OPERATION MANUAL

(Original instructions)

DairyRobot R9500
Automatic milking system

Hoof care system PedicoSprayer (Single and Double)

GEA Farm Technologies GmbH
7821-9001-027
01. January 2025

Engineering for a better world.

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Table of Contents

1 General Information

1.1 Information About the Document

- This manual is part of the delivery scope.
- This manual should be kept accessible and should remain with the device even if the device is sold.
- Reprints, translations, and reproductions in any form, even in part, require the written consent of the manufacturer.
- The issuance of this manual is not subject to a change service.
- We reserve the right to make changes due to technical advancements in comparison to the data and illustrations mentioned in this manual.
- In this manual, the word “product” is synonymous with: GEA PedicoSprayer

Structure of the Manual

- It is modularly structured and refers exclusively to the specified product.
- Additional information about the product and the components related to the product can, if necessary, be found in the corresponding documents or manuals. This is especially true for safety instructions!
- Abbreviations, units, technical terms, special designations, or industry-standard terminology used in this manual are explained in more detail in the “Appendix” chapter.

Scope of the Product Documentation

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

Material No.	Description
7000-90 . . -200	Planning Basics / Installation Instructions
7821-90 . . -020	Operating Instructions
7821-90 . . -021	Assembly Instructions
7821-90 . . -022	Installation Plans for Wiring and Piping
7821-90 . . -023	Spare Parts

Sources

The instructions can be obtained as follows:

- Order a paper version from the manufacturer or specialist dealer
- Download the file online (only for specialist dealers)
  https://geacloud.sharepoint.com/sites/09_02781

1.2 Manufacturer's address

GEA Farm Technologies GmbH
Siemensstraße 25-27
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www.gea.com/contact
www.gea.com

1.3 Customer service

Authorized Technical Dealer

If necessary, please contact your nearest dealer.

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

www.gea.com

European Contact Information:

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1.4 CE-Conformity documentation

Declaration of incorporation for incomplete machinery in accordance with EC Machinery Directive 2006/42/EC, Annex II 1. B

Manufacturer:	**GEA Farm Technologies GmbH** **Siemensstraße 25-27** **D-59199 Bönen**

We, as manufacturer, declare in sole responsibility that the incomplete machinery

Name:	Hoof care system
Type:	
Model:	PedicoSprayer
Serial number:	

complies to all relevant provisions of this and the following directives and regulations:

Relevant EC-Directives:	2006/42/EC	EC Machinery Directive
	2014/68/EC	Pressure Equipment Directive
	2014/30/EU	EMC Directive
Applied harmonized standards, in particular:	DIN EN ISO 12100:2011-03	Safety of machinery - General design principles - Risk assessment and risk reduction
	DIN EN 60204-1:2014-10	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
	DIN EN 61000-6-2:2016	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
	DIN EN 61000-6-3:2007	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
	DIN EN 61000-3-2:2014	Electromagnetic compatibility (EMC) - Part 3-2: Limit values - Limit values for harmonic current emissions
	DIN EN 61000-3-3:2013	Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply networks for devices with a rated current <= 16A per conductor
Other applied standards and technical specifications:		

Remarks:	We also declare that the special technical documentation for this incomplete machine has been created in accordance with Annex VII, Part B and we obligate to provide these upon reasoned request from the individual national authorities by data transfer. Commissioning is prohibited until it has been confirmed that the machinery into which the incomplete machine above is to be incorporated complies with the EC Machinery Directive and an EC Declaration of Conformity, Annex II. 1. A exists.
Authorized person for compiling and handing over technical documentation:	Abteilung Technische Dokumentation GEA Farm Technologies GmbH Siemensstraße 25-27 D-59199 Bönen ☏ +49 (0) 2383 / 93-70

Bönen, 30. January 2025

Andreas Seeringer ppa

Dr. Andreas Seeringer
(Managing Director)

Thomas Mader
(Head of Technology and Innovation)

1.5 UKCA-Conformity documentation

UK - Declaration of Incorporation for incomplete machines within the meaning of the Regulation: Supply of Machines (Safety) UK Regulations 2008, 2008 No. 1597, Annex II 1.B

Manufacturer:	**GEA Farm Technologies GmbH** **Siemensstraße 25-27** **D-59199 Bönen**

We, as manufacturer, declare in sole responsibility that the incomplete machinery

Name:	Hoof care system
Type:	
Model:	PedicoSprayer
Serial number:	

complies to all relevant provisions of this and the following directives and regulations:

relevant UK-provisions:	UK 2008 No. 1597	Supply of Machinery (Safety) Regulations
	UK 2016 No. 1105	Pressure Equipment (Safety) Regulations
	UK 2016 No. 1091	Electromagnetic Compatibility Regulations
Applied harmonized standards, in particular:	DIN EN ISO 12100:2011-03	Safety of machinery - General design principles - Risk assessment and risk reduction
	DIN EN 60204-1:2014-10	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
	DIN EN 61000-6-2:2016	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
	DIN EN 61000-6-3:2007	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
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Remarks:	We also declare that the special technical documentation for this incomplete machine has been created in accordance with Annex VII, Part B and we obligate to provide these upon reasoned request from the individual national authorities by data transfer. Commissioning is prohibited until it has been confirmed that the machinery into which the incomplete machine above is to be incorporated complies with the EC Machinery Directive and an EC Declaration of Conformity, Annex II. 1. A exists.

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Bönen, 30. January 2025

Andreas Seeringer ppa

Dr. Andreas Seeringer
(Managing Director)

Thomas Mader
(Head of Technology and Innovation)

1.6 Introduction

The PedicoSprayer is an automatic dairy cow hoof cleaning and care system, for GEA robotic milking systems. The PedicoSprayer unit is installed in the robot room, and the Nozzle bar is installed on the robot floor.

The information in this manual is for operators. The operator uses the information to program and operate the GEA PedicoSprayer. The operator also uses the information to do maintenance.

This manual is designed for use on an electronic device, such as a PC, an iPhone, Android phone, iPad or Android Tablet.

2 Safety

2.1 Introduction

The GEA PedicoSprayer is an automated machine. Therefore, it is of the utmost importance to obey all safety instructions.

The safety alert symbol identifies important safety messages on your GEA PedicoSprayer and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instruction of the safety message.

2.2 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:

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.

Danger

Risk of electrical shock.

Notice

Is used to address practices/functions not related to physical injury e.g. equipment or property damage.

Tip

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

Notice

Risk of damaging equipment, during periods of temperatures below 0 °C.

2.3 Warning & Safety Decals

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

YOU are the key to safety. Good safety practices protect you and the people around you. Make these practices a working part of your safety program. Make sure EVERYONE who operate, maintain or work obeys the safety precautions. Do not risk injury or death by ignoring good safety practices.

2.3.1 General Safety

- Read and understand the manual and all safety signs before you connect power supplies to operate, maintain or adjust the GEA PedicoSprayer.
- GEA PedicoSprayer owners must train operators before they operate the GEA PedicoSprayer. Review safety related requirements with all machine operators annually.
- A person who has not read and understood all safety and operating instructions is not permitted to operate or maintain the GEA PedicoSprayer.
- Keep unauthorized persons, especially small children away from the GEA PedicoSprayer at all times.
- A first-aid kit, especially an eye wash station, must be available near the GEA PedicoSprayer. Store in a visible place.
- Wear the correct protective clothing and equipment. Disconnect and isolate the electrical power supply, release pneumatic pressure before you clean or do maintenance on the GEA PedicoSprayer.
- Only use the GEA PedicoSprayer in a frost-free environment.
- Do not modify the GEA PedicoSprayer in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment and safety of operators.
- Contact your nearest GEA service provider if you have any questions.

2.3.2 Electrical Safety

- Only an authorized electrician is allowed install the electrical power supply wall socket for the GEA PedicoSprayer.
- Make sure the grounding of the electrical system and all parts of the GEA PedicoSprayer is functional and meet the local rules and regulations.
- Replace any damaged electrical lines, switches and components immediately. This must always be done by an authorized technician.

2.3.3 Chemical Safety

- The GEA PedicoSprayer uses chemicals for cleaning and disinfection purposes.
- Read the chemical safety instructions, and keep the safety data sheets stored accessible for all GEA Pedico-Sprayer operators
- Always wear protective gloves and safety goggles when you do work on parts where a chemical product flows through.
- GEA Farm Technologies is not liable for, and does not cover under warranty, any damage or harm due to the use of chemical products not meeting the GEA specifications.
- The safety data sheets of the GEA products are available at www.GEA.com

2.3.4 Operating Safety

- Read and understand the GEA PedicoSprayer manual and all safety signs before you connect power supplies to operate, maintain or adjust the GEA PedicoSprayer.
- Only trained personnel are permitted to operate and the GEA PedicoSprayer.
- Always install all covers before you operate the GEA PedicoSprayer.
- Before pneumatic pressure is supplied to the GEA PedicoSprayer, make sure all parts are tight and that all hos-es and fittings are in good condition.
- Always observe the GEA robot's safety instructions when working near the robot.
- Contact your nearest GEA service provider if you have any questions

2.3.5 Maintenance Safety

- Read and understand the applicable manual and all safety signs before you connect the power supply to oper-ate, maintain or adjust the GEA PedicoSprayer.
- Only trained personnel are permitted to maintain the GEA PedicoSprayer.
- Take extreme care when you work near or with pressurized pneumatic systems. Always depressurize the GEA PedicoSprayer, before you work on it.
- Always block the cow traffic to the GEA PedicoSprayer, before you work on the GEA nozzle/light bar.
- Wear protective clothing and safety goggles when you do work on the pneumatic system.
- Wear protective gloves and safety goggles when you do work on parts where disinfection and cleaning fluids flow through.
- Always observe the GEA robot's safety instructions when working near the robot.
- Always read and understand the chemical safety data sheet before you do work on the chemical systems. Make sure all covers are installed when maintenance work is complete.
- Only use approved spare parts, and make sure they are only installed by authorized technicians.
- Contact your nearest GEA service provider if you have any questions.

2.4 Warning & Safety Decals

2.4.1 Explanation of Warning & Safety Decals

GEA PedicoSprayer and Upgrade kit double second care pump (see location of the safety decals in chapters below)

Danger: Hazardous voltage

Disconnect the power plug from the socket before doing maintenance, adjustment or repair on the PedicoSprayer.

Warning sign: Corrosive liquid

Risk for serious injury. Obey all applicable health and safety rules. Avoid contact between the liquid and skin or eyes. Wear gloves, safety goggles and protective clothing.

Mandatory sign

Wear safety goggles before doing maintenance, adjustment, repair or test on the GEA Pedico-Sprayer.

Mandatory sign

Wear safety gloves before doing maintenance, adjustment or repair on the PedicoSprayer.

2.4.2 Location of Warning & Safety Decals, GEA PedicoSprayer

GEA PedicoSprayer and Upgrade kit double second care pump (see location of the safety decals in chapters below)

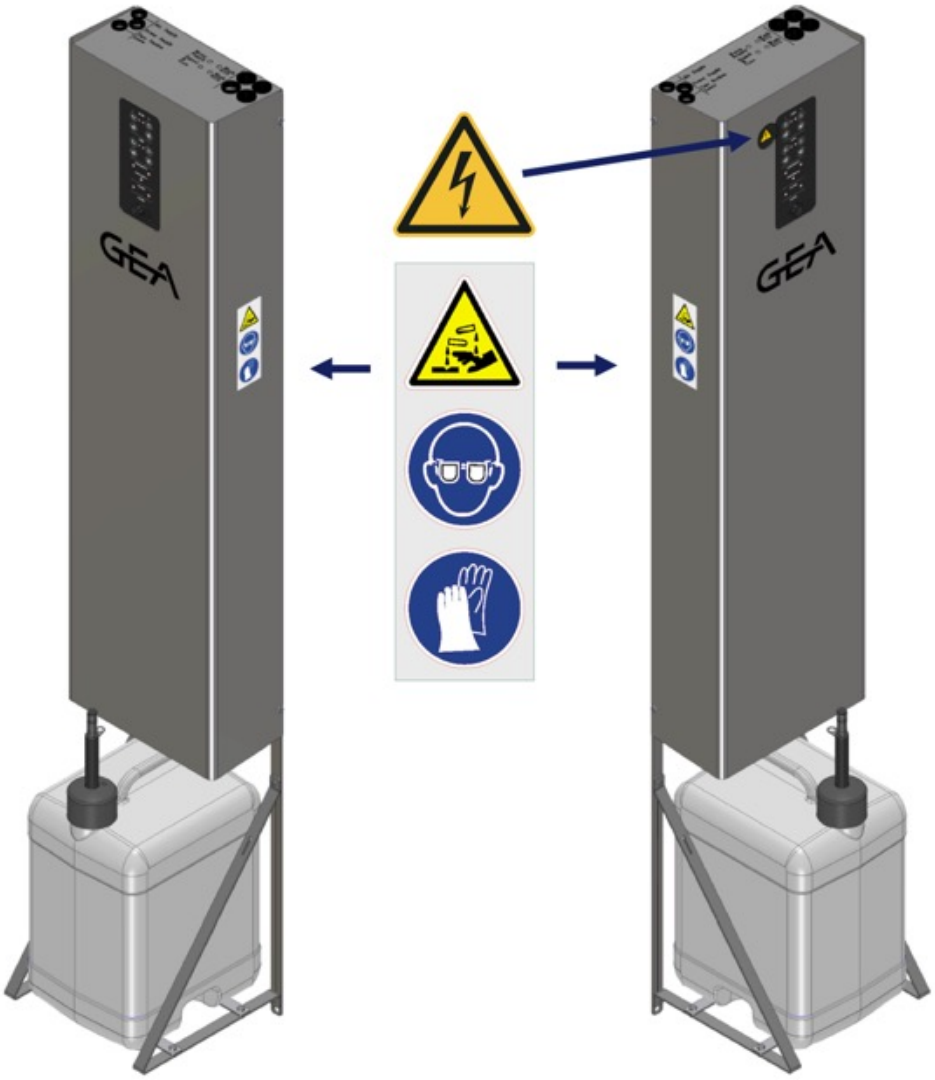


Figure 1. Location of safety decals, GEA PedicoSprayer

2.4.3 Location of Warning & Safety Decals, GEA PedicoSprayer Care Pump

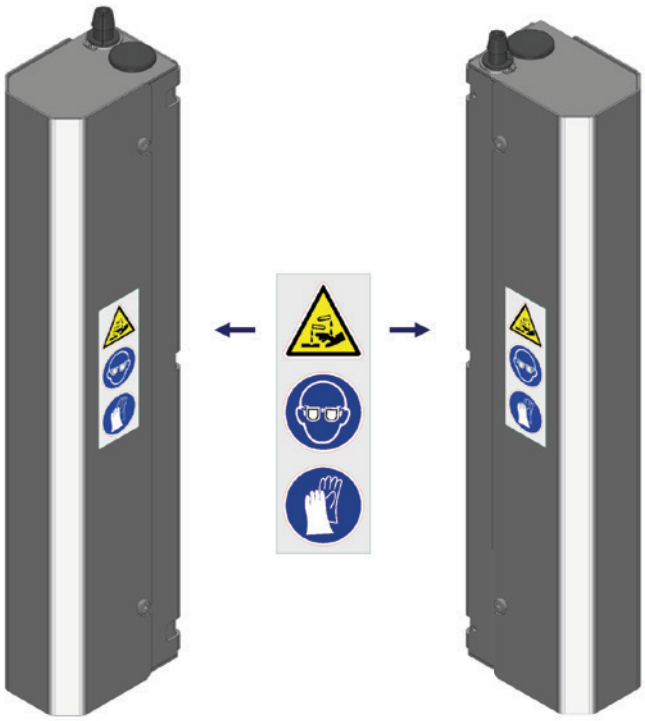


Figure 2. Location of safety decals, GEA PedicoSprayer Care Pump

2.4.4 Maintenance of Warning & Safety Decals

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

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

- Always keep the safety decals clean and readable. 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 GEA service provider.

2.5 Specifications

2.5.1 Transport dimensions and weight

- Lenght: 132 cm (52 in)
- Height: 56 cm (22,1 in)
- Width: 38 cm (15 in)
- Weight: approx. 46 kg (83.78 lb)

2.5.2 Product dimensions and weight

- Height: 168 cm (66.1 in)
- Depth: 23 cm (9 in)
- Width: 30,5 cm (12 in)
- Weight: approx. 46 kg (83,78 lb)

2.5.3 External Requirements

GEA PedicoSprayer is not provided with any backflow prevention device category 5 (in conformity with EN 1717) in the water supply line.

Risk of bacterial contamination of the connected drinking water system and connected devices.

- In case of local legislation requiring any backflow prevention device category 5 in the water supply, be aware to obtain one before you install the GEA PedicoSprayer! Example of such device is an AB Break unit.
- A backflow prevention device category 5 (in conformity with EN 1717) in the water supply line is mandatory in the Netherlands. For these reasons, GEA strongly advices use of such device in the water supply line.
- In case of local legislation not requiring an AB Break unit, GEA highly recommends the application of a AB Break Unit in the water supply line..

2.5.4 Air Supply

- PedicoSprayer working pressure: 6-8.5 bar (87 – 124 PSI)
- Max. Pressure: 8.5 bar (124 PSI)
- Quality: 40 Micron (0.00157 in) Filtered Air
-

2.5.5 Electrical power

- Voltage [Ue]: 100-240VAC 1PH+N+PE
- Frequency Range: 50/60Hz
- Max. Fuse size: 16 A type gL-Gg
- ISCmax = 10KA

Install the wall socket in a location easily accessible, in case of emergency or maintenance.

2.5.6 Water supply

- Pressure: 2-5 bar (29 – 72.5 PSI)
- Water flow rate: 8 – 48 l/min (2 – 12.7 gpm)
- Water temperature: 0 to 40°C. (32 to 140 □)
- Always use potable water (fresh tap water)

2.5.7 Consumption

- Air: 170 kWh/year
- Water: 1250 ml.
- Soap: 2.5 - 10 ml.
- Care: 15 ml.

2.6 Precautions

The GEA PedicoSprayer must be installed in a frost free environment.

Do not install the PedicoSprayer where it can be subject to splashing or spaying of fluids.

Do not install the PedicoSprayer in a place where it is accessible for cows.

The water quality worldwide is different from area to area. The water quality can have influence on the life time of certain components of GEA PedicoSprayer. Also, the water used for the outside cleaning of the device could harm certain components (e.g. cover), even if it is made of stainless steel

3 Description, Operation & Adjustment

The GEA PedicoSprayer is a stand-alone device. The product needs only two electric start signals, a 6-8 bar air supply, a water supply and a 100-240~V 50/60Hz power supply.

