



From February 1st, 2017 SAMES Technologies SAS becomes SAMES KREMLIN SAS
A partir du 1/02/17, SAMES Technologies SAS devient SAMES KREMLIN SAS



User manual

Vortemail VEC Atomizer

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Vortemail VEC

Atomizer

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WARNING : This document contains links to the following user manuals:

- [see RT Nr 6360](#) control module user manual.
- [see RT Nr 4120](#) CHT 301/302 user manual.
- [see RT Nr 6256](#) UHT 108-208 High Voltage Unit user manual.

1. Health and Safety Instructions

1.1. Safety Regulations

This equipment may be dangerous if it is not used in compliance with the security regulations specified in this manual.

- The electro-pneumatic control module with the GNM 200 P generator must never be installed where there is a risk of explosion.
- It is essential that the equipment be located in an insulated enclosure to which access must be restricted by a high-voltage cutoff system.
- The electrostatic paint spraying equipment must only be used by qualified personnel fully informed of rules no.° 1 to 8 as follows:

- 1 A warning notice written in a language understood by the operator, summarizing safety regulations nos.° 2 to ° 8, section 1.1 of this manual, must be placed in a clearly visible position close to the powder-spraying booth.
- 2 Shoes intended for operator use must be anti-static and comply with the ISO 2251 publication. If gloves are used, only anti-static gloves or gloves ensuring grounding of the operator may be worn.
- 3 The floor in the area in which the operator works must be anti-static (ordinary bare concrete floors are anti-static).
- 4 The automatic spraying of liquid enamel must be carried out in a ventilated spraying booth provided for this purpose. The startup of the control module for Vortemail atomizers must be interlocked to the operation of the ventilation system.
- 5 All conducting structures such as the floors and walls of the liquid enamel spraying booth, ceilings, barriers, work pieces to be enameled and the ground terminal of the control module must be electrically connected to the protective grounding system of the electricity supply.
- 6 Parts to be painted must have a resistance in relation to the ground system that is less than or equal to 1 MΩ.
- 7 Liquid enamel spraying equipment must be regularly maintained overall in accordance to the manufacturer's instructions. Repairs must be carried out in strict compliance with these instructions.
- 8 Before cleaning the atomizer or carrying out any other work in the spraying area, high-voltage electricity and air supplies must be shut off. The energizing of the high-voltage supply by the control module must be interlocked with the spraying booth so that the high voltage supply is cut off if a person enters the spraying booth.
- 9 Only SAMES original spare parts guarantee operating safety of the equipment.
- 10 Ambient temperature must not exceed 40 °C.



WARNING : This equipment is intended for spraying solvent-free products, in particular, liquid enamel, ceramics or charged water-soluble products. It must not under any circumstances be used in an explosive atmosphere.



WARNING : The Vortemail atomizer may in certain cases cause the death of the operator or any other person who does not comply with the safety instructions for this equipment.



WARNING : To avoid any risk to life while the Vortemail equipment is being used, all the safety components connected to the protective enclosure around products held at high voltage while in use must be of Category 3.



WARNING : During the maintenance, use and startup of the Vortemail Equipment, the operator must wear appropriate personal protective equipment (goggles, gloves, safety shoes, etc.).

1.2. Important Recommendations

1.2.1. Compressed air quality

The air must be filtered to a level that will guarantee a long life time and prevent any pollution during painting.

The filter must be installed as close to the installation as possible. The filter cartridges must be changed regularly to ensure that the air is clean.

The inside of all pneumatic hoses supplying air to the atomizer must be clean and free of any traces of paint, solvent or other foreign matter.

1.2.2. Product Quality

The enamel paint must be filtered and of density less than 2 in order to avoid any damage to the Vortemail equipment.

The fineness of the enamel must correspond to the quality mark "enamel of electrostatic fineness", the maximum size of particle admissible in Vortemail equipment is 2 microns.



WARNING : The guarantee does not cover damage caused by foreign matter (paint, solvents or other foreign matter) entering the product or air circuits of the Vortemail equipment.

1.2.3. Spraying air

Do not spray enamel if the inner air is less than 0.5 bar at the inlet to the atomizer in order to avoid premature fouling of the spray head and the floor of the spraying booth.

