User documentation

Pulsfog K-40

FRANS VEUGEN
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Nederweert, the Netherlands

ABOUT THIS DOCUMENTATION

This documentation was originally drawn up in Dutch by Frans Veugen Bedrijfshygiëne B.V.

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PRODUCT IDENTIFIER

This user documentation is associated with the following product:

Name:	Pulsfog
Type:	K-40

THE MANUFACTURER

The product is produced by:

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Pulsfog K40 is being produced by Frans Veugen Bedrijfshygiëne BV under licence held by Dr. Stahl & Sohn GmbH - Pulsfog

CONTENTS

INTRODUCTION

Activities to be carried out by the manufacturer's personnel are not included in this documentation.

This documentation is a part of the product!
So save this documentation carefully. It includes information that will be useful at a later time or is needed for example for repairs and maintenance. It is advised to keep a copy with the product and save a copy at your technical department. The manufacturer can supply you with an extra copy if desired.
If the product is transferred the documentation must also be passed on.

Warning!

- The operator must be instructed on use of the equipment by a recognised supplier.
- During operation and during the cooling phase the machine may only be accessible for instructed persons.

USE OF THIS DOCUMENTATION

The instructions in this documentation are arranged per type of user of the product. In the "Safety" section, where necessary it is mentioned in more detail what requirements are made of the different users.

The following terms are used:

User:	The generic term for everyone who works with or on the product.
Operator:	This is the daily user of the product. **Sections to be consulted: Introduction, Safety and Operating Instructions.**
Service personnel:	Persons with training, experience and resources required for the activities described. **Sections to be consulted: All.**
Safety officer:	The person responsible for the working conditions at the company of the user. If no one is designated for this purpose, this will be employer itself. **Sections to be consulted: Safety and Specifications**

Activities not included in this documentation must be carried out by personnel of or in consultation with personnel from Frans Veugen Bedrijfshygiëne B.V..

TYPOGRAPHY:

The parts of texts relevant to the health and safety of persons are **printed in bold,** with the exception of the section specifically on safety. The following warning texts can be used:

TIP

This sign indicates specific instructions and/or information for the purposes of clarification.

Caution!
This sign warns about possible damage to the product.

Warning!

This sign warns about the possibility of injury to persons.

Danger to life!

This sign warns about the possibility of immediate danger to life.

SERVICE AND INFORMATION

You can contact the manufacturer for more specific information about the product (see "About this documentation" on page 2).

GUARANTEE AND LIABILITY

Unless otherwise agreed in writing, the following guarantee provisions apply.

- The manufacturer provides a guarantee to the first user for a period of 12 months after delivery.
- Faults must be reported to the manufacturer before the end of the guarantee period.
- The guarantee is applicable to faults that:
  - occur during normal use of the product/installation,
  - originate due to defective construction or materials,
  - originate due to faulty workmanship by the manufacturer.
- The guarantee is no longer applicable to faults that occur due to:
  - normal wear and tear,
  - incompetent or inappropriate use,
  - use of other consumer goods than those specified.
- In the event of faults the manufacturer will:
  - replace the parts; the manufacturer is the owner of the replaced parts.
  - repair the fault,
  - choose another replacement solution if a repair is not reasonably possible. The customer must give the manufacturer the opportunity to remedy any faults.
- For built-in parts from third parties the guarantee conditions of the supplier concerned are applicable. The guarantee period can also differ from that stipulated above.
- The manufacturer reserves the right to modify its machines/installations without prior warning.

Unless otherwise agreed in writing, the guarantee and liability provisions as included in the General Conditions apply.

We draw attention to the following liability restrictions:

The manufacturer **cannot be held liable** for unsafe situations, accidents or damage as a result of disregarding warnings or conditions as shown on the product/installation or mentioned in this documentation, for example:

- incompetent or incorrect use or maintenance;
- use for other applications or in different conditions to those mentioned in this documentation.
- use of parts other than those specified.
- repairs without the permission of the manufacturer.
- changes to the product/installation, including:
  - changes to the control system;
  - welding, mechanical processes;
  - extensions to the product/installation or the control system.

The manufacturer also **cannot be held liable**:

- If the customer has not fully complied with all his obligations with respect to the manufacturer (financial or otherwise);
- for consequential damage due to faults in the product/installation (for example damage to products to be processed, operational stoppages, delays, etc.).

1 INTRODUCTION

1.1 PURPOSE AND FUNCTION OF THE PRODUCT

The Pulsfog K40 is a thermal fogger. The liquid is turned into a fine fog in the resonator. The machine works according to the jet engine principle and involves spontaneous combustion. The Pulsfog K40 is the largest machine in the thermal fogger series from Pulsfog. The large capacity enables a fog range of 120 metres*. The Pulsfog K40 has a capacity that can vary from 60 to 150 litres/hour

* These values depend on the crop type, the liquid used and the size of the sprayers.

Pulsfog foggers are technically suitable for fogging all authorised and permitted liquids, pesticides, disinfectants and plant protection products.

1.2 NOT PERMITTED USE

The generation of aerosols or fog from flammable substances or acids that isolate oxygen as a mixture with air and/or dust involves a fire and explosion hazard if a source of ignition is present. The hot flow of exhaust fumes from the motor is a potential source of ignition. For this reason: draw up a risk analysis and develop a strategy to prevent the origination of risks!

1.3 VERSIONS AND ACCESSORIES

The product consists of:
- Pulsfog K40
- 2 x 50 litre liquid tanks
  (1 x 100 litres or 1 x 150 litres are optional)
- 1 x 20 litres petrol tank
- Trolley
- Battery (not supplied)
- Battery charger
- Spare parts
- Funnels
- Hearing protection / Earmuffs
- Card holder for placing information pesticides
- Instructions for use

2 SAFETY

2.1 INTRODUCTION

This product is designed and constructed in such a way that it can be safely used and maintained. This applies for the application, the circumstances and the conditions as described in this documentation. Reading this documentation and following the instructions is therefore **required** of everyone who is to work with or on this machine. With professional use the employer is responsible for these instructions being known and complied with.

Extra safety measures can be prescribed by the company or the country where the product is in use. This concerns the working conditions in the phase of use. This documentation does **not** describe how these conditions must be met. The necessary product information is provided. If in doubt consult your safety officer.

In this documentation a distinction is made between **normal use** (see "Instructions for use" on page 17) and **other activities** (see "Other activities" on page 28) with the product. This is because, particularly for the purposes of safety, different requirements are made of service personnel to the operators.

The simple maintenance activities mentioned in the operating instructions can be carried out by the operators. Activities not described in the operating instructions may only be carried out by personnel trained to do so.

2.2 SAFETY RULES

2.2.1 FIRE HAZARD

Caution!
Fire hazard

Do not use alcoholic disinfectants or other substances with an alcohol level above 10%!
The generation of aerosols or fog from flammable substances or acids that isolate oxygen as a mixture with air and/or dust involves a fire and explosion hazard if a source of ignition is present. The hot flow of exhaust fumes from the motor is a potential source of ignition. For this reason: draw up a risk analysis and develop a strategy to prevent the origination of risks!
In case of doubt, consult your supplier of the product beforehand about whether fogging using the Pulsfog method is possible.

- Smoking is not allowed when working with this machine!
- Never fill the fogging liquid tank and cooling water tank with petrol.
- When fogging highly flammable liquids always keep a fire extinguisher ready near the machine.

- When fogging highly flammable liquids only use machines with the following characteristics:
  - "O" types (e.g. K10/O, K-22/O, K-30/O) with double cooling jacket
  - K-10 SP of BIO machines with separate water injection (e.g. K-22 BIO)
  - Provided with automatic cut-out device for the fogging liquid.
  - The Pulsfog K40 is a BIO machines
- Do not fog in spaces with danger of dust explosions or flying substances (e.g. in corn mills, silos, used or uncleaned chicken coops or floors covered with straw or wood chippings).
- Check the ignition point and flash point with highly flammable fogging liquids. Do not fog with any liquids with a flash point that is lower than 70 ºC in combination with an ignition point that is lower than 220 ºC (e.g. diesel oil). If the flash point is lower than 70 ºC, the ignition temperature must proportionately increase. With a flash point of 35 ºC the ignition temperature must be at least 440 ºC.
- Never fog more than 2.5 L of a flammable liquid/1000 m³ space or more than 10 L of a highly flammable watery liquid with a water concentration of less than 50% per 1000 m³ space.
- Do not fog with flammable liquids in a pipe or tunnel without ventilation (danger of explosion).
- Never top up petrol if the motor is hot.
- When working on the fogger and petrol tank, all sources of ignition in the surrounding area such as spark plugs and batteries must be removed.

2.2.2 PERSONAL PROTECTION EQUIPMENT

- When fogging, and during preparation, always wear suitable protective clothing as prescribed by the supplier of the substance to be fogged (full face mask with appropriate filter, protective suit, gloves, rubber boots) and ear protection for the motor noise.

Warning!

Not using the ear protection supplied can result in irreparable hearing damage after very short time.

Consult your safety officer as to whether the use of other personal protection equipment is required (relating to the product, surroundings, etc.).

2.2.3 PROTECTION OF OBJECTS, BUILDING AND USER

- Follow the application instructions of the producer or the supplier of the used active substances and fogging liquids.
- Respect the rules for use of the resources. In the event of severe drought in the open field or a general fire hazard, work may only take place if an automatic cut-out device is fitted. Keep a fire extinguisher at hand.
- The user instructions and the safety data sheet of the manufacturer or dealer of the active substances and fogging liquids used must be complied with (these do not limit the safety instructions of the manufacturer of the machine).
- In the open field only use with no wind or in a maximum air speed of 6 kph. Avoid exceeding the target area by observing a safety distance to the limit. Always comply with the local regulations concerning the permitted liquid drift.
- Precautions to be taken during mixing, loading, application, emptying, cleaning, servicing and transport operations in order to avoid contamination of the environment, while working with pesticides.
- When using products that can be hazardous for the enviroment, make a risk assessment. Only fog in completely closed areas and only air them once the fog is completely gone, to prevent any drift from hazardous products.
- Only fill the tank with the active substance using a funnel and a strainer. Close the discharge valves before filling the tank with the active substance. Also connect the hose or open the venting.
- Suitable protective clothing must be worn during preparation and use (full face mask with a suitable filter, protective clothing, gloves, rubber boots) as well as ear protection to protect against motor noise.
- Visibly wear the card holder which clearly states what pesticide is used.
- While working and during the cooling period only trained persons may have access to the machine.

2.2.4 BEFORE USE

- Close both liquid valves
- Check that the machine works safely. With stationary use make sure that the machine is stable (e.g. make sure that it cannot slip or fall over).
- You may not use the machine if safe work is not guaranteed.

- When filling the tanks with flammable liquids smoking and the use of a source of ignition in the proximity is prohibited. Remove all sources of ignition and switch electrical switches off if a flammable liquid is to be fogged in a space.

- Leaks in the machine (petrol or active substance) must be immediately sealed.
- Ensure a fresh air supply to the carburettor. When flammable liquid is to be fogged in a space, all sources of ignition must be removed and electrical switches must be switched off.
- Close off the area of use for unauthorised persons (e.g. place a sign stating “no access” on the doors). Close openings to the area of use and repair any leaks.

2.2.5 DURING USE

- Wear the prescribed protective clothing and ear protection
- Keep a fire extinguisher ready if flammable substances are used.
- Never leave the machine working without supervision.
- Ensure a fresh air supply to the carburettor.
- Stop the motor as soon as the tank with active substance is empty.
- Close the fogging valve before the motor stops.
- The hot fogging pipe and the hot gases may not come into contact with flammable materials (e.g. wall lead-through). Minimum distance from the pipe surface to the wall: 5 cm.
- In the event of a leak in the machine or the tank close the fogging valve and end use.
- Do not insert the fogging pipe through another pipe with a comparable diameter during fogging (this can cause overheating of the motor).

2.2.6 AFTER USE

- Close off the fogged space with a warning sign.
- Thoroughly ventilate before the fogged space is entered again.
- Close the main petrol valve.
- The fogging pipe stays hot for a long time after the motor has stopped. Do not touch the fogging pipe.
- Never transport a hot machine in a closed vehicle/car.
- When there is still petrol or active substance in the tanks, the machine must be kept upright, secured against falling over and the tanks must be properly sealed.
- First empty the petrol tank and the tank for the active substance if the machine must be transported.
- Store in a safe place, being a dry, dust-free space, protected against falling over and only if the tank with active substance is empty. We advise storing the petrol tank well filled to prevent the formation of condensation.
- Check and make sure the tanks are relieved of all pressure.

Warning!

Regular maintenance of the machine is required
The machine must be maintained at regular intervals (and in any event after 50 operating hours) by a trained person in accordance with the safety standards and accident prevention regulations. Replace the fogger membranes according to the operating instructions.

The following general safety rules also apply:

- Make sure that children or animals have no access to the product!
- Keep the workplace clean and free of obstacles.
- Ensure a sufficient level of lighting.

Particular safety rules are mentioned in the instructions for the activities concerned, see “Instructions for use” on page 17 and “Warning sticker” on page 31.

2.3 NOT PERMITTED USE

The product is **unsuitable** for:

- Any use other than described in this manual

2.4 USERS

2.4.1 OPERATORS (LEVEL 1)

The product may only be operated by adult persons who know and comply with the content of sections "Safety" and "Instructions for use" in this documentation. The operator must be instructed on use of the equipment by a recognised supplier.

2.4.2 SERVICE PERSONNEL (LEVEL 2)

Service personnel must be aware of the extra risks associated with their work. Besides the requirements mentioned in "Operators" above the following is also required:

- training or knowledge at secondary technical education level in the relative field,
- experience of servicing activities

2.5 WARNINGS ON THE PRODUCT

The warnings on the product must remain clearly readable. Restore them if necessary. For the texts see "Warning sticker" on page 31.

The hazards concerned are described in more detail in the operating and maintenance instructions.

2.6 SUBSTANCES HAZARDOUS FOR THE POPULATION AND THE ENVIRONMENT

2.6.1 GENERAL

Precautions to be taken during mixing, loading, application, emptying, cleaning, servicing and transport operations in order to avoid contamination of the environment, while working with pesticides.

The following substances involved with the functioning of the machine require particular attention:

- The consumer goods
- The petrol still present in the fuel tank
- The battery

The producer of hazardous substances specifies the hazards and the measures to be taken in Material Safety Data Sheets.
The safety officer and the environmental coordinator must be aware of the content of these sheets. The information on the sheets is also of importance to internal occupational health and safety and care for the environment.

2.6.2 TRANSPORT, STORAGE AND DISPOSAL

Legal regulations may apply for transport, storage and disposal. Consult the relative authorities for the prevailing conditions and licences required.
Always store hazardous substances in a space that is not accessible for unauthorised persons.

2.6.3 EMISSIONS DURING THE OPERATION OF THE MACHINE

The motor driving the machine produces exhaust gases including carbon monoxide. Carbon monoxide is a colourless, odourless and deadly gas.
It is forbidden to leave the combustion motor of the machine running or start it in a confined space where a shortage of oxygen can occur.

The machine itself contains no substances with an emission danger.

2.7 DISPOSAL OF THE PRODUCT

If the product is to be disposed of, the instructions for waste processing applicable at the time for the location must be observed.

The product itself is only made of generally known materials. At the time of construction there were no relative waste treatment options and there were no particular risks known to persons responsible for disassembly.

The following parts and/or substances present in the machine must be regarded as chemical waste and processed as such:

- The battery
- Petrol
- The active substances
- Electrical components

3 INSTRUCTIONS FOR USE

Before starting to use the product the information in the "Safety" section must be known.

Before the first time use, use after a long period of the machine not being used or after transport over a longer distance, the machine must be brought into use according to the "Bringing into use" section on page 28.

This section is intended for operators as described in "Operators" on page 14.

Activities not mentioned in this section may only be carried out by service personnel, see "Service personnel" on page 14.

Specific safety instructions before, during and after use:

Important: read, understand and respect the following safety instructions before you start working with the machine. Not complying with these safety rules can cause a **fire accident**.
Before one starts fogging with the machine the instructions for use must be read carefully by the operator.

Caution!
Fire hazard

- Always test the functioning of the fogger with so-called idling before one actually starts fogging.
- Never allow the fogger to operate without supervision. The operator must always be able to immediately close the liquid valve should the machine suddenly stall.
- Never top up the fuel tank with petrol if the motor is still hot.
- Never pour petrol in the fogging liquid tank or cooling water tank.
- When filling the tanks with a flammable liquid, or with repairs to the fogger, smoking is always prohibited and there may never be other open flames in the proximity of the machine. Always disconnect the plug cap and the battery terminals when the carburettor is opened.
- Do not fog in spaces where a dust explosion can occur or where there is much dust in the air.
- Do not fog liquid with a flash point lower than 70 °C.
- Never fog more than 2.5 litres of a flammable liquid or a water-based liquid with less than 50% water per 1000 m of space.
- Do not fog with flammable liquids in a pipe or tunnel without ventilation (danger of explosion). An exception here is fogging with the BIO system that is fitted on the Pulsfog K40. In this case use must be made of a separate cooling water tank which is connected to the cooling sprayers (upper line/sprayer closest to the carburettors).

- Do not fog any chlorinated products because these damage the stainless steel tank.

3.1 INSTRUCTIONS FOR USE

For the examples see "Graphic machine explanation" on page 20.

3.1.1 PREPARATION:

1. Disassemble the petrol tank and place it on the ground 2 metres away from the machine. Fill the petrol tank.
2. Screw the cap on petrol tank.
3. Fix and secure the filled petrol tank to the machine (Figure 2) and connect the petrol hose (Figure 3 and Figure 4). Make sure that the petrol tank is at least ¾ filled with petrol.
4. Open the petrol valve (Figure 5).
5. Make sure that when the machine turns to the left or right that the trolley cannot topple over.
6. 12 V-battery connection.
7. Fill cooling water tank no.1 (50, 100 or 150 litres) with water.
8. Close the ball valve on the tank (only 100 or 150 litres tanks).
9. Connect the water and air hose to the fogging liquid tank, firmly close the cap to prevent any pressure loss (Figure 9 and Figure 10).
10. Fill fogging liquid tank no. 2 (50, 100, or 150 litres) with the required concentration of the substance for fogging (use the funnel with strainer).
11. Connect the fogging liquid and air hose to the fogging liquid tank and firmly close the cap to prevent any pressure loss (Figure 9 and Figure 10).
12. Secure all hoses from both tanks to the machine so that they:
    - do not pinch:
    - cannot come into contact with hot parts of the machine.