3.1 GEA PedicoSprayer Main Unit Components Layout

1. Enclosure
2. Control box
3. Water pump
4. Air valve panel
5. Water supply valve
6. Soap & Care suction lance
7. Soap container bracket 20L
8. Nozzle bar fittings
9. Nozzle/light bar cover (Retrofit kit)
10. Care pump

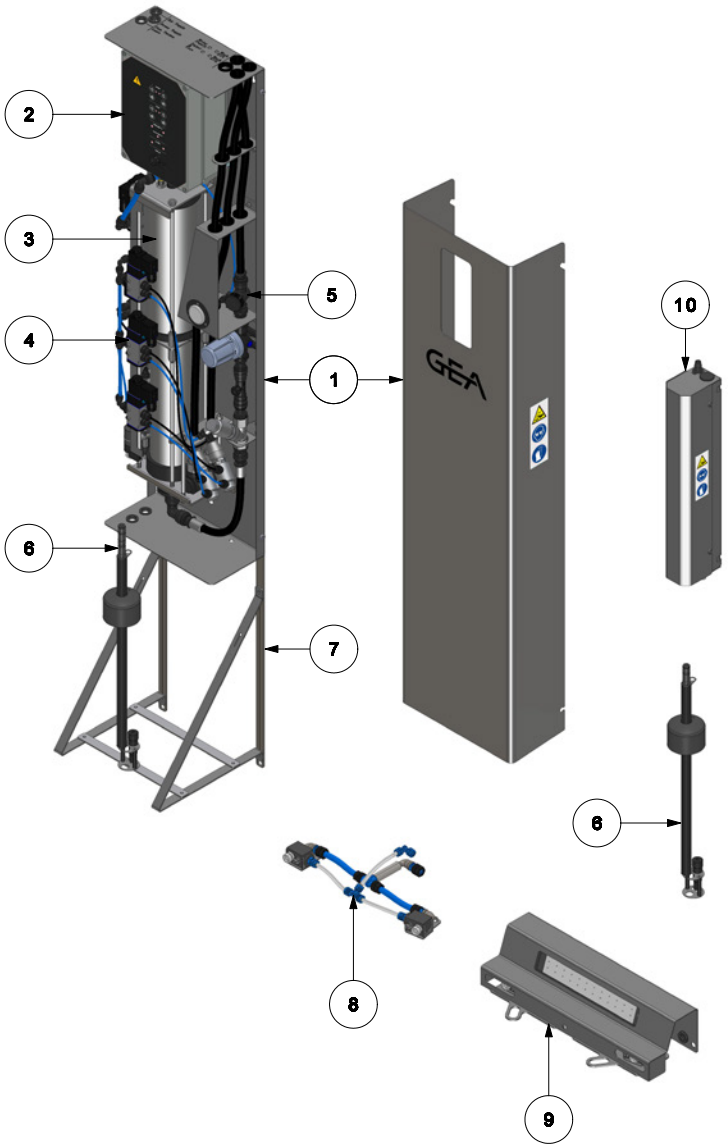


Figure 4: GEA PedicoSprayer main components layout

3.2 Enclosure

The enclosure base and cover are made of AISI 304 stainless steel and ABS plastic. The main function of the enclosure is to protect the GEA PedicoSprayer internal components from external damage.

3.3 Remove/install enclosure cover

Always wear protective gloves when handling sheet metal parts.

- Loosen the two bottom fix bolts about 5 mm, using a 5 mm hex key. Pull the bottom of the cover towards yourself and lift the cover off. Check Figure 5.
- Reinstall the cover and tighten the two bottom fix bolts.

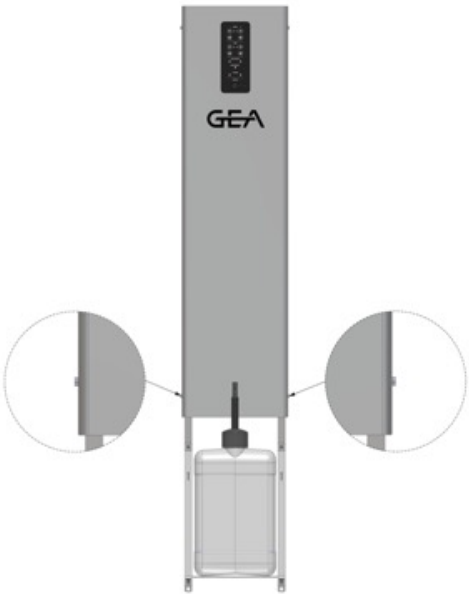


Figure 5: GEA PedicoSprayer cover

3.4 Electrical control Unit

The electrical control unit controls all operations of the GEA PedicoSprayer Single and the GEA PedicoSprayer Double. It consists of a polycarbonate base and a polycarbonate cover fitted with a keypad. The main components inside the box are a 24Vdc power supply, a PCB board.

The 24Vdc control circuit is protected by a fuse [-F1]. The fuse is placed in the cylindrical panel mounted fuse holder placed in the bottom of the control unit base.

Only authorized technicians are allowed to do work inside the GEA PedicoSprayer control unit cabinet.

The PCB board is prepared for future ethernet communication.

3.5 How to replace 24Vdc control circuit fuse [-F1] a

Remove the fuse socket with a suitable flathead screwdriver and replace the fuse.

The fuse is placed in the cylindrical panel mounted fuse holder placed in the bottom of the control unit base.

Fuse type: 5x20 mm T 2.0A 250V

Figure 6: Fuse holder

3.6 Power Spray 1250 wash pump

Risk of chemical spray. Always wear safety goggles and gloves when you do work on the GEA PedicoSprayer care or wash system.

Always Disconnect the GEA PedicoSprayer power supply and air supply when mentioned, to avoid unintended operation, when working on the system.

The PowerSpray 1250 is pneumatic/hydraulic operated piston pump inte- grated with the PowerDos 2.5 reciprocating soap injection pump. Every wash cycle has a fixed volume of 1250 ml. The pump gives an factor x1,5 from air supply to spray pressure, 6 bars of air supply produces 9 bars of spray pressure.

- Air inlet: 12 mm push-in connector
- Control voltage: 24 Vdc
- Soap inlet: 6/4mm push-on connector
- Water supply Pressure: 1-5 bar tap water
- Cylinder volume: 1250 ml/spray
- Air Supply Pressure: 6-8 bars
- Spray pressure: 9-12 bars
- Air consumption PS1250: 13.75 l/spray at 6 bar
- Air Quality: Filtered and lubricated compressed air
- Air consumption PD2.5: 0.067 l/spray at 6 bar

Diagram

1. PS1250 inductive sensor
2. PS1250 pressure relief check valve
3. PS1250 non-return valve
4. Pneumatic angle seat wash outlet valve RU1 & RU2
5. PowerDos 2.5 soap injection pump

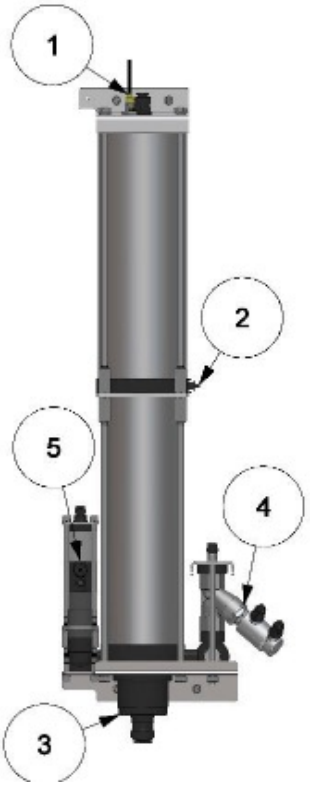


Figure 7: Power Spray 1250 wash pum

3.7 PS1250 inductive sensor [-B1]

The inductive LED will light orange when the pump is in top position, full of water and ready to operate.

The PS1250 inductive sensor main purpose is to register when the pump is cylinder is full of water. The GEA PedicoSprayer will not be allowed to wash if the sensor has not been activated.

Figure 8: PS1250 inductive sensor

3.8 PS1250 pressure relief check valve

Small amounts of liquid are allowed to exit the PS1250 pressure relief check valve.

The PS1250 pressure relief check valve is designed to avoid contaminated air entering the pump housing.

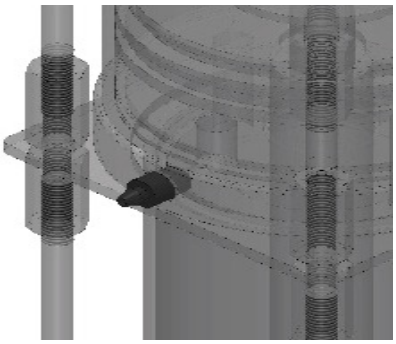


Figure 9: PS1250 pressure relief check valve

3.9 PS1250 non-return valve

To drain the pump entirely of water, the PS1250 non return valve must be removed.

To remove the PS1250 non-return valve, the check valve bowl must turned counter clockwise.

Figure 10: PS1250 non-return valve

3.10 Pneumatic angle seat wash valve RU1 & RU2

To operate the pneumatic angle seat valves manually, activate the air valves [-V4] & [-V5] manually.

Each nozzle bar is connected to a pneumatic angle seat wash valve 12mm hose stud. A GEA PedicoSprayer Double system has two pneumatic angle seat wash valves installed. The pneumatic angle seat valves will open/close when the air valves [-V4] & [-V5] activates/deactivates.

Figure 11: Pneumatic angle seat wash valve

3.11 PowerDos 2.5 soap injection pump

Risk of chemical spray. Always wear safety goggles and gloves when you do work on the GEA PedicoSprayer care or wash system.

Always Disconnect the GEA PedicoSprayer power supply and air supply when mentioned, to avoid unintended operation, when working on the system.

The PD2.5 can be controlled manually, by manually activating air control valve [-V3].

Always make sure a 50-mesh suction filter is installed on the suction lance.

The soap concentration of the wash dilution is adjustable in the GEA PedicoSprayer Tool from 0-0.8% with a 0,2% interval.

PowerDos 2.5 soap injection pump is a self-priming pneumatic operated reciprocating piston pump.

The pump has a capacity of 2.5ml/stroke.

The pump injects soap directly in the PS1250 hydraulic cylinder, just before filling the hydraulic cylinder with water.

- Suction tube connector: 6/4mm push-on
- Suction tube: 6/4mm clear PVC tube
- Air supply pressure: 6-8 bar

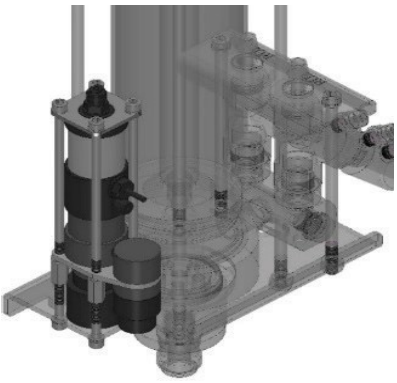


Figure 12: PowerDos 2.5 soap injection pump

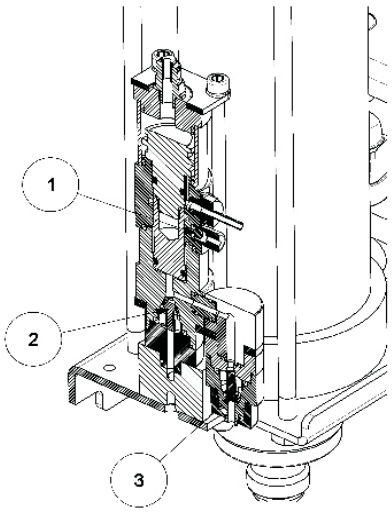


Figure 13: PowerDos 2.5 soap injection pump diagram

1. Pressure relief valve
2. Spray check valve
3. Suction check valve

If large amounts of liquid drains through the pressure relief valve, the pump must be checked.

3.12 Air valve panel

Risk of chemical spray.
Always wear safety goggles and gloves when you do work on the GEA PedicoSprayer care or wash system.

Always Disconnect the GEA PedicoSprayer power supply and air supply when mentioned, to avoid unintended operation, when working on the system.

All pneumatic control valves are mounted on the air valve panel, the panel consists of the following components.

1. Air supply exhaust valve
2. Air supply pressure gauge
3. 3/2 way control for the PS1250 wash pump [-V2]
4. 5/2 way control valve for pneumatic angle seat valves [-V1, -V4 & -V5]
5. 5/2 way control for the PD2.5 soap injection pump [-V3]

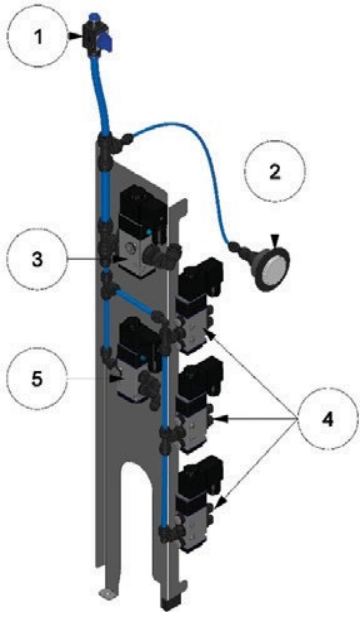


Figure 14: Air valve panel

3.13 Air supply exhaust valve

The air supply exhaust valve will relief the product of air pressure when closed.

- Turn the hand valve 90º in counterclockwise direction to turn OFF air supply and release air pressure.
- Turn the hand valve 90º in clockwise direction to turn ON air supply

Figure 15: Air supply exhaust valve

3.14 Air supply pressure gauge

The pressure drop during a wash cycle should be approx. 0.5 bar and no more than 1 bar.

The air supply pressure gauge will show the GEA PedicoSprayer actual air supply pressure.

Figure 16: Air supply pressure gauge

3.15 3/2 way control valve for the PS1250 wash pump [-V2]

The valve can be controlled manually, by pushing the small blue activator on the right side of the valve.

The 3/2 way control valve applies pressure to the PS1250 wash pump air cylinder when activated. When deactivated the valve will relief the pressure trough an exhaust filter. The filter must be replaced at least once a year or if needed.

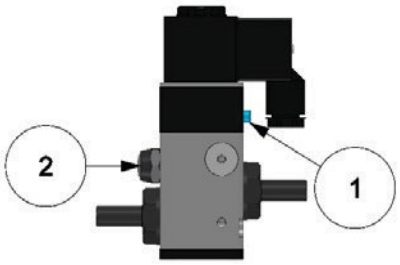


Figure 17: 3/2 way control valve for the PS1250 wash pump

1. Manual override activator
2. 3/8” exhaust filter

3.16 5/2 way control valves for the pneumatic angle seat valves [-V1, -V4 & -V5]

The valves can be controlled manually, by pushing the small blue activator on the right side of the valve.

The 5/2 way control valves activates or deactivates the pneumatic operated angle seat valves for wash and PS1250 filling. The valves have two exhaust filters installed. The filters must be replaced at least once a year or if need- ed.

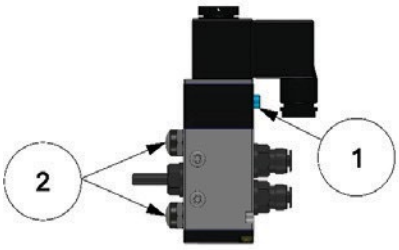


Figure 18: 5/2 way control valves for the pneumatic angle seat valves

1. Manual override activator
2. 1/8” exhaust filter

[-V1]: Filling valve
[-V4]: Wash valve RU1 [-V5]: Wash valve RU2

3.17 5/2 way control for the PD2.5 soap injection pump [-V3]

The valve can be controlled manually, by pushing the small blue activator on the right side of the valve.

The 5/2 way control valve activates the PowerDos 2.5 soap pump. The valve have one exhaust filter and one preset exhaust filter regulator in- stalled. They must be replaced at least once a year or if needed.

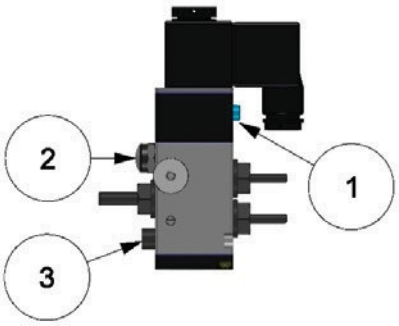


Figure 19: 5/2 way control valve for the PD2.5 soap injection pump

1. Manual override activator 2
2. 1/8” exhaust filter regulator
3. 1/8” exhaust filter

3.18 Water inlet line

Risk of chemical spray.
Always wear safety goggles and gloves when you do work on the GEA PedicoSprayer care or wash system.

Always Disconnect the GEA PedicoSprayer power supply and air supply when mentioned, to avoid unintended operation, when working on the system.

The water inlet line consists of the following main components.

1. Water supply on/off hand valve
2. Water supply filter
3. Water supply double check valve
4. PS1250 pneumatic angle seat filling valve

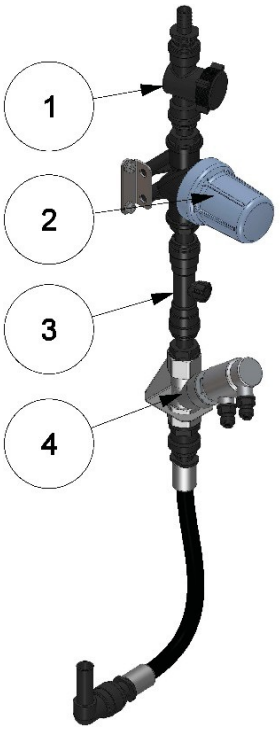


Figure 20: Water inlet line

3.19 Water supply on/off hand valve

Use the valve to turn the water supply off.

- Turn the hand valve 90º in clockwise direction to turn the water supply off.
- Turn the hand valve 90º in counterclockwise direction to turn the water supply on.

Figure 21: Water supply on/off hand valve

3.20 Water supply filter

If the filling time of the PS1250 hydraulic cylinder increases over time, it might be because of a clogged filter.

The water supply 50-mesh filter filtrates the water supply to avoid excess wear on the hydraulic seals in the PS1250 wash pump.

The filter insert must be replaced or cleaned at least every 6 months or if needed.

To replace or clean the filter insert, remove the transparent filter bowl.
To remove the filter bowl, it must be turned counterclockwise.

Figure 22: Water supply filter

3.21 Water supply double check valve

The water supply double check valve is installed as an extra safety precaution, to avoid back pressure in case of PS1250 non-return valve failure.

Figure 23: Water supply double check valve

3.22 PS1250 pneumatic angle seat filling valve

To operate the pneumatic angle seat filling valve manually, activate the air valves [-V1] manually.

The PS1250 pneumatic angle seat filling valve controls filling of the PS1250 hydraulic cylinder.

The pneumatic angle seat valve will open/close when the air valve [-V1] activates/deactivates.

Figure 24: PS1250 pneumatic angle seat filling valve

3.23 PowerDos 15 Care pump

Risk of chemical spray. Always wear safety goggles and gloves when you do work on the GEA PedicoSprayer care or wash system.