1.2.4. High Voltage

Prohibit access to the booth and products being sprayed.

A distance of 500 mm at least must be maintained at all times between all parts connected to the high-voltage supply and all parts connected to ground.

1.2.5. Control module

The control module for Vortemail atomizers includes safety devices to limit the risks of accident (mechanical and electrical shocks, spray). It is important to ensure that before using the Vortemail equipment that all these safety devices are working and effectively protect persons present in the environment of the Vortemail equipment.

1.3. Guarantee

Under the guarantee, which applies only to the buyer, SAMES Technologies agrees to repair operating faults resulting from a design fault, materials or manufacture, under the conditions set out below.

The guarantee claim must define the exact nature of the fault concerned, in writing. The **SAMES Technologies** guarantee only covers equipment that has been serviced and cleaned according to standard procedures and our own instructions, that has been fitted with parts approved by SAMES or that has not been modified by the customer.

More precisely, the guarantee does not cover damage resulting from:

- the customer's negligence or inattention,
- incorrect use,
- failure to follow procedures,
- use of a control system not designed by SAMES Technologies or a SAMES Technologies control system modified by a third party without written permission from an authorized SAMES Technologies technical agent,
- accidents such as: collision with external objects, or similar events,
- flooding, earthquake, fire or similar events,
- inadequate filtration of the enameling air,
- use of seals not complying with SAMES Technologies recommendations, especially at the spray nozzle.
- pollution of air circuits by fluids or substances other than air.

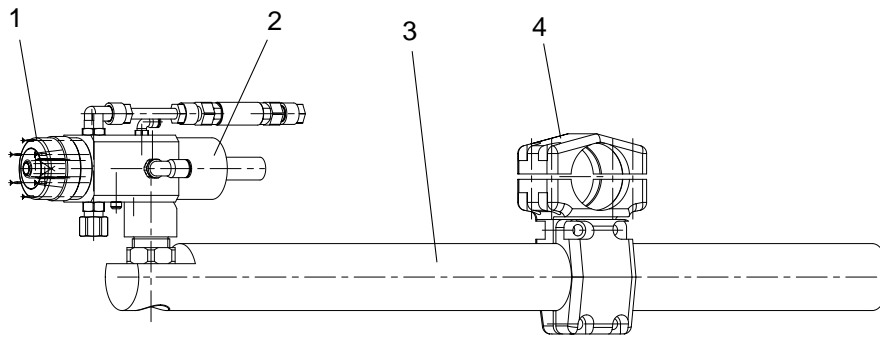
The SAMES Technologies Vortemail equipment is covered by a one-year guarantee for use in two 8-hour shifts under normal operating conditions.

2. Description

The Vortemail atomizer applies liquid enamel and solvent-free products. Vortemail electrostatic spraying provides a perfect finish by refining the size of the product particles sprayed. High transfer efficiency gives a better deposit yield and substantial economies in the product used. The painting time for the work piece is also reduced together with the maintenance of the paint booths.

This is all integrated into an automatic installation and gives spraying with cutoff at the head as well as a variation of the impact diameter. It is generally mounted on a sweep-action machine, a multi-axis robot or a fixed station.

The standard Vortemail atomizer comprises:

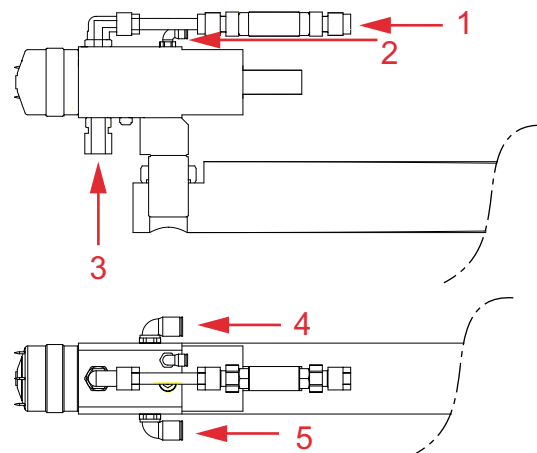


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1	Enameling nozzle
2	Vortemail atomizer
3	Insulating support arm
4	Swivel nuts

The Vortemail atomizer has two atomizing air inlets, needle control, and two product inlets (water and enamel). High tension energizing is carried out by the product.