The construction and the filling of the tanks must be done **before** starting.

3.1.2 STARTING:

1. Fit ear protection
2. Open the air vent valve of the petrol tank(Figure 8 no. 1)
3. Turn the left-hand adjustable screw (Figure 8 no. 2), a quarter turn.
4. Press the start button **pulsing** (at most two seconds) and at the same time gradually open the left-hand adjustable screw (Figure 8 no. 2) until the machine starts.
5. If the machine does not start, close the left-hand adjustable screw (Figure 8 no. 2) and press the start button 3 times pulsing (blow carburettor clean). Then repeat the start procedure as described above.
6. Open both adjustable screws equally until the machine runs stationary with a powerful deep humming tone. The machine may not run with a high humming tone but a deep powerful humming tone must be heard with a number of "small explosions" also heard.

3.1.3 FOGGING:

1. Allow the motor to warm up and after approx. 1 minute start fogging.
2. First open the cooling water valve (Figure 6 no. 9).
3. The BIO fogging valve remains opened when the motor is at full power, i.e. with a dull, deep humming tone.
4. After several seconds turn the liquid valve (substance) (Figure 6 no. 6) open. The pressure gauge on the machine must show 0.3 to 0.5 bar depending on the quantity of liquid in the tanks. Only then does the machine fog at maximum power. If the pressure stays below 0.3 bar, the machine again runs with a high humming tone (too little power) or the connection to the fogging liquid tank or other places in the pressure line are not well sealed (pressure loss). When both fogging valves have been opened and the machine starts to fog, both adjustable screws must be equally further opened until the deep humming tone has stabilised.

3.1.4 STOPPING

1. Manually close the liquid valve (substance) (Figure 6 no. 6) .
2. After 20-30 seconds manually close the BIO fogging valve (water) (Figure 6 no. 9).
3. Connect the fogging liquid hose to the cooling water tank and open the liquid valve. Allow the water to flow through the fogging liquid lines for 30 seconds. This cleans the fogging liquid lines. After cleaning close the liquid valve again.
4. Turn both adjustable screws shut to the right until the motor stops.

The adjusting screws must not be tightened too firmly to avoid damage to the carburettor and petrol sprayers.

5. Relieve the pressure from the cooling water tank and the fogging liquid tank (remove sealing cap).
6. With a longer pause, close the petrol valve (Figure 3).
7. After each time of use clean the fogging liquid tank and the water tank. Collect cleaning water and prevent harmful pesticides from entering surface water.
8. It’s possible to shut down the machine with the petrol valve for a short pause. The adjustable screws don’t need to be shut. By opening the petrol valve you can start the machine with 1 push on the start button and the machine will run at the adjustment of the latest start.

This only works when the device is still warm. Has the the device cooled down, the device will have to be adjusted again according to the start procedure (3.1.2)

3.1.5 EMERGENCY STOP

In case of emergency, the petrol valve serves as an emergency stop. By turning it off, the device will be shut down within 2 seconds.

3.1.6 GENERAL:

After a longer period of use with a strongly heated machine, allow the machine to cool down before starting again. Starting is then easier and safer. **Never** fill a heated machine with petrol. FIRE HAZARD. Comply with the safety and accident conditions!

3.2 GRAPHIC MACHINE EXPLANATION

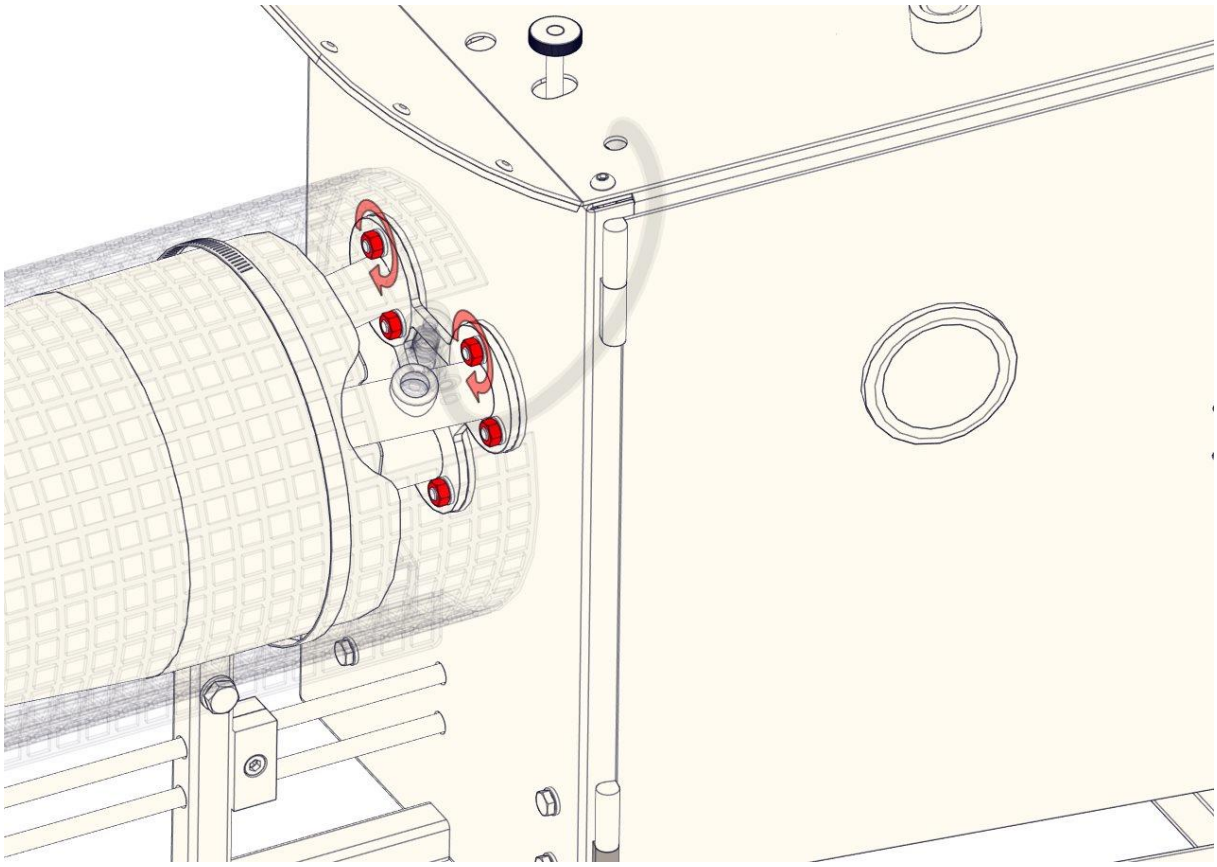


Figure 1

Firmly tighten the 9 hexagonal nuts that fix the exhaust on the frame. This is to prevent leaks.

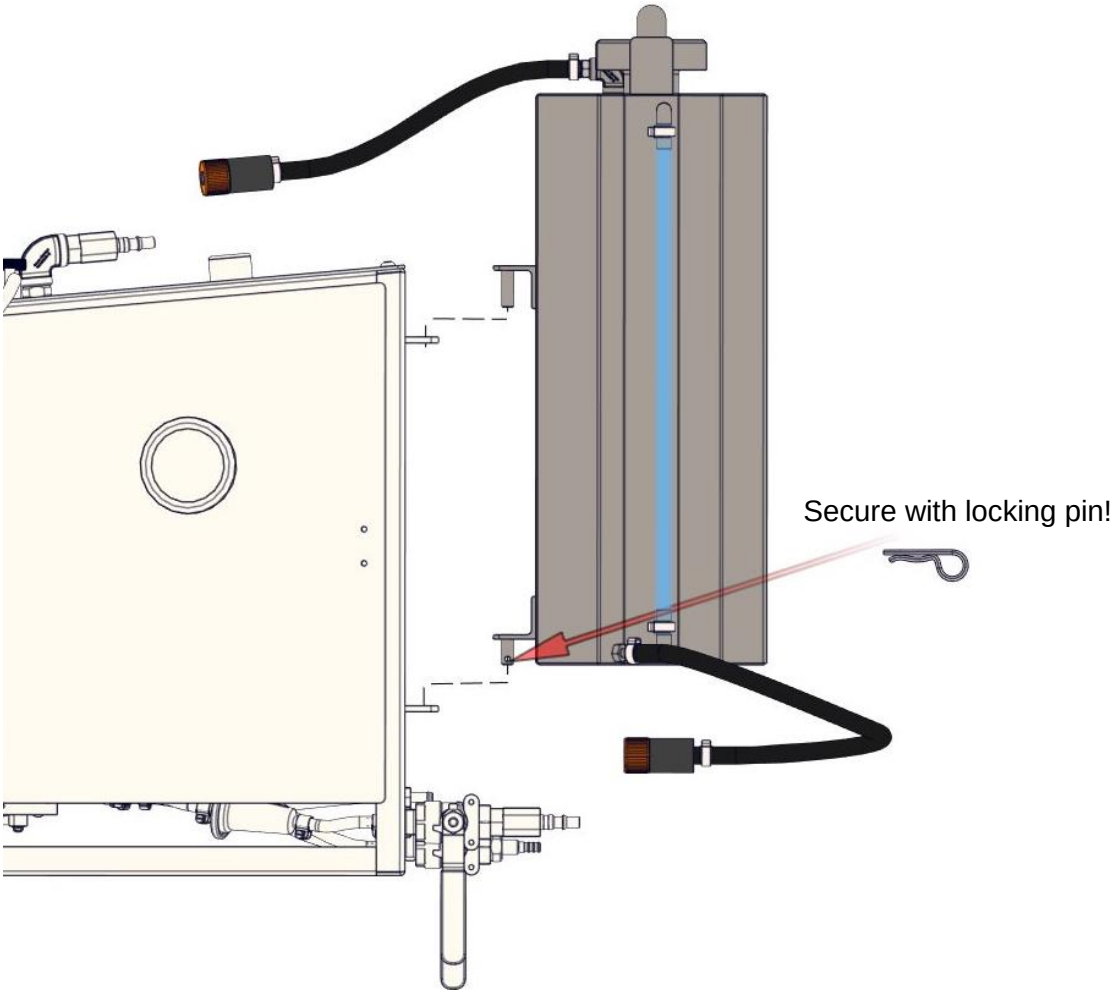


Figure 2

Hang the filled petrol tank with the three pins in the holes for that purpose. Secure the fuel tank with the locking pin to prevent bumping loose. Make sure that the cap is on the tank.

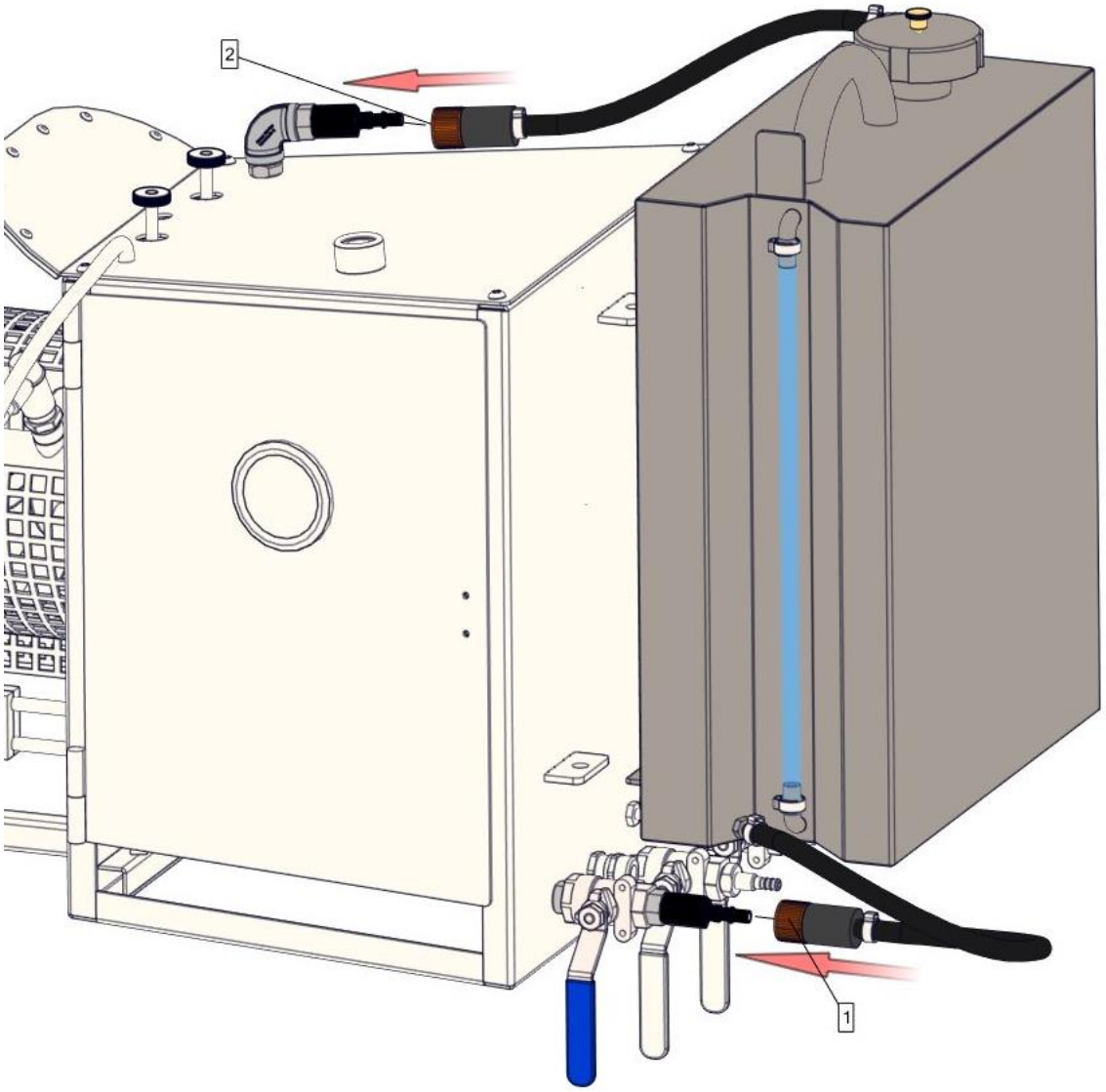


Figure 3

Click the lower petrol hose coupling on the machines petrol supply(Figure 3 no.1). Click the upper petrol hose coupling on the venting clutch top of the machine(Figure 1 no. 2). The quick-release coupling is self-closing. In the uncoupled state no fuel can leak from the connector. In the figure the petrol valve is **closed**.

User Manual petrol connector K40

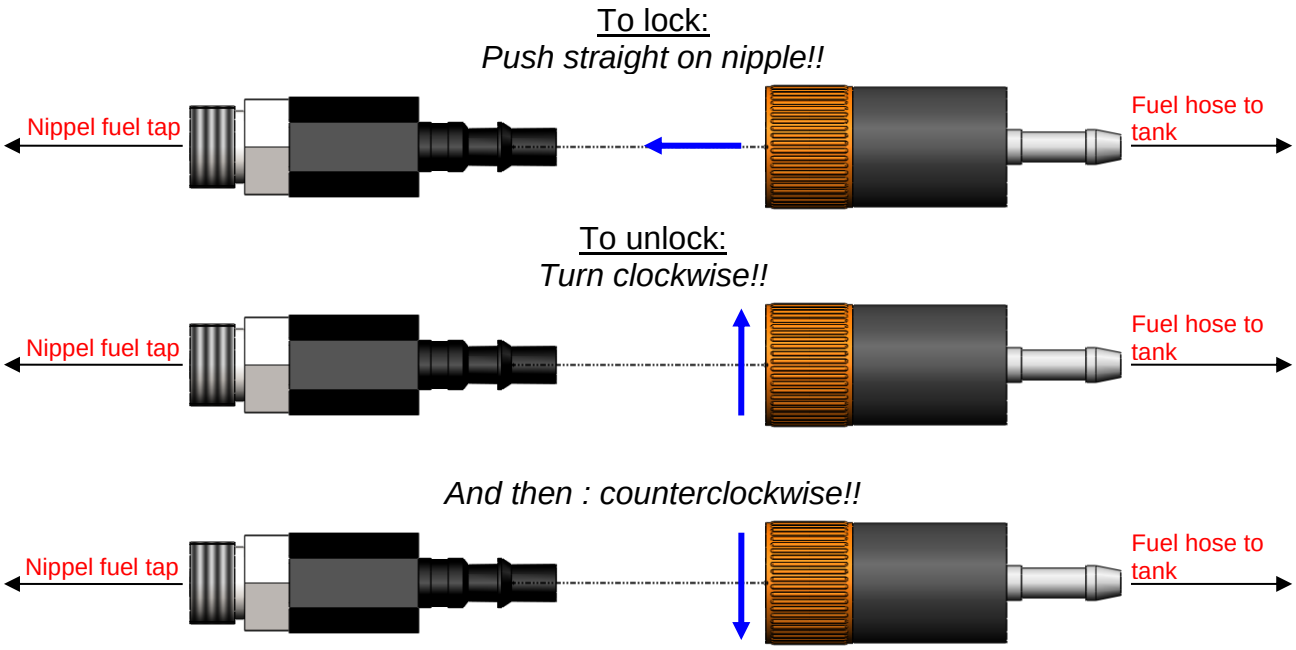


Figure 4
Uncoupling petrol coupling

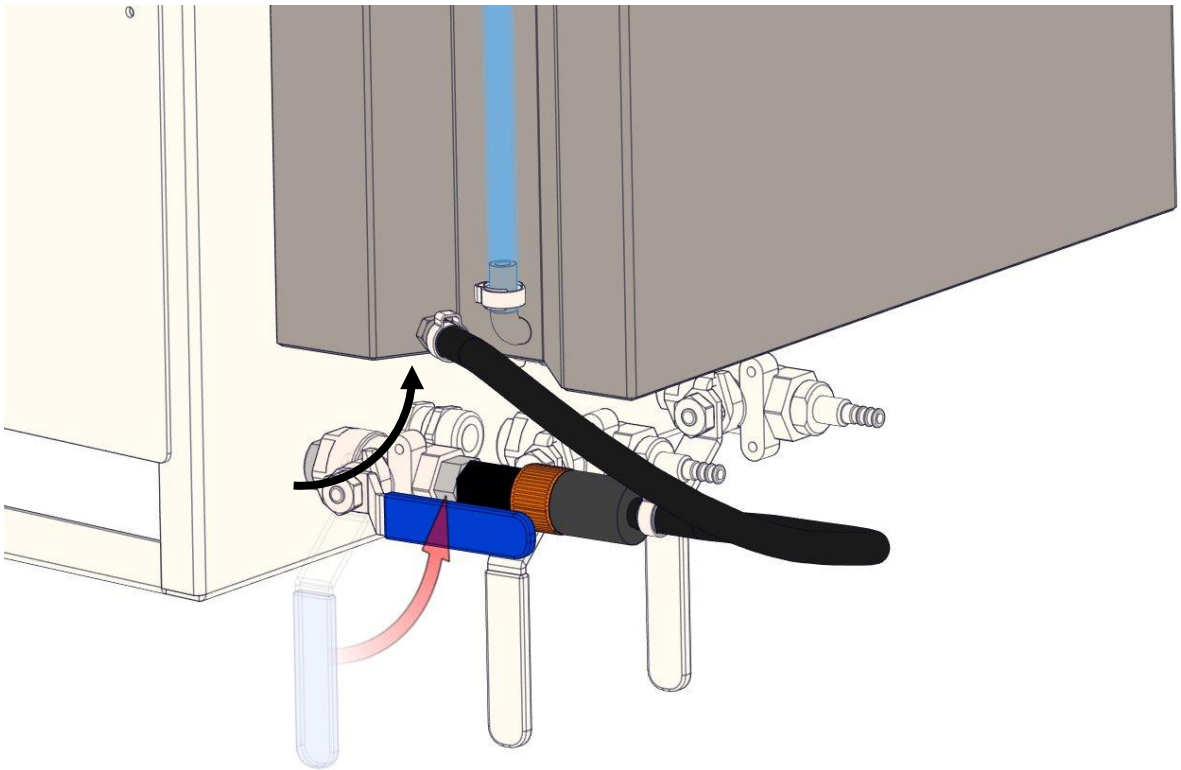


Figure 5
When the petrol hose is coupled, the petrol valve can be opened.