Always Disconnect the GEA PedicoSprayer power supply and air supply when mentioned, to avoid unintended operation, when working on the system.

The PD15 can be controlled manually, by manually activating the air control valve.

Always make sure a 50-mesh suction filter is installed on the suction lance.

The PowerDos 15 can be set to do a single (15 ml) or a double (30 ml) stroke at each spray in GEA PedicoSprayer Service tool.

The Care pump is a reciprocating pneumatic piston pump, which deliver 15ml. sprays through two nozzles.

- Control voltage: 24 Vdc
- Air supply pressure: 6-8 bars
- Air inlet: 8 mm push-in connector
- Spray pressure: 10-15 bars
- Cylinder volume: 15 ml/spray
- Suction height: Max. 4 meters
- Air quality: Filtered and lubricated compressed
- Air consumption PD15: 0,4 l/spray at 6 bar
- Suction valve: 8/6 mm push-on connector
- Spray valve: 8/6 mm push-on connector
-

Diagram

1. Signal plug
2. Solenoid valve
3. Spray valve
4. Suction valve
5. Filter
6. Muffer

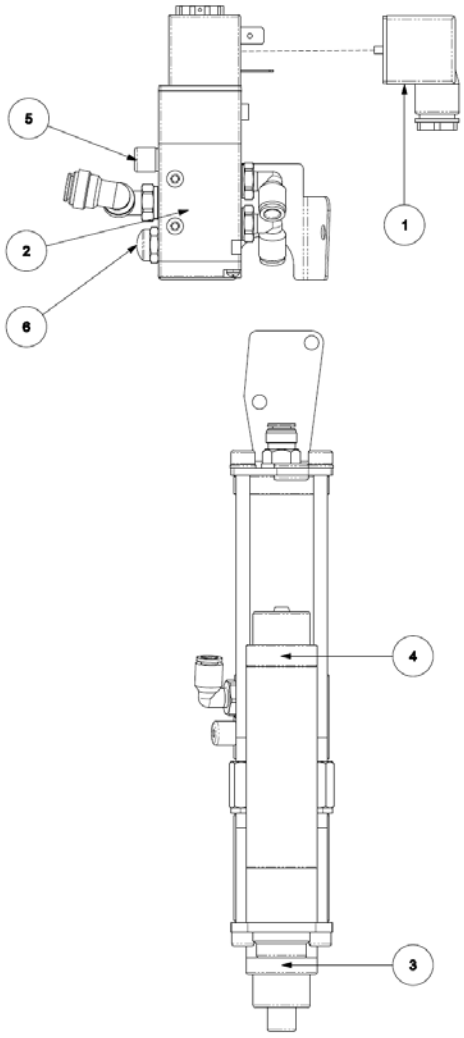


Figure 25: Care Pump

3.24 PD15 Pump unit

If large amounts of liquid drains through the pressure relief valve, the pump must be checked.

1. Pressure relief valve
2. Spray check valve
3. Suction check valve

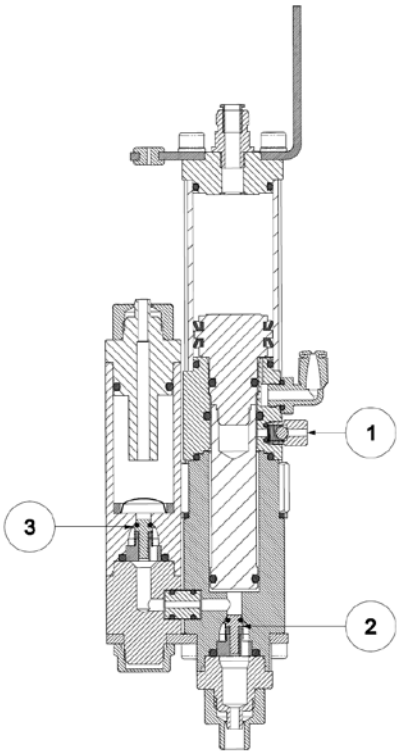


Figure 26: PD15 Pump unit

3.25 PD15 Air Control Valve

The valve can be controlled manually, by pushing the small blue activator on the right side of the valve.

The 5/2 way control valve activates the PowerDos 2.5 soap pump.

The valve have one exhaust filter and one preset exhaust filter regulator installed. They must be replaced at least once a year or if needed.

1. Manual override activator
2. 1/8” exhaust filter regulator
3. 1/8” exhaust filter

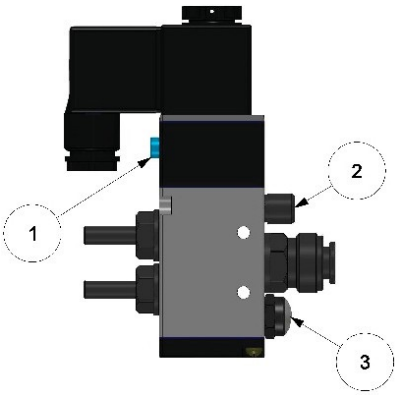


Figure 27: Soap empty indicator

3.26 Care & Soap suction lance

Risk of chemical spray. Always wear safety goggles and gloves when you do work on the GEA PedicoSprayer care or wash system.

Always Disconnect the GEA PedicoSprayer power supply when mentioned, to avoid unintended operation, when working on the system.

When working on the suction lances, the environment must be clean.

Care suction lance incl. filter and level sensor

- For 20 L container
- Inlet 8/6 mm push-on connector

Soap suction lance incl. filter and level sensor

- For 20 l container
- Inlet 6/4 mm push-on connector

Diagram

1. Male 2-pole connector
2. Female 2-pole connector
3. Suction tube
4. Container lid
5. 50-mesh suction filter
6. Level sensor / Float Switch

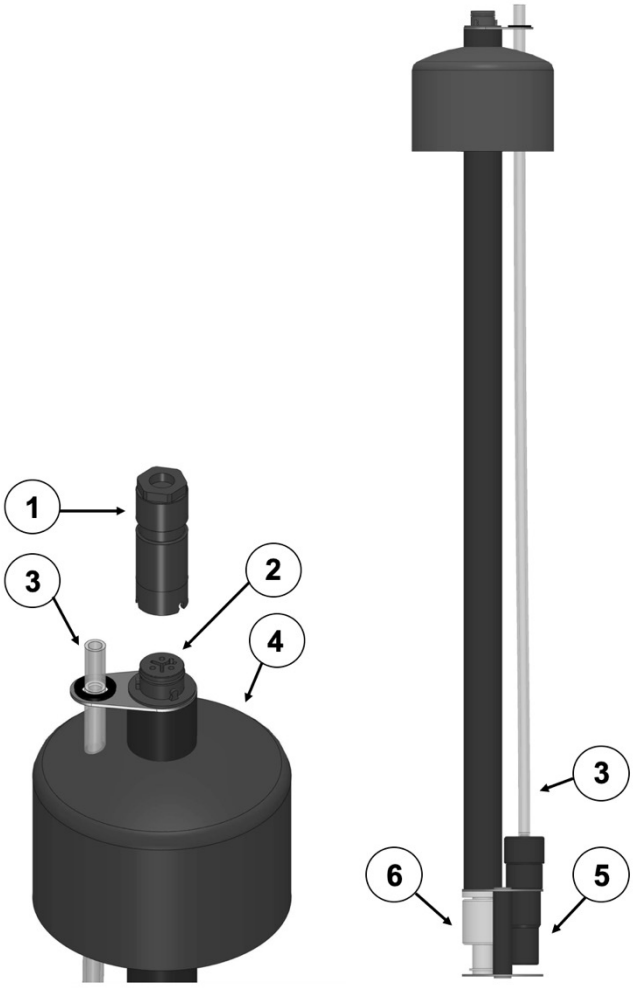


Figure 28/29: Care Suction Lance 60 L

3.27 20 L Soap container bracket

Unit mounted bracket for storage and protection of the soap container (GEA recommends GEA Wash Spray) to be applied in the GEA PedicoSprayer. Designed to hold a 20 L (22.05 lb) container. All parts are made of AISI 304 stainless steel.

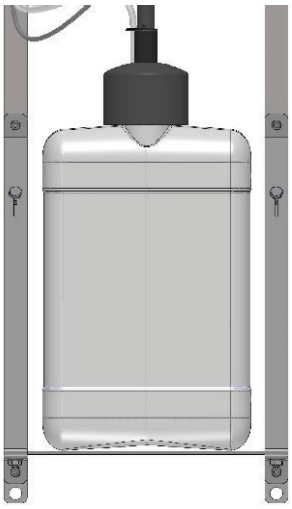


Figure 31. Soap container unit mount bracket.

3.28 How to replace Soap & Care container

Soap:

1. Remove container cap and suction lance from the container.
2. Lift the chain-strap and remove the empty container.
3. Install the new container, insert suction lance and reinstall container cap.
4. Fix the chain-strap to the new container.

Care:

1. Turn Care Off, to avoid pump operation, when the suction lance is removed from the container.
2. Remove the suction lance from the container.
3. Install the new container and the insert suction lance.
4. Prime PD15 care pump if needed.

3.29 PowerDos 15 Care pump

Risk of contact with chemicals.
Always wear safety goggles and gloves when handling chemicals.

After replacing the soap container, make sure the chain strap is fixed properly around the new con- tainer and out of reach of the cows.

Make sure the suction filter is clean and properly installed.

Make sure to keep the suction lance and filter in a clean place when replacing the container. Any kind of dirt in the soap liquid will compromise the functionality of the suction lance.

Make sure the suction lance reaches the bottom of the container.

As an option, it is possible to connect two PD15 Care pumps, to a single care level sensor suction lance. To operate with a single suction lance for two robot units, the "common care level sensor" function in the GEA PedicoSprayer Service tool must be activated. A suction double check valve must also be installed, as illustrated.

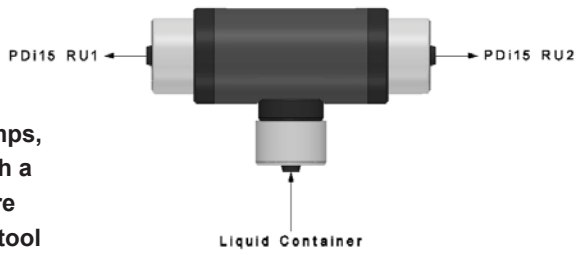


Figure 32

3.30 Nozzle bar fittings

Risk of chemical spray. Always wear safety goggles and gloves when you do work on the GEA PedicoSprayer care or wash system.

Always Disconnect the GEA PedicoSprayer power supply and air supply when mentioned, to avoid unintended operation, when working on the system.

1. Dual nozzle holders
2. Wash connection - 12 mm push-on
3. Care connection - 8mm push-on

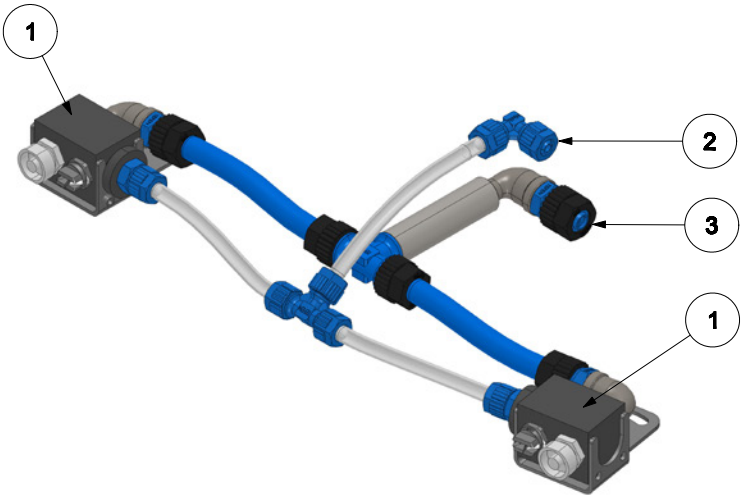


Figure 33

1. Standard wash nozzle
   Material: PVC
   Spray angle: 65°
   Capacity size: 30

2. Standard care Quick Fit nozzle and Nozzle body
   Material: PVC
   Spray angle: 65°
   Capacity size: 05

3. Dual nozzle holder Material: POM
   Nozzle connection: G1/4”
   Wash connector: 8 mm hose stud
   Care connector: 8/6 mm push-on

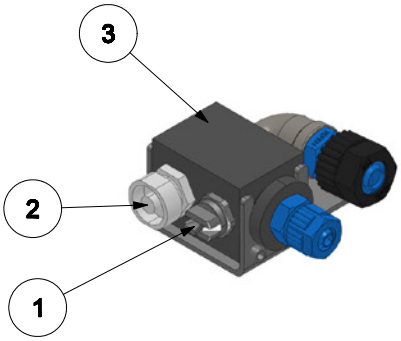


Figure 34

3.31 Nozzle bar cover (Retrofit)

Risk of chemical spray. Always wear safety goggles and gloves when you do work on the GEA PedicoSprayer care or wash system.

Always Disconnect the GEA PedicoSprayer power supply and air supply when mentioned, to avoid unintended operation, when working on the system.

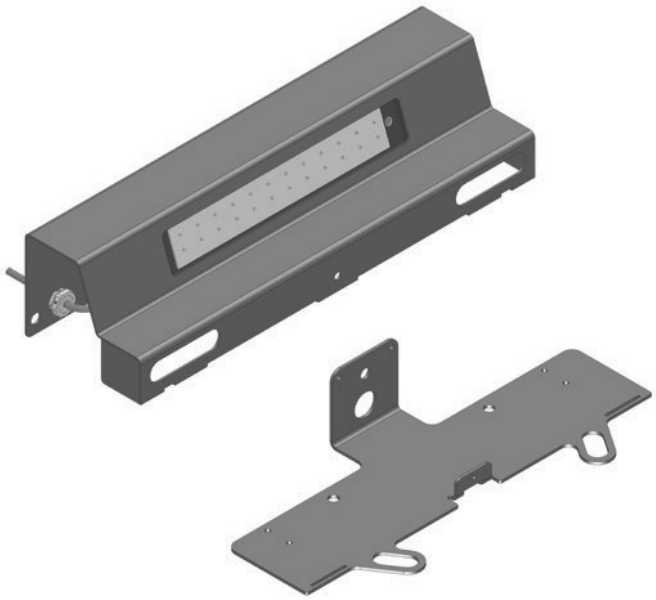
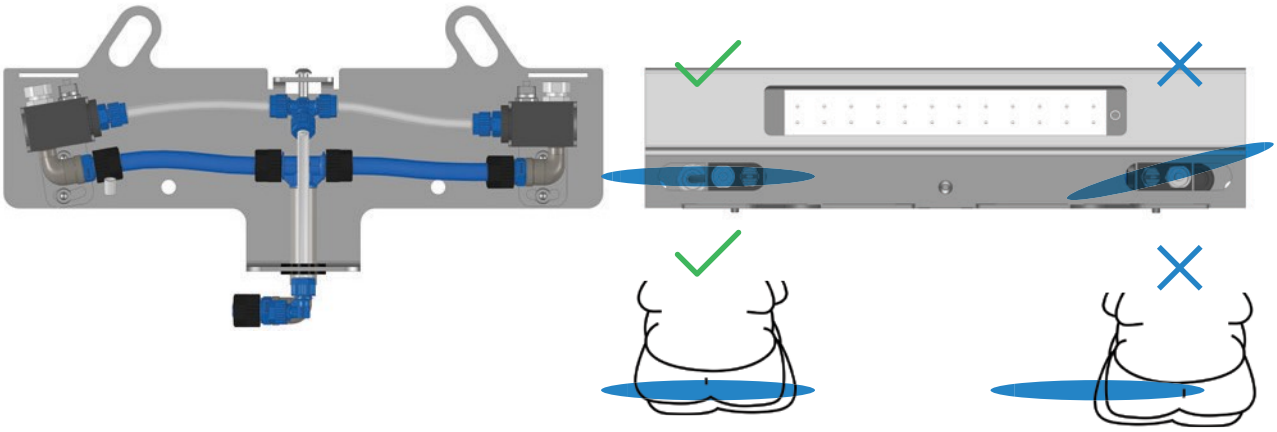
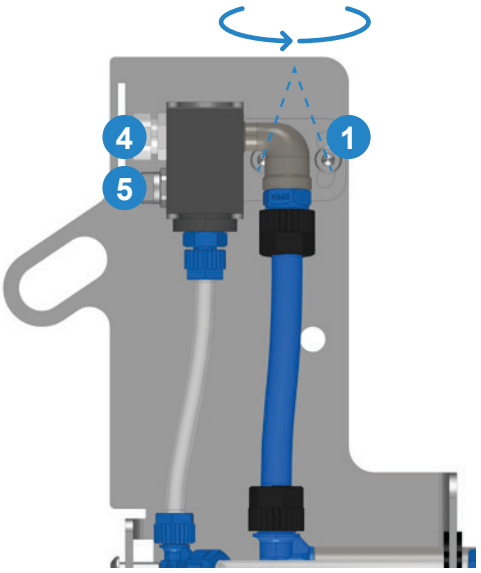


Figure 35

3.32 Nozzle Adjustment



Horizontal Adjustment



1 **Horizontal Adjustment**

Tool: 5 mm hex key

4 **Water Nozzle**

Default: 65° size 30
Part no. (Coming soon)

5 **Care Nozzle**

Default: 65° size 5
Part no. (Coming soon)

See installation manual for more information.

4 Operating & test instructions

4.1 GEA PedicoSprayer, Keypad layout

Robot I (left) & Robot II (right)

- Wash On/Off key & LED
- Wash Test key
- Care Program On/Off key & LED
- Care Test key
- Care Empty LED
  (one for Robot I, one for Robot II separately)
- Soap Empty LED (applies to both Robots)
- Alarm LED (one for Robot I, one for Robot II separately)
- Slot for USB connection with PedicoSprayer Tool

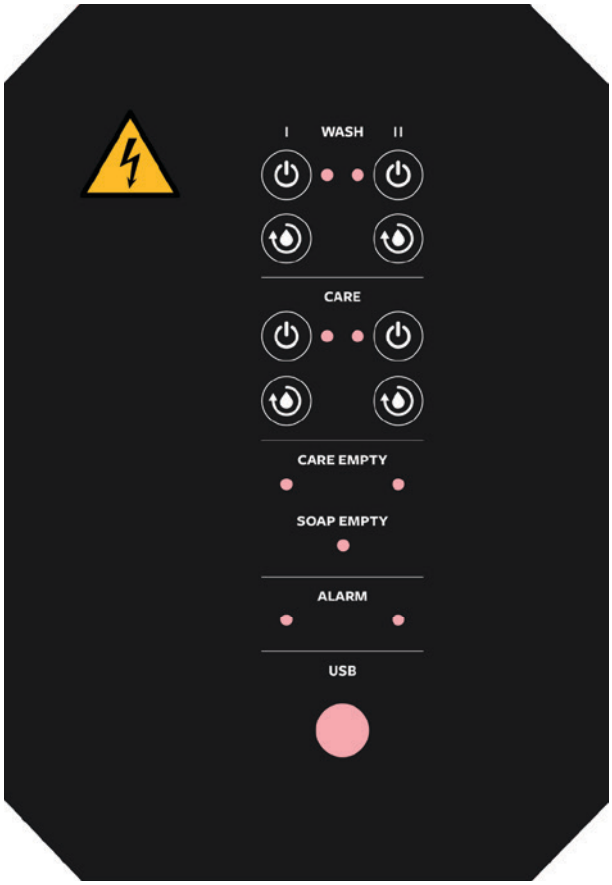


Figure 39: GEA PedicoSprayer Electric Control unit

4.2 LED Indicators, General Description

- Steady green light: ON
- Steady yellow light: Empty
- Flashing red light: Alarm

Figure 40:
Wash keys and indicators

4.3 Wash Functions

4.3.1 Wash ON/OFF key, Robot I & II

- Push the Wash ON/OFF key to turn Wash ON or OFF
  The Wash ON/OFF
- LED light will turn green if Wash is ON.

