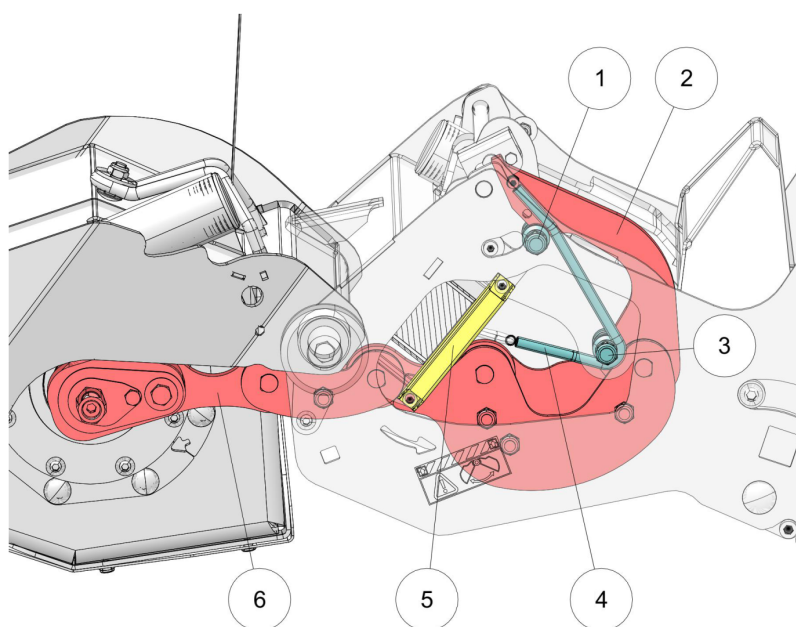


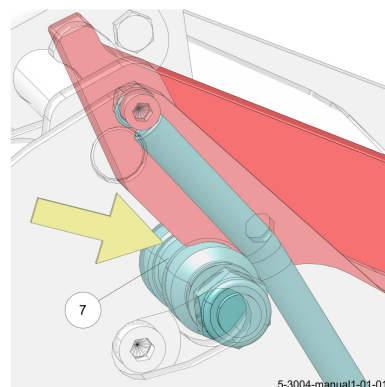
Figure 73. Put the crank in its correct position

KEY: 1. Socket wrench - 2. Crank - 3. Shackle

6. Position the end link (2) in the groove of the lower pin (3) (see figure 74 on page 7-30).



5-3004-manual1-01-007



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Chain in its correct position

Put the end link over the groove of the top pin

Figure 74. Chain in its correct position

KEY: 1. Top pin - 2. End link - 3. Lower pin - 4. Spring - 5. Safety handle - 6. Chain - 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).




**Risk of being crushed.**  
**Slowly close the grabber to secure the position of the metal block.**

8. Remove the metal block (2) (see figure 71 on page 7-27).
9. Connect the smartphone to the Feed Grabber.
10. Go to the page **Testing > Test Grabber**.
11. 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.

### Close up

1. Connect the smartphone to the Feed Grabber.

2. Make sure the grabber is still open for 60 - 65%.
3. Go to the page **Testing > Test Lift Motor**.
4. Push the button  **UP** to lift the grabber all the way up.
5. Put the Feed Grabber in operation (see procedure).
6. If present, put the Bridge Crane in operation (see procedure).
7. Switch on the Mixing and Feeding Robot with the Key (see procedure), if present switch on the second Mixing and Feeding Robot.



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## 8 Disposal

### 8.1 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.

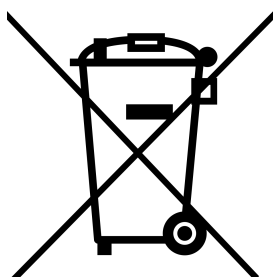
Lubricants and fluids must be disposed correctly to prevent pollution of the environment. Read the safety data sheets of the used lubricants and fluids for correct disposal. All lubricants, chemicals and fluids must be disposed in compliance with the local rules and regulations.



***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.

### 8.2 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.



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.