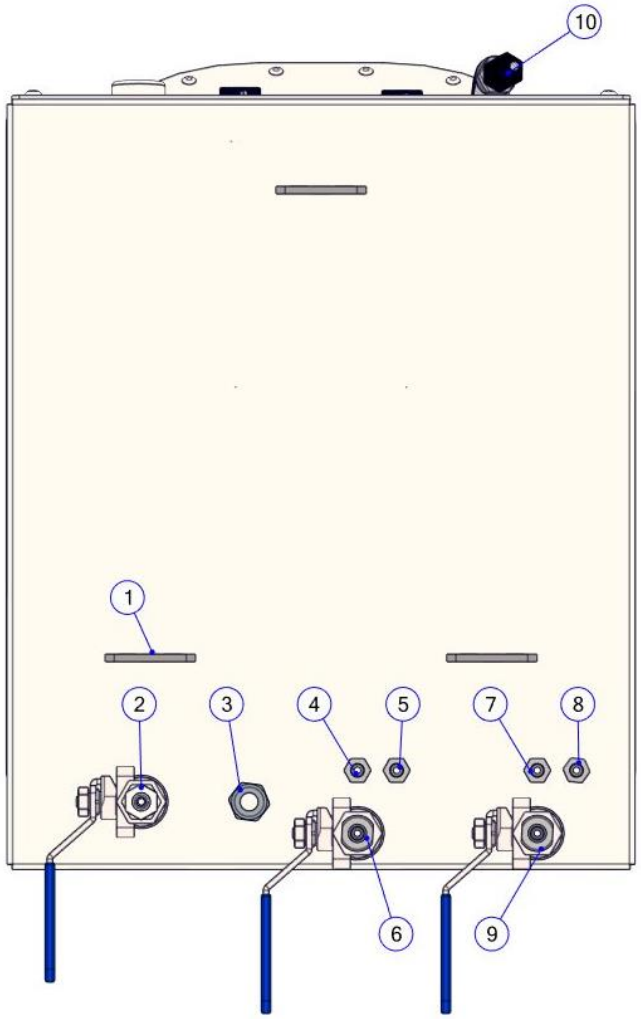


Figure 6

Rear of the machine

1. Mounting bracket petrol tank
2. Petrol valve
3. Cable to battery
4. Air supply depressurizing valve fogging liquid tank
5. Air supply fogging liquid tank
6. Fogging liquid valve
7. Air supply depressurizing valve water tank
8. Air supply water tank
9. Water valve
10. Air vent fuel float

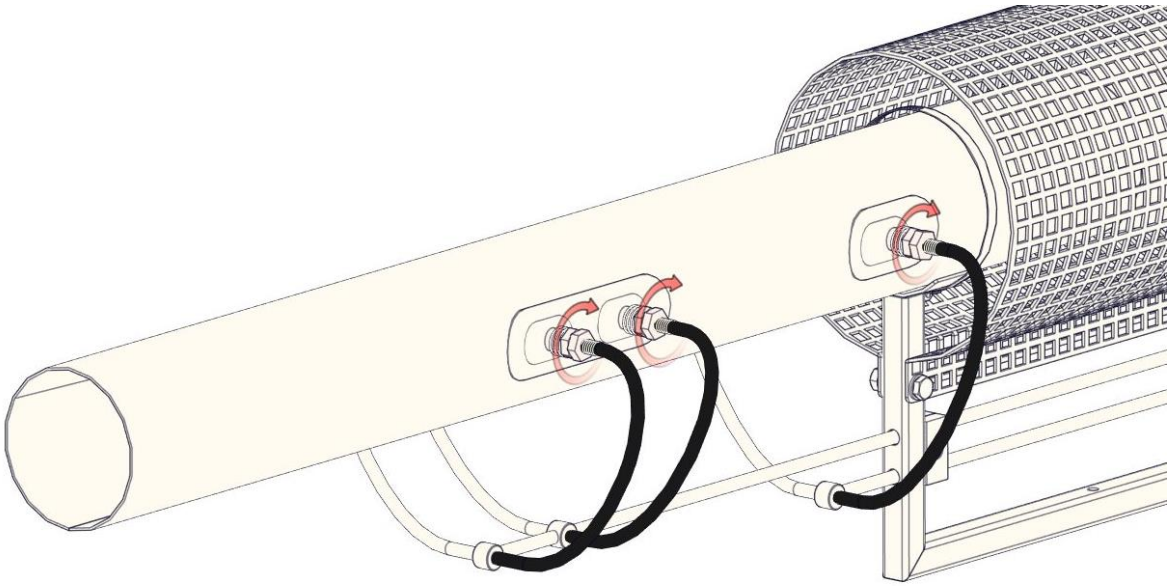


Figure 7

6 sprayer holders and sprayers opposite each other (for water and fogging liquid). Check they are firmly connected before each time of use. Sprayers opposite each other must always be the same format.

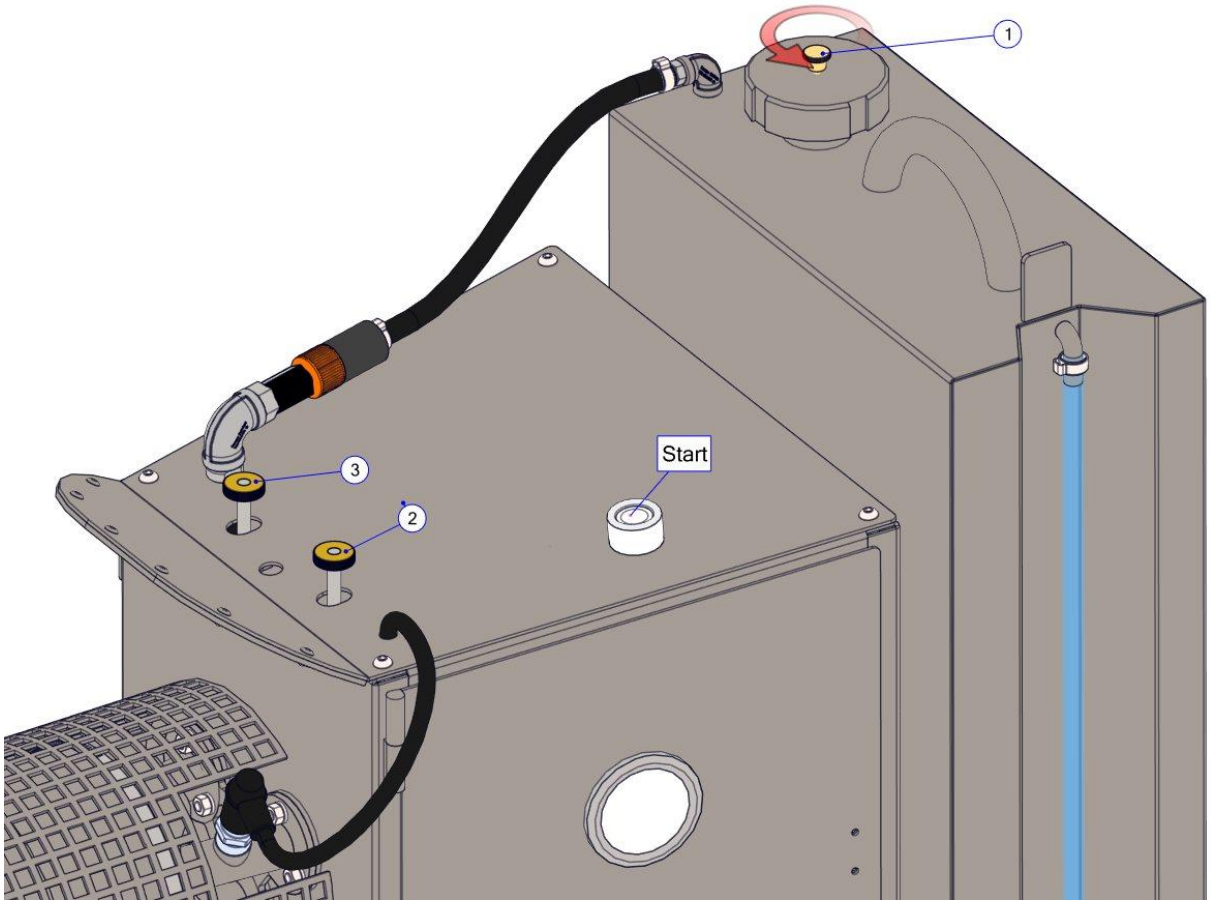


Figure 8

Open the air vent valve on the petrol tank no.1.
Open adjusting screw left, no. 2, a quarter turn.

Press the start button pulsing and at the same time gradually open adjustable screw no. 2 until the motor starts. Turn both, no. 2 and 3, screws together further until the motor runs stationary with a powerful deep tone.

The fogging liquid and the cooling water tank will automatically be depressurized at the stop of the Pulsfog K40, so no pressure remains on the tanks. This requires a special depressurizing mechanism that has been mounted on top of the tank. For the mechanism to work an air hose needs to be fitted.

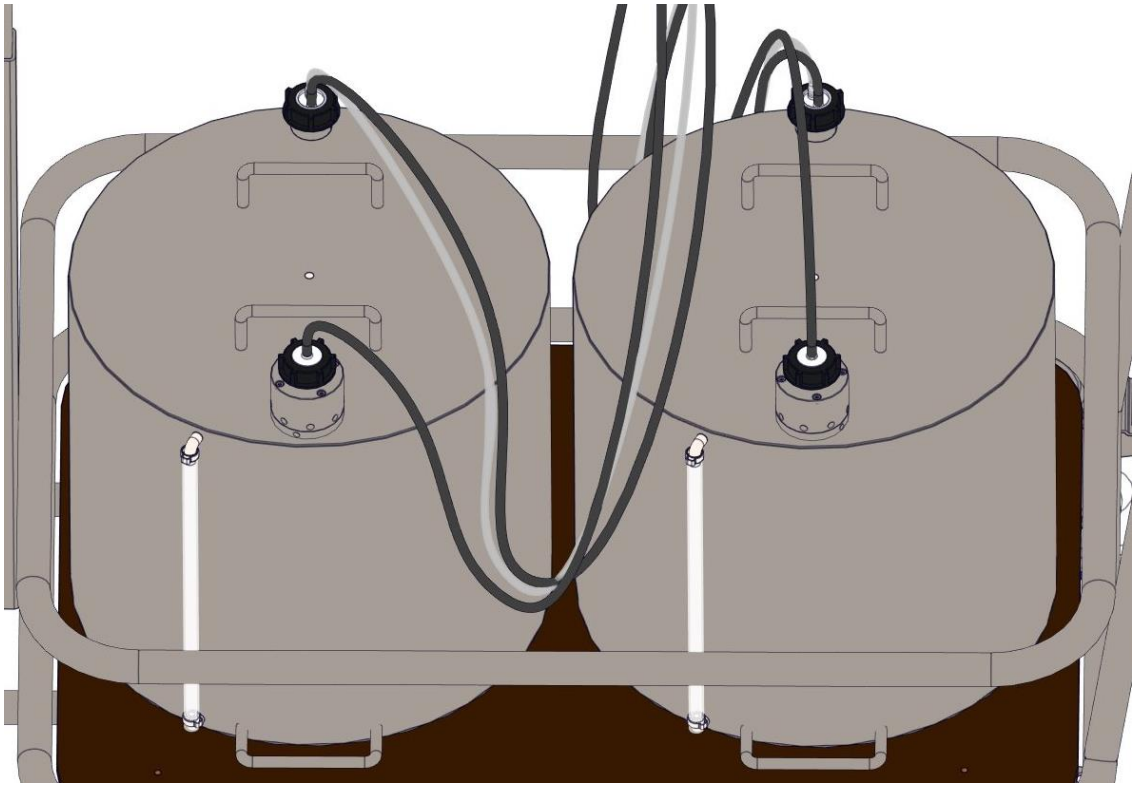


Figure 9

The fluid hose goes into the tank. The other goes on the depressurize mechanism.

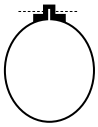
Figure 10

4 OTHER ACTIVITIES

Activities mentioned in this section may only be carried out by service personnel as described in "Service personnel" on page 14.

4.1 BRINGING INTO USE

1. Tighten all three hexagonal nuts on the three carburettors (Figure 1). Check this again **after the first time of use**.
2. Check all lines through which petrol passes for the firmness of connections and tighten the hose clips if necessary.
3. Tighten the carburettor caps on all three carburettors.
4. Check all dosing sprayers for firm attachment. Check this again **after the first time of use**. Tighten as necessary with two 17 open end spanners.
5. If the petrol tank is full, check that the prescribed connection is well sealed. Immediately remove any dust and dirt on the coupling or disruptions to the petrol supply can occur. A loose hose can also cause a FIRE HAZARD (Figure 3 and Figure 4).
6. **Before the first time of use** you must open the pressure gauge venting. Open the door with pressure gauge. On the top of the pressure gauge there is a rubber cap with point. Cut this point off so air can enter the pressure gauge.



rear of pressure gauge

Not doing so, will cause the pressure gauge to indicate a not accurate pressure.

4.2 MAINTENANCE

4.2.1 MAINTENANCE INSTRUCTIONS

Checklist

See "Annex 1 Technical documentation" for reference to page- and the position numbers between brackets after the parts(page nr./position nr.).

- Replace Teflon membranes (39,20/40,8), also replace lock nut M6 (39,24/40,12);
- Take out the needles of the two upper carburettors (41,36) and visually check for damage or corrosion. If the needles are in very poor condition also replace the associated fuel jet (39,13/40,1);
- Replace the choke jet (39.13) and the fibre washers (39,14/39,11);
- Clean the seal (39,16);
- Replace hose clamps (41,7/41,1) if they have become loose with deformation during tightening. Hose clamps are for one-time-use only;
- Clean all non return valves (green/grey (51.12), black/grey (50.18), blue/red (48,3/50,19/52,6), and block valve (50,16)) (with e.g. degreaser) and check their working (red fuel valves(41,38) do not have to be cleaned but their working must be checked (manually pump petrol, petrol may not return));
- Check all hoses, these may not be porous, hard or swollen;
- Replace fuel filter (49,1438,4

- Tighten the nuts (65) with which the inner pipe is assembled against the frame;
- Check that the nozzles (35,8/35,7) in the pipe are firmly connected, and check hoses to the nozzles;
- Check plug (57,1) (spark) and the battery terminals (if the cable at the battery terminals is very thin this can cause high resistance with as a consequence the compressor and ignition having too little power);
- Check liquid valves (45,2/45,3) on the rear of the Pulsfog K40, hoses provided with safety springs;
- Visually check the inner pipe (38,2) (shine with torch), if the pipe is soiled scrape clean;
- Check hoses to the tanks, check hoses in the tanks (must be fitted with safety springs) and check the suction filters;
- Check hose clamps (35,4/35,5) around the outer pipe (38,5), they may not be tightened to much because of expansion of the pipe;
- If one notices that the second needle reacts poorly or has too little power, the fuel nozzle for the needle must be replaced. Remember that with the replacement of the nozzle the needle disk must be adjusted again. Otherwise the needle will be turned in too far and damage the nozzle.

TIP

- Make sure that sufficient petrol is present and preferably up to temperature (the machine is difficult to start with very cold petrol).
- Have a charged spare battery present to test the machine.

4.2.2 PERIODIC INSPECTION

At least once a year the product must be inspected for safety aspects by an expert in working conditions law.

4.2.3 REPAIRS/REPLACEMENT OF PARTS

During the warranty period repairs may only take place under the management of the manufacturer.

All parts replaced must at least suffice with regard to the specifications of the original parts.

All parts can be ordered from the manufacturer.
The annexes include a list of replacement parts.

Warning!

Not complying with these instructions can have consequences for the safety of the machine. The manufacturer can accept no liability for this.

5 SPECIFICATIONS

5.1 PRODUCT SPECIFICATIONS

- Weight: 108 kg.
- Material: Fully “stainless steel” 2 mm.
- Power: 125 hp/79200 Kcal/h.
- Noise emission (1,5 metre operator side): 108 dB (appendix 3 “Sound measurement”)
- Volume combustion chamber: 3 litres.
- Fog throw low culture: 120 metres.
- Capacity: 60 to 150 l/h
- Volume petrol tank: 20 litres (tank is detachable).
- 2 liquid tanks stainless steel: 2 x 50 litres
- Electrical start 12 volt.
- 6 Dosing sprayers.
- 3 Carburettors

Bio system, 2 separate liquid lines

6 NUTRIFOG

Nutrifog

carrier

Nutrifog is a special carrier developed as an additive to products that can be used with the Pulsfog fogging method in horticulture.