4.3.2 Wash ON/OFF LED indicator, Robot I & II

- The LED light will turn green if Wash is ON

4.3.3 Wash Test key, Robot I & II

The wash test key will only work if wash is ON.
The water pump must be fully primed to do a test.

4.3.3.1 – Wash test, RU1 & RU2

- Push the Wash ON/OFF key to turn Wash ON or OFF The Wash ON/OFF

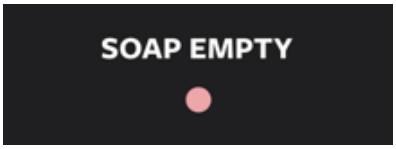


Figure 41: Soap empty indicator

4.3.3.2 – Prime Soap

- Hold the RU1 Wash Test key and the PD2.5 will start to prime after 2 sec.
  Release the Test key to stop priming.

4.3.4 Soap Empty LED indicator

- The LED will flash red if the soap container is empty.
- The Soap pump will stop operating automatically if the soap liquid container is empty.

4.3.4.1 – Empty soap pump

1. Remove the soap suction lance from the liquid container
2. Hold the RU1 Wash Test key and the soap pump will start to operate after 2 sec. Release the Test key when the pump and tubes are completely empty.
3. Clean the pump and suction tube with water, insert the suction lance in a bucket of clean water and prime the pump.
4. Repeat step one and two, to empty the pump again.

The soap pump can be damaged if the soap drys out, clean with water before turning of the system for more than 7 days.

4.4 Care Functions

Risk of contact with chemicals.
Always wear suitable safety goggles and gloves when handling chemicals.

4.4.1 Care ON/OFF key, RU1 & RU2

- Push the Care ON/OFF key to turn Care ON or OFF. The Care ON/OFF LED light will turn green if Care is ON.

4.4.2 Care ON/OFF LED indicator, RU1 & RU2

- The LED light will turn green if Care is ON.

4.4.3 Care Test key, RU1 & RU2

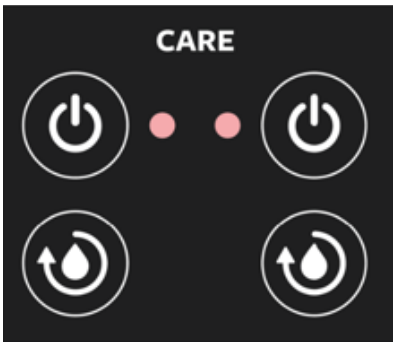


Figure 42: Care keys and indicators

The care test key will only function if care is ON.

4.4.3.1 – Care Test spray

- Push the Care test key, to do a care test spray. The care test spray will start after 5 sec.

4.4.3.2 – Prime Care pump

Replace/refill the liquid container and remember to insert the suction lance in the liquid container, before priming.

- Hold the RU1or RU2 Care Test key and the PD15will start to prime after 2 sec. Release the Test key to stop priming.
- Do a test spray after finished priming and check that the spray is solid and free of air.

4.4.4 Care Empty LED indicator, RU1 & RU2

- The LED will flash red if the care liquid container is empty.
- The Care pump will stop operating automatically if the care liquid container is empty.

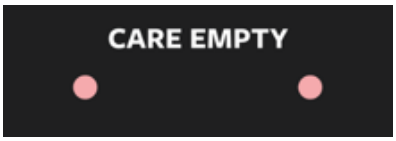


Figure 43: Care empty indicator

If the “Common Care Level Sensor” function is activated in the GEA PedicoSprayer Tool, both LED’s will flash red, if the liquid container is empty.

4.4.5 Empty Care pump

1. Remove the care suction lance from the liquid container.
2. Hold the RU1 or RU2 Care Test key and the care pump will start to operate after 2 sec. Release the Test key when the pump and tubes are completely empty.
3. Clean the pump and suction tube with water, insert the suction in a bucket of clean water and prime the pump.
4. Repeat step one and two, to empty the pump again.

The care pump can be damaged if the care product drys out, clean with water before turning of the system for more than 7 days.

4.5 Programming with GEA PedicoSprayer Tool, Robot I & II

Contact local Farm support advisor for help to set-up a customized program.

- Download the GEA PedicoSprayer Tool (PC) with this link: https://www.je-electronic.dk/publish/je935/GEA-N8UV94LF/publish.htm
- Use USB-A male to USB-Mini-B cable – Min. 1.5 m

Figure 44: USB slot connection control box

4.5.1 Options in programming

- Time – Weekly & 12/18/24 hours/day
- Action – Entry & exit
- Soap concentration – 0,2/0,4/0,6/0,8 %
- Care – Single or double stroke
- Central care suction – Use commen care level sensor (RU1 + RU2)

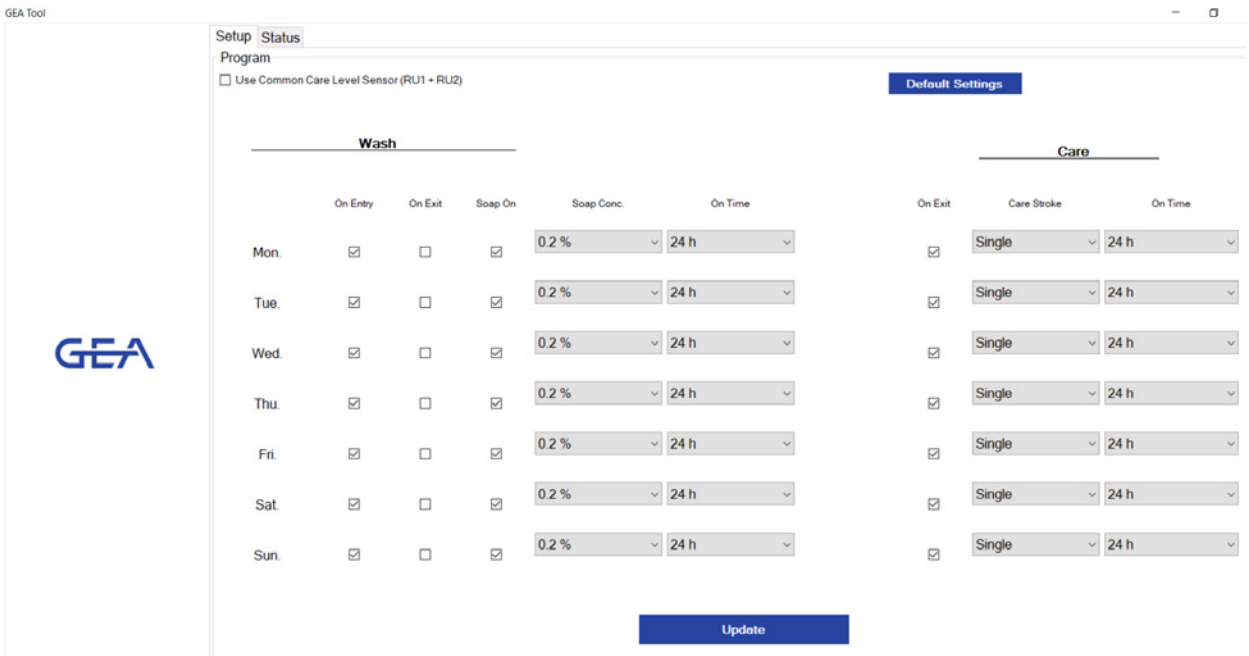


Figure 45: GEA PedicoSprayer Tool (PC) – Setup Page

5 Troubleshooting

5.1 Alarm Functions, Robot I & II

Figure 46: Alarm indicators

5.1.1 Alarm: The indicator will turn red

- Use GEA PedicoSprayer tool to find the issue
- Download the GEA PedicoSprayer Tool (PC) with this link: https://www.je-electronic.dk/publish/je935/GEA-N8UV94LF/publish.htm
- Use USB-A male to USB-Mini-B cable – Min. 1.5 m

Figure 47: USB slot connection control box

5.1.2 Checking status in tool

- Level sensors – Indicates if empty
- Alarms – Indicates if error
- I/O Status – Indicates if active
- Counters – Pump strokes for each robot

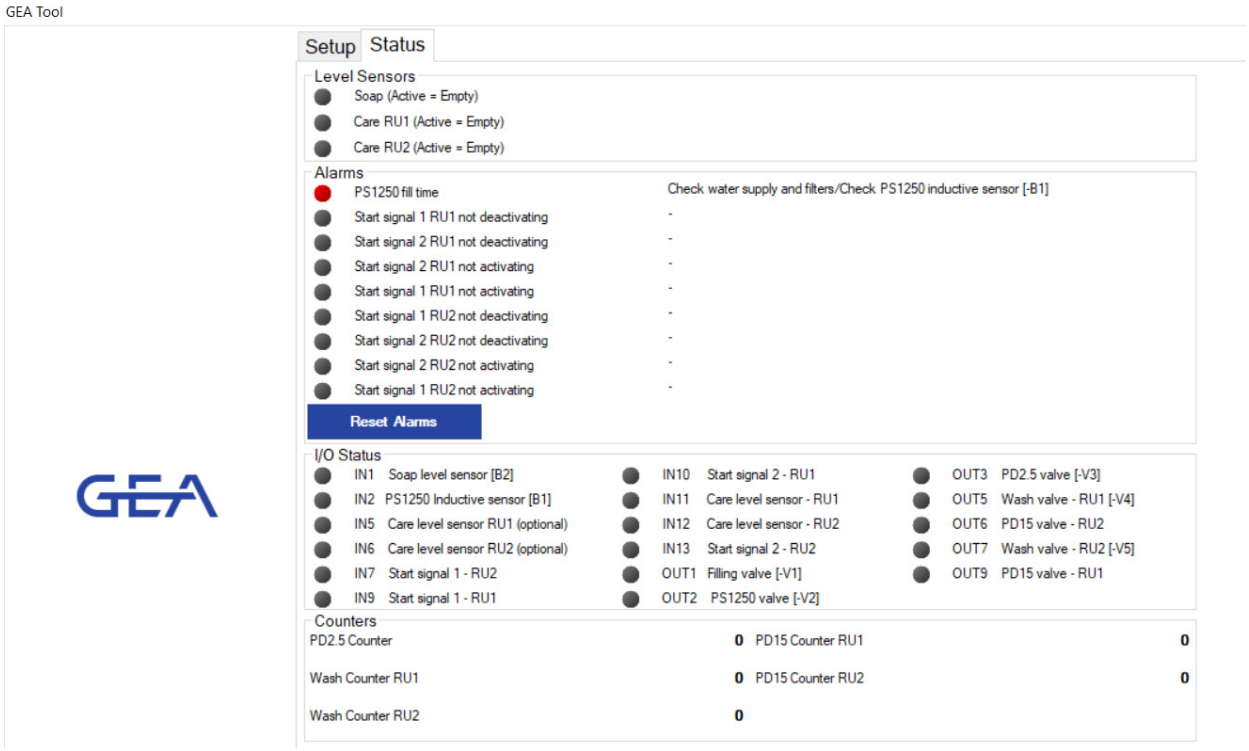


Figure 48: GEA PedicoSprayer Tool (PC) – Status page

6 Frost Protection

To protect the system against frost damage, during periods of temperatures below 0° C, empty both the wash and care system completely of liquid.

Empty wash system of liquid

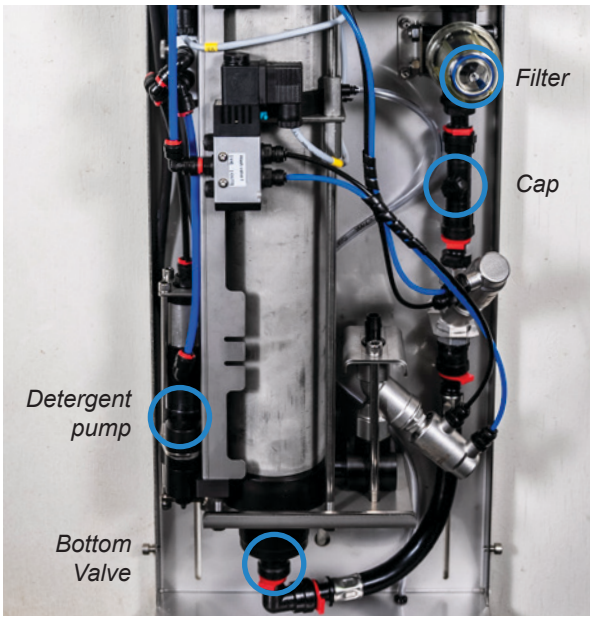
Risk of chemical spray. Always wear safety goggles and gloves when you do work on the PedicoSprayer care or wash system.

1. Close water supply
2. Remove water supply hose
3. Remove wash suction lance from can
4. Press/hold wash test key until detergent pump is empty.
5. Press wash test key to empty water pump
6. Disassemble bottom valve on PS1250 wash pump.
7. Take of filter and ventilation cap on water supply.

Empty Care pump

8. Remove the care suction lance from the liquid can.
9. Hold the RU1 or RU2 Care Test key and the care pump will start to operate after 2 sec. Release the Test key when the pump and tubes are completely empty.
10. Clean the pump and suction tube with water, insert the suction lance in a bucket of clean water and prime the pump.
11. Repeat step one and two, to empty the pump again.

Wash test key & Care test key



Disassembled parts

The care pump can be damaged if the care product drys out, clean with water before turning off the system for more than 7 days.

7 Maintenance

Risk of chemical spray. Always wear safety goggles and gloves when you do work on the PedicoSprayer care or wash system.

During work on the GEA PedicoSprayer nozzle bar, always block cow traffic to the nozzle bar and put the robot on which you intend to work on out of operation, following the procedure as described in the GEA Robot Operator Manual

The GEA PedicoSprayer does not require a lot of maintenance, but please uphold the maintenance instructions below, to ensure that the GEA PedicoSprayer will keep functioning as intended.

Contact your nearest GEA service provider if you have any questions.

7.1 Weekly Visual Inspection (Farmer)

- Clean the nozzles with high pressure water.
- Check both wash and care nozzle spray pattern and angles, does the spray cover the hoofs as intended? See Nozzle Bar Quick guide)

7.2 Monthly (Farmer)

- Check the level of Soap and Care.
- Clean filters on both Soap and Care suction lances.
- Check the system for leakages or damages.

7.3 Every 12 months: (Technician)

- Clean Soap & Care suction lance filter.
- Check the system for leakages or damages.
- Clean water supply filter
- Replace exhaust filter regulator on all valves
- Replace silencer on all valves
- Replace the filters on all valves
- Replace nozzles and reset spray pattern
- Watch video guide - QR code

12 month maintenacne kit part nr.
Single unit:
Double unit:

7.4 Maintenance Quick Guide

7.4.1 Weekly

1. Use brush to clean nozzles
2. Check spray pattern (See nozzle bar quick guide)
3. Check if Soap and Care needs refill

7.4.2 Monthly

1. Clean filters on suctions lances for Soap & Care with water

A. Take of 8mm PCV hose
B. Clean with water pressure

Suction lance filter 50 mesh
Part no. (Coming soon)

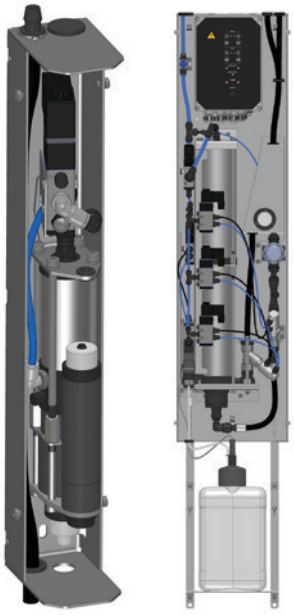
2. Check system for any leakages or damages

A. Main unit
- Take of cover
- Check while running
- Put on cover

B. Care pump
- Take of cover
- Check while running
- Put on cover

C. Supply hoses

D. Nozzle bar
- Take of cover (See Nozzle Bar quick guide on next page)
- Put on cover



8 Installation

8.1 Introduction

The installation process of the GEA PedicoSprayer and GEA PedicoSprayer upgrade kit double has the following phases:

1. Prepare for the installation.
2. Install the GEA PedicoSprayer main unit
3. Install the container bracket on the main unit
4. Install the care pump
5. Install the nozzle bar fittings
6. Install the nozzle/light bar cover (Retrofit)
7. The installation is done by a GEA certified technician

8.2 Preparation

Install the GEA PedicoSprayer Automatic Hoof Sprayer with support from the GEA service provider. Below are the tasks needed to be done at the farm and the purchase of equipment necessary to install the GEA PedicoSprayer:

- Water supply point needs to be placed close (<1m) (3.3 ft) to the GEA PedicoSprayer unit by an authorized person. Place ball valve in-between supply point and the unit.
- Power supply wall socket with grounding needs to be placed close (<1m) (3.3 ft) to the GEA PedicoSprayer unit by an authorized person.

Please contact your local GEA service provider for help with your specific requirements.

8.2.1 Installation Material Kits

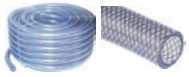
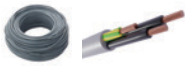
Parts not included are sold separately.