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# 9 Declarations of Conformity

EC DECLARATION OF CONFORMITY  
EG-KONFORMITÄTSEKHLÄRUNG  
DECLARATION DE CONFORMITÉ AUX NORMES DE LA CE  
DICHIARAZIONE CE DI CONFORMITÀ  
CERTIFICADO DE CONFORMIDAD CEE  
DECLARAÇÃO DE CONFORMIDADE CE  
DEKLARASJON EU MASKINDIREKTIV  
VAATIMUSTENMUKAISUUSVAKUUTUS  
EU-KONFORMITÄTSEKHLÄRUNG  
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 - PREHLÁSENIE 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  
produsenten  
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,  
fabricant  
gyártó  
výrobce  
producent  
výrobca  
tootja  
gamintojas  
производитель  
proizvodač  
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  
vörulysing

Lely Vector Mixing and Feeding Robot

περιγραφή του προϊόντος  
descrierea produsului  
termék megnevezése  
označení produktu  
opis produktu  
označenie výrobku  
toote kirjeldus  
gaminio aprašymas  
наименование изделия  
naziv proizvoda

## typennummer

model number  
Typnummer  
numéro de modèle  
numero di modello  
modelo  
número do modelo  
modellnummer  
mallinnumero  
modellnummer  
gerðamúmer

5.2011.0054.x  
5.2011.0055.x  
5.2011.0056.x  
5.2011.0057.x

αριθμός μοντέλου  
numărul modelului  
típus száma  
numar modelu  
typové číslo  
tüübi number  
modello 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 directivas  
de acordo com a directiva  
opfylder følgende direktiver  
täyttää seuraavien direktiivien vaatimukset  
opfylder 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  
rendelkezeseknek megfelelen  
podle směrnice  
zgodny z dyrektywą  
v zhode so smernicami  
direktivide järgi  
pagal direktyvas  
соответствует 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  
opfylder følgende standard  
uppfyller följande standarder  
uppfyllir eftirfarandi staðla  
ηλποοι τις η ποδιονποαφες

EN-ISO 12100:2010  
EN 1525:1997  
EN 60204-1:2006/AC:2010

în 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 og dato  
allekirjoitus ja päiväs  
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.

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  
potpis i datum  
podpis in datum

5-7-2018

5.2011.8510.9

EC DECLARATION OF CONFORMITY  
EG-KONFORMITÄTSEKLÄRUNG  
DECLARATION DE CONFORMITÉ AUX NORMES DE LA CE  
DICHIARAZIONE CE DI CONFORMITÀ  
CERTIFICADO DE CONFORMIDAD CEE  
DECLARAÇÃO DE CONFORMIDADE CEE  
DEKLARASJON EU MASKINDIREKTIV  
VAATIMUSTENMUKAISUUSVAKUUTUS  
EU-KONFORMITETSEKLÄRING  
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 – PREHLÁSENIE O ZHODE  
VASTAVUS EU DIREKTIIVIDELE  
ES ATITIKTIES DEKLARACIJA  
ЗАЯВЛЕНИЕ О СООТВЕТСТВИИ НОРМАМ ЕС  
EG - POTVRDA O SUKLADNOSTI  
ES IZJAVA O SKLADNOSTI

Wij fabrikant

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Nous, soussignés, le fabricant  
fabbricante  
fabricante  
producent  
valmistaja  
produsenten  
tillverkare  
framleiðandi

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gamintojas  
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proizvodac  
naziv proizvajalca

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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 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  
modellnummer  
mallinnumero  
modellnummer  
gerådnummer

5.2011.0532.x  
5.2011.1174.x  
5.2011.1241.x

αριθμός μοντέλου  
numărul modelului  
típus száma  
număr modelu  
typové číslo  
tüüli number  
modelo numeris  
номер модели  
broj modela  
številka artikla

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täyttää seuraavien direktiivien vaatimukset  
opfylder følgende direktiver  
uppfyller följande direktiv  
uppfyllir eftirlitandi tilskipanir