Nutrifog delays the premature evaporation of the water and precludes the premature crystallization of the product. Nutrifog contains nutrients to improve the vitality and the growth of the plants. Nutrifog may be added to plant protection agents.

Dosage:
Mix 100 to 150 ml Nutrifog with 1 to 1.5 litres of water per 1000 m².
To be used with intervals of at least 5 days. An increase of the dose of 500 ml/1000 m^2 is sometimes possible, but it must be assured that the total quantity of Nutrifog fogged is never more than 1.5 litres/1000 m^2 per month. Always check the label on the product that one wishes to mix with Nutrifog.

Creation of the fogging liquid:
First put water in the fogging liquid tank and then add Nutrifog.

Users instructions:
Always wear a gas mask with at least an A2B2-P3 filter because one will often work with combined products. Always start at the back of the greenhouse/space and while fogging walk backwards with the fogger. When fogging has finished do not enter the space again. Before entering the space, always ensure sufficient ventilation.

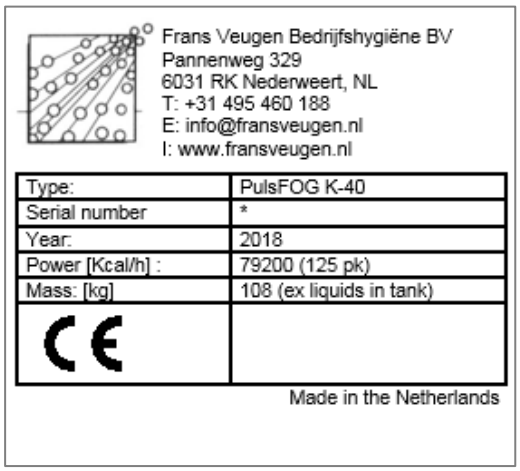
Storage:
Store Nutrifog in the original can and out of the reach of children. Do not allow the product to dry out and shield it against sunlight. Do not store in a temperature below 4° C or above 40° C.

Nutrifog is available from your crop protection supplier or enquire at Frans Veugen Bedrijfshygiëne BV.

7 INDICATIONS ON THE PRODUCT

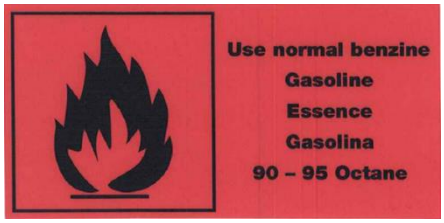
7.1 CE TYPE PLATE

The following type plate is applied to the Pulsfog K40:



7.2 WARNING STICKERS

The following warning stickers are applied to the product. Contact Frans Veugen Bedrijfshygiëne for replacement with damage or illegibility.



8 EC DECLARATION OF CONFORMITY

We Frans Veugen Bedrijfshygiëne B.V.
Platinastraat 9
6031 TW Nederweert
Nederland
Tel: +31 (0)495 460188
Fax: +31 (0)495 460186

declare entirely under our own responsibility:

1. We are the producer of the machine:

   Pulsfog:

Make:	Frans Veugen Bedrijfshygiëne B.V.
Type:	K-40
Serial no.	all serial numbers of this type

   to which this declaration relates.

2. The machine is designed and constructed in compliance with the requirements of Machinery Directive 2006/42/EC

3. The machine meets the requirements of the following other EC directives:

   EMC directive 2004/108/EEC (as last amended).
   2009/127/EC
   EN ISO 13732
   EN ISO 13856

4. The machine is designed and constructed according to the following (European) standards or normative documents:

NEN-EN-ISO 12100: 2011	**Safety of machines – Basic terms for design – Risk assessment and risk reduction.**

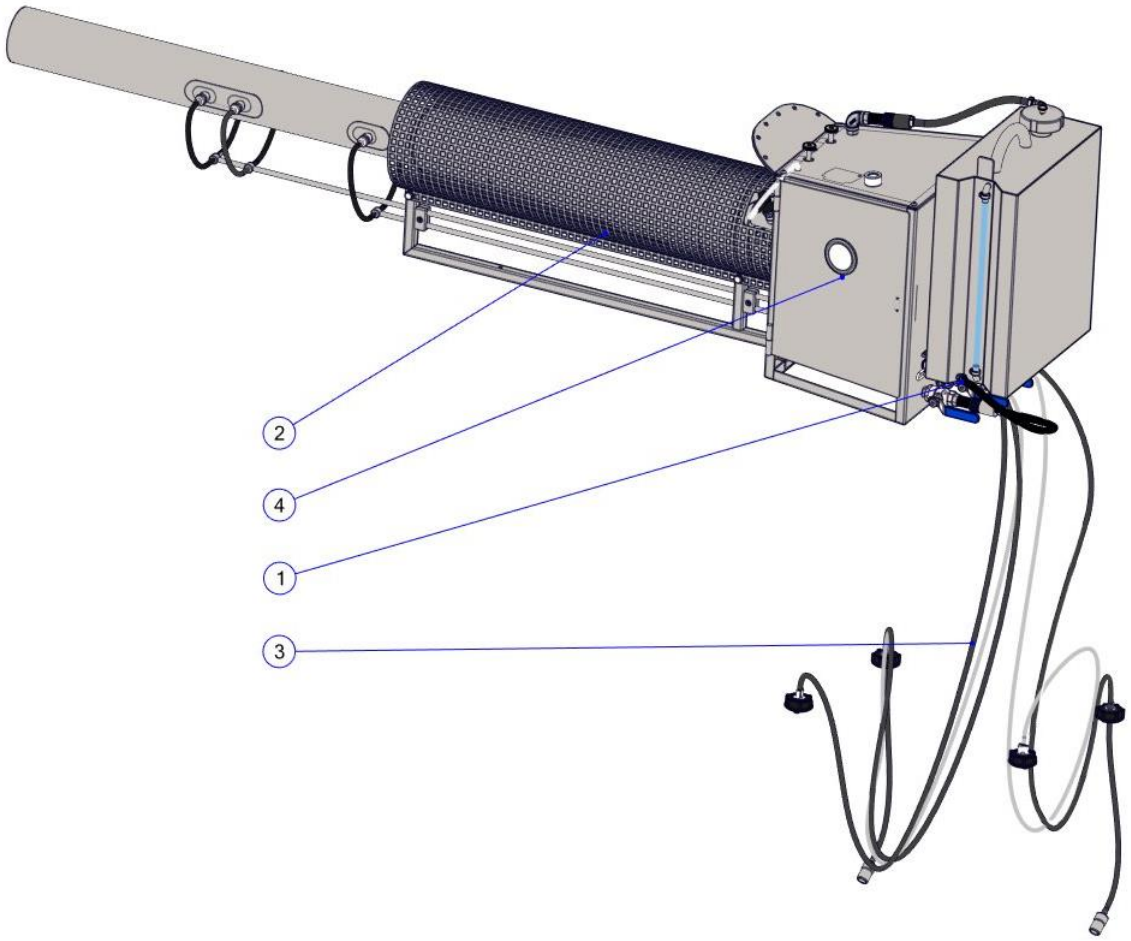
Signed in Nederweert
Date: 13-08-2018

Signed by: Jos Veugen
Position: Director

ANNEX 1 TECHNICAL DOCUMENTATION

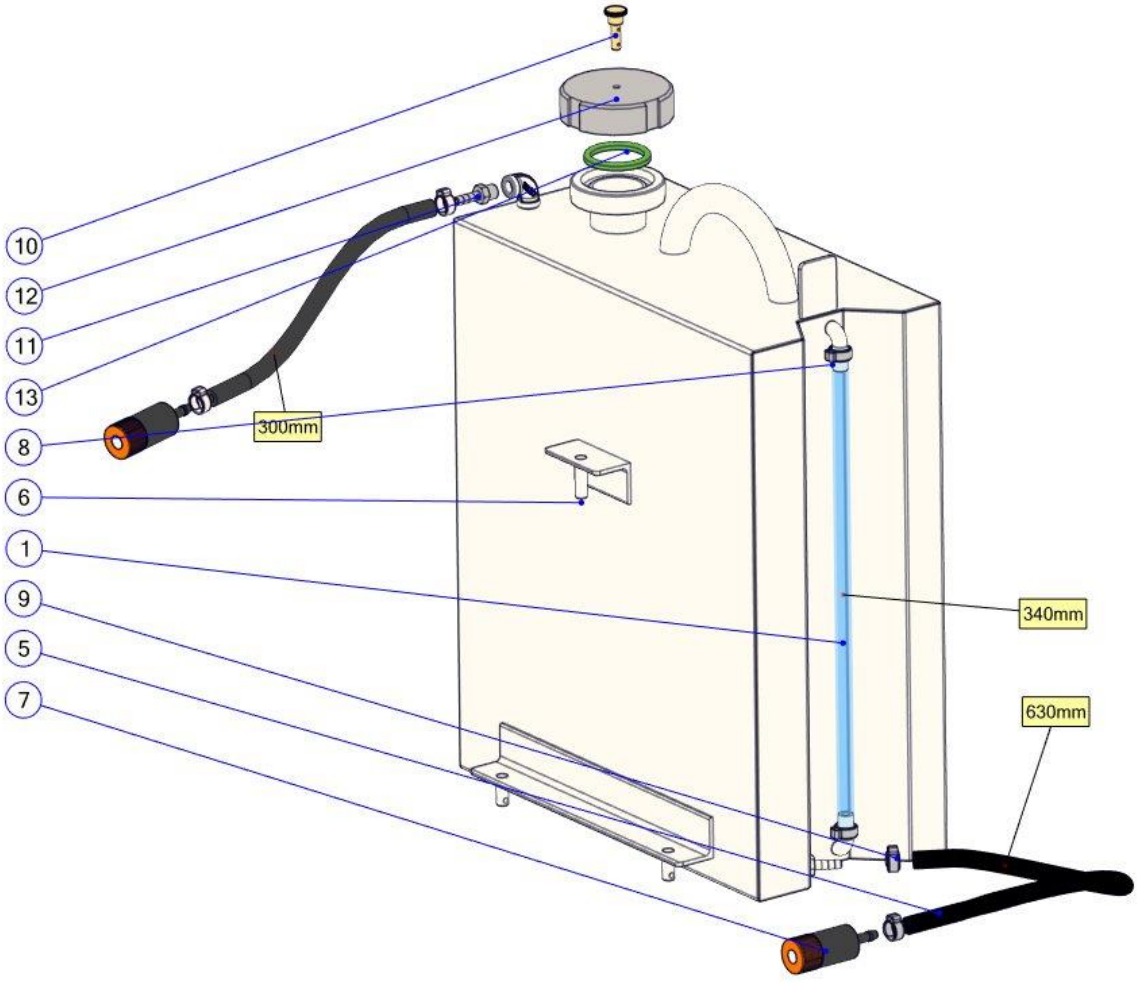
PulsFOG K-40

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	011661	Petroltank stainless steel for K4/K40 + glass gauge	1
2	010065	Cooling jacket with protective grating K40	1
3	011426	Hose set TBV K4 / K40 with venting 180cm - 50 ltr tank	2
4	010061	Door frame K40 left	1



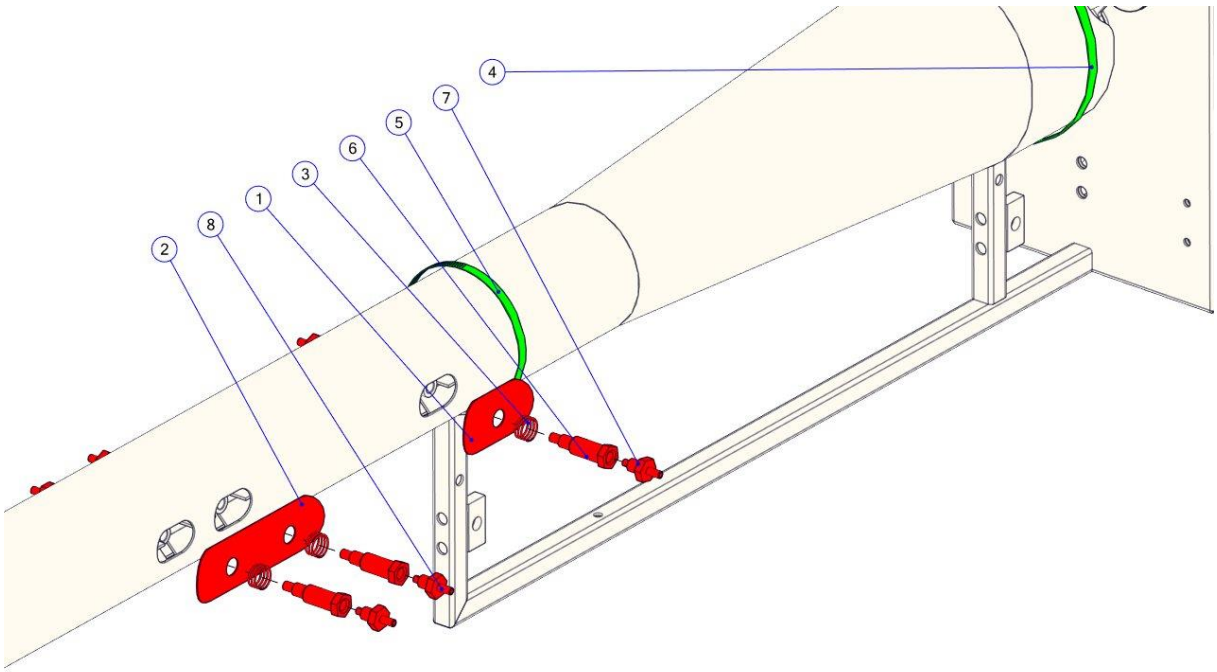
PETROL TANK

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	010035	Fuelhose 12x2mm	1
5	010004	Petrol hose 6x12mm	2
6	010064	Fuel tank K40 bare	1
7	010331	Petrol coupling K40 "Female"	2
8	010967	Pinch clamp stainless steel 11.8-13.8mm (14.5)	2
9	010968	Pinch clamp stainless steel 10.6-12.6mm(13,3)	4
10	011648	Fuel tank vent kit 10/20 liters. stainless steel	1
11	103530	Hose insert stainless steel tube 1/8 "x 6.5 mm	1
12	011667	Cap gasolinetank stainless steel K40 20 ltr tank	1
13	103972	Seal ring viton 38 mm	1



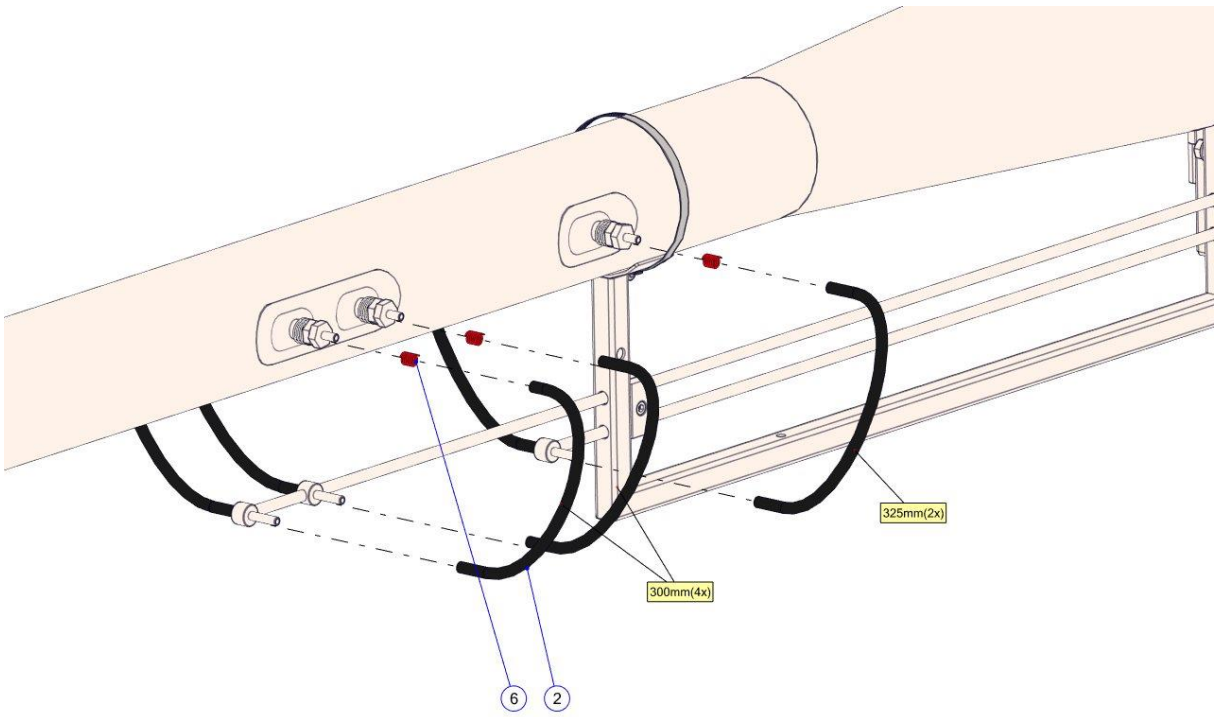
ASSEMBLY NOZZLES

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	010520	Cover plate single hole	2
2	010525	Cover plate double hole	2
3	010530	Compression spring cover plate	6
4	010617	Hose clip stainless steel 150-180 mm	1
5	010618	Hose clip stainless steel 87-112 mm	1
6	011512	Holder for dosing nozzle unit M10	6
7	231492	Dosing nozzle M10 SS no. 1.0	2
8	231494	Dosing nozzle M10 SS no. 1.2	4