Item	Name
1	Water inlet
2	Needle control
3	Product inlet
4	Atomizing air (or vortex air)
5	Inner air



DES02832

2.1. Technical Data

2.1.1. Mechanical characteristics

- Weight of atomizer alone: 1.3 kg.
- Weight of Vortemail atomizer assembly: 3 kg

- Temperature-range for use: 50°C

2.1.2. Electrical characteristics

Current delivered by one (or two) UHT 208s: 400 µA ([see RT Nr 6256](#))

Current controlled by a control module ([see RT Nr 6360](#))

Polarity	negative
Max. voltage	10 to 100 kV (+/- 5 kV)
Max. current	0 to 100 mA (+/- 5 µA)



WARNING : The equipment may be life-threatening for the operator or any other person in the neighborhood or in contact with the equipment (1mA). The equipment must be installed and used with strict discipline and in accordance with the manufacturer's recommendations (electrical connection to the ground system, discharge cylinder, door contact, etc.). The safety devices included with the module must be installed rigorously.

2.1.3. Pneumatic characteristics

[see RT Nr 6360](#) control module user manual.

Supply	Value
Spraying air pressure	6 bar max.
Control air pressure	5.5 bar min.
Product pressure	3 bar max.
Flow rate of product	1000 cc/max (according to density)
Air consumption:	60 m ³ /h under 5bar

2.1.4. Characteristics of liquid enamel

Flow rate

[see RT Nr 4120](#) CHT 301/302 pumping table user manual

[see RT Nr 6360](#) control module user manual which gives the setpoint of the liquid enamel flow rate to the atomizers.

Circulating pressure	< 2 bar
Density	< 2

3. Operating Principle

The Vortemail atomizer is used for the electrostatic spraying of liquid enamel. It incorporates automatic rinsing of the spray head.

The Vortemail atomizer is supported by an insulating arm and a connection which enables the atomizer to be swiveled through 160°. It is associated with a control module which can control up to four atomizers, one or two CTH 301 (302) pumping tables, one or two UHT 208 high voltage units, and a head rinsing system.

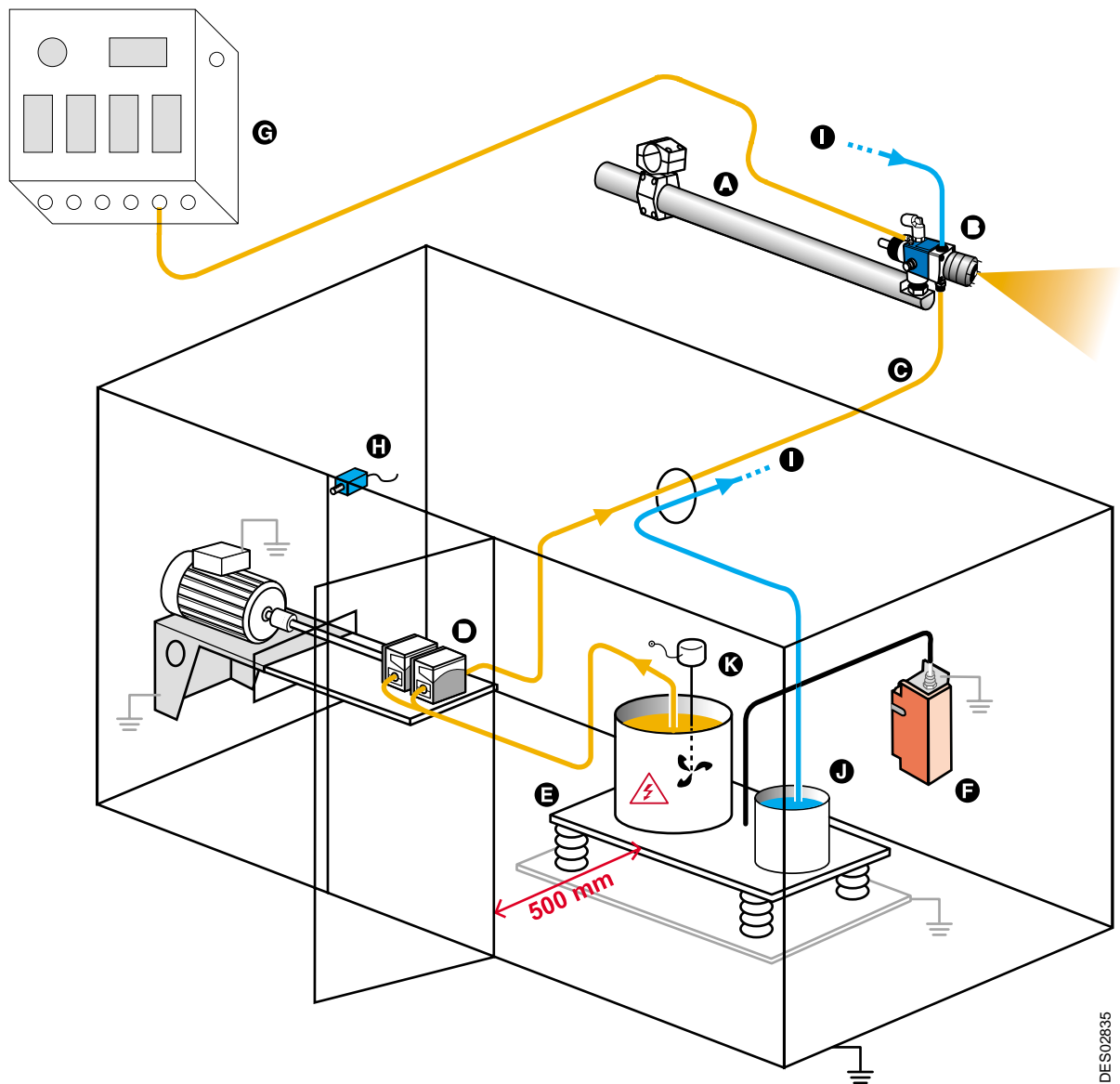
The parameters for all the functions required for spraying the liquid enamel can be set (flow rate, atomizing air, HT, rinsing).