Low voltage directive 2006/95/EC  
Electromagnetic compatibility 2004/108/EC

conform cu directivele  
rendelkezőseknek megfeleléen  
podle směrnice  
zgodny z dyrektywy  
v zhode so smernicami  
direktiveide järgi  
pagal direktyvas  
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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opfylder følgende standarder  
uppfyller följande standarder  
uppfyllir eftirlitandi 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  
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zodpovedá normám  
normidele vastavus  
atitinka standartus  
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Unterschrift und Datum  
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allekirjoitus ja päiväs  
signatur og dato  
underskrift och datum  
undirskrift og dagsetning



S. Loosveld  
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potpis i datum  
podpis in datum

20-1-2015

5.2011.8504.9

5.2011.8607.0 D

EC DECLARATION OF CONFORMITY  
EG-KONFORMITÄTSEKHLÄRUNG  
DECLARATION DE CONFORMITÉ AUX NORMES DE LA CE  
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ES – PREHLÁSENIE O ZHODE  
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ЗАЯВЛЕНИЕ О СООТВЕТСТВИИ НОРМАМ ЕС  
EG - FÖRSÄKRAN OM ÖVERENSSTÄMMELSE  
CB – SAMRÆMISYFIRLÝSING



ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ Ε.Ε.  
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ES-PROHLÁSENÍ O SHODĚ  
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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

#### typennummer

model number  
Typnummer  
numéro de modèle  
numero di modello  
modelo  
número do modelo  
modellnummer  
mallnumero  
modellnummer  
gerðarnúmer

5.3004.000x.x  
5.3004.002x.x

αριθμός μοντέλου  
numărul modelului  
típus száma  
număr modelu  
typové číslo  
tüüli number  
modello numeris  
номер модели  
broj modela  
številka artikla

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uppfyller följande direktiv  
uppfyllir eftirfarandi tilskiptanir

Machinery directive 2006/42/EC  
Low voltage directive 2014/35/EU  
Electromagnetic compatibility 2014/30/EU

conform cu directivele  
rendelkezeseknek megfelelően  
podle směrnice  
zgodny z dyrektywą  
v zhode so smernicami  
direktivide jāgāj  
pagal direktīvas  
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v skladu z direktivo

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opfylder følgende standarder  
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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normidele vastavus  
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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  
allkirjotus 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.

υπογραφή και ημερομηνία  
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podpis a datum  
podpis i data  
podpis a dátum  
allkirj ja kuupäev  
parašas ir data  
подпись и дата  
potpis i datum  
podpis i datum

4/8/2020

5.3004.8502.9B

EC DECLARATION OF CONFORMITY  
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VAATIMUSTENMUKAISUUSVAKUUTUS  
EU-KONFORMITETSEKLRÆRING  
EG-FÖRSÄKRAN OM ÖVERENSSTÄMMELSE  
CB – SAMRÆMISYFIRLÝSING



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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 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  
modellnummer  
mallinnumero  
modellnummer  
gerådnumér

**5.2013.0210.x**

αριθμός μοντέλου  
numărul modelului  
típus száma  
numar modelu  
typové číslo  
tüübi number  
modelo numeris  
номер модели  
broj modela  
številka artikla

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uppfyller följande direktiv  
uppfyllir eftirlitrandi 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 zohode so smernicami  
direktiveide järgi  
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po smjernicama  
v skladu z direktivo

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opfyller følgende standard  
uppfyller följande standarder  
uppfyllir eftirlitrandi 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**

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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 og dato  
allekirjoitus ja päiväs  
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.

υπογραφή και ημερομηνία  
semmátúra și data  
aláírás és dátum  
podpis a datum  
podpis i data  
podpis a dátum  
allkiri ja kuupäev  
parašas ir data  
подпись и дата  
potpis i datum  
podpis in datum

**7-2-2018**

5.2013.8503.9A

5.2011.8607.0 D

EC DECLARATION OF CONFORMITY  
EG-KONFORMITÄTSEKLÄRUNG  
DÉCLARATION DE CONFORMITÉ AUX NORMES DE LA CE  
DICHIARAZIONE CE DI CONFORMITÀ  
CERTIFICADO DE CONFORMIDAD CEE  
DECLARAÇÃO DE CONFORMIDADE CEE  
DEKLARACJA ZGODNOŚCI WE  
ES – PREHLÁSENIE O ZHODE  
VASTAVUS EU DIREKTIIVIDELE  
ES ATITIKTIES DEKLARACIJA  
ЗАЯВЛЕНИЕ О СООТВЕТСТВИИ НОРМАМ ЕС  
EG - POTVRDA O SUKLADNOSTI  
CB – SAMRÆMISYFIRLÝSING



ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ Ε.Ε.  
DECLARATIE DE CONFORMITATE CE  
EU MEGFELELŐSÉGI NYILATKOZAT  
ES-PROHLÁSENÍ O SHODĚ  
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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  
produsenten  
tillverkare  
framleiðandi

**Lely Industries N.V.**  
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www.lely.com

Εμείς, ο κατασκευαστής  
fabricant  
gyártó  
výrobce  
producent  
výrobca  
tootja  
gamintojas  
производитель  
proizvodač  
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  
vörulysing

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

#### typennummer

model number  
Typnummer  
numéro de modèle  
numero di modello  
modello  
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  
typové číslo  
tüübi number  
modello numeris  
номер модели  
broj modela  
števčka artikla

#### waarop deze verklaring betrekking heeft, in overeenstemming is met de bepalingen van de volgende Richtlijn(en):

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worauf sich diese Erklärung bezieht, hergestellt ist gemäß den Bestimmungen der Richtlinie(n):

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de acuerdo con las directivas  
de acordo com a directiva  
opfylder følgende direktiver  
täyttää seuraavien direktiivien vaatimukset  
opfylder følgende direktiver  
uppfyller följande direktiv  
uppfyllir eftirlitandi tilskipanir

Machine directive 2006/42/EC  
Low voltage directive 2014/35/EC  
Electromagnetic compatibility 2014/30/EC

conform cu directivele  
rendelkezeseknek megfelelelen  
podle smérnice  
zgodny z dyrektywą  
v zhode so smernicami  
direktiivde järgi  
pagal direktyvas  
соответствует 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 :

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täyttää seuraavien standardien vaatimukset  
opfylder følgende standarder  
uppfyller följande standarder  
uppfyllir eftirlitandi staðla  
πληροί τις προδιαγραφές

EN-ISO 12100:2010, EN 60204-1:2018,  
EN 61000-6-2:2016, EN 61000-6-4:2018

în conformitate cu standardele  
megfelel a szabványoknak  
odpovídá normám  
zgodny z normą  
zodpovedá normám  
normidele vastavus  
atitinka standartus  
соответствует стандартам нормам  
v 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  
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  
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  
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podpis i datum

19-02-2024

EC DECLARATION OF CONFORMITY  
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CB – SAMRÆMISYFIRLÝSING



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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  
modellnummer  
mallinnumero  
modellnummer  
gerðarnúmer

5.2011.0496.0  
5.2011.0533.0

αριθμός μοντέλου  
numărul modelului  
típus száma  
numar modelu  
typové číslo  
tüüli number  
modelo numeris  
номер модели  
broj modela  
številka artikla

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opfylder følgende direktiver  
uppfyller följande direktiv  
uppfyllir eftirlitandi tilskipanir

Machinery directive 2006/42/EC  
Low voltage directive 2006/95/EC  
Electromagnetic compatibility 2004/108/EC

conform cu directivele  
rendelkezőseknek megfelelően  
podle směrnice  
zgodny z dyrektywą  
v zohode so smernicami  
direktiveide järgi  
pagal direktyvas  
соответствует требованиям директив  
po smjernicama  
v skladu z direktivo

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opfyller følgende standard  
uppfyller följande standard  
uppfyllir eftirlitandi staðla  
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  
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odpovídá normám  
zgodny z normą  
zodpovedá normám  
normidele vastavus  
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u skladu sa standardima  
v skladu s standardi

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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  
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undirskrift 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  
semmátúra și data  
aláírás és dátum  
podpis a datum  
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podpis a dátum  
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parašas ir data  
подпись и дата  
potpis i datum  
podpis in datum