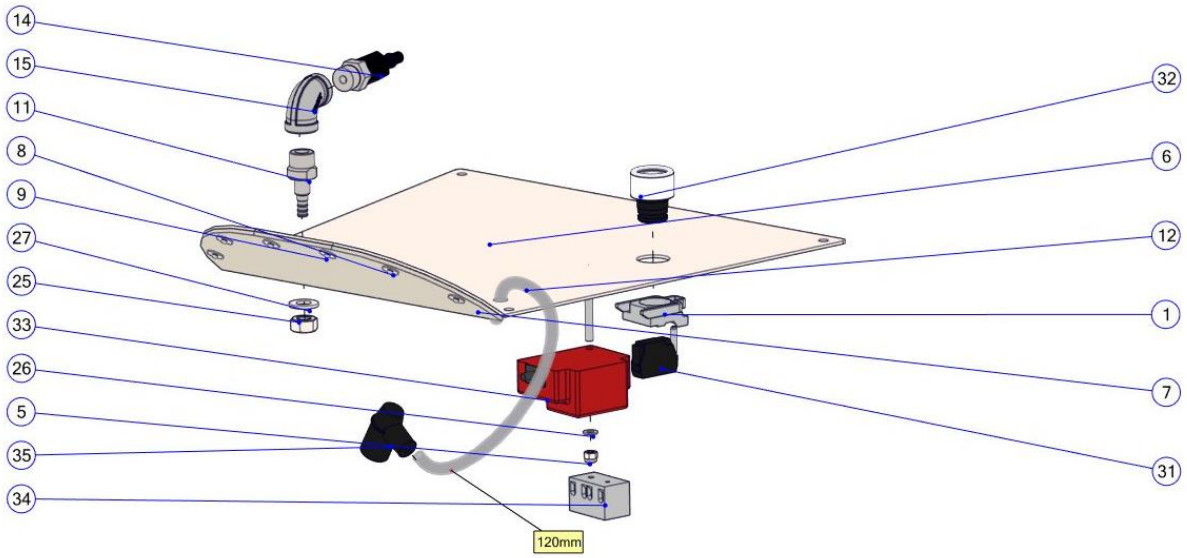
ASSEMBLY HOSES ON NOZZLES

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
2	010000	Viton hose 5x8mm	6
6	011290	Supporting spring Ø8x100 for Viton	6



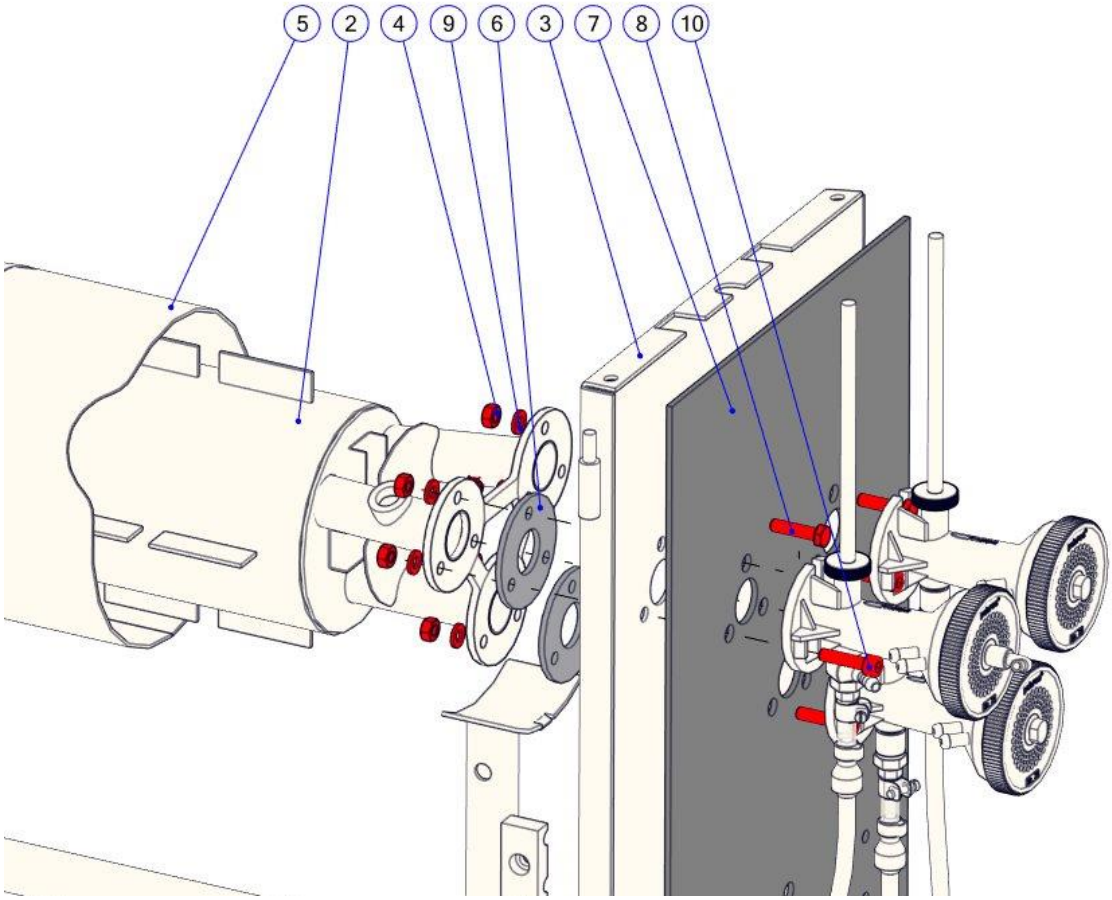
ELECTRICS

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	105530	Fixing Base ZB4-BZ009	1
5	310002	Lock nut M5 stainless steel Din985	1
6	010063	Cover plate K40	1
7	010325	Seal cover K40	1
8	310021	Car body ring M4 stainless steel Din 9021	6
9	310915	Blind rivet 4.0x8 stainless steel	6
11	011206	Hose coupling 3/8" M105 mm stainless steel	1
12	010009	Transp.hose Polyros/rauclair 6x1,5mm	1
14	010330	Petrol coupling K40 "Male"	1
15	103511	Knee stainless steel 90 gr. 3/8"	1
25	310065	Hexagon nut M10 stainless steel	1
26	310082	Washer M5 SS din125	1
27	310085	Washer M10 SS din125	1
31	105527	Contact NP ZBE 1015 feather	1
32	011846	Push button black ZB4BA2	1
33	011830	Electronical ignition device	1
34	011848	Phoenix contact G5/4 K40	1
35	012091	Spark plug cap	1



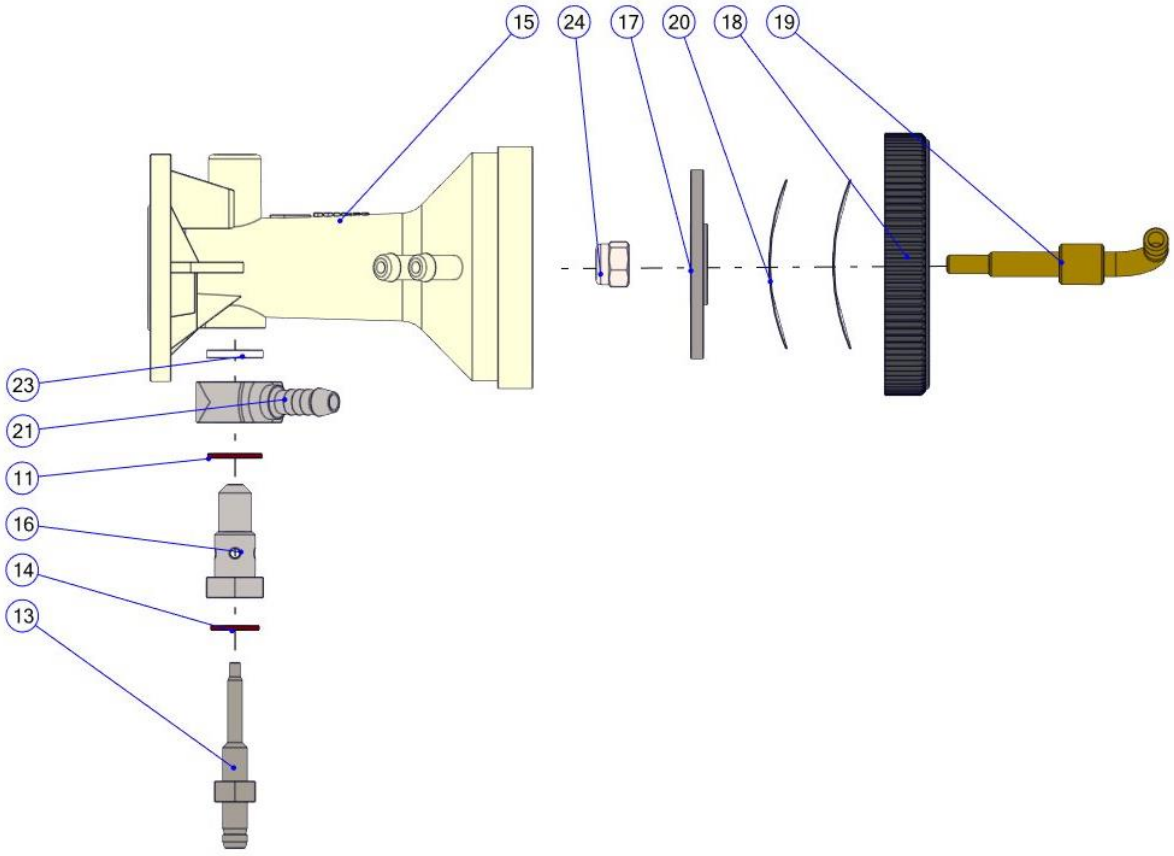
ASSEMBLY CARBURETTORS

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
2	010316	Resonator K4/K40	1
3	010060	Frame K40 - 2	1
4	310063	Hexagon nut M6 stainless steel	9
5	010478	Cooling jacket K40 1.5 mm SS	1
6	010781	Gasket Carburettor K40	3
7	010326.01	Seal frontplate K40 long	1
8	310106	Hexagon bolt M6x25 stainless steel Din933	3
9	310083	Washer M6 SS din125	9
10	310043	hexagon socket M6x25 stainless steel din912	6



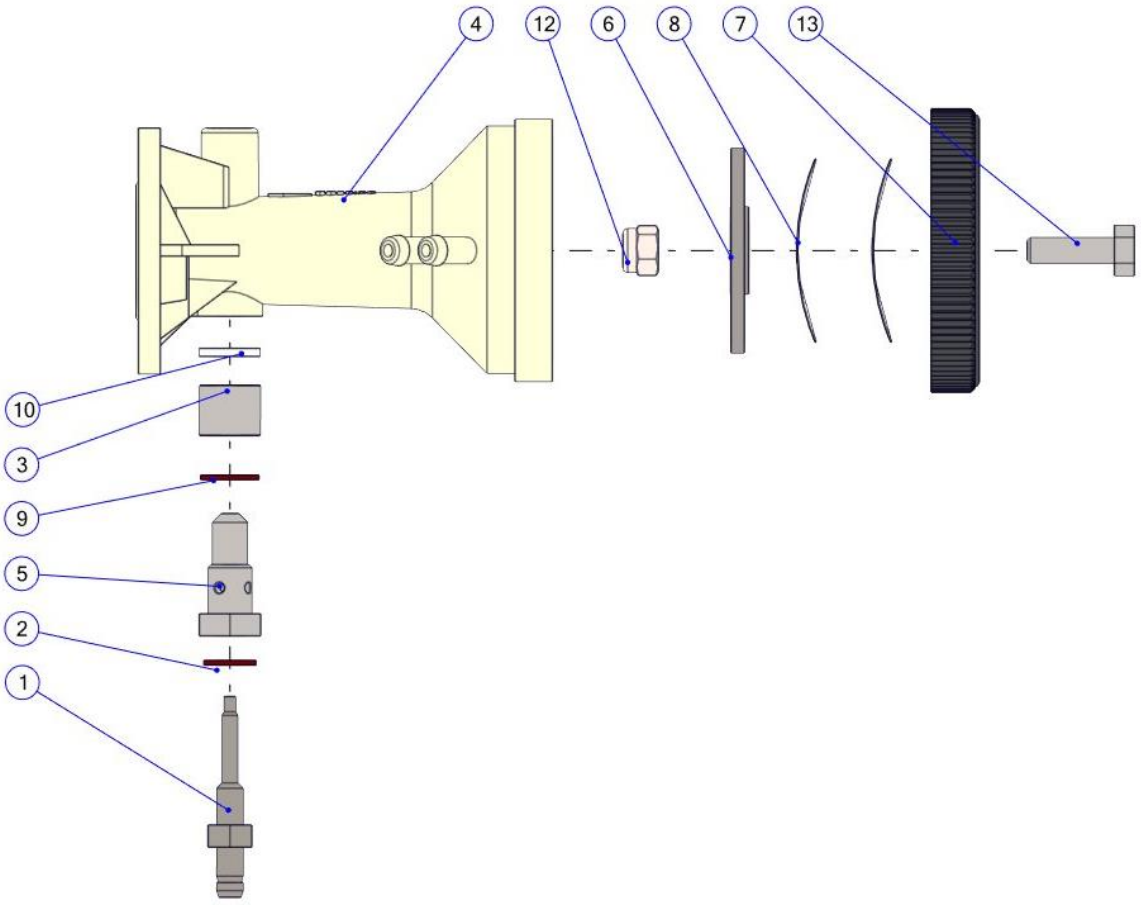
CARBURETTOR - START

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
11	011760	Sealing ring fibre 10/14/1	1
13	010663	Fuel injector stainless steel nr. 10	1
14	010760	Sealing ring fibre 6/12/1	1
15	010635	Carburettor (white) body K30/K4/K40	1
16	010672	Ring slot nozzle K22/K30/K40 stainless steel	1
17	010700	Support plate (Ryton)	1
18	010730	Diaphragm lid (threaded cap for carburettor)	1
19	013022	Starting nozzle	1
20	010720	Membrane teflon	2
21	011110	Ringpiece Carburator	1
23	011537	Seal PETP 14x8x1.8	1
24	310003	Lock nut M6 stainless steel Din985	1



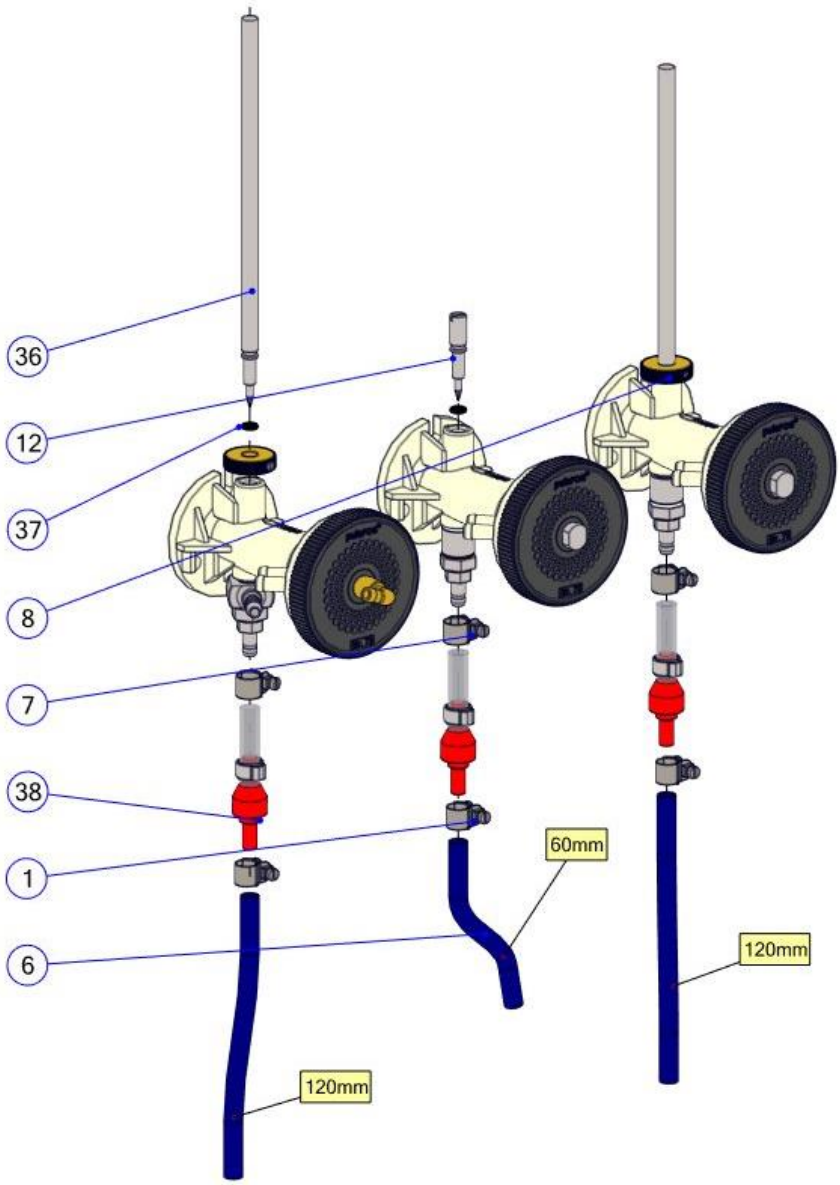
CARBURETTOR - MIDDLE/RIGHT

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	010663	Fuel injector stainless steel nr. 10	1
2	010760	Sealing ring fibre 6/12/1	1
3	011522	Spacer Nozzle holder carburettor Pulsfog stainless steel	1
4	010635	Carburettor (white) body K30/K4/K40	1
5	010672	Ring slot nozzle K22/K30/K40 stainless steel	1
6	010700	Support plate (Ryton)	1
7	010730	Diaphragm lid (threaded cap for carburettor)	1
8	010720	Membrane teflon	2
9	011760	Sealing ring fibre 10/14/1	1
10	011537	Seal PETP 14x8x1.8	1
12	310003	Lock nut M6 stainless steel Din985	1
13	010719	Bolt M6x20 stainless steel for membrane holder	1