Its carefully studied design and tools make maintenance easy and fast.

Setting the circulating product to a high voltage creates a negative electrical potential of 10 to 100 kV. This enables the enamel to be charged electrically during its journey from the supply tank to the work piece to be painted.

To ensure the charged enamel adheres to the work piece, it is essential that this is of a sufficiently conducting material and correctly connected to ground.

4. Installation of the atomizer



A	Insulating arm in propylene
B	Vortemail atomizer
C	Insulated product circulating
D	Pumping table
E	Insulating table
F	Remote UHT 208
G	Control module
H	Insulated enclosure and door contact
I	Rinsing circuit
J	Pressure tank
K	Pneumatic stirrer

5. Installing the Atomizer

- Put the securing nut on a support.
- Put the insulating arm in the fixing nut.
- Screw the swivel ring on the atomizer.
- Screw the ring and the atomizer onto the insulating arm.
- Tighten the locking nut with multigrip pliers.
- Connect the air and product inlets (enamel and water) to the atomizer ([see § 2 page 7](#)).

6. Atomizer settings

No settings need to be made to the atomizer. All controls are given from the control module:

- Spraying air 1 (inner air)
- Spraying air 2 ("vortex" air)
- Flow rate of product.
- High voltage.
- Rinsing control.

The atomizer can also be controlled (product and rinsing) by a PLC or a control rack by means of the module.

The "inner air" enables the impact diameter to be reduced.

The "vortex air" gives a "fine" enamel spray

The settings of the spraying air, flow rate and high voltage depend on the shape of the parts to be painted, the enamel used, distance of application, etc.

We can however give an indication of the following impact widths to give a first approximation to the settings possible with the "Vortemail Equipment":

For an enamel density of 1.78, "inner" air switched off, we obtain the following impact widths:

Parameters	Impact width (mm)
Inner Air = 4 bar / Vortex Air = 0 bar / Flow rate = 221 cc/min	180
Inner Air = 4 bar / Vortex Air = 0 bar / Flow rate = 468 cc/min	210
Inner Air = 4 bar / Vortex Air = 0 bar / Flow rate = 525 cc/min	380
Inner Air = 5.5 bar / Vortex Air = 0 bar / Flow rate = 525 cc/min	360

At a distance of 300mm, with 4 seconds of spraying.

