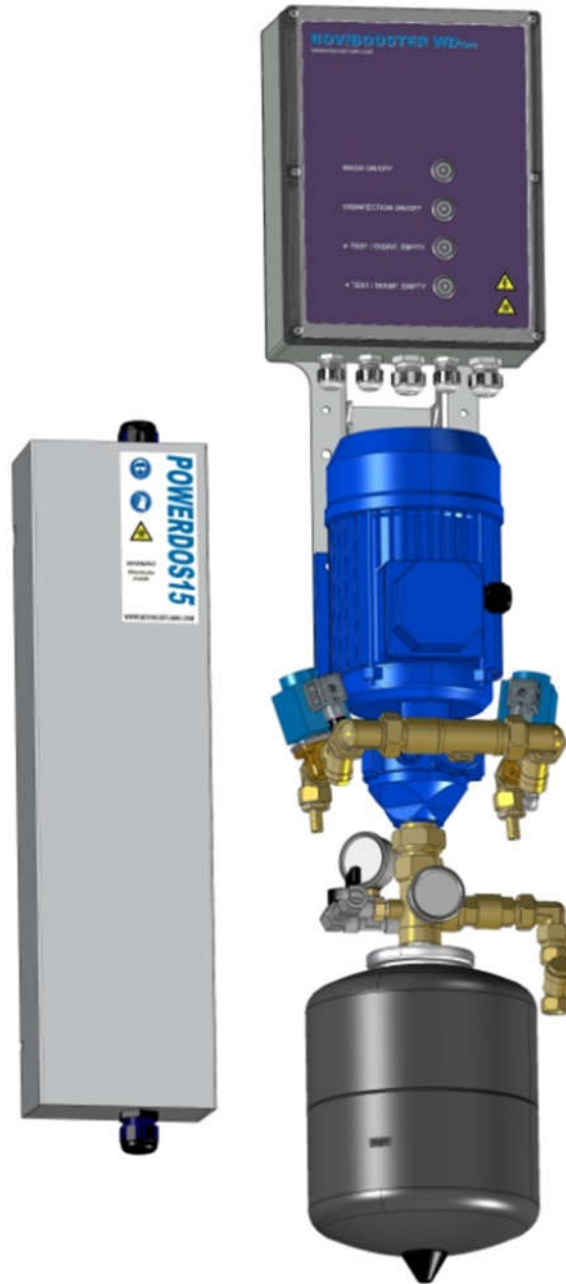


BBWDone
BBWtwo
PowerDos15
D2NBax
D2NBDL



Always wear suitable protective equipment when working on the BOVIBOOSTER
Always disconnect the electrical supply when working on the system



To protect the system against frost damage, during periods of temperatures below 0 °C, it is recommended to turn off the system and empty it of water

General information

The Bovibooster system is designed for automatic hoof washing and disinfection in various robotic milking systems

It is important to remember, that the Bovibooster system is a preventive rather than a curative system. In order to achieve optimal efficiency of the system, you have to supplement with other treatment methods.

Start Signals

The system requires two 3 bar compressed air start signals, one for washing and one for disinfection. The wash should start when the cow enters the robot and the disinfection when the cow is about to leave the robot. If the PD15 is not installed, a separate start signal pressure switch and interface relay is required.

Wash and disinfection

The wash and disinfection circuits are completely separated and can operate independently. Never use chemicals which are unhealthy for the cows or chemicals that can damage the robot or other equipment.

Contents

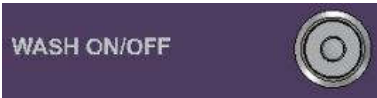
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CONTROL BOX

Push Buttons and Indicators



Changes in settings should only be performed by qualified personnel



WASH ON/OFF:

Wash ON/OFF
Blue LED lit, indicates ON



DISINFECTION ON/OFF:

Disinfection ON/OFF
Blue LED lit, indicates ON



TEST/DISINF. EMPTY (Right & Left):

Hold "Right" Test button with WASH and DISINFECTION OFF:
Activates Wash solenoid valves (for priming and emptying the water pump)

Single push:

Wash Test with 8 sec. On-delay (WASH needs to be ON)

Double push:

Disinfection test with 8 sec. On-delay (DISINFECTION needs to be ON)

Hold for 2 sec.:

Run disinfection pump for priming/emptying
(DISINFECTION needs to be ON)

Red LED lit indicates disinfection suction line empty

(This LED can be used as indicator when priming or emptying the pump)