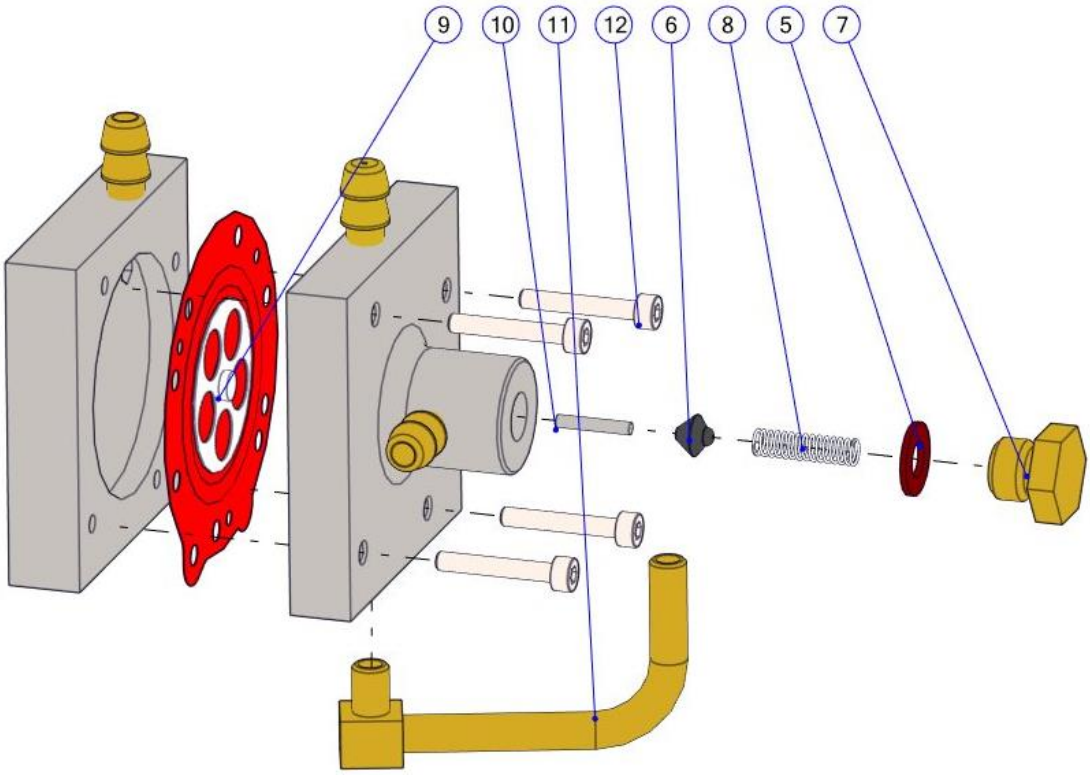
CARBURETTORS

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	010940	Hose clamp 7mm Norma	3
6	010963	Fuel hose blue 1 meter	3
7	010970	Hose clamp 9 mm Norma	3
8	011031	Knurled washer cpl. with locking screw	2
12	011033	Adjustable screw short with O-ring 39mm	1
36	011036.01	Adjustable screw SS with O-ring 177mm	2
37	011100	O-ring viton for adjusting screw	3
38	079800	Fuel valve (red) with transparent tube	3



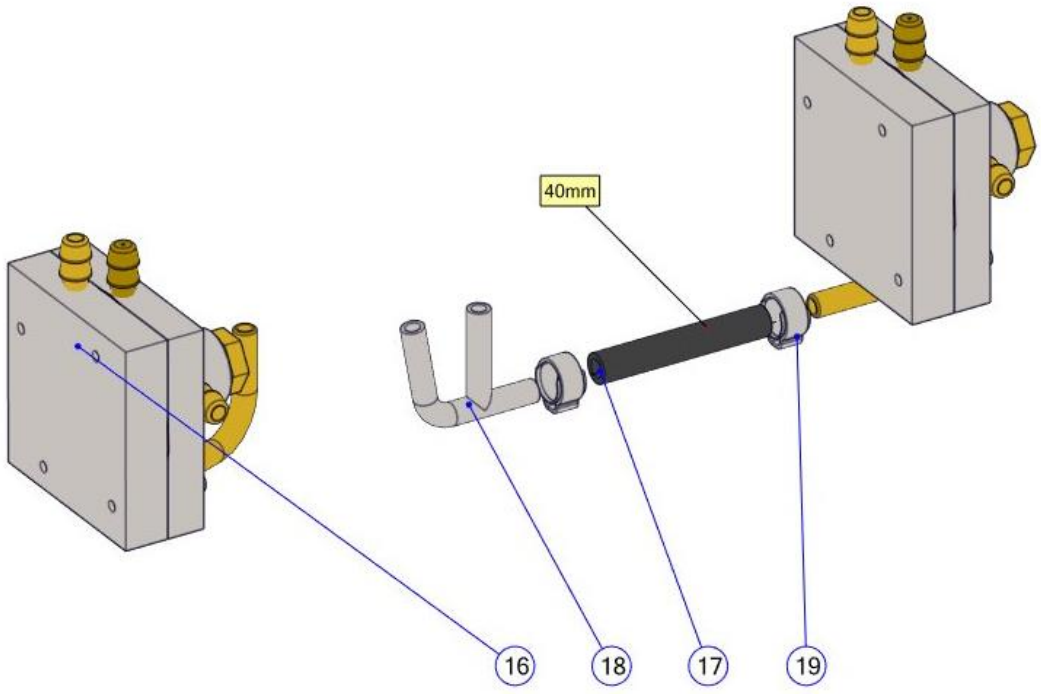
FUEL FLOAT

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
5	011760	Sealing ring fibre 10/14/1	1
6	010804	Valve cone	1
7	010806	Brass bolt	1
8	010808	Pressure spring for Membrane-floater	1
9	010810	Diaphragm for fuel floater	1
10	010811	Parallel pin 2x12	1
11	010820	Float output single K22 K30 K40	1
12	310175	Hexagon socket M3x16 stainless steel din912	4



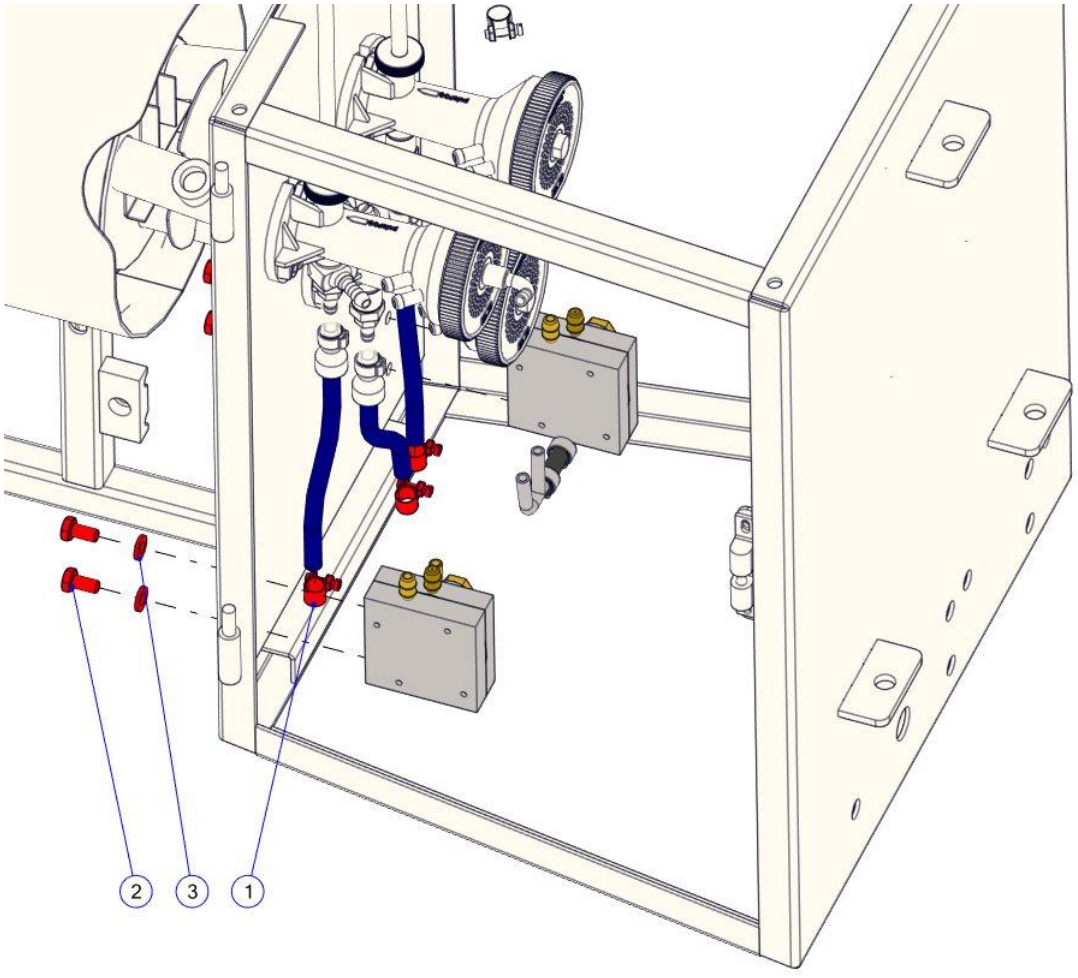
CONNECTION FUEL FLOATS

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
16	010800	Membrane-floater cpl. with 1 exit	2
17	010000	Viton hose 5x8mm	1
18	010801	Splitter fuelline for floater K40	1
19	010965	Pinch clamp RVS 8,2-9,5mm.	2



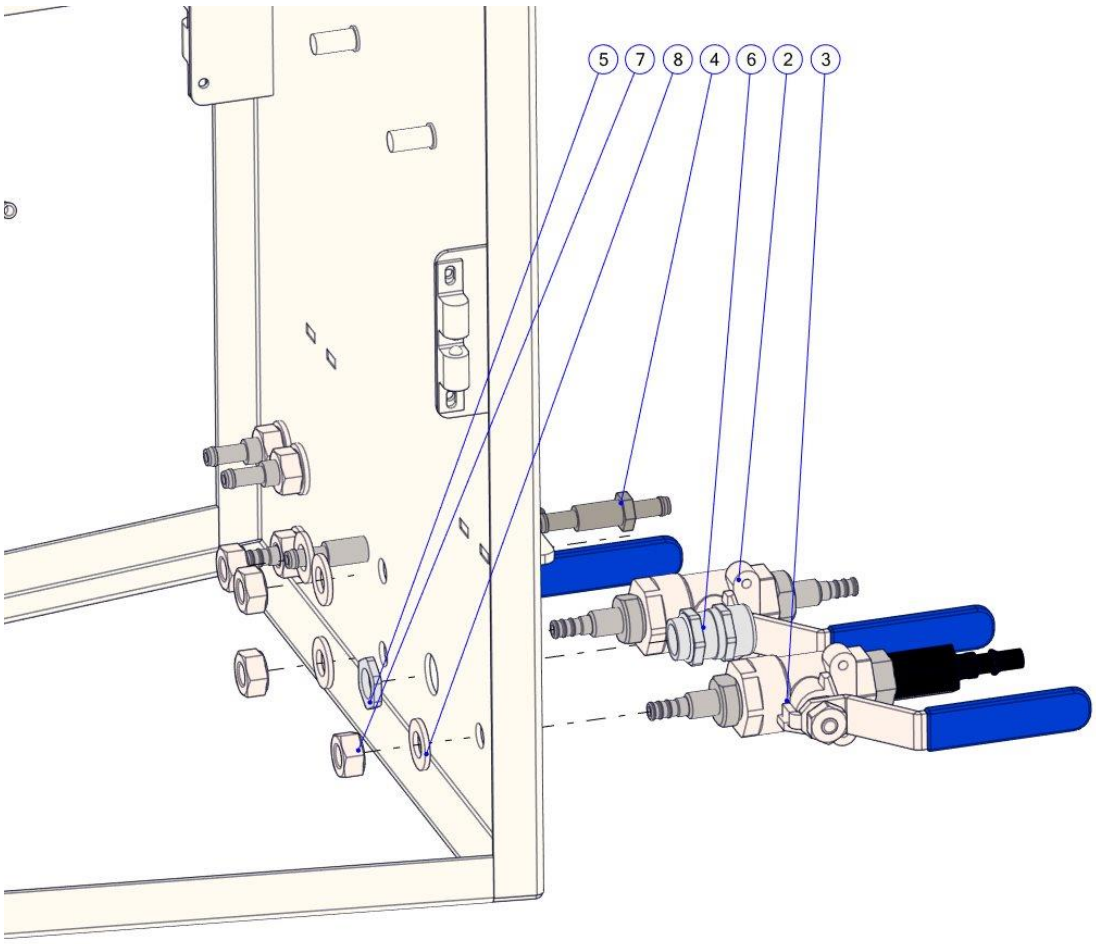
ASSEMBLY FUEL FLOATS

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	010940	Hose clamp 7mm Norma	3
2	310451	Hexagon bolt m6x12 SS din933	4
3	310083	Washer M6 SS din125	4



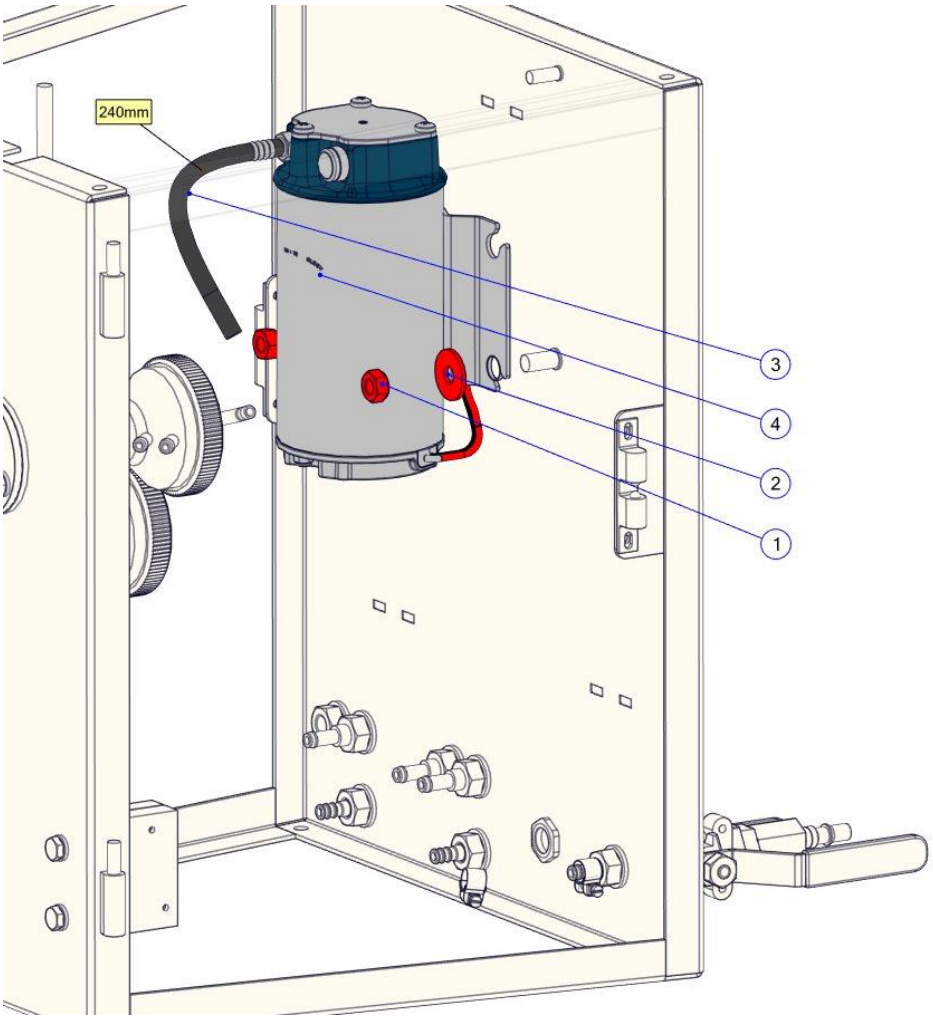
FOG LIQUID VALVE AND PETROL VALVE

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
2	011208	Fluid valve K4/K40 stainless steel complete	2
3	011204	Fuel tap K4/K40 stainless steel	1
4	130730	Transit piece Stainless Steel 6 mm x M10	4
5	010431	Union nut M16 K30 - K40	1
6	010430	Swivel Uni M16 K30 - K40	1
7	310065	Hexagon nut M10 stainless steel	7
8	310085	Washer M10 SS din125	7



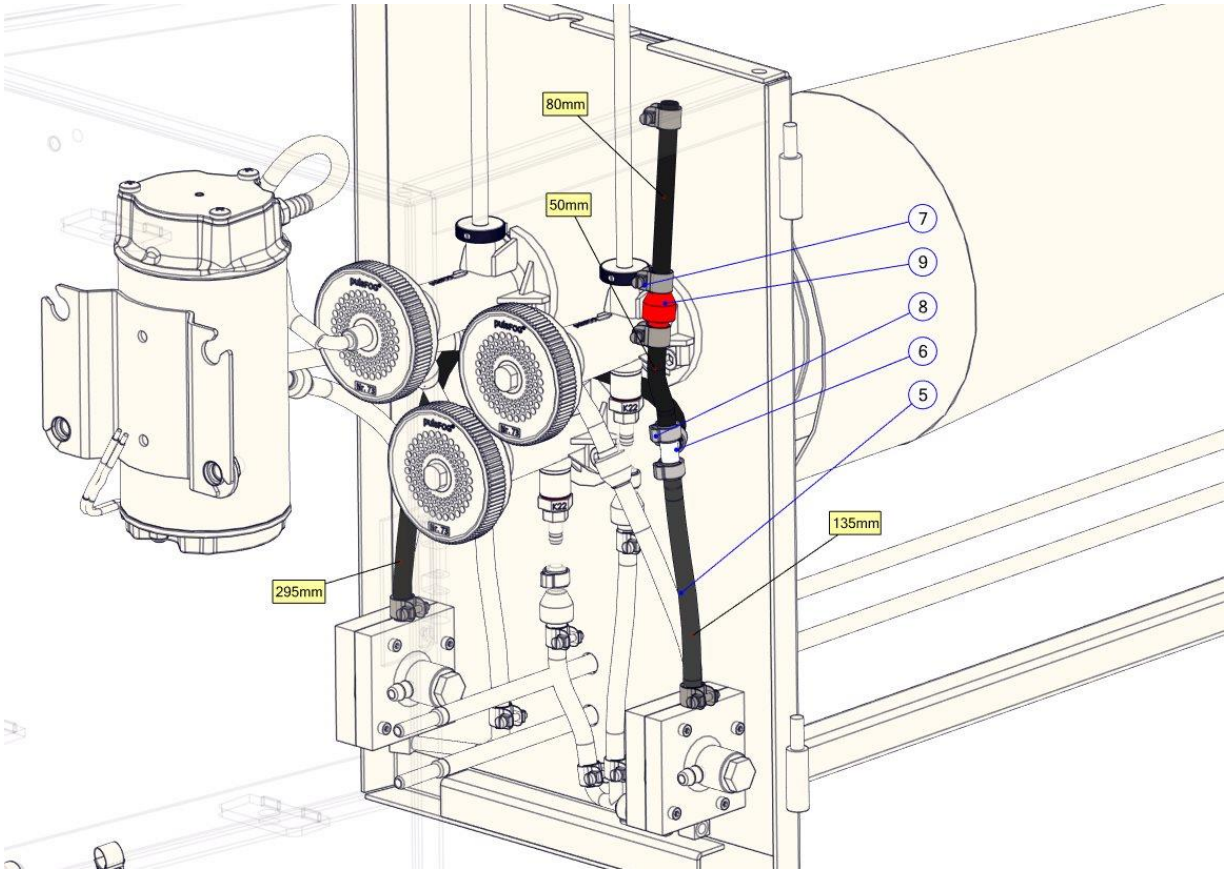
COMPRESSOR

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	310064	Hexagon nut M8 stainless steel	2
2	310024	Car body ring M8 RVS Din 9021	2
3	010000	Viton hose 5x8mm	1
4	010411	Compressor K4/K40 12V 20A	1