7. Tools

No specific tools.

8. Maintenance and Checks

Fouling and wear of the "Vortemail" atomizer vary according to how it is used and the operating conditions.

For this reason, the maintenance frequency indicated here is given as a guide only. With a little experience of using SAMES equipment, the user will be able to draw up their own maintenance schedule.

Nevertheless, as an initial guide, the following maintenance program is recommended:

Frequency	Action
Before starting work.	Check the safety regulations (see § 1 page 4)
Daily	Cleaning the nozzle needles with water
Between 50 and 150 hours of work.	Check the state of the cap seals and the stainless steel enamel nozzle
Every 2 months	Carry out a visual examination of the circulating enamel and dismantle the spray chamber (front section) to check if there is any product sedimentation



WARNING : Do not use a manual solvent spray. Clean using water and a rag, soft brush or soft paint brush.



WARNING : Cleaning is carried out without removing the needle cap nut. The needles can cause injury and must be paid particular attention during this phase of the cleaning process.



WARNING : Cleaning must be carried out while wearing Personal Protection Equipment. i.e. goggles, gloves, safety shoes, etc. The Vortemail atomizer must be cleaned daily. If it is done immediately after working, cleaning is easier and quicker.

Switch off the electric power and pneumatic supplies:

- Clean the atomizer using a cloth.
- Clean the spray nozzle using a soft brush.
- Check the passage of enamel around the outlet of the round spray cap.
- Carefully dry with compressed air.

No other cleaning needs to be done.

9. Maintenance

9.1. Nozzle

9.1.1. Disassembly

- Cut off the air and product supplies.



WARNING : Before doing anything, to avoid any injuries from the needles and to avoid damaging them, wear gloves and put the protective plug on the needle cap nut.

- Loosen the needle cap nut ([see § 11.3 page 18](#)).
- Remove the round spray cap in delrin.
- Unscrew the body of the enamel nozzle.

9.1.2. Reassembly



WARNING : Check the degree of wear on all obvious seals and replace them if necessary ([see § 11.3 page 18](#)).

- Carry out the dismantling operations in reverse order.
- Switch all supplies back on.

9.2. Needle end-piece

9.2.1. Disassembly

- Switch off the air and product supplies.
- Depressurize the circuits.
- Unscrew the nozzle assembly ([see § 11.3 page 18](#)).
- Unclip the needle end cap ([see § 11.2 page 17 8](#)) so as to separate the needle carrier ([see § 11.2 page 17 4](#)).

9.2.2. Reassembly

- Clip on the new needle end-piece.
- Put the spray gun in "Open" position in order to assemble the nozzle without damaging the new needle.

9.3. Diaphragm

9.3.1. Disassembly

- Unscrew the nozzle assembly ([see § 11.3 page 18](#)).
- Loosen the four M 5 x 25 screws ([see § 11.2 page 171](#)). Remove the product body (2).
- Unscrew the needle end cap ([see § 11.2 page 17 8](#)).
- Unscrew the cylinder (16) to separate it from the air body (9).
- Unscrew the nut (14)
- Pull the needle-diaphragm assembly (4) towards the front of the spray gun.

9.3.2. Reassembly

- Take a new "assembled diaphragm" (4).
- Unscrew the nut (14) mounted on this assembly.
- Smear grease (PTFE type) on the needle stem.
- Insert the diaphragm assembly in the product body (2) by the front of the atomizer.
- Check the position of the piston (10) in the air body (9).
- Position the needle drive correctly (19) in the piston (10).
- Put weak thread locking glue on the thread of the diaphragm assembly at the end of the needle.
- Moderately tighten the nut (14).
- For the remainder of the reassembly process, proceed in reverse order of dismantling.
- Check the state of the various components and replace them if necessary.

10. Troubleshooting

Often, malfunctions are caused by sedimentation of the enamel in the circuit or in the atomizer, which causes the enamel circuit to block.