Single – Part no. 7830-3000-070
Double – Part no. 7830-3000-080

Purpose	Description	Single	Double	Unit
Wash spray tube	PA 16/13 mm Tube black 14 bar 25m	1	2	pcs
Wash protection hose	PVC spiral hose 20/27 mm 60m	1	2	pcs
Main Unit air supply tube	PA 12/10 mm tube black 15 bar 20m	1	2	pcs
Care Pump spray tube & air supply tube	PELD 8/6 mm tube clear 9 bar 100m	1	2	pcs
Care protection hose	PVC spiral hose 10/16 mm 50cm	1	2	pcs
Care protection hose	PVC spiral hose 10/16 mm 3m	1	2	pcs
Water supply hose	Hose PVC braided CLEAR 19/13 - 10m	1	1	pcs
Suction lances cable	2X0.75mm2 control cable PVC outer sheath 30m	1	2	pcs
Care pump cable	3G0.75mm2 control cable PVC outer sheath 50m	1	2	pcs
Signal cable	3X0.75mm2 control cable PVC outer sheath 50m	1	2	pcs

Table 1: Content overview of the installation kits

8.2.2 Installation Material Spare Parts

Part no.	Description	Purpose	Stock location advice
	PA 16/13 mm Tube black 14 bar 100m	Spray tube from main unit to nozzle bar	
	PVC spiral hose 20/27 mm 60m	Spray tube protection	
	PA 12/10 mm tube black 15 bar 100m	Air supply tube for main unit	
	PELD 8/6 mm tube clear 9 bar 100m	Supply & Spray tube care pump	
	PVC spiral hose 10/16 mm 60m	Care tube protection	
	Reinforced PVC hose 13/19 mm 15 bar 10m	Water supply hose	
	2X0.75mm2 control cable PVC outer sheath	Suction lance cable	
	3G0.75mm2 control cable PVC outer sheath	PD15 Valve cable	
	3x0.75mm2 control cable PVC outer sheath	Signal cabel	
	0.75 mm2 end sleeve	End sleeves	
	Routing pipe for cow toilet incl. brackets	Care pump installation on cow toilet	
	20/25 L Container wall mount bracket	Wall Bracket 20/25 L	
	Suction lance for 200/1000l drum - POM	200 l/1000 L care suction	
	Hose clamp - 12x20/9mm - A2	Hose clamp water supply main unit	
	Hexnipple 316 1/2”	Nipple ½”	
	Bushing 316 m/f 3/4×1/2”	Reducer ring ¾”-½”	
	Hosetail 316 14×1/2”	Hose pillar 13mm x ½”	
	Tee 316 1/2”	T-Coupling 1/2”, SS	
	Ballvalve 316 2-pc FB 1/2”	Ball valve ½”	

8.2.3 Tools

- Hammer drill
- Drill
- Heat gun
- Hammer
- Cable cutter
- Measuring tape
- Flathead screwdriver 3mm
- Flathead screwdriver 6mm
- Hexagon wrench 4mm / Hex Allen key set
- Hexagon wrench 5mm / Hex Allen key set
- Wire stripping tool
- Crimping pliers for wire end furrules
- 100 PCS Wire end furrules 0,75mm2
- Spanner 19mm
- Silicon spray
- Strips 300mm
- Marker pen
- Knife
- Hose cutter
- Gloves
- Eye protection
- Ear protection

Figure 49: Installation tools

8.2.4 List of Supplied Parts

The GEA PedicoSprayer package must contain the parts listed below. Make sure all these Parts are present before you start the installation.

GEA PedicoSprayer Single – 1 x Carton box with:

- 1 x GEA PedicoSprayer Single Unit
- 1 x Robot I installation kit

Guide & Service kit:

- Manuel + USB stick 1 pcs.
- Operator & tool quick guide 1 pcs.
- Nozzle bar quick guide 1 pcs.

Robot I installation kit:

- Main Unit fixation set 1 pcs.
- Care Pump unit 1 pcs.
- Care Pump fixation set 1 pcs.
- Nozzle bar fitting set 1 pcs.
- Nozzle bar fixation set 1 pcs.
- Soap Container unit mount bracket 1 pcs.
- Container unit mount bracket fixation set 1 pcs.
- Soap Suction Lance w/dry run sensor 1 pcs.
- Care Suction Lance w/dry run sensor 1 pcs.
- Suction Lance fixation set 1 pcs.

GEA PedicoSprayer Double – 1 x Carton box with:

- 1 x GEA PedicoSprayer Double unit
- 1 x Robot I installation kit
- 1 x Robot II installation kit

Guide & Service kit:

• Manuel + USB stick	1 pcs
• Operator & tool quick guide	1 pcs
• Nozzle bar quick guide	1 pcs

Robot I installation kit:

• Main Unit fixation set	1 pcs.
• Care Pump unit	1 pcs.
• Care Pump fixation set	1 pcs.
• Nozzle bar fitting set	1 pcs.
• Nozzle bar fixation set	1 pcs.
• Soap Container unit mount bracket	1 pcs.
• Container unit mount bracket fixation set	1 pcs.
• Soap Suction Lance w/dry run sensor	1 pcs.
• Care Suction Lance w/dry run sensor	1 pcs.
• Suction Lance fixation set	1 pcs.

Robot II installation kit:

• Care Pump unit	1 pcs.
• Care Pump fixation set	1 pcs.
• Nozzle bar fitting set	1 pcs.
• Nozzle bar fixation set	1 pcs.
• Care Suction Lance w/dry run sensor	1 pcs.
• Suction Lance fixation set	1 pcs

8.3 Diagrams, Description & Installation overview

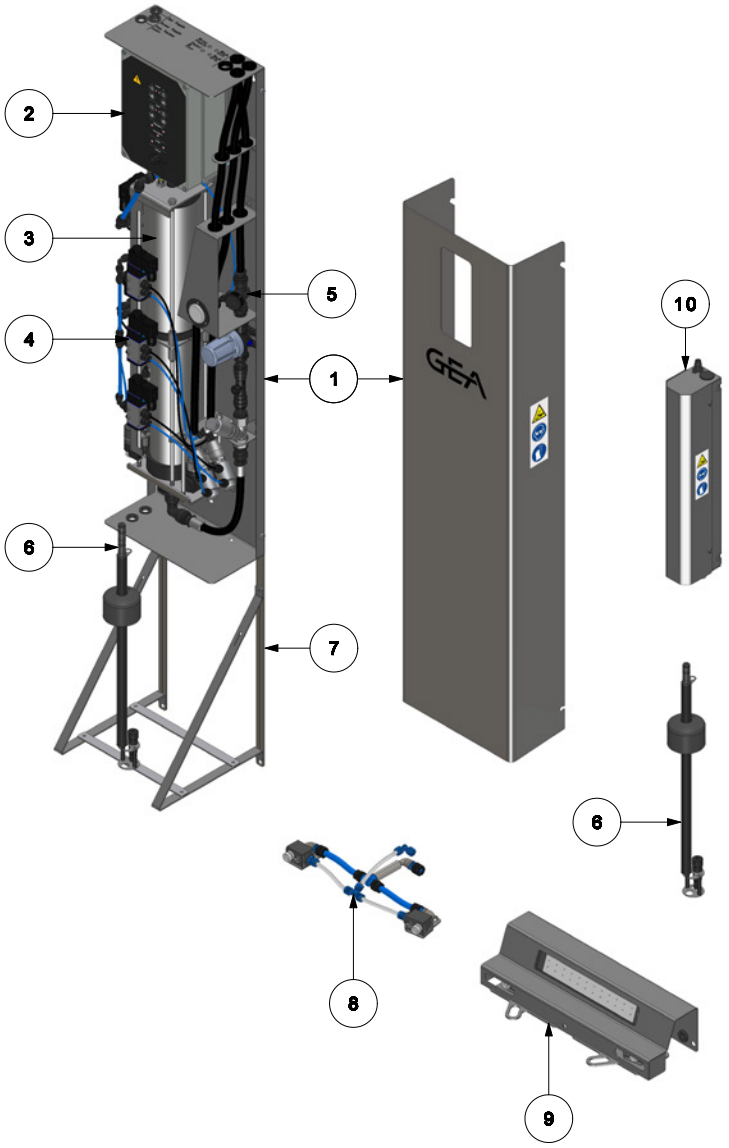


Figure 50: GEA PedicoSprayer main components layout

1. Enclosure
2. Control box
3. Water pump
4. Air valve panel
5. Water supply valve
6. Soap & Care suction lance
7. Soap container bracket 20L
8. Nozzle bar fittings
9. Nozzle/light bar cover (Retrofit kit)
10. Care pump

8.3.1 GEA PedicoSprayer Single Installation Overview

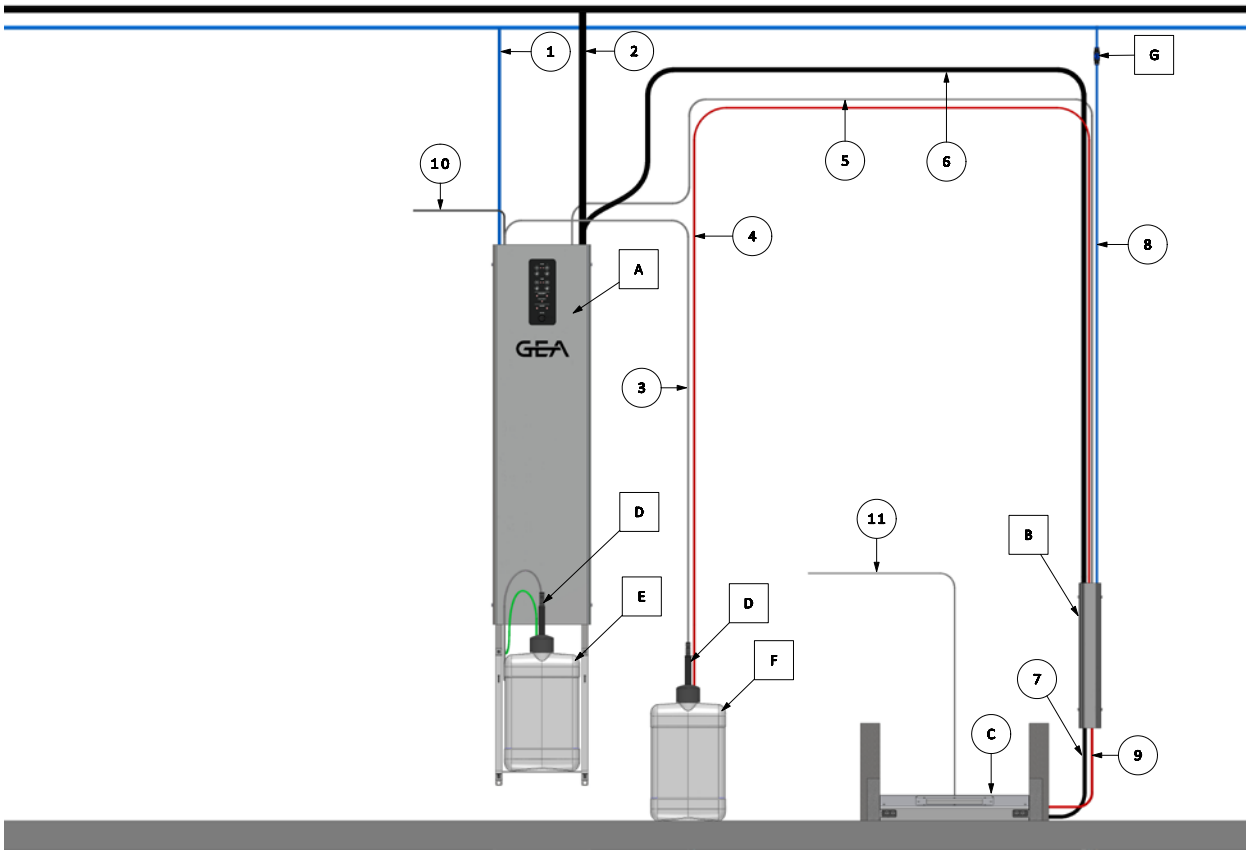


Figure 51: GEA PedicoSprayer Single – Installation Diagram

1. Air supply hose
2. Power supply cable
3. Water supply hose
4. Care suppy tube
5. Care pump valve cable
6. Wash tube 16mm
7. Wash tube 12mm
8. Care air supply tube
9. Care spray tube
10. Signal cable
11. Power supply lightbar

A. Main unit
B. Care pump
C. Nozzle bar
D. Suction lance
E. Detergent can 20 L
F. Care can 20 L
G. Hand valve

8.3.2 GEA PedicoSprayer Double Installation Overview

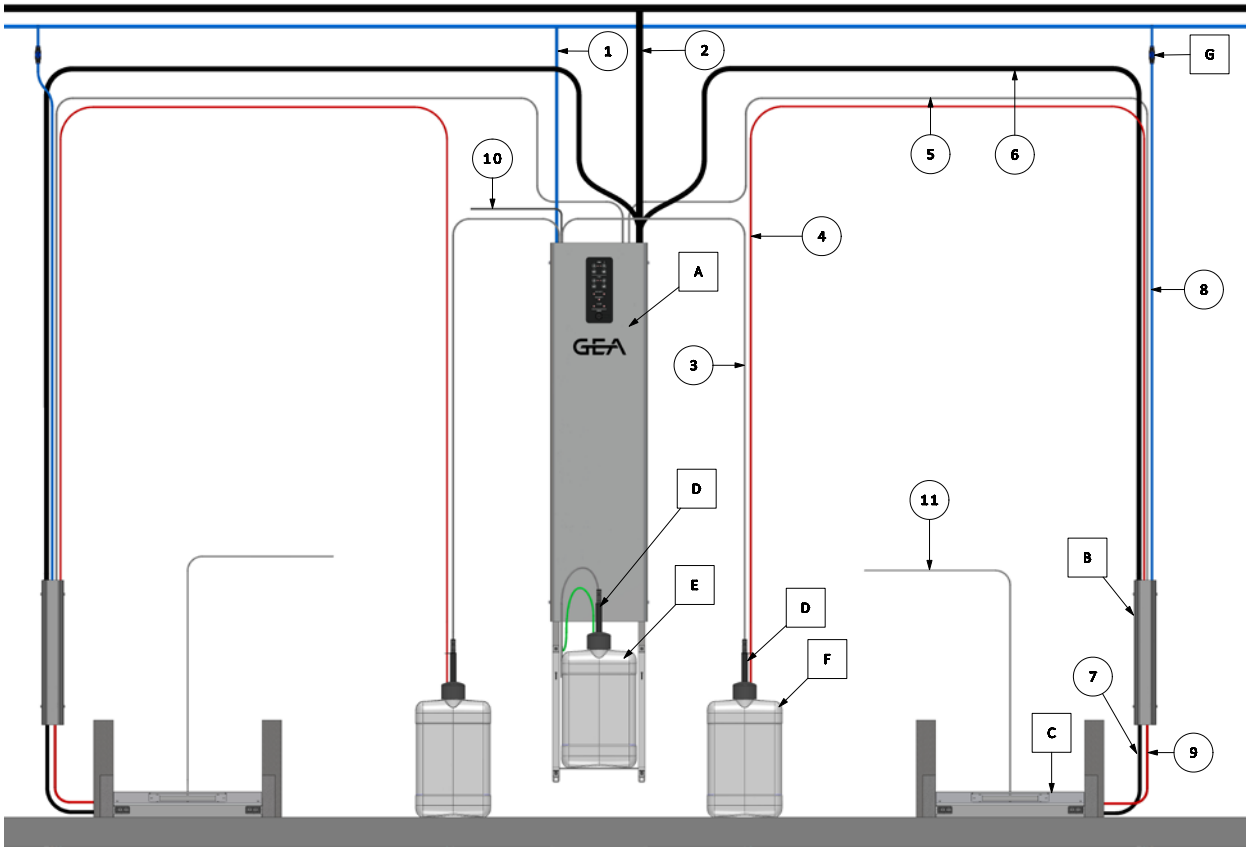


Figure 53: GEA PedicoSprayer Double – Installation Diagram

1. Air supply hose
2. Power supply cable
3. Water supply hose
4. Care suppy tube
5. Care pump valve cable
6. Wash tube 16mm
7. Wash tube 12mm
8. Care air supply tube
9. Care spray tube
10. Signal cable
11. Power supply lightbar

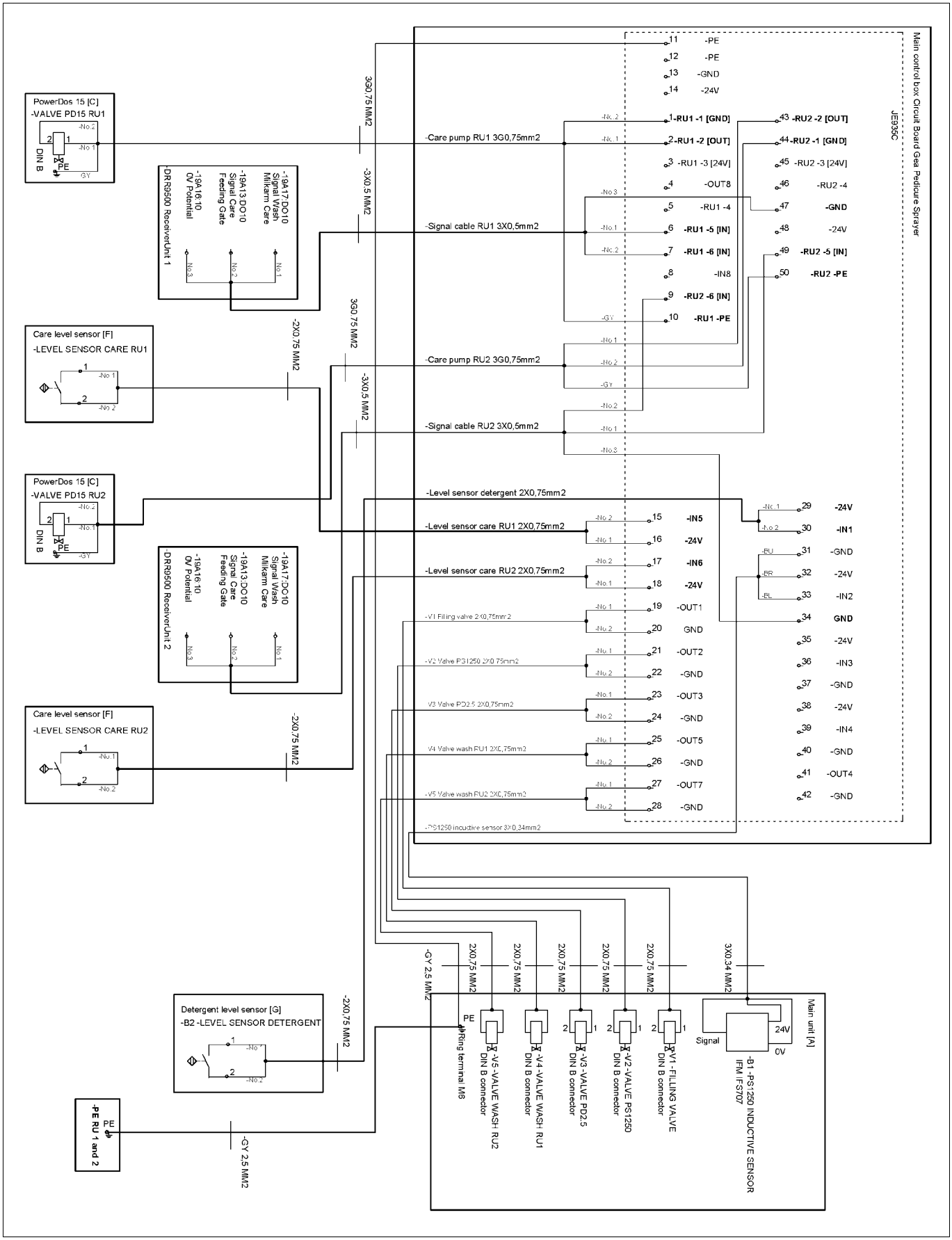
A. Main unit
B. Care pump
C. Nozzle bar
D. Suction lance
E. Detergent can 20 L
F. Care can 20 L
G. Hand valve

8.3.3 Main unit placement in robot room

If the robots are place far from each other, we recommend mounting the PedicoSprayer Unit beside the Central Unit. This will often be the optimal location to install between the Robot units.