Test Right



Test Left (WDtwo only)

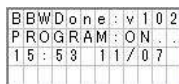
Program Function



Remove the control box cover, to gain access to the PLC controller keypad



Push the **ESC** key to show the BB menu



Hold down the **ALT** key and simultaneously press the **LEFT** button to toggle between PROGRAM ON/OFF



PROGRAM default settings:

WASH: ON every day from 00:00 – 23:59

Disinfection: ON Tuesday, Thursday and Saturday from 00:00-23:59

The PROGRAM settings can be changed, see WDone-two ZEN QUICK GUIDE

PLC program version:

The BB program version is displayed in the upper right corner of the BB menu



The PLC clock has to be set correctly, for the PROGRAM times and days to be correct (see ZEN quick guide)

MPCB and Fuses

[-F1]

The MPCB (motor protection circuit breaker) protects the pump motor from overheating. The MPCB will shut off in case a phase is missing, the supply voltage is too low or in case of a short circuit in the motor or motor cable.

[-F2]

The -F2 fuse protects the 230Vac control circuit. The fuse will blow in case of a short circuit in either the -T1, -V1 or -V4 circuits

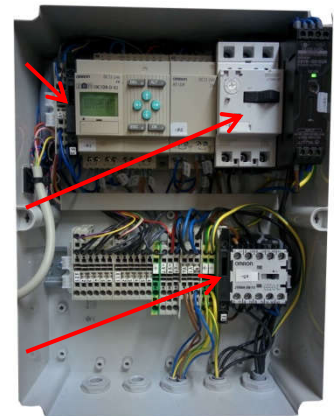
[-F3]

The -F3 fuse protects the 24Vdc control circuit. The fuse will blow in case of a short circuit in the cable to the control box cover push buttons, the PD15 10x0.75 control cable or a short circuit in the PD15 terminal box. An extra fuse is included in the fuse holder.

[-F3] 500 mA
5x20mm F
250 V

[-F1] MPCB
400V

[-F2] 3,15A
5x20mm FF
250 V



To replace the -F2 or -F3 fuses you need to open the fuse holder. Push down and out on the tap in the top of the fuse holder at the same time. Always turn off the power supply when working on the control box.

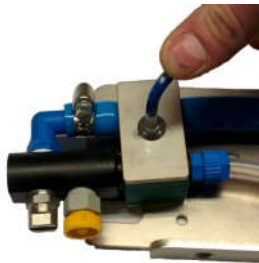
NOZZLE BARS



Always perform a weekly visual inspection of the nozzle bars. Check nozzle spray pattern and direction.

Vertical model

Vertical nozzle bars are designed with two vertical and horizontal adjustable 4020 wash nozzles and two vertical and horizontal adjustable 4006 disinfection nozzles. The spray direction should be parallel with the robot floor towards the "target area", see illustration

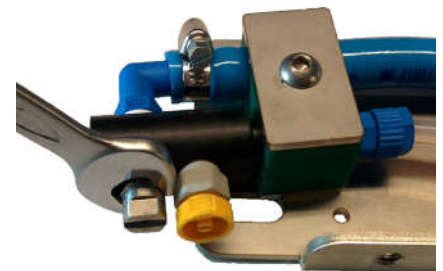


Nozzle Adjustment

Remove the three 8mm cover plate bolts using a 5 mm hex key and then remove the cover plate. Slightly loosen the 8 mm bolt as illustrated to the left, adjust the vertical and horizontal angle and then firmly tighten the bolt again.

Nozzle Replacement/Cleaning

Remove the three 8mm cover plate bolts using a 5 mm hex key and then remove the cover plate. The disinfection nozzles can easily be removed and reinstalled by hand. Use a 14 mm spanner to remove and install the washing nozzles.



The wash nozzles need to be sealed with 5 rounds of 12 x 0,075 mm PTFE tape.

Horizontal model

Horizontal nozzle bars are designed with four horizontal adjustable 4010 wash nozzles and two horizontal adjustable 6506 disinfection nozzles. The horizontal model nozzle bar is also fitted with two check valves, one before each disinfection nozzle, to avoid that the nozzle tubing drains in between disinfection sprays. The spray direction should be parallel with the robot floor towards the "target area", see illustration



Nozzle Adjustment

Remove the two 8mm cover plate bolts using a 5 mm hex key and then remove the nozzle bar. Slightly loosen the 21 mm nut as illustrated, adjust the horizontal angle and then tighten the nut again. When reinstalling the nozzle bar, the height can be adjusted by moving the nozzle bar up and down. Make sure the nozzle bar is **leveled** before tightening the bolts.