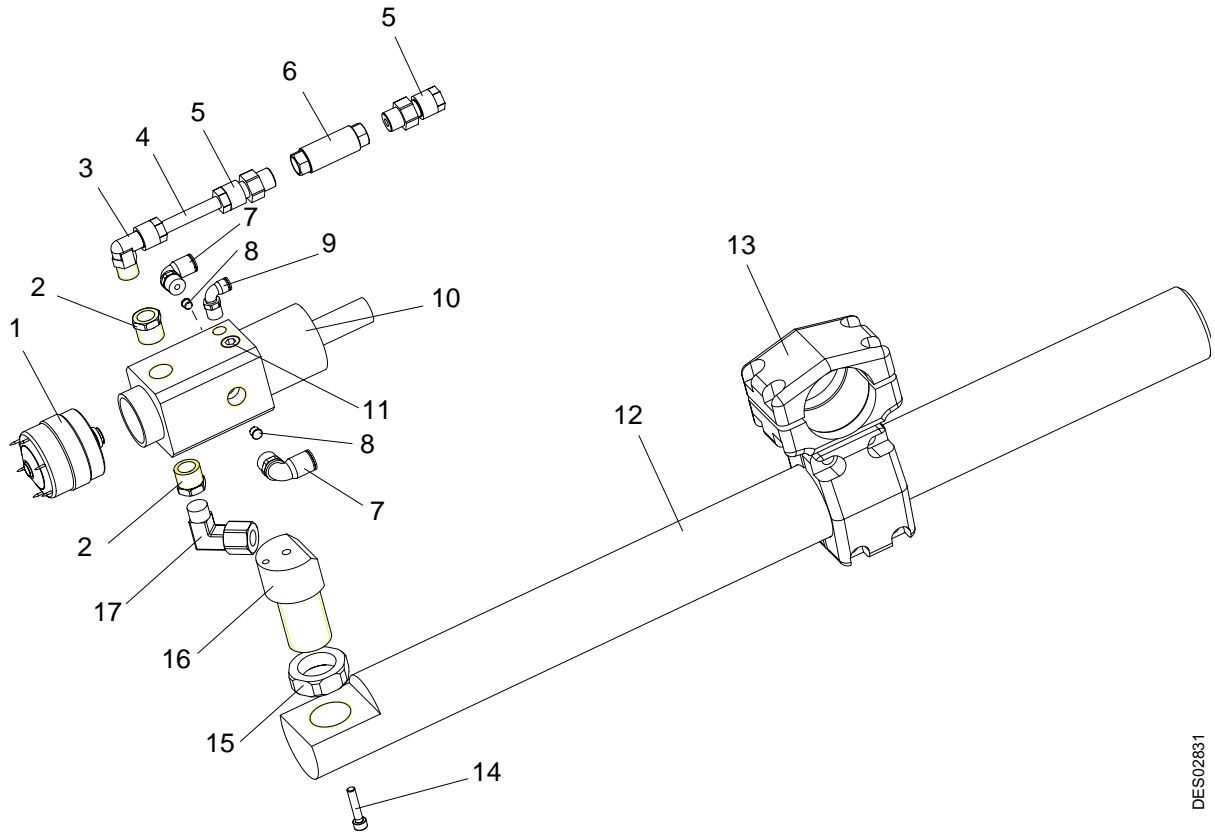
- Carry out several automatic rinses.
- Switch off all supplies.
- Check the whole length of the enamel circuit to ensure it is clean and there are no deposits.
- Dismantle the atomizer chamber (front section) and check that sedimentation of the enamel has not occurred in this area.

11. Spare Parts



WARNING : Equipment performance is only guaranteed if original spare parts distributed by SAMES Technologies are used.