Figure 54

8.3.4 Installation plans



The electrical connection is also shown in the following circuit diagrams:
7821-3350-000, 7821-3350-130

8.3.5 Main unit PCB diagram

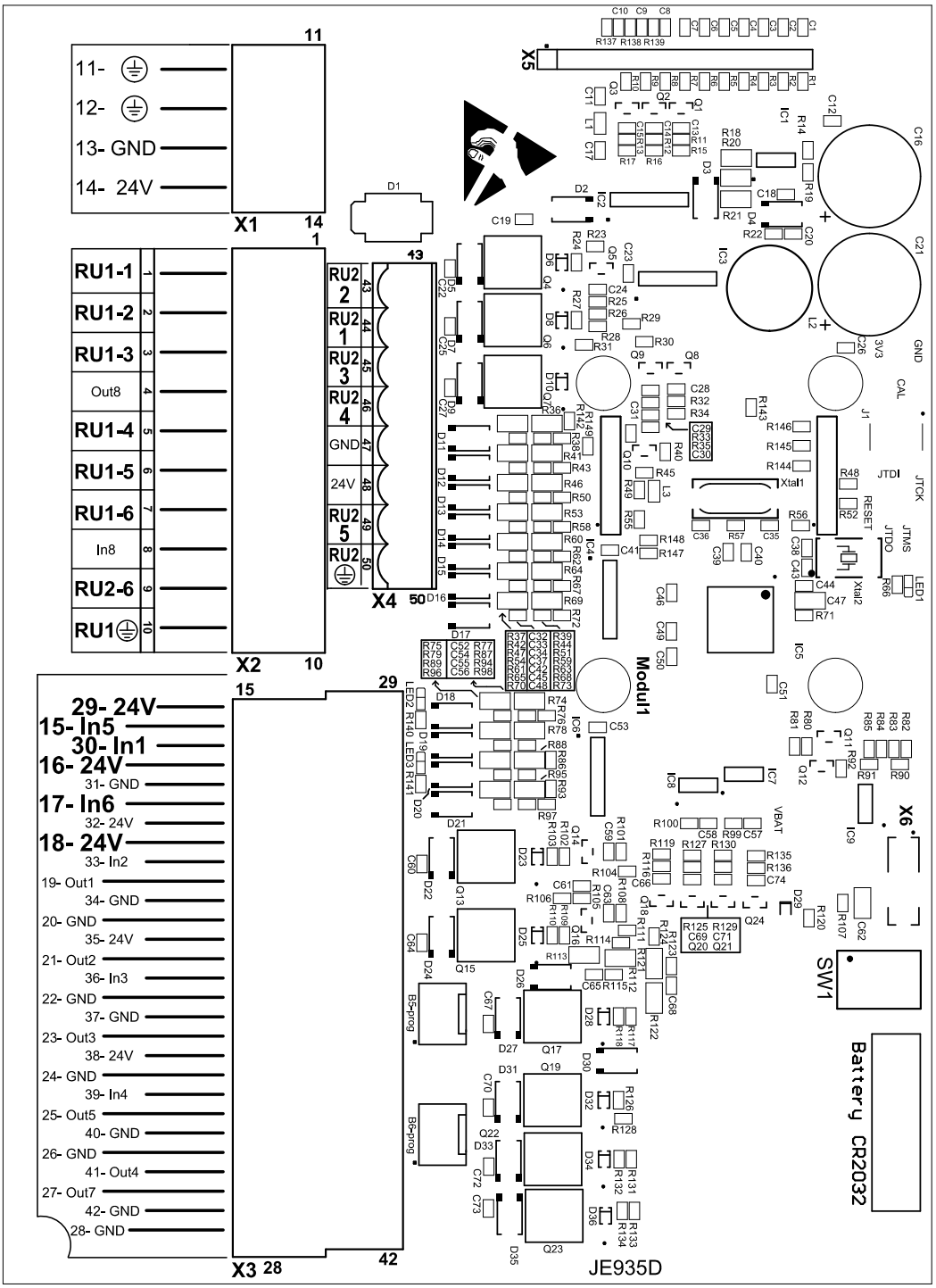


Figure XX: Main unit PCB diagram

8.3.6 Diagram of inputs and outputs

Diagram - Main Unit - Top	
No. 1	Air supply
No. 2	Preinstalled - Power supply cable
No. 3	Care suction lance connection – Robot I & Robot II
No. 4	Signal & care pump valve cables – Robot I & Robot II
No. 5	Spray tube - Robot I
No. 6	Water supply
No. 7	Spray tube - Robot II

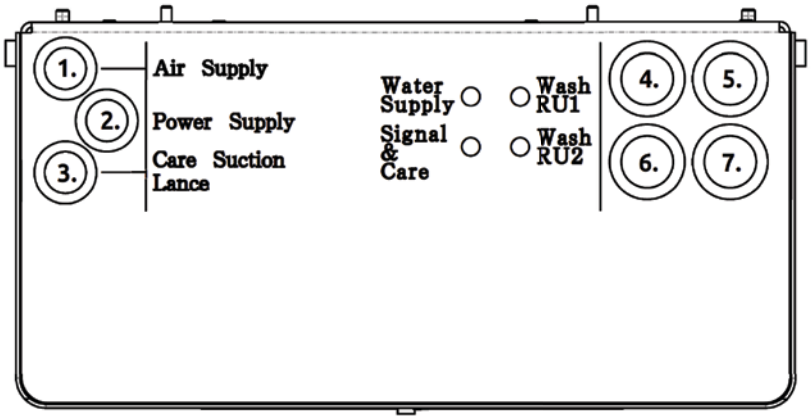


Figure 56: Main Unit – Top diagram

Diagram - Main Unit Bottom	
No. 1	Suction tube PD2,5 Soap Pump
No. 2	Suction lance cable to Main Unit control box

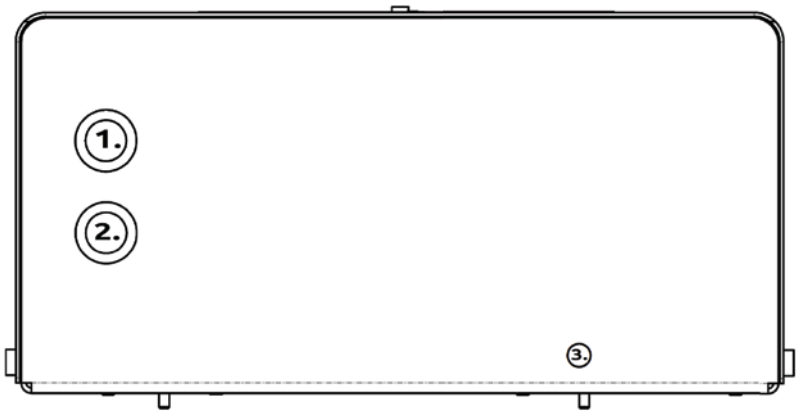


Figure 57: Main Unit – Bottom diagram

Diagram - Main Unit - Control Box	
No. 1	1 x Soap suction lance connection – 2 x Care suction lance connection (Robot I & II)
No. 2	Signal cable - Robot I & II
No. 3	Care pump valve connection - Robot I & II
No. 4	Fuse
No. 5	Preinstalled – Power cable
No. 6	Preinstalled – 2 x Valves [V1, V2] + Ground connection
No. 7	Preinstalled – 3 x Valves connection [V3, V4, V5]
No. 8	Preinstalled – Inductive sensor
No. 9	Pluged

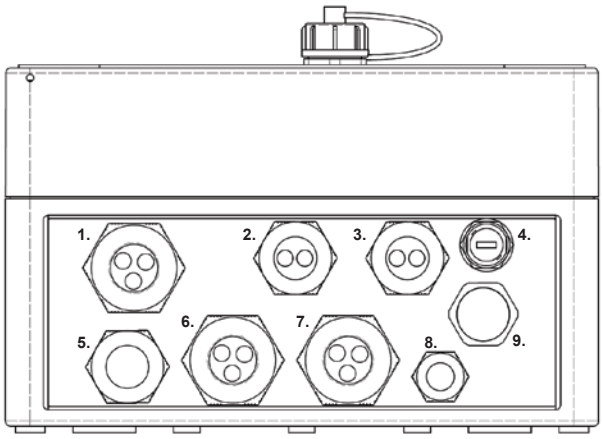


Figure 58: Control Box diagram

Diagram – Care Pump - Top	
No. 1	Wash tube
No. 2	Air tube supply, Care spray tube supply & Valve cable

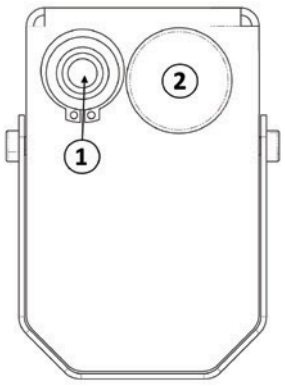


Figure 59: Care Pump – Top diagram

8.4 Installation Procedure

At all time, block cow traffic and take the robot out of operation. Shut off the air supply of the robot before connecting, the main air supply and start signal tube, to the GEA PedicoSprayer.

The installation for robot I procedure has the following steps:

1. Read General hose and tube installation instructions
2. Read Water, chemicals and air supply guideline
3. Install Main unit on the wall
4. Install Soap container bracket
5. Connect Soap suction lance & PD2,5 Soap Pump
6. Install PD15 Care Pump
7. Connect supply hose & cable to Care pump
8. Connect care pump valve unit to main unit
9. Connect wash spray tube to Main Unit
10. Connect Care Suction Lance
11. Install Nozzle bar fittings
12. Install Nozzle & light bar base (Retrofit)
13. Connect Care pump tubes to Nozzle & light bar
14. Connect air & Water supply to Main unit
15. Connect robot start signals to Main Unit
16. Connect power supply to Main Unit

The installation for robot II procedure has the following steps:

1. Install PD15 Care Pump
2. Connect supply hose & cable to Care pump
3. Connect care pump valve unit to main unit
4. Connect wash spray tube to Main Unit
5. Connect Care Suction Lance
6. Install Nozzle bar fittings
7. Install Nozzle & light bar base (Retrofit)
8. Connect Care pump tubes to Nozzle & light bar

8.4.1 General hose and tube installation instructions

- When installing the hoses and tubes it is important that you avoid sharp edges, which can damage the hose.
- It is important that you avoid any sharp bends when installing the hose, see allowed bending radius for the tubes below.
- It is very important that the hose keeps its round shape, all the way through the installation.
- Always install the tubes out of reach of the cows. If this is not possible, protect the tubes in a proper manner.
- Never install hoses or tubes in places where leaks can cause damage to buildings and/or other equipment.
- Warm up the hose ends with heat gun or warm water (max 60 °C (140 F)) and lubricate when connecting the hose to the hose barbs for easier installation.

Description	Name	Part nr.
Spray tube	PA 16/13 mm Tube black 14 bar 100m	Coming soon
	PA 16/13 mm Tube black 14 bar 25m	Coming soon
Spray tube protection	PVC spiral hose 20/27 mm 60m	Coming soon
Supply & Spray tube	PELD 8/6 mm tube clear 9 bar 100m	Coming soon
Care tube protection	PVC spiral hose 10/16 mm 60m	Coming soon

8.4.2 Wash and Care spray tube installation instructions

- Connect the supplied PA 11 16/13 mm (0.62/0.51 in) wash spray tube to the blue 12 mm (0.47 in) hose connector in the nozzle bar, use the included 8/16mm (0.31/0.62 in) hose clamp to fix the tube.
- Install the 20/27 mm (0.78/1.06 in) PVC steel spiral wash spray tube protection hose and cut it to the correct length, the hose needs to go 20 mm (0.78 in) inside the GEA PedicoSprayer enclosure protection hose fixation bracket.
- Connect the supplied PELD 8 mm Care spray tube to the blue barb block 8 mm (0.31 in) T connector in the nozzle bar.
- Install the 10/16 mm (0.39/0.51 in) PVC steel spiral Care spray tube protection hose and cut it to the correct length, the hose needs to go 20 mm (0.78 in) inside the GEA PedicoSprayer enclosure protection hose fixation bracket.
- Cut the wash spray tube to the correct length and connect it to the GEA PedicoSprayer water unit:
- Use the included 8/16 mm (0.31/0.62 in) hose clamp to fix the tube.
- Cut the PELD 8 mm (0.31 in) Care spray tube to the correct length and connect it to the Care pump blue barb block 8 mm (0.31 in) connector outlet.
- Tighten the protection hose fixation bracket with a spanner until the protection hoses are secured
- Install additional hose protection if necessary.

8.4.3 Connect water, chemicals and air supply

Use a proper scaffold or double-sided ladder when you do this procedure.

GEA PedicoSprayer is not provided with any backflow prevention device category 5 (in conformity with EN 1717) in the water supply line.

- Risk of bacterial contamination of the connected drinking water system and connected devices
- In case of local legislation requiring any backflow prevention device category 5 in the water supply, be aware to obtain one before you install the GEA PedicoSprayer! Example of such device is an AB Break unit.
- A backflow prevention device category 5 (in conformity with EN 1717) in the water supply line is mandatory in the Netherlands. For these reasons, GEA strongly advices use of such device in the water supply line.
- In case of local legislation not requiring an AB Break unit, GEA highly recommends the application of a AB Break Unit in the water supply line.
- Connect only PedicoSprayer to AB Break Unit to provide cross termination.

Connect the water supply:

- Connect a 18 mm (0.70 in) tube from the water connector to the water supply.
- Open main water supply.
- If the water connector leaks tighten the tube clamps.

Always use GEA approved products

- Connect a 6 mm (0.24 in) tube from the chemical connector with the lance with dry run sensor and filter.
- Put the lance in the liquid container.

Connect the air supply:

- Connect robot air supply by using T-Coupling 14-12-14.

8.4.4 Install Main Unit

Parts:

- GEA PedicoSprayer unit
- Main Unit Fixation Set

Tools needed:

- Hammer drill
- Drill
- Measuring tape
- Marker pen

Install the GEA PedicoSprayer unit vertical on the wall max. 25 m (82.02 ft) in the straight line from the nozzle bar!

1. Mark the locations where to drill the holes for the screws.
2. Drill the holes in the wall.
3. Push wall plugs in the holes.
4. Place the screws and spacers in the holes.
5. Open the GEA PedicoSprayer unit by loosen up two M6 Allen (hexagon) screws on the underside.
6. Install the GEA PedicoSprayer unit with three screws on the wall.

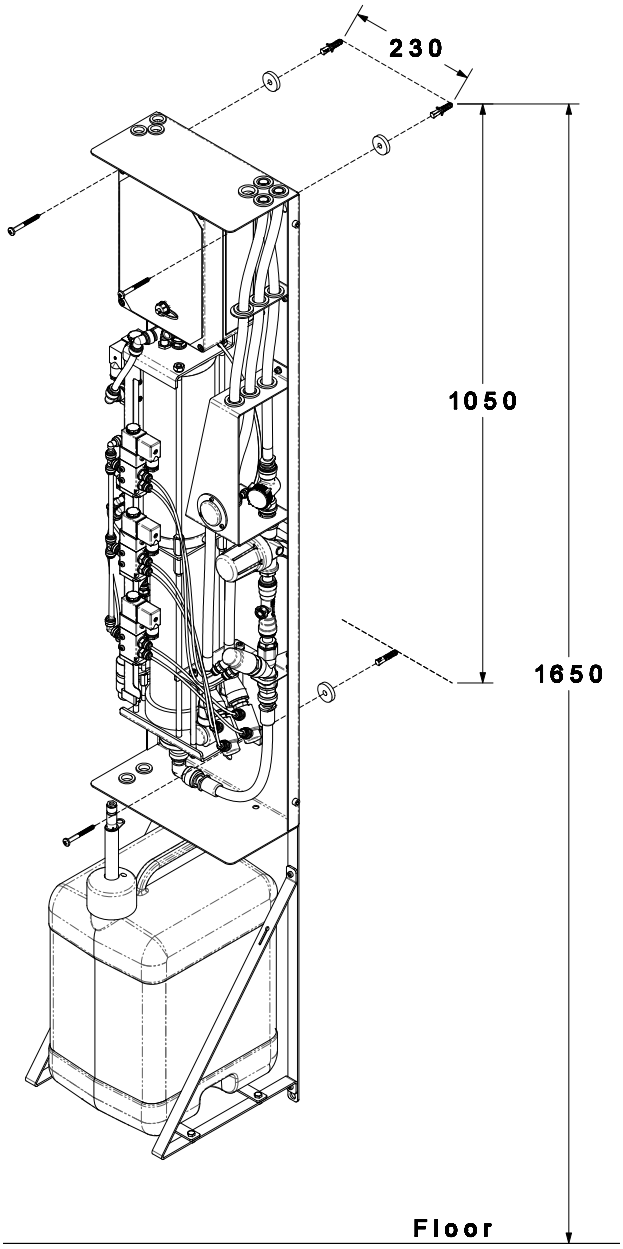


Figure 60: Installation Main Unit.
Distance in mm.

The Main unit must be installed in the frost-free environment.

8.4.5 Install Soap container bracket

Parts:

- Soap container bracket
- Soap container bracket Fixation Set

Tools needed:

- Allen key M4
- Spanner 10mm

Install the 10L container bracket to the base of GEA PedicoSprayer unit, with the container bottom approx. 10-20 cm (4-8 in) from the robot floor.