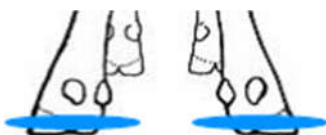
Nozzle Replacement/Cleaning

The nozzles can be removed directly from the front. Use a 17 mm socket wrench for the wash nozzles and a 11 mm socket wrench for the disinfection nozzles. Remove the nozzle from the elbow fitting and then clean or replace the old nozzle.



The nozzles need to be sealed with 5 rounds of 12 x 0,075 mm PTFE tape.

Check valve flow direction →

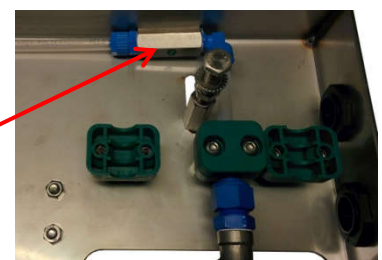


Perfect spray pattern impact



Target area

Check valve



BOOSTER PUMP UNIT

Description

The booster pump can boost the water supply pressure with 7-8 bars for washing, when using a standard Nozzle bar.

When washing the booster pump starts and the high flow wash solenoids open for 2.8 sec.

The booster pump is designed with a stepless washing pressure adjustment system.

The 8L pressure tank on the unit, functions as a water supply buffer tank, which makes sure that there is always enough water for the pump.



Always ensure that the pump is fully primed before operating

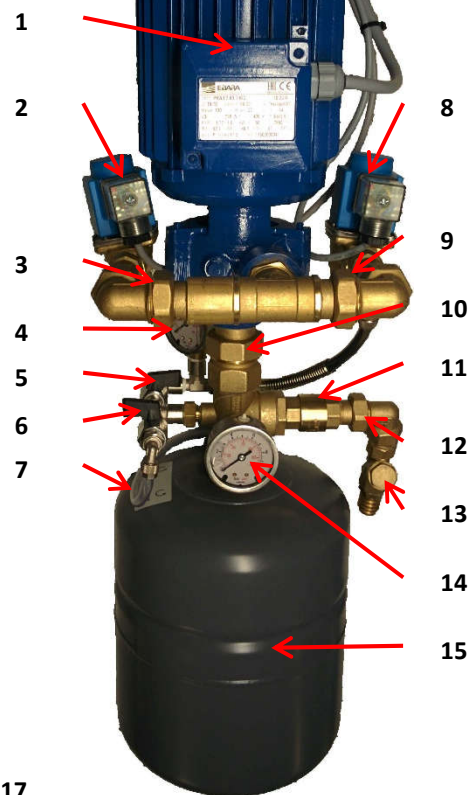
Always empty the pump unit of water during longer periods of standstill (two weeks or longer), to avoid pump corrosion.

Never add chemicals to the water supply, only use clean water

Booster Pump Unit layout

No. Description

- 1 Booster pump
- 2 Wash solenoid "left" (WDtwo)
- 3 Wash "left" union coupling
- 4 Washing pressure manometer
- 5 Pressure adjustment valve
- 6 Drain valve
- 7 Drain tube
- 8 Wash solenoid "right"
- 9 Wash "right" union coupling
- 10 Main union coupling
- 11 Water supply non-return valve
- 12 Water supply union coupling
- 13 Water supply filter
- 14 Main manometer
- 15 Water supply pressure vessel
- 16 Valve filter "left"
- 17 Valve filter "right"
- 18 10/8 mm push-on coupling



Washing Pressure Adjustment

The washing pressure can be adjusted from about 4.5 – 10 bar by setting the "Pressure adjustment valve", check the washing pressure on the "washing pressure manometer" while washing

4.5 bar = Valve in open position

7 bar = Valve in middle position

10 bar = Valve in closed position

Washing pressure manometer



Washing pressure adjustment valve

Drain valve



Water supply manometer

Tire blow gun



Pressure Tank precharge pressure adjustment

The buffer tank is supplied from factory with a precharge pressure of **1.9 bars**.

The precharge pressure must be 1 bar lower than the water supply pressure.