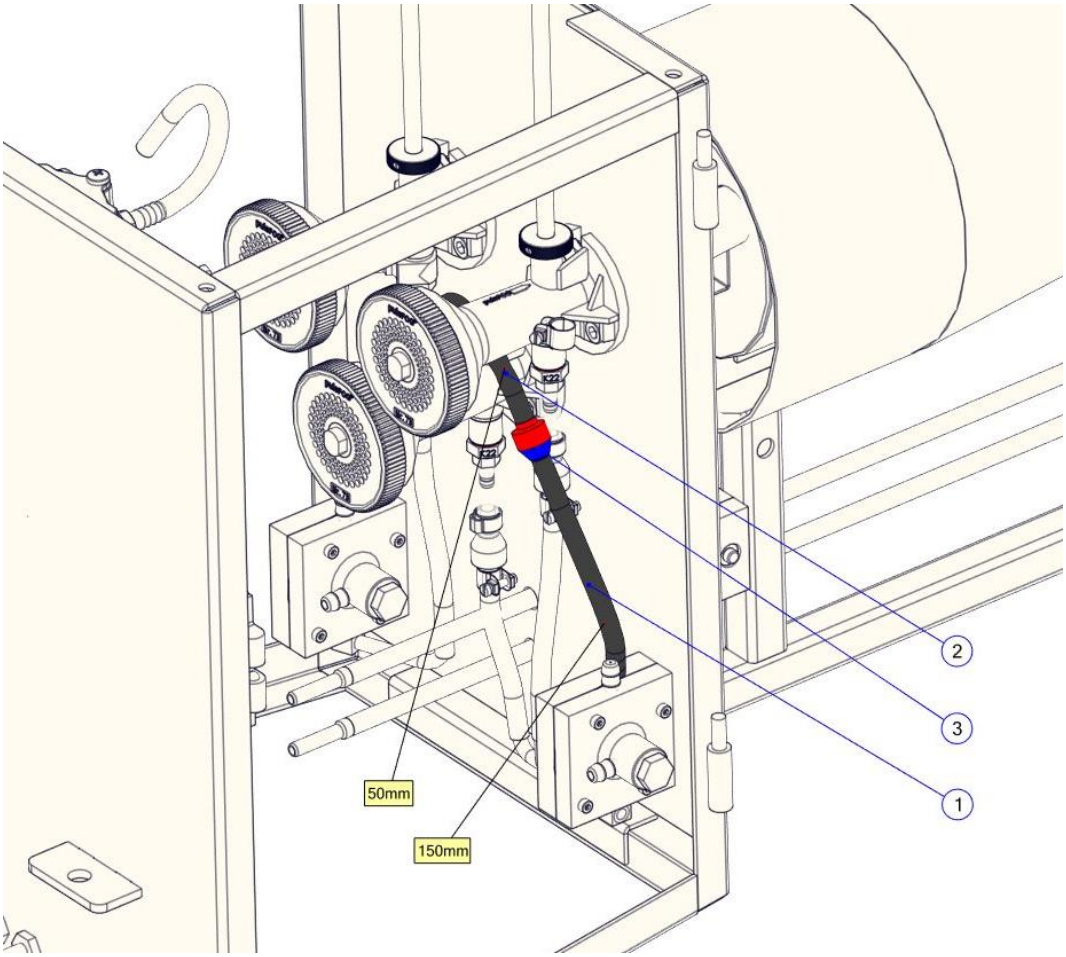
VENT FLAOTS

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	010000	Viton hose 5x8mm	4
4	079800	Fuel valve (red) with transparent tube	1
5	010970	Hose clamp 9 mm Norma	2
10	010991	Pinch clamp SS 8,5-10,0mm(10,5)	3
24	010370	T-piece 6 mm nylon	1



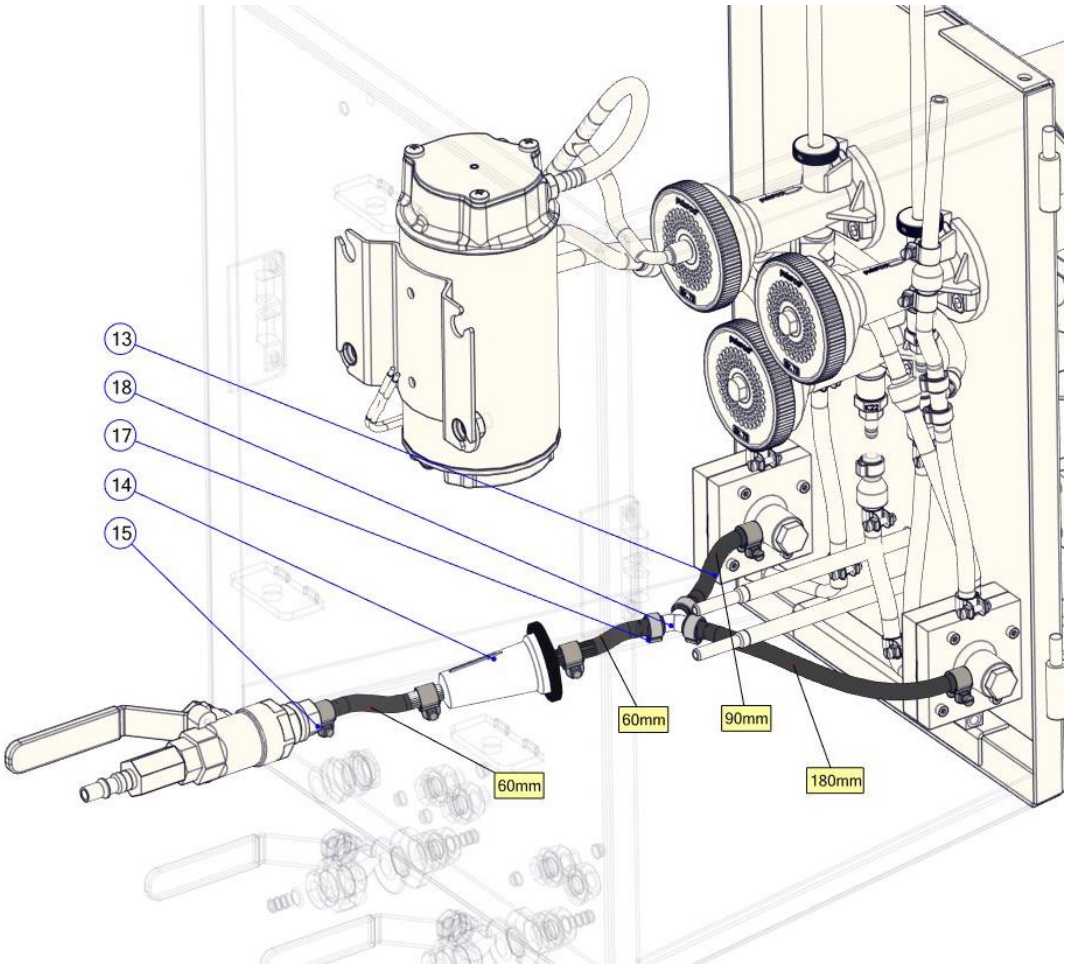
AIR TUBE FLOAT

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	010000	Viton hose 5x8mm	1
2	020001	Airhose black	1
3	085834	Float venting valve (blue/red)	1



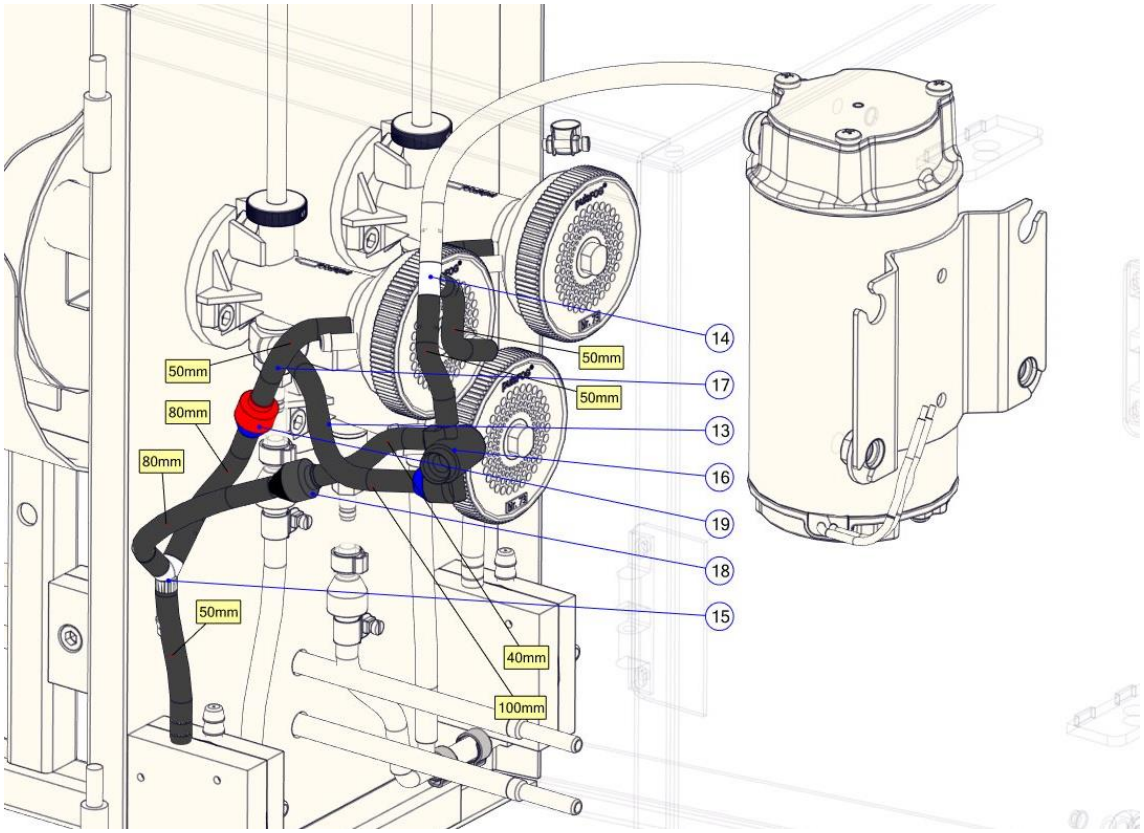
FUEL TUBE

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
13	010000	Viton hose 5x8mm	4
14	010335	Fuel filter K40	1
15	010970	Hose clamp 9 mm Norma	4
17	010991	Pinch clamp SS 8,5-10,0mm(10,5)	3
18	011560	Y-piece 6mm nylon	1



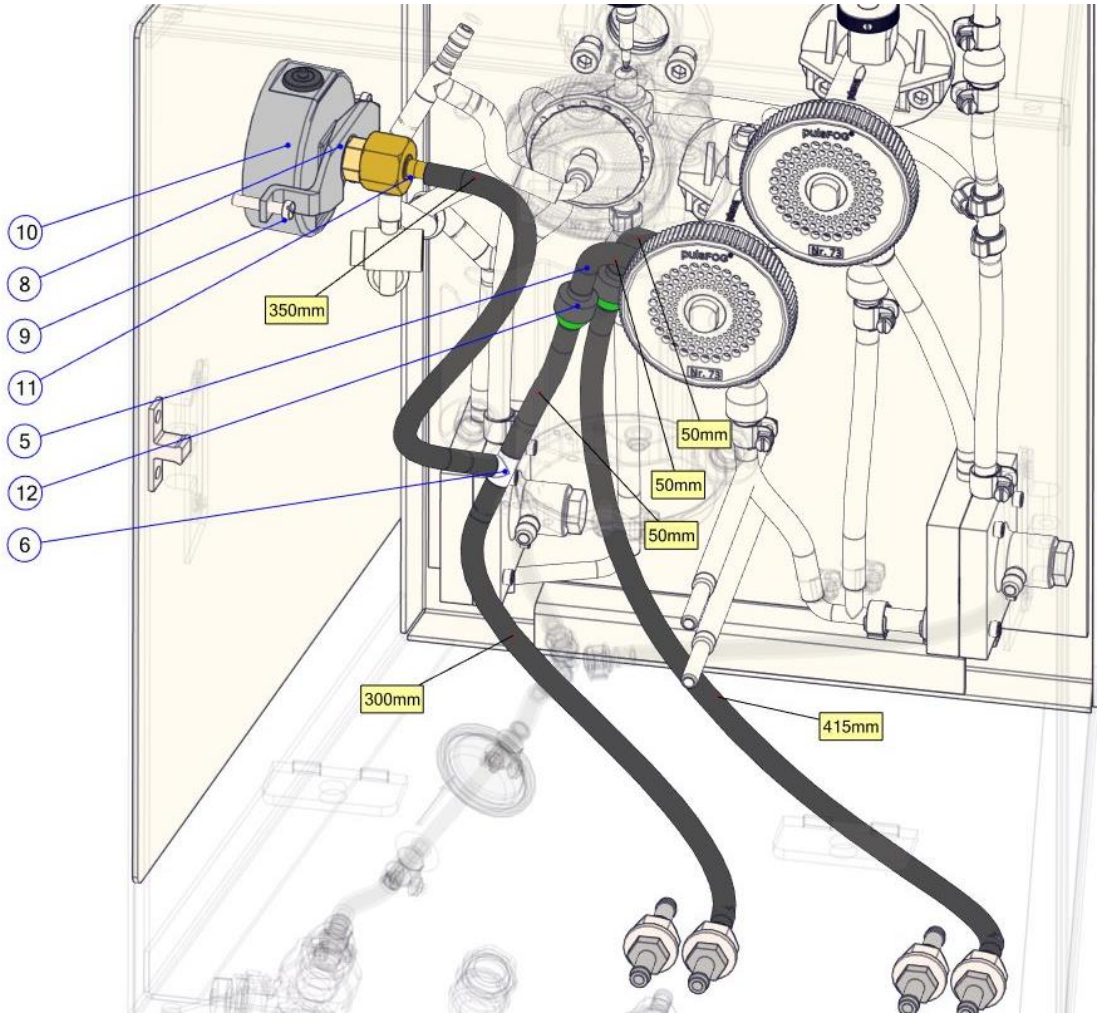
AIR TUBE COMPRESSOR

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
13	010000	Viton hose 5x8mm	8
14	010370	T-piece 6 mm nylon	1
15	011560	Y-piece 6mm nylon	1
16	013013	Block valde blue / grey	1
17	020001	Airhose black	1
18	085831	Fuel non-return valve (grey/black)	1
19	085834	Float venting valve (blue/red)	1



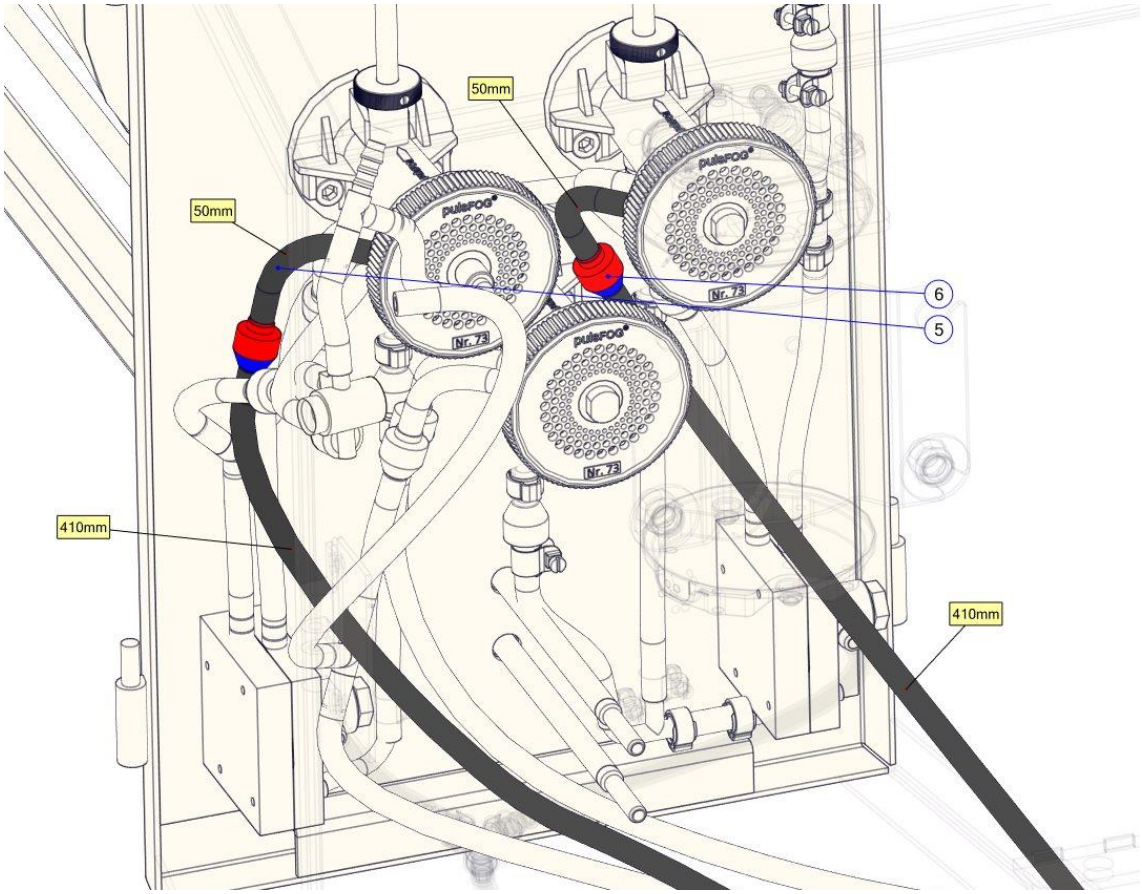
AIR TUBES – PRESSURE ON TANKS

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
5	010000	Viton hose 5x8mm	6
6	010370	T-piece 6 mm nylon	1
8	010831	Mounting bracket for Pressure Gauge K40	1
9	010832	Screw M4x20 Cil slotted head. Din 84	2
10	010837	Pressure gauge 0-0.6 bar K4 / K40	1
11	010838	Hose socket for pressure gauge K4/K40 MS	1
12	085830	Pressure valve (grey/green)	2