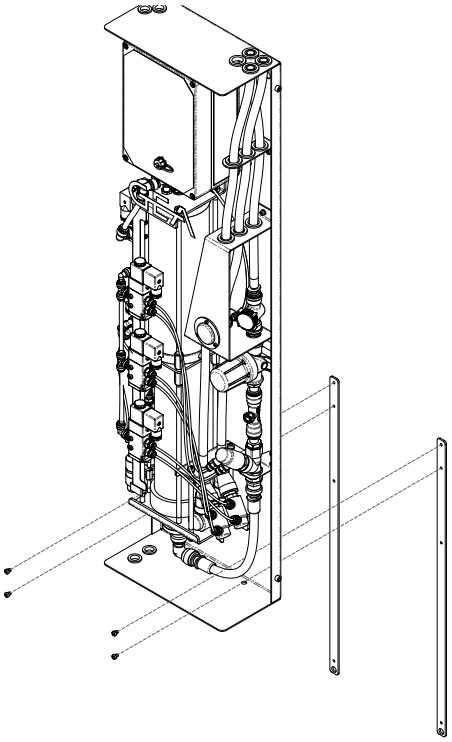


Figure 61: Detergent container assembly 1

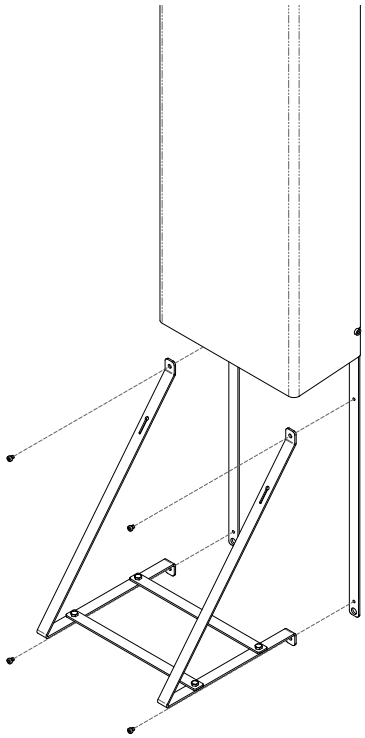


Figure 62: Detergent container assembly 2

8.4.6 Connect Soap suction lance & PD2,5 Soap Pump

Tools needed:

- Wire stripping tool
- Crimping pliers for wire end furrules
- 4 PCS Wire end furrules 0,75mm2
- 0,9 Allen key (Included)

Cables needed:

- Suction lance cable
  2G0.75mm2 control cable PVC outer sheath
- Suction Lance fixation set

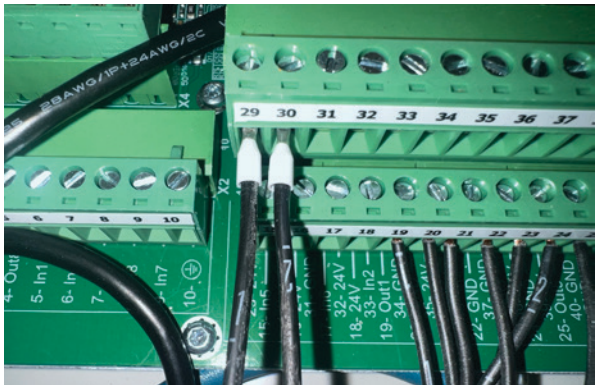


Figure 63: Control box connection [-X29/-X30]

Connection table		
Wire nr. 1	T.No. 29	24V
Wire nr. 2	T.No. 30	In1

Figure 64: Soap Suction Lanse

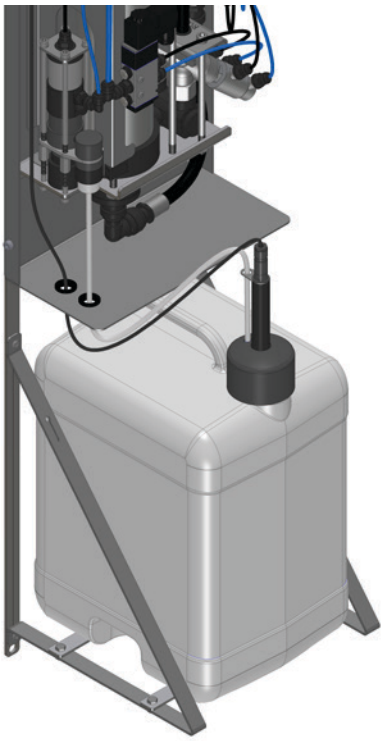


Figure 65: Soap Suction Lance

8.4.7 Install PD15 Care Pump

Parts:

- Care Pump
- Care Pump Fixation Set

Tools needed:

- Hexagon wrench 4 mm / Hex Allen key set
- Hexagon wrench 5 mm / Hex Allen key set

Install the Care Pump Unit on the robot / cow toilet leg

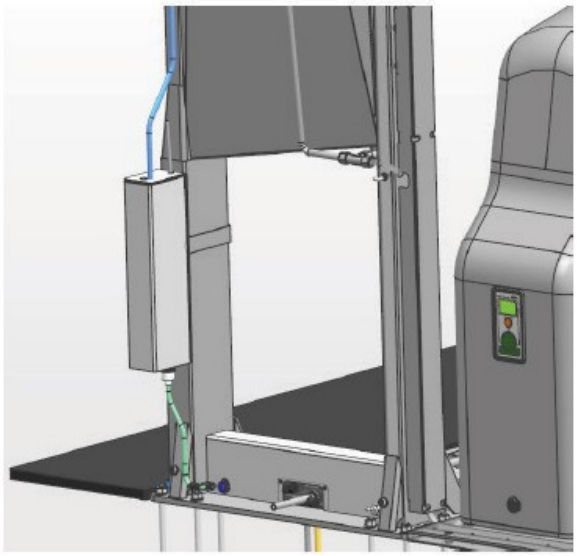


Figure 66: Care Pump placement

1. Open Care Pump unit by loosen the 2 x M4 Allen (hexagon) screws on the front. (See figure 19)
2. Place Care Pump with fixation set to the existing holes on the robot leg. (See figure 18)

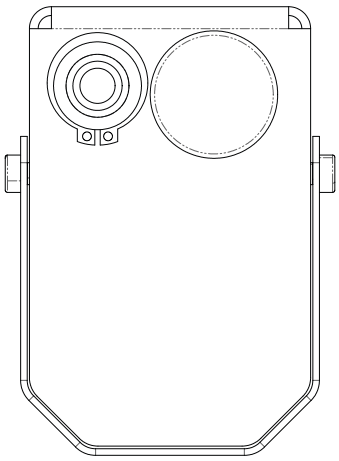


Figure XX: XXXX

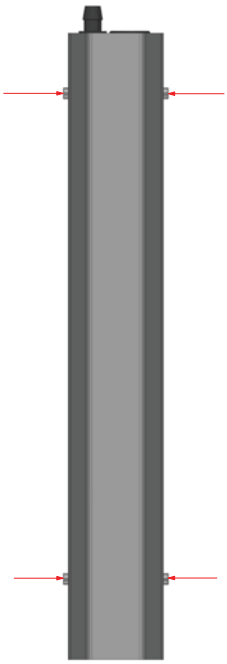


Figure 67: Care Pump

Figure 68: Care Pump internal

Figure 21: New installation mounting point top

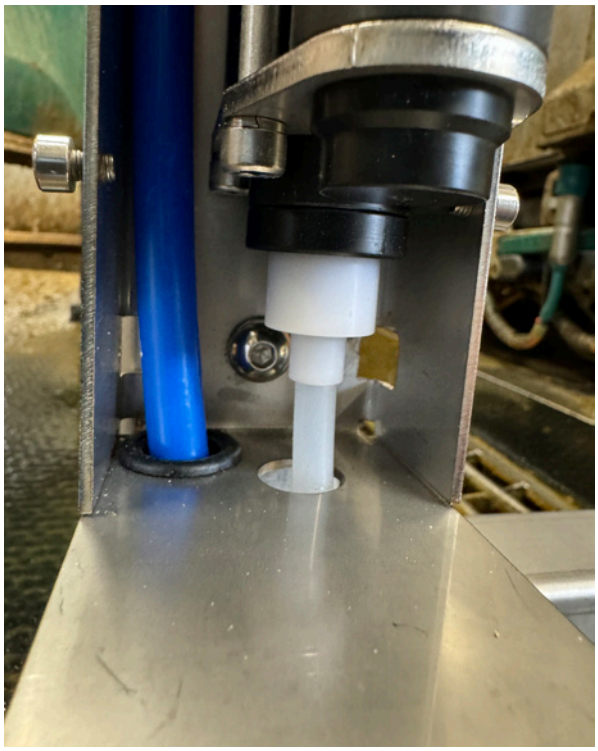


Figure 22: New installation mounting point bottom

Figure 69: Retrofit installation fasten with supplied brackets to pillar

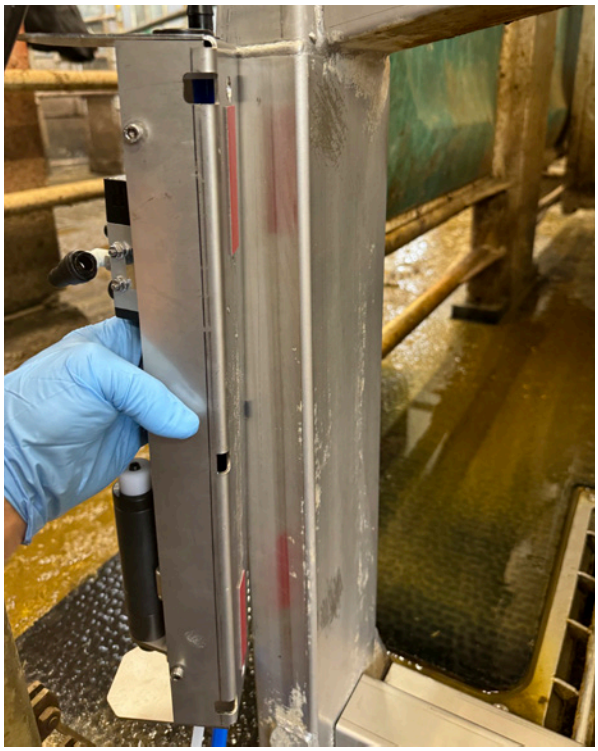


Figure 70: Retrofit installation place care pump on pillar with supplied adhesive

8.4.8 Connect supply hose & cable to Care Pump

Tools needed:

- Cable cutter
- Hose cutter
- Wire stripping tool
- Crimping pliers for wire end furrules
- 3 PCS Wire end furrules 0.75 mm2

Figure 83: Care Pump hand valve

Description	Name	Part nr.
Supply & Spray tube	PELD 8/6 mm tube clear 9 bar 100m	Coming soon
	PVC spiral hose 10/16 mm 60m	Coming soon
	T-Coupling 10-08-10mm, Push-in fi tting	Included
Care pump valve cable	3G0.75mm2 control cable PVC outer sheath 100m	Coming soon

1. Connect signal cable to valve B from connector plug - See figure 74
2. Connect plug to care pump air valve - See figure 76
3. Connect air supply with hand valve at supply end - See figure 83
4. Connect air supply to Care Pump - See figure
5. Connect care supply to Care Pump - See figure

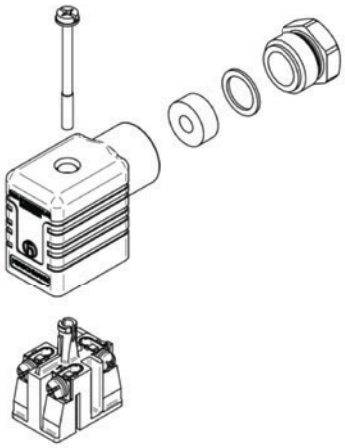


Figure 74: Valve B Form connector plug

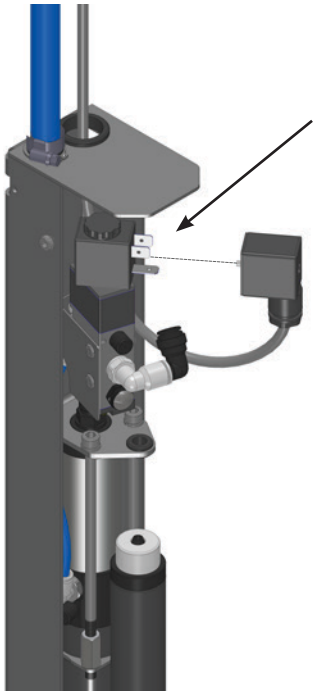


Figure 76: Valve plug connection to Care Pump

B form connector plug	
Wire no. 1	1 – 24V
Wire no. 2	2 – 0V
Wire no. 3 - ⏚	3 – PE [⏚]

Valve DIN B Form connector plug	
Wire no. 1	1 - 24V
Wire no. 2	2 - 0V
G/Y	GND ⏚

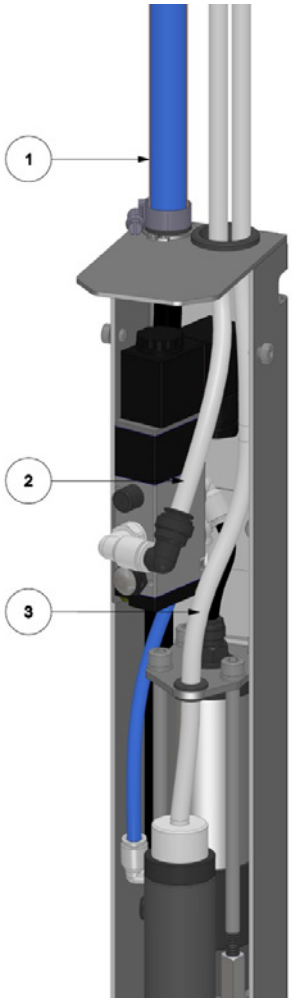


Figure XX: Connections on top

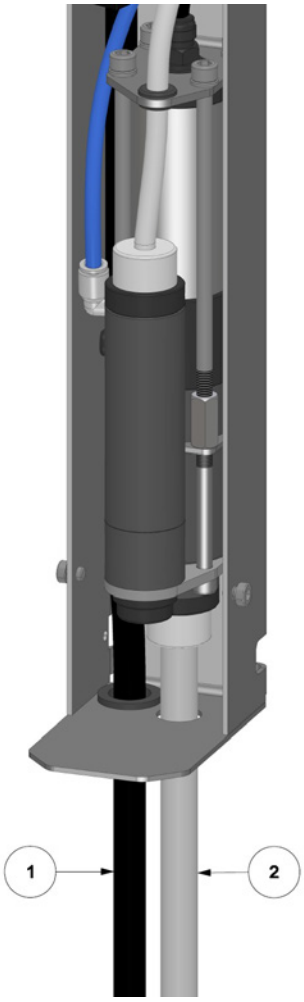


Figure XX: Connections on bottom

Care Pump connections Top

1. Wash supply tube 16mm
2. Air supply tube 8mm
3. Care supply 8mm

Care Pump connections Bottom

1. Wash supply tube 12mm
2. Care supply 8mm and protection hose

8.4.9 Connect Care pump to Main Unit

Tools needed:

- Wire stripping tool
- Crimping pliers for wire end furrules
- 6 PCS Wire end furrules 0,75mm2

Cables needed:

- PD15 Valve cable
- 3G0.75mm2 control cable PVC outer sheath
- Connector plug

1 x Valve B Form connector plug included

Robot I		
Wire nr. 1	T.No. 2	RU1 [GND]
Wire nr. 2	T.No. 1	RU1 [OUT]
Wire nr. 3 - ⏚	T.No. 10	1RU1 [⏚]

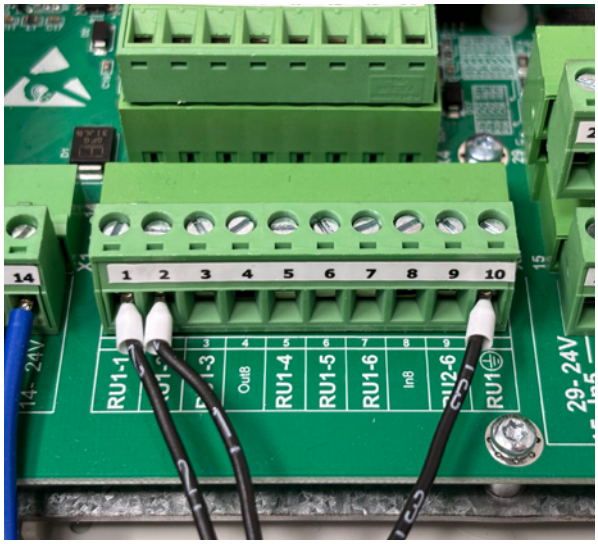


Figure xx: xx

Robot II		
Wire nr. 1	T.No. 43	RU2-2 [GND]
Wire nr. 2	T.No. 44	RU2-1 [OUT]
Wire nr. 3 - ⏚	T.No. 50	RU2 [⏚]

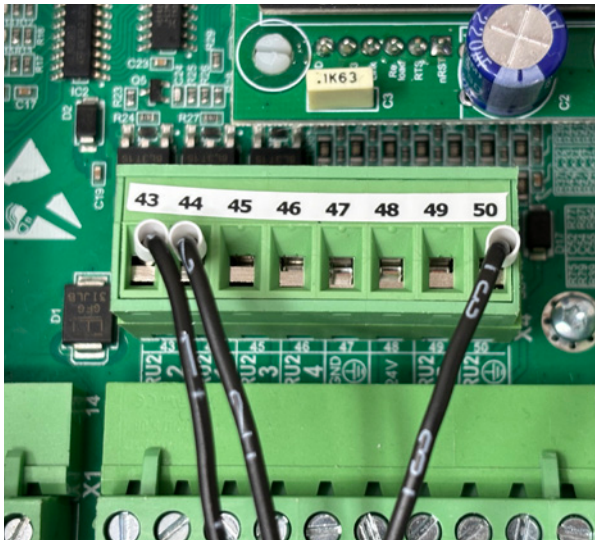


Figure xx: xx

8.4.10 Connect wash spray tubes to Main Unit

Tools needed:

- Heat gun
- Hose cutter
- Knife

Cables & tubes needed:

Description	Name	Part nr.
Spray tube	PA 16/13 mm Tube black 14 bar 100m	
	PA 16/13 mm Tube black 14 bar 25m	
Spray tube protection	PVC spiral hose 20/27 mm 60m	
Hose clamps	Hose clamp - 8x16/9mm - A2	Included

1. Connect spray tube to outlet valves (See i gure 89 & 90)
2. Feed hoses to care pump (See page 88)
3. Connect hoses to care pump (See page 88)

Connect Spray tubes	
RU1	Spray tube - Robot I
RU2	Spray tube - Robot II

Diagram	
Nr. 5	Spray tube - Robot I
Nr. 7	Spray tube - Robot II

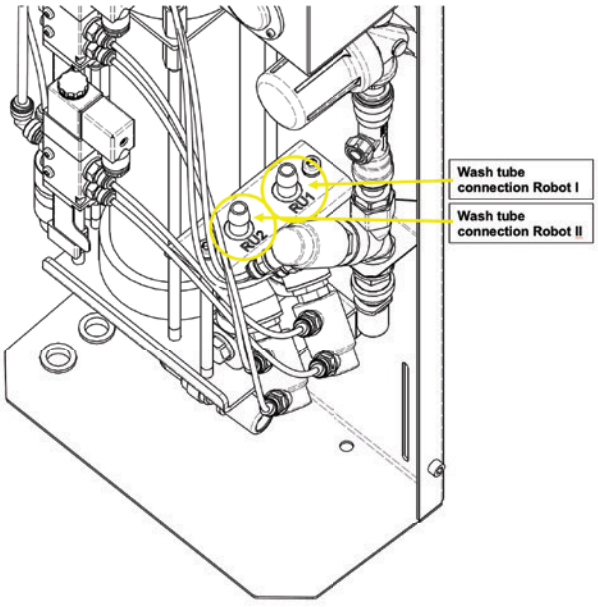


Figure 89: Wash hoses connection to valves

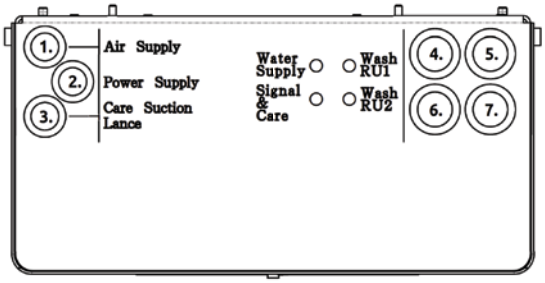


Figure 90: Wash hoses feed holes

8.4.11 Connect Care Suction Lance

Tools needed:

- Wire stripping tool
- Crimping pliers for wire end furrules
- 8 PCS Wire end furrules 0,75mm2

Parts needed:

- Suction lance cable
  2G0.75mm2 control cable PVC outer sheath
- Suction Lance fixation set - Included

1. Connect wires to Connector 2-pole – Male
   (See figure 77)
2. Connect 2G wire to Signal Box
   (See page 36, figure 34)
3. Place Care Suction lance into care container

Diagram:

1. 2-pole connector male
2. 2-pole connector female
3. Suction hose
4. Filter
5. Level sensor
6. Container lid

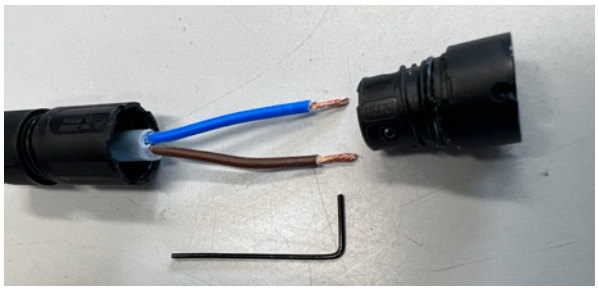


Figure 77: 2G Wire to male connector

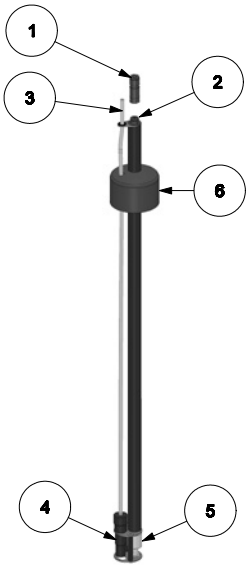


Figure 79: Suction Lance Diagram

Robot I		
Wire nr. 1	T.No. 15	In5
Wire nr. 2	T.No. 16	24V

Robot II		
Wire nr. 1	T.No. 17	In5
Wire nr. 2	T.No. 18	24V

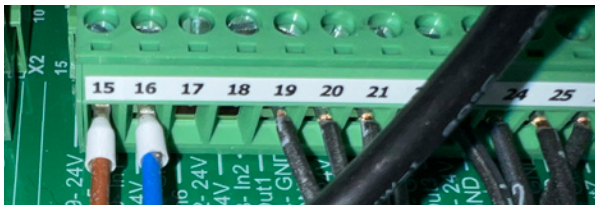


Figure 81: Main Unit connection - Robot I

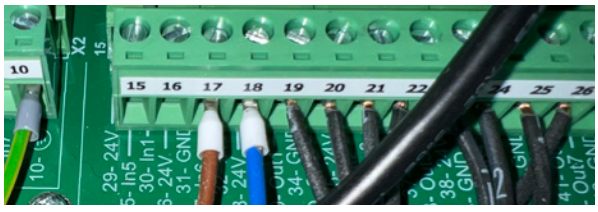


Figure 82: Main Unit connection - Robot II

The Care container and suction lance must be installed in the frost-free environment.

Install the 20L Care liquid container within a range of 30m (98.43 ft) (tube length) from the Care Pump

8.4.12 Install Nozzle bar fittings

Talk with Farm support about placement of nozzle bar to best fit the cow breed

Parts:

- Nozzle Bar Fittings set
- Nozzle Bar Fixation Set

Tools needed:

- Hexagon wrench 4mm / Hex Allen key set
- Hammer

1. Take of nozzle & light bar cover
2. Hammer out cover plates on nozzle & light bar cover - See igure
3. Install the itting set with included ixation set on the Nozzle and Light bar base bracket
4. Adjust nozzle horizontal spray direction - See page 34
5. Re-attached nozzle & light bar cover oh the base bracket

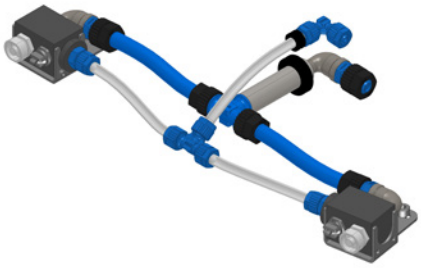


Figure XX: Nozzle bar fittings set

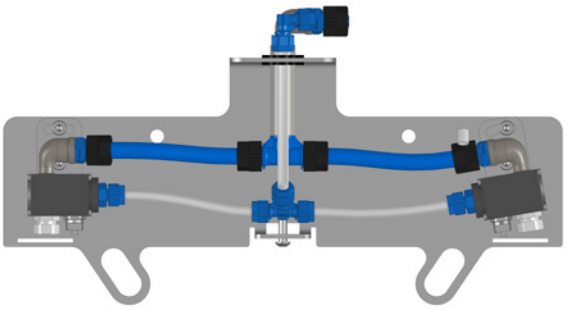


Figure XX: Nozzle bar fittings set attached to bracket

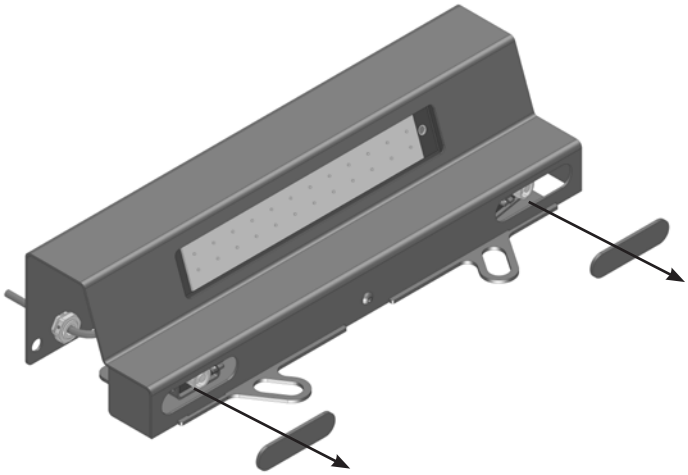


Figure XX: Coverplate on nozzle & light bar cover

8.4.13 Install Nozzle & light bar base (Retrofit)

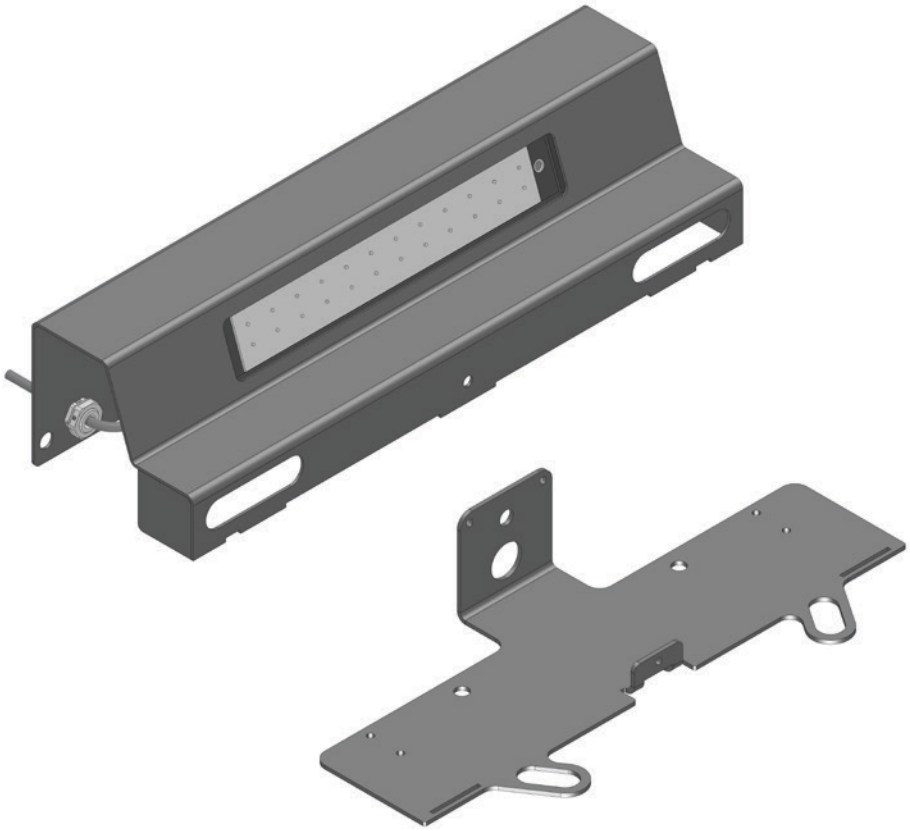
Parts not included:

- PedicoSprayer - Retrofit kit - Single - Part nr. 7830-3000-110
- PedicoSprayer - Retrofit kit - Double - Part nr. 7830-3000-100

Tools needed:

- Spanner 19 mm
- Hexagon wrench 4 mm / Hex Allen key set
- Hammer

1. Take of old light bar cover & base bracket
2. Install new base bracket on the robot
3. Hammer out cover plates on the new nozzle & light bar cover - page 73 - See igure
4. Install the itting set with included ixation set on the Nozzle and Light bar base bracket - See page 72
5. Adjust nozzle horizontal spray direction - See page 34
6. Attached new nozzle & light bar cover



8.4.14 Connect Care pump tubes to Nozzle & light bar

Parts:

- Nozzle Bar
- Nozzle Bar Fixation Set

Tools needed:

- Hexagon wrench 4 mm / Hex Allen key set
- Hexagon wrench 5 mm / Hex Allen key set

1. Connect wash spray tube from fitting in the top of the Care Pump, to Nozzle light bar with included pre-cut tube
2. Connect care spray tube from bottom of the PD15 in the Care Pump, to Nozzle & light bar with included pre-cut tube and protection hose

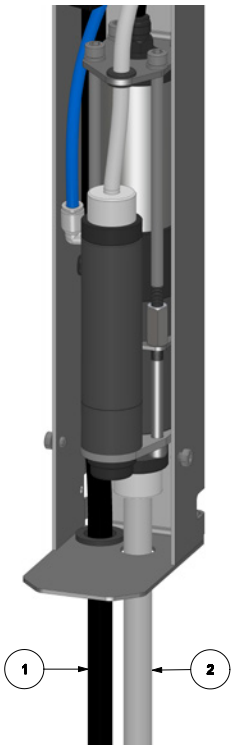


Figure XX: Care pump bottom connections:
1: Wash spray tube
2: Care spray tube

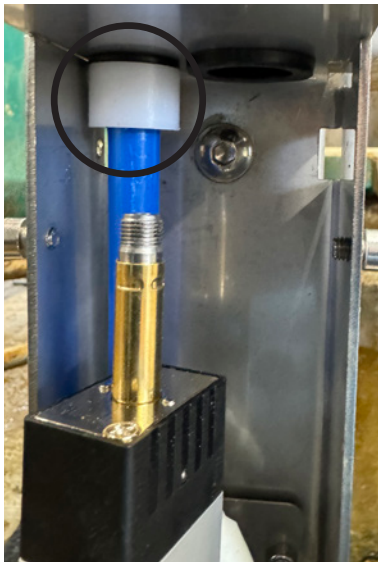


Figure XX: Wash spray tube connections

Figure XX: Wash & Care spray tube connections

8.4.15 Connect air & water supply to Main Unit

1. Connect air supply with included T-coupling to the PedicoSprayer main unit (Figure 87).
2. Connect Water supply the prepared water tap (Figure 88).

Cables & tubes needed:

Description	Name	Part nr.
Air supply main unit	PA 12/10 mm tube black 15 bar 100m	
	T-Coupling 14-12-14mm, Push-in fitting	
Water supply	Hose OD 18 x ID 12 mm, PVC, Multibar	Coming soon
Hose clamps	Hose clamp - 8x16/9mm - A2	Included

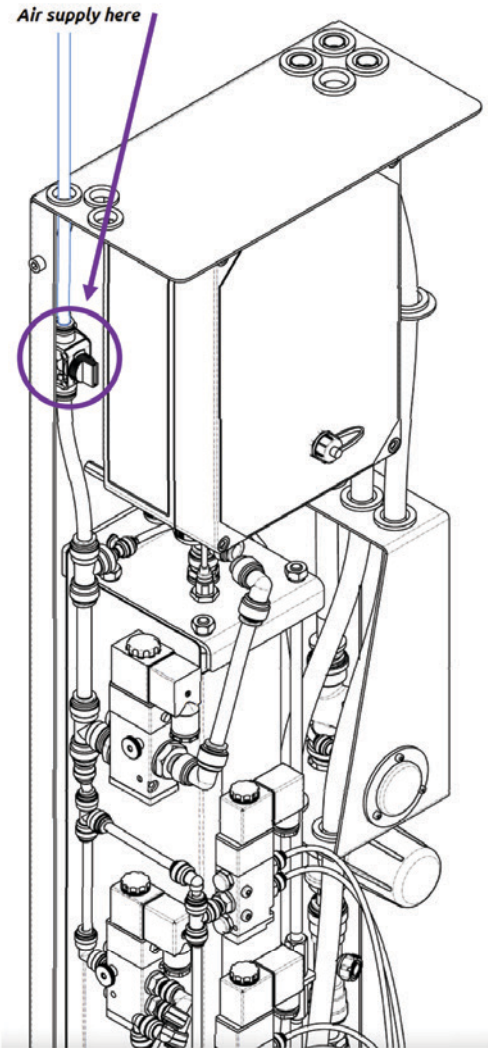


Figure 87: Air supply connection

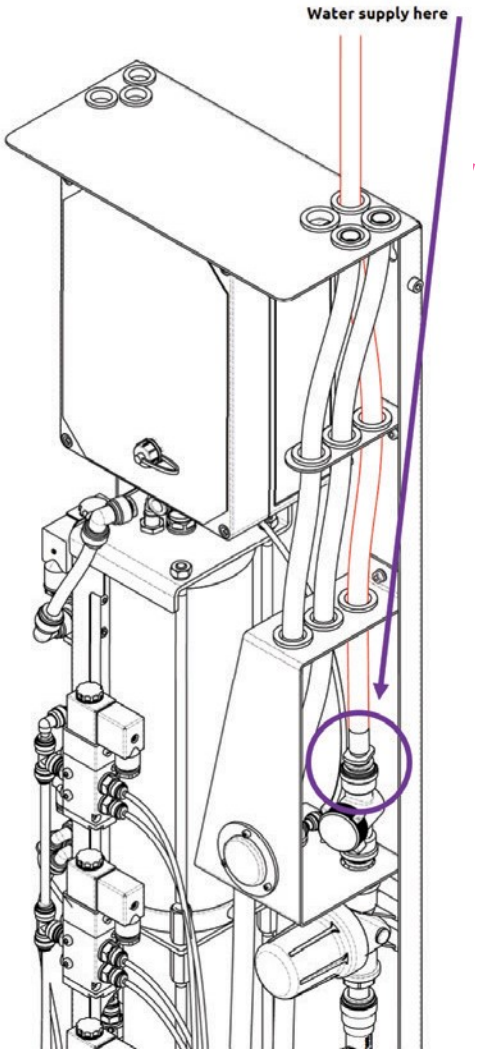


Figure 88: Water supply connection

8.4.16 Connect robot start signals to Main Unit

Tools needed:

- Wire stripping tool
- Crimping pliers for wire end ferrules
- 6 pcs Wire end ferrules 0.75 mm2

Cable needed:

- Signal cable 3X0.75 mm2 control cable PVC outer sheath

Robot I			
Wire nr. 1	24V supply	T.No. 3	RU1-3 [24V]
Wire nr. 2	Start signal exit	T.No. 6	RU1-5 [IN]
Wire nr. 3	Start signal entrance	T.No. 7	RU1-6 [IN]

Robot II			
Wire nr. 1	24V supply	T.No. 45	RU2-3 [24V]
Wire nr. 2	Start signal exit	T.No. 49	RU2-5 [IN]
Wire nr. 3	Start signal entrance	T.No. 9	RU2-6 [IN]

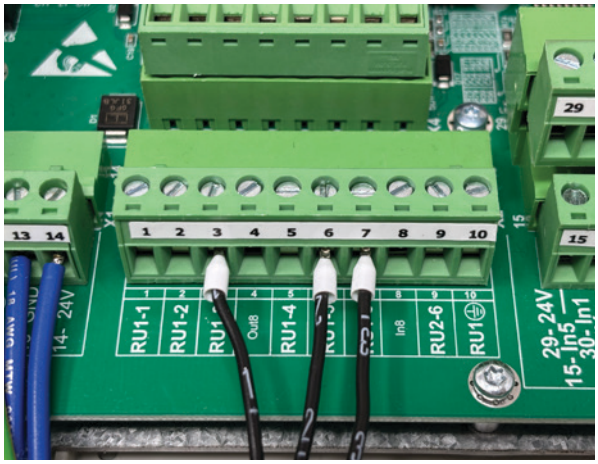


Figure XX: PCB terminals - Robot I

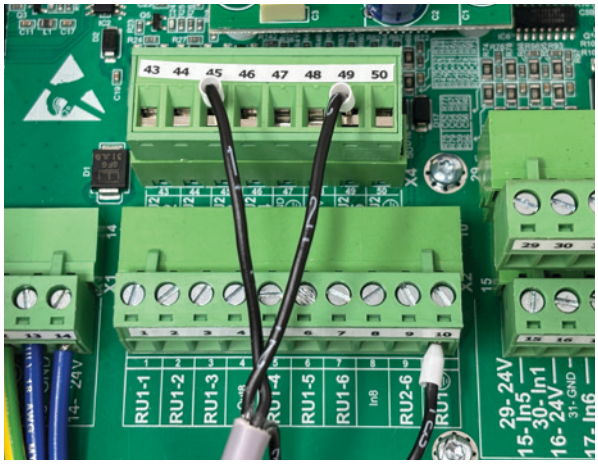


Figure XX: PCB terminals - Robot II

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