The water supply pressure can be read on the water supply manometer

Adjust precharge pressure

Shut down the system and close the water supply. Open the drain valve and wait until the pressure is 0 bars. Remove the air valve cap and release or add nitrogen using a suitable tire blow gun, to make the precharge pressure about 1 bar lower than the water supply pressure

There must be performed an annual inspection of the pressure tank

Frost Protection/Empty System Off Water



To protect the system against frost damage, during periods of temperatures below 0 °C, always empty the system completely of water.

Remove the pressure tank

You need a suitable 15” and 8” wrench.

Turn off both “Wash” and “Disinfection”, close the water supply and open drain valve⁶. Disconnect the water supply union coupling¹², the 10/8 mm push-on coupling¹⁸ and the main union coupling¹⁰. Empty the tank and store it in a frost-free environment.



The tank must be stored in the same upright position as when fitted on the pump, to avoid glycerin leakage from the manometers

Empty the pump

You need compressed air and a blow gun.

Hold the ► “TEST” button, while blowing air through the 10/8 mm push-on coupling¹⁸, until the system is empty.

PowerDos15 (PD15)

Description

The PowerDos15 pneumatic pump is designed to spray 15 ml hoof product, when the cow is about to leave the robot. The liquid is sucked directly from a container of pre-mixed hoof product. The pump requires a 6.5-8 bar air supply.

PowerDos15 Part Materials and Seals

Pump Plastic Parts	Pump Seals	Check valves	Connection Fittings	Tubes
PVC-U	FKM/FPM	AISI 316	PP	PELD
		AISI 303	POM	PVC

Liquid Compatibility



The liquids used in the pump, must be compatible with all pump parts and seals.

If the liquid is too viscous and the suction tube is long, the pump might not be able to prime properly. Dilute the liquid when water if necessary.

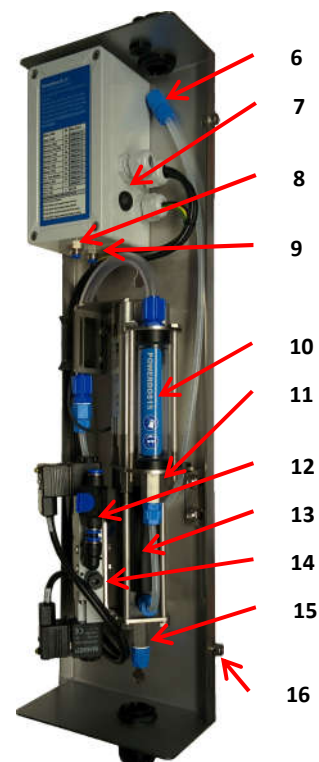
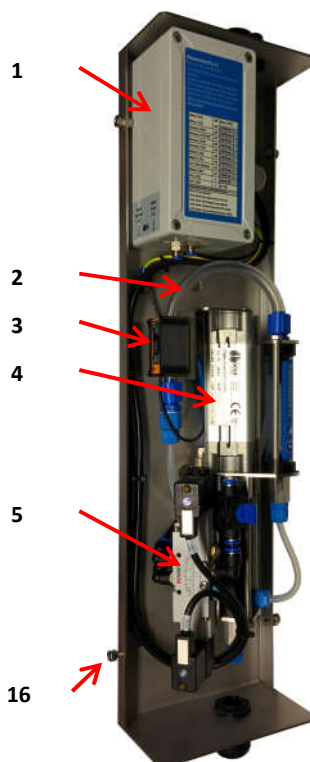
Contact you hoof product supplier for details regarding compatible materials



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PowerDos15 Unit layout

- No. Description**
- 1 Terminal Box
- 2 Dry-run sensor PVC tube
- 3 Dry-run sensor
- 4 Pneumatic cylinder
- 5 Pneumatic control valve
- 6 Liquid connection coupling
- 7 Test button
- 8 Wash start signal pressure switch
- 9 Disinf. start signal pressure switch
- 10 Buffer tube
- 11 Suction check valve
- 12 Air supply valve
- 13 Liquid cylinder
- 14 Suction exhaust regulator
- 15 Spray check valve
- 16 Cover fix bolt
- 17 Cover



Remove Cover

Loosen the two lower cover fix bolts¹⁵ about 5 mm out using a 5mm hex key. Pull the bottom of the cover out and remove it.

Test Button

The Test button⁶ have the same function as the test button on the control box (check page 3). It can with advantage, be used when servicing and installing the PowerDos15 pneumatic pump.