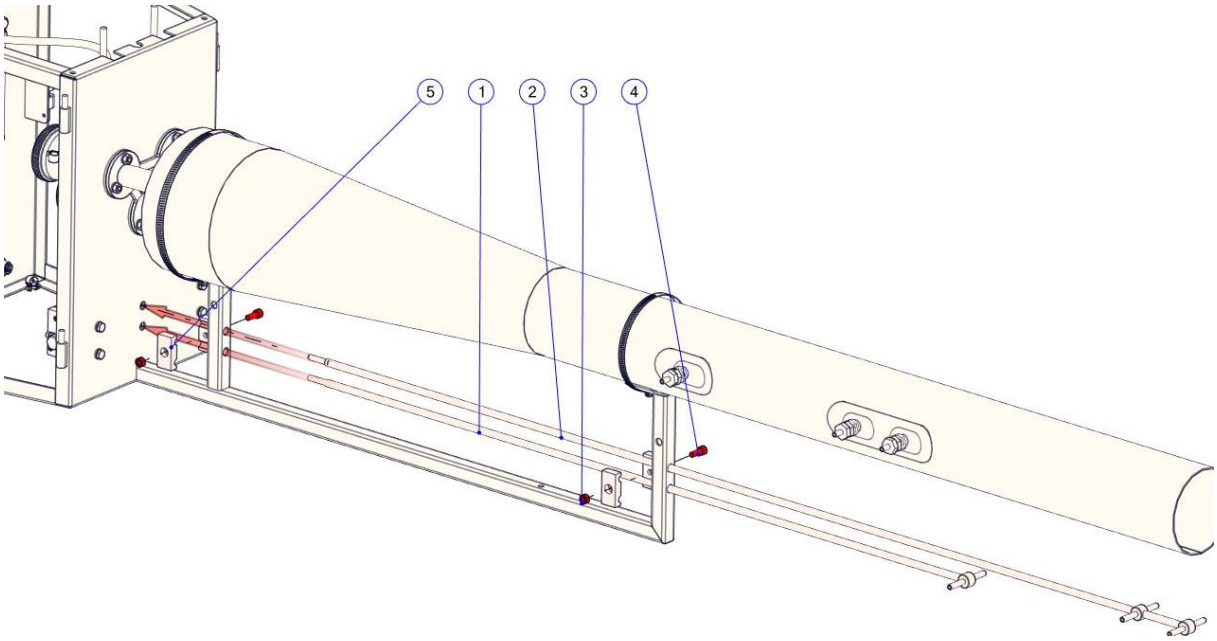
AIR TUBES – VENT MECHANISM TANKS

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
5	010000	Viton hose 5x8mm	4
6	085834	Float venting valve (blue/red)	2



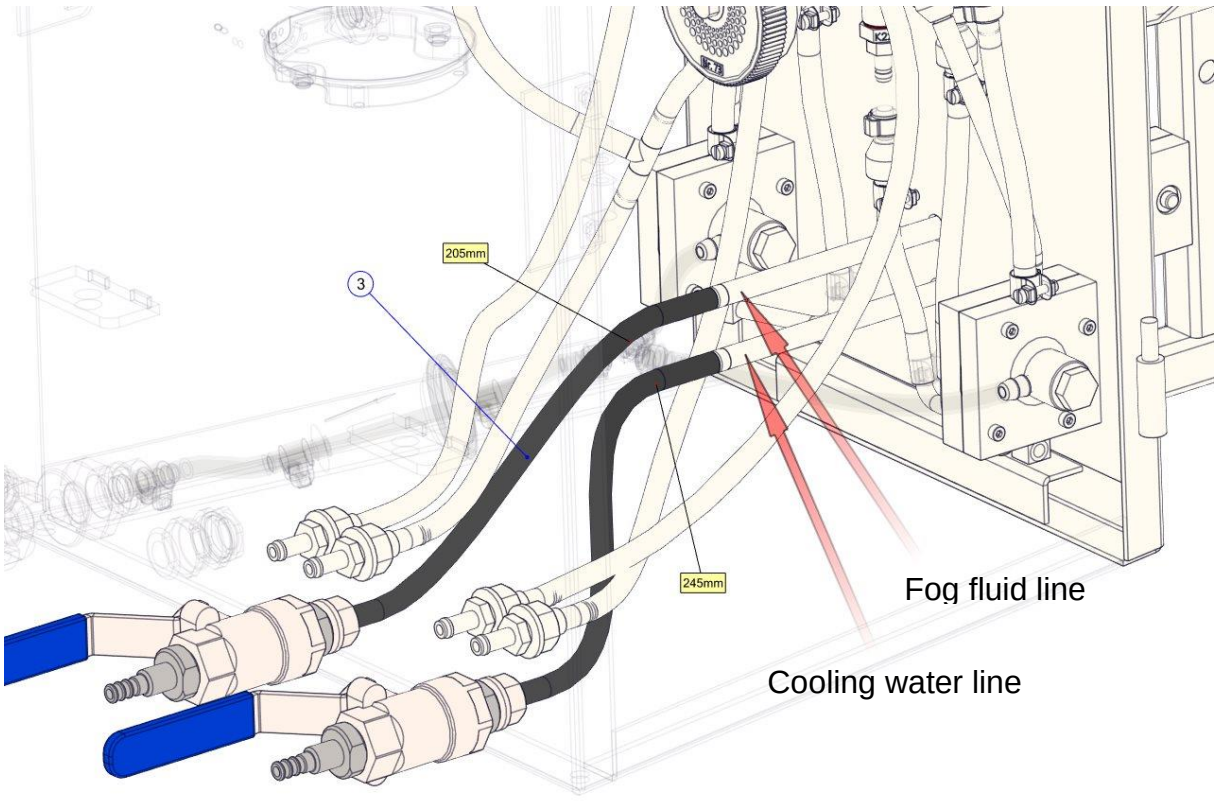
FOG FLUID- AND COOLING WATER LINE

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	011236	Liquid line K40 short (2UN)	1
2	011237	Liquid line K40 long (4UN)	1
3	310063	Hexagon nut M6 SS din934	2
4	310048	Hexagon socket bolt M6x16 SS din912	2
5	010642	Pipe clamp K40	2



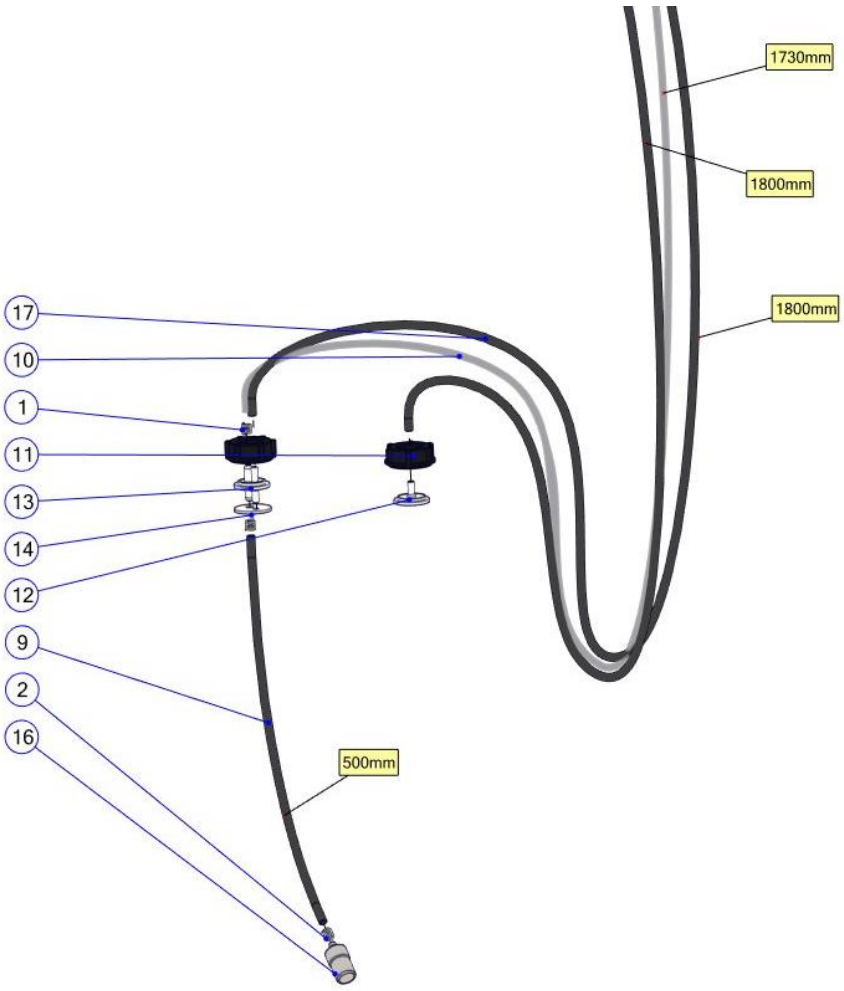
FOG FLUID- AND COOLING WATER TUBE

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
3	010000	Viton hose 5x8mm	2



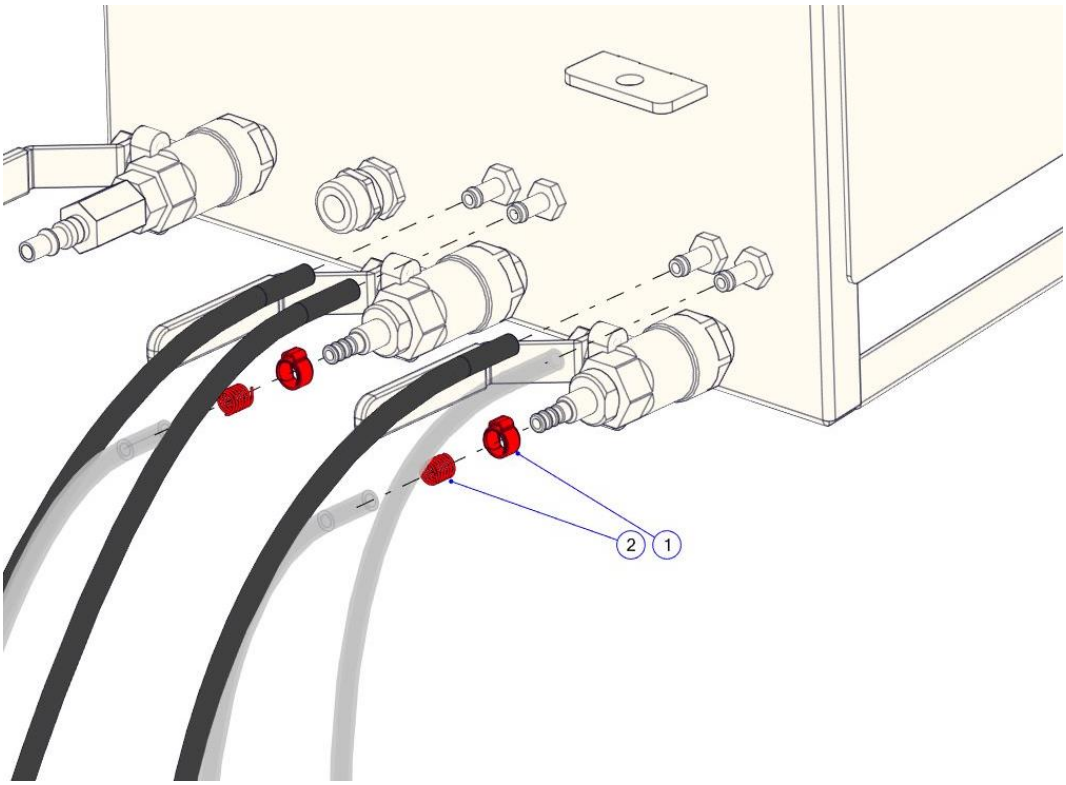
HOSE SETS

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	011292	Supporting spring Ø8,5x100 for Viton	2
2	011290	Supporting spring Ø8x100 for Viton	1
9	010000	Viton hose 5x8mm	1
10	010003	Transparent hose Polyros / rauclair 5x1,5mm	1
11	011130	Cap with hole 5/9/30/50 L pulsfog	2
12	011150	Transition de-aeration K40 PETP	1
13	011151	Passage fluid tank 5/10/30/50 L	1
14	011191	Laminate gasket	1
16	011395	Suction filter fluid stainless steel	1
17	020001	Airhose black	2



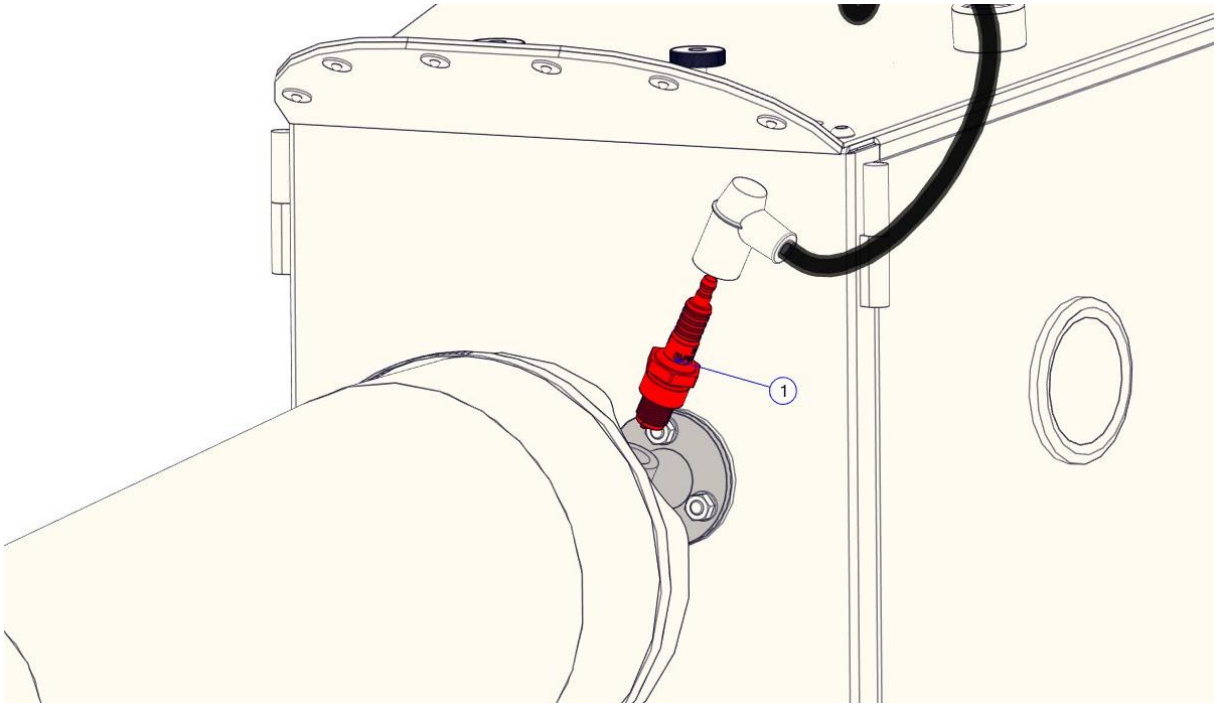
HOSE SETS ON VALVES

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	010991	Pinch clamp SS 8,5-10,0mm(10,5)	2
2	011290	Supporting spring Ø8x100 for Viton	2



IGNITION

Pos.	*Artikelnr.*	*Omschrijving*	*QTY*
1	011860	Sparkplug M14	1



PulsFOG K-40 + 2x 50ltr liquid tank Stainless Steel

Pos.	***Artikelnr.***	***Omschrijving***	***QTY***
1	205106	Car Support Pulsfog K40	1
2	205120	Car K4 400mm tire chassis	1
3	011140	Fluid Tank SS K40 50L + pressure release valve	2
4	010400	Battery 12V 44Ah	1

ANNEX 2 SOUND MEASUREMENT

GO consult
ADVISEURS VOOR MILIEU EN OMGEVING

Correspondentieadres:
Postbus 12
5845 ZG SINT ANTHONIS
IBAN: NL47 RABO 0138 5766 10
BTW-nummer NL819094298B01
K.v.K. Brabant, nr. 17220016

Bezoekadres:
Burg. Wijtvlietlaan 1
De Rips
Tel. (0493) 59 75 00
Fax (0493) 59 75 09

Frans Veugen Bedrijfshygiëne BV
Pannenweg 329
6031 RK Nederweert

kiwa gecertificeerd ISO 9001 KWALITEIT

Datum	:	dinsdag 18 maart 2014
Uw kenmerk	:	
Ons kenmerk	:	3744a00114 O:\KLANTEN\V\VEUGEN FRANS BEDRIJFSHYGIËNE BV.NEDERWEERT\A001\MEETRAPPORT PULSFOG K4.DOC
Bestand	:	
Behandeld door	:	jverhoeven@go-consult.nl
E-mail	:	
Bijlage(n)	:	uitdraai geluidmetingen (7 pagina's)

Onderwerp : ***Meetrapport geluidmetingen Pulsfog K4***

Gebruikte meetapparatuur:

- Brüel en Kjær, hand-held Analyser Type 2250;
- Brüel en Kjær, Frequency Analysis Software BZ-7223;
- Brüel en Kjær, microfoon Type 4189;
- Brüel en Kjær, calibrator Type 4231;

Meetdata:

Frequentie (Hz.)	31,5	63	125	250	500	1000	2000	4000	8000	Totaal	
1. L_{we} zijkant/bedieningszijde	55	95	98	114	120	115	110	104	97	122	dB(A)
2. L_{we} uitblaaszijde	58	97	97	115	120	119	111	103	96	123	dB(A)
3. L_{we} zijkant	54	94	93	117	118	115	109	107	100	122	dB(A)
4. L_{we} achterzijde	50	87	88	109	111	111	108	103	96	116	dB(A)

	bronniveau	1,5 meter	2 meter	7 meter	
1. L_p zijkant/bedieningszijde	122	108	105	94	dB(A)
2. L_p uitblaaszijde	123	109	106	95	dB(A)
3. L_p zijkant	122	108	105	94	dB(A)
4. L_p achterzijde	116	101	99	88	dB(A)

(1/1)

The complete report is available upon request