20-1-2015

5.2011.8505.9

5.2011.8607.0 D

EC DECLARATION OF CONFORMITY  
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nombre del producto  
designação de produto  
produktnavn  
tuotenimi  
produktnavn  
produktnamn  
vörulýsing

Lely External Concentrates box

περιγραφή του προϊόντος  
descrierea produsului  
termék megnevezése  
označení produktu  
opis produktu  
označenie výrobku  
toote kirjeldus  
gaminio aprašymas  
наименование изделия  
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typenummer

model number  
Typnummer  
numéro de modèle  
numero di modello  
modelo  
número do modelo  
modellnummer  
mallinnumero  
modellnummer  
gerðarnúmer

5.2011.0534.0

αριθμός μοντέλου  
numărul modelului  
típus száma  
numar modelu  
typové číslo  
tüüli number  
modelo numeris  
номер модели  
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številka artikla

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uppfyllir eftirlitrandi tilskipanir

Low voltage directive 2006/95/EC  
Electromagnetic compatibility 2004/108/EC

conform cu directivele  
rendelkezőseknek megfelelően  
podle směrnice  
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handtekening en datum

signature and date  
Unterschrift und Datum  
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firma e data  
firma y fecha  
assinatura e data  
underskrift og dato  
allekirjoitus ja päiväs  
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undirskrift og dagsetning

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parašas ir data  
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potpis i datum  
podpis in datum

20-1-2015

5.2011.8507.9

EC DECLARATION OF CONFORMITY  
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Lely Automatic door control box

περιγραφή του προϊόντος  
descrierea produsului  
termék megnevezése  
označení produktu  
opis produktu  
označenie výrobku  
toote kirjeldus  
gaminio aprašymas  
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número do modelo  
modellnummer  
mallinnumero  
modellnummer  
gerådnummer

5.2011.0831.0  
5.2013.0637.0

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típus száma  
număr modelu  
typové číslo  
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modelo numeris  
номер модели  
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de acordo com as normas  
opfylder følgende standarder  
täyttää seuraavien standardien vaatimukset  
opfylder følgende standarder  
uppfyller följande standarder  
uppfyllir eftirlitandi staðla  
πληροί τις προδιαγραφές

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

în 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 og dato  
allekirjoitus ja päiväs  
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.

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  
potpis i datum  
podpis in datum

17-8-2017

5.2011.8506.9B

5.2011.8607.0 D

# 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 Vector Mixing and Feeding Robot

## Model number

5.2011.0054.x  
5.2011.0055.x  
5.2011.0056.x  
5.2011.0057.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)

and is in conformity with the following standard(s) or other such specifications :

EN-ISO 12100:2010  
EN 1525:1997  
EN 60204-1:2006/AC:2010

## Signature and date



J.W. Rodenburg  
Manager Product Safety & Compliance  
Lely Industries N.V.

09-Dec-21

5.2011.8510.9

5.2011.8607.0 D

## 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 Vector Power Distribution Box

Model number

5.2011.0532.x  
5.2011.1174.x  
5.2011.1241.x

5.2011.8607.0 D

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

## UKCA Declaration of Conformity




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### 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 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)

---

and is in conformity with the following standard(s) or other such specifications :

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

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### Signature and date



J.W. Rodenburg  
Manager Product Safety & Compliance  
Lely Industries N.V.

09-Feb-22

5.3004.8502.9B

5.2011.8607.0 D

## UKCA Declaration of Conformity



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**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 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)

---

and is in conformity with the following standard(s) or other such specifications :

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

5.2011.8607.0 D

# 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 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):

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,

Signature and date



Serge Loosveld  
Managing Director Feeding  
Lely Industries N.V.



A. Mateboer  
Competence Director PD  
Lely Industries N.V.

19-02-2024

5.2011.8607.0 D

## UKCA Declaration of Conformity



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**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 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

5.2011.8607.0 D

## 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 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

5.2011.8607.0 D

## 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 Automatic door control box

Model number

5.2011.0831.0  
5.2013.0637.0

5.2011.8607.0 D

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

5.2011.8506.9B



**Lely Industries N.V.**

Cornelis van der Lelylaan 1

NL-3147 PB Maassluis

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