Suction Exhaust Regulator

The suction exhaust regulator¹³ is for adjusting the suction speed of the pump. The suction time should be 0.4 sec. A 2,5mm hex key is needed to adjust the regulator. Turn the center screw clockwise to increase the suction time and turn it counter clockwise to decrease the suction time.

Dry-run Sensor

The dry-run sensor³ activates when the dry-run sensor PVC tube² is empty. After five sprays with the sensor activated, the automatic disinfection spray stops.

Start Signal Pressure Switches

The start signal sensor pressure switches^{7 and 8} are installed in PD15 terminal box¹. The switches have a standard activation pressure of 2.5 bars. If necessary the sensors can be adjusted. Use a small flat head screwdriver. Turn the switch adjustment screw clockwise to increase activation pressure and counter clockwise to decrease activation pressure. **Always adjust the sensors in small steps.**

Replace/Refill Hoof Product

After replacing or refilling the hoof product container, the system needs to be primed. Hold the Test button until the red light on the control box turns off. The buffer tube⁹ should always be at least half full after finished priming.

Always make sure the suction filter is clean and installed on the suction tube.

Frost Protection/Empty the Pump of Liquid



To protect the pump against frost damage, during periods of temperatures below 0 °C, always empty the pump completely of chemicals.

You need a bucket of clean water.

1. Remove the suction lance from the chemical container and put it in bucket of clean water.
2. Hold the test button until the water has passed through the entire system
3. Remove the suction lance from the bucket, make sure that the suction filter lies free in the air
4. Hold the test button until the entire PD15 system is emptied of water

Replace the PD15 pump unit

If the PD15 pump malfunctions or breaks, the pump unit needs to be renovated or replaced with a refurbished unit. Contact your local dealer for further information.

Maintenance

Weekly Visual Inspection

- Check the entire system for leakages or damages. Do both a wash and disinfection test and check nozzle spray pattern.

Annually

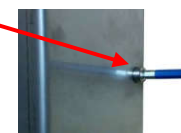
- Check pressure tank precharge pressure. See page 5.
- Replace both wash and disinfection nozzles if necessary. See page 4.
- Replace dry-run sensor PVC tube

Technical Data

See nameplates. BBWDone-two nameplates are placed on the upper left side of the control box. PD15 nameplates are placed on the pneumatic cylinder⁴

Spare Parts

See www.bovibooster.com



PD15 Pump unit

BBWDone-two		PowerDos15	
	Page		Page
Washing pressure is too low		Spray pressure is to low	
Check washing pressure regulator	5	Check if there is liquid in the buffer tube, it should be at least half full	
Check pump direction of rotation			
Check water supply filter	5	Check if there is air in the system, hold test button, until the spray pressure is normal	3
Check water supply			
Check nozzles for deposition or dirt	4	Check nozzles for deposition or dirt	4
System is washing, but the pump is not running		Check the PD15 air supply, pressure should be between 6,5 and 8 bars	
Check [-F1] MPCB	3		
ON/OFF Led's won't turn ON		Check spray tube for leakages	
Check fuse [-F3]	3	The liquid moves very slowly in the suction line when priming	
Check electrical supply			
Wash and Disinfection is not starting		Check liquid viscosity, if the liquid is too thick and the suction line is long, the pump can't prime properly. Try to make a test using clean water	
Check Wash and Disinfection ON/OFF push buttons	3		
Check electrical supply		Check the suction filter	
Check Start signal pressure switches, activate the switches manually using compressed air		Check suction line for sharp bends and damages	
		Place the liquid container closer to the pump	
	7	Air build-up in the suction line	
Check fuse [-F3]	3	Check the suction line installation, maximum allowed tube length in downward installation in flow direction is 135 cm. If the tube is longer, a loop "air trap" of the tube needs to be made for every 120 cm	
Check if the PLC [-K1] is on			
PLC display is black			
Check if the power supply [-T1] is on (green led)			
Check fuse [-F2]	3	Check the pump and suction line for leakages	
Check electrical supply			
Water keeps running after a wash		Tighten all push-on fittings	
Disassemble and clean wash solenoid valve		Check the suction filter	
Disinfection is ON, but not working		Liquid piston moves too slow when sucking	
Check if the PROGRAM function is activated	3	Check suction exhaust regulator	7
Check Start signal pressure switches	7	Automatic disinf. does not work after priming	
Check the PD15 pump		Hold the test button again. A spray with the dry-run led off, needs to be made, to reset	7
Disinfection PROGRAM function is not working			
Check the PLC time and date settings			