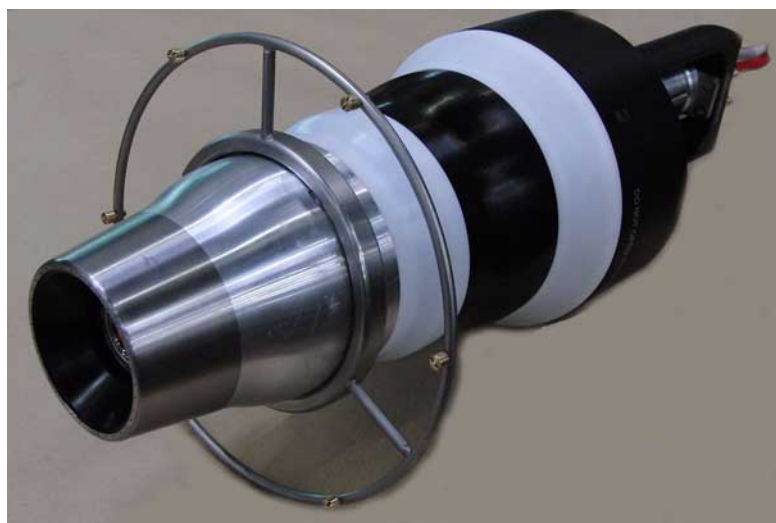




From February 1st, 2017 SAMES Technologies SAS becomes SAMES KREMLIN SAS  
*A partir du 1/02/17, SAMES Technologies SAS devient SAMES KREMLIN SAS*

**SAMES**  **KREMLIN**



# User manual

## PPH 707 SB M

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Our training courses can be delivered at your site or in the training centre at our Meylan head office.

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# 1. Health and Safety Instructions

This manual contains links to the following user manuals:

- [see RT Nr 6357](#) for the user manual of the magnetic bell cups
- [see RT Nr 6354](#) for the user manual of the high-speed turbine
- [see RT Nr 6258](#) for the user manual of the nanovalve
- [see RT Nr 6021](#) for the user manual of the microvalve
- [see RT Nr 6190](#) for the user manual of the microphone
- [see RT Nr 7038](#) for the user manual of the high-voltage unit UHT 157
- [see RT Nr 6213](#) for the user manual of the control module GNM 200
- [see RT Nr 6364](#) for the user manual of electrical systems

## 1.1. Configuration of certified equipment

These user manuals define the configuration of certified equipment.

## 1.2. Marking on atomizer

SAMES Meylan France

CE 0080

PPH 707

P/N : \*

ISSeP05ATEX032X\*\*



II 2 G

EEx > 350mJ

(Serial no.)

### \* ATEX PPH 707 configurations

<b>Atomizer - P/N 910011220</b> Body – P/N 910005624 Microvalve – P/N 1507375 Nanovalve – P/N 1510004 High-speed turbine - P/N 1525849	<b>High-voltage unit UHT 157 - P/N 910002870</b>	<b>P/N PPH 707 (*)</b>	<b>Low-voltage connection - P/N 910004015</b>	<b>GNM 200A P/N 1517071</b>
<b>X</b>	<b>X</b>	<b>910011220</b>	<b>X</b>	<b>X</b>

\*\* 'X' indicates that the safety distance specified in this manual (between the HV components of the atomizer and all grounded parts) must be observed to ensure safe operation of the equipment.

### 1.3. Precautions for use

This document contains information that all operators should be aware of before using atomizer PPH 707 SB M. This information includes indications of situations potentially resulting in severe damage and of the preventive precautions to be taken.



**WARNING :** Before any use of the PPH 707 equipment, check that all operators:

- have previously be trained by the compagny Sames Technologies, or by their distributors registered by them for this purpose.
- have read and understood the user manual and all rules for installation and operation, as laid out below.

**It is the responsibility of the operators' workshop manager to ensure these two points and it is also his responsibility to make sure that all operators have read and understood the user manuals for any peripheral electrical equipment present in the spraying area.**

### 1.4. Warnings



**WARNING :** This equipment may be dangerous if it is not used, disassembled and reassembled in compliance with the regulations specified in this manual and in all applicable European standards or national safety regulations.



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



**WARNING :**

This equipment must only be used in spraying areas in compliance with standards EN 50176, EN 50177, EN 50223, or under equivalent ventilation conditions. To reduce health, fire and explosion risks, this equipment must only be used in well ventilated areas. The efficiency of the ventilation system must be verified on a daily basis.

**Only appropriate explosion-proof electrical equipment must be used in the explosive atmospheres generated by the spraying process.**

Before carrying out any cleaning or general work on atomizers in the spraying area, the high-voltage generator must be switched off and the HV atomizer circuit must be discharged to ground. Never point the pressurized coating product or the compressed air towards persons or animals.

Suitable measures must be taken to prevent the presence of energy potential (liquid, air pressure or electrical) in the equipment during downtimes and/or periods when the equipment is not being used.

The use of individual protective means can limit the risks caused by contact and/or inhaling of toxic products, gases, vapors, mist and dust likely to be generated by the equipment when it is in use. The operator must follow the manufacturer's instructions for the coating product.

Electrostatic spraying equipment must be serviced regularly in accordance with the information and instructions given by SAMES Technologies.

Cleaning operations must be carried out either in authorized areas equipped with a mechanical ventilation system, or using cleaning liquids with a flash point at least 5°K higher than the ambient temperature.

Only metal containers may be used for cleaning liquids, and they must be safely grounded.

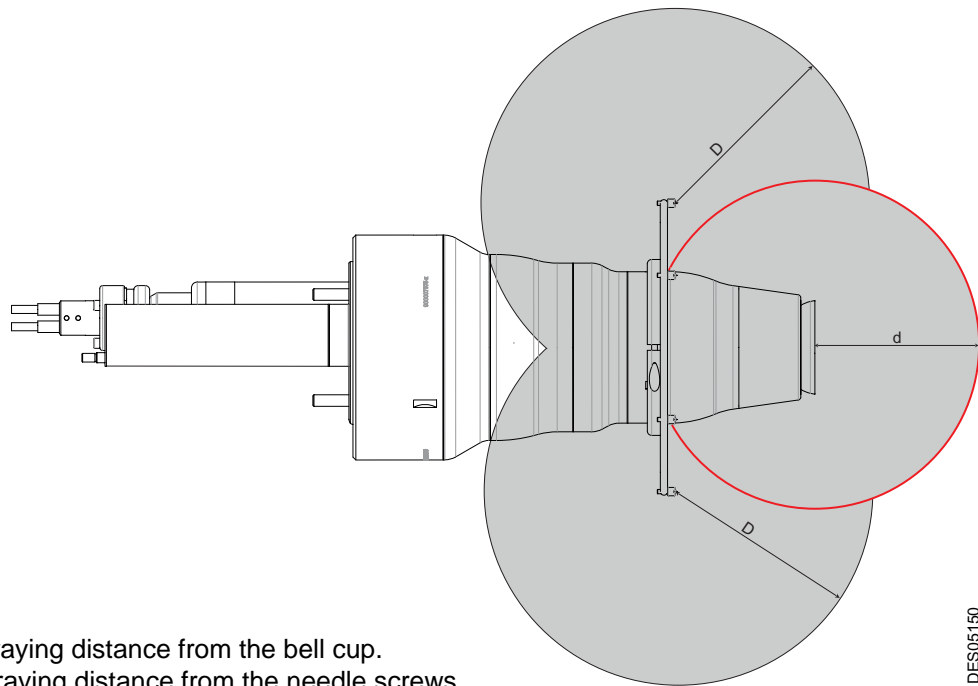
Inside the booth it is forbidden to use naked flames, glowing objects or devices likely to produce sparks. It is also forbidden to store flammable products, or recipients that have contained them, in the vicinity of the booth.

The surrounding area must be kept clear and clean.



**WARNING** : The use of very high voltage increases the risk of sparks. SAMES Technologies atomizers and high-voltage electrostatic generators are designed to minimise this risk. Although the HV electrode is the only accessible part, a safety distance of X mm (see table below) must be observed between the HV parts of the atomizer and all grounded parts.

PPH 707 SB M and UHT 157 high voltage unit, safety distance from each needle screw of the repelling ring and also from the bell cup:



**d**: authorised spraying distance from the bell cup.

**D**: authorised spraying distance from the needle screws

#### Authorised spraying distance

Voltage (kV)	Distance d (mm)	Distance D (mm)
0	160	200
70		
80	195	240
90	235	270
100	270	310

In addition, a careful check must be made to ensure that any conducting or semi-conducting part closer than 2.5 m to the atomizer is correctly grounded.

If it is not, electrical charges capable of causing sparks could build up on it. Operating personnel must wear anti-static shoes and gloves to avoid this risk.

Each substrate must have a ground resistance of less than or equal to 1 M $\Omega$  (measurement voltage of at least 500V). This must be checked regularly.

All conducting enclosures of electrical equipment and conducting components in explosive atmospheres



must be grounded by connecting them to the grounding terminal.

Finally, for the same reasons, the spraying area must have an anti-static floor, such as concrete, metal duckboard, etc.

It is essential to provide sufficient ventilation in the spraying booths to avoid the build up of inflammable vapors.

The correct operation of the overcurrent protection (di/dt) must be verified daily. This verification must be carried out **in a non-explosive atmosphere**, by placing a ground wire near the atomizer electrode with the atomizer switched on (the operator must be grounded): the control module must switch to the fault state.

The associated equipment must be located outside hazardous areas, and its operation must be interlocked with that of the booth extraction fan. The correct operation of the servocontrol system must be verified once a week.

A warning sign must be placed in full view near the spraying area.

Excessive turbine speed can result in serious damage to the turbine and loss of connection between the bell cup and turbine, presenting a risk to persons and equipment. The maximum operating speed specified in this manual must not be exceeded ([see § 3.2 page 17](#)).

## 1.5. Important Recommendations

### 1.5.1. Paint resistivity

Atomizer PPH 707 is designed for use with solvent-based liquid paints with a resistivity > of 3 MΩ.cm as measures with resistivity meter AP 1000 (P/N 910005790). For lower values, contact Sames Technologies.



**WARNING :** The product supply system must be grounded.



**WARNING :** The dump return hose must be grounded at a sufficient distance from the atomizer to withstand the potential (leak current reduction).

### 1.5.2. 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.

Teflon tape or glue should not be used between the filter and the bearing as glue residue or pieces of Teflon may block the small holes of the air bearing and cause turbine failure.

The inside of hoses supplying air to the atomizer and the ports of the quick-disconnect plate must be clean and free of any traces of paint, solvent or other foreign matter.

The guarantee does not cover faults caused by unclean, unfiltered bearing air resulting from non-compliance with the previous recommendations.



**WARNING :** If the air is not correctly filtered, the bearing may become fouled resulting in a turbine operating fault. The filtering system used must prevent particles greater than 0.1 μm in diameter from reaching the bearing.



**WARNING :** The guarantee does not cover damage caused by foreign matter (paint, solvent or other foreign matter) entering the air circuits of atomizer PPH 707 SB.

### 1.5.3. Product quality

The paint must be filtered to prevent any damage to the atomizer.

The maximum permissible particle size in the atomizer is 200 μm.

### 1.5.4. Bearing safety

The compressed air connection to the air bearing must be made directly via the supply circuit (without using an isolating valve). A sudden cutoff