11.1. Vortemail VEC Atomizer assembly with support

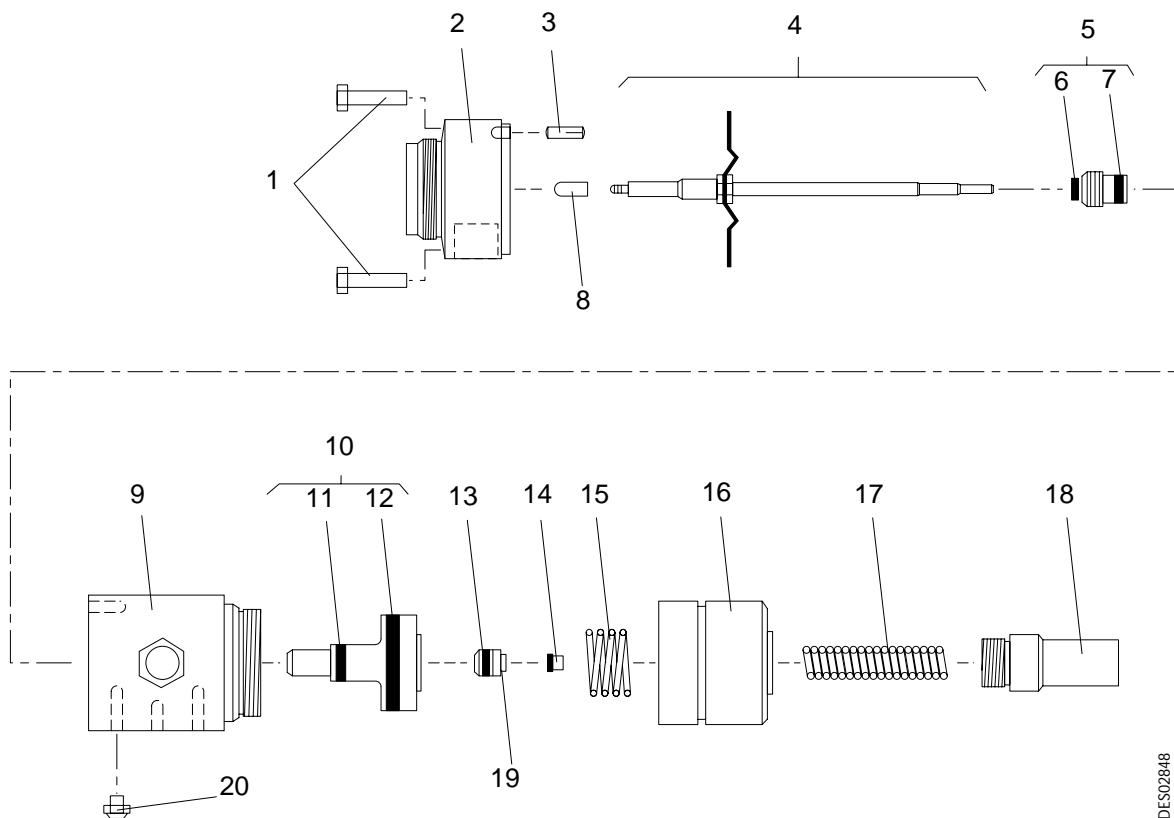


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11.1 Vortemail VEC Atomizer assembly with support (cont)

Item	Part Number	Description	Qty	Unit of sale
	1525939	Vortemail VEC Atomizer with support	1	1
1	1525411	Nozzle assembly (see § 11.3 page 18)	1	1
2	F6RXRP302	Male/Female reducer	2	1
3	1411370	Male elbow	1	1
4	U1GCBR012	Teflon hose, D: 5 / 8	0,06	m
5	1411375	Male union	2	1
6	R2RPRE033	Non-return valve	1	1
7	F6RLCS393	Conical male union bracket	2	1
8	1411382	Vortemail atomizer Teflon air plug	2	1
9	F6RLCS265	Conical male union bracket	1	1
10	1314741	Atomizer	1	1
11	F6RLBH004	Plug, 1/4	1	1
12	1313825	Polypropylene support Diameter: 50 mm	1	1
13	429104	Orthogonal Union Diameter: 50/50 removable	1	1
14	X4FVSY187	Screw, CHC M 5/25, stainless steel 316	1	1
15	747420	Securing nut	1	1
16	1410623	Spray gun adaptor base plate	1	1
17	F6RXCQ055	Conical male union bracket	1	1

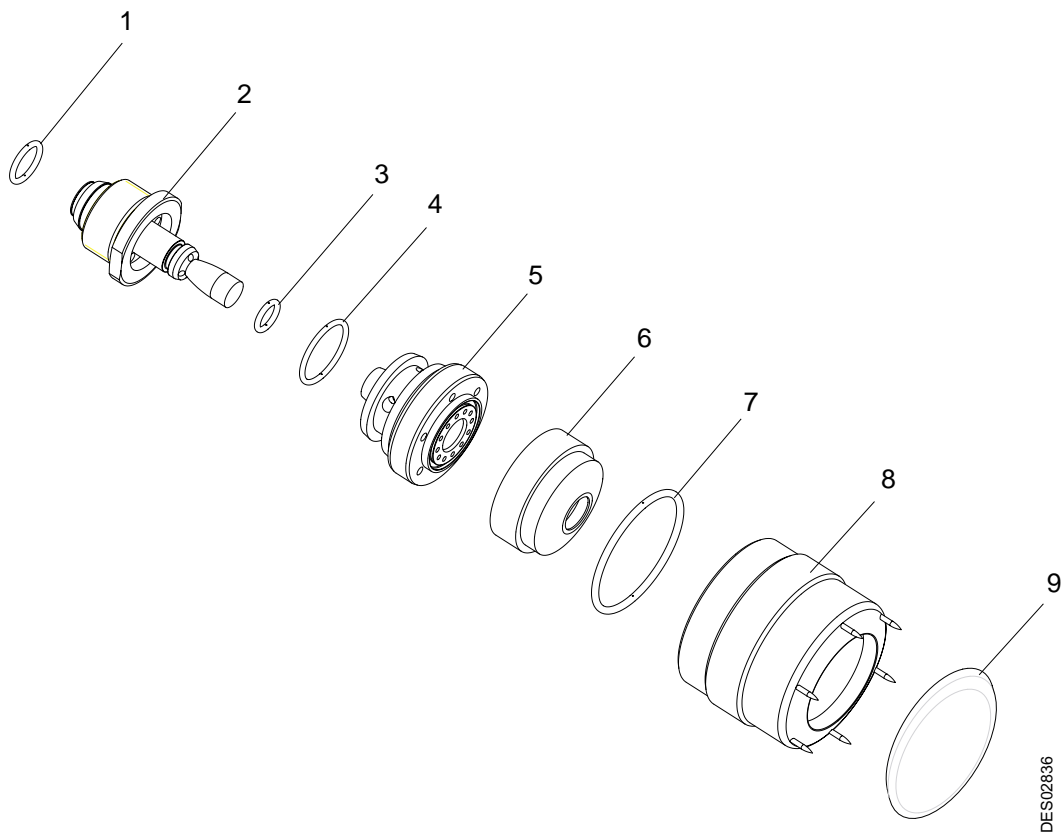
11.2. Vortemail atomizer



DES02848

Item	Part number	Description	Qty	Unit of sale
1	X4FVSY187	Screw, CHC M 5/25, stainless steel 316	4	1
2	F3PACC244	Product body	1	
3	F3PACC245	Pin	2	1
4	F3PACC246	Assembled diaphragm	1	1
5	F3PACC247	Needle bearing assembly	1	1
6	F3PACC249	R3 seal	1	1
7	F3PACC248	R5A seal	1	10
8	F3PACC240	Needle end-piece (Pack of 10)	1	1
9	F3PACC250	Air body	1	1
10	F3PACC251	Piston assembly	1	1
11	F3PACC252	R8 seal	1	10
12	F3PACC253	R22 seal	1	10
13	F3PACC261	R5A FPM seal	1	10
14	F3PACC254	Special nut (included in item 4)	1	1
15	F3PACC255	Piston spring	1	1
16	F3PACC256	Cylinder	1	1
17	F3PACC257	Needle spring	1	1
18	F3PACC258	Spring stop	1	1
19	F3PACC260	Needle driver	1	1
20	F3PACC259	Silencer	1	1

11.3. Enamel nozzle assembly - Ref.: 1525411



DES02836

Item	Part number	Description	Qty	Unit of sale
	1525411	Enamel nozzle assembly	1	1
1	J3TTCN188	O-ring	1	1
2	1203426	Vortemail nozzle diffuser	1	1
3	J2CTCN436	O-ring	1	1
4	J3ETOR037	O-ring	1	1
5	1203427	Vortemail nozzle body	1	1
6	312956	Round spray cap, Delrin	1	1
7	J2CTPC376	O-ring	1	5
8	1409380	Nut with assembled needles	1	1
9	F6NPLB129	Protective plug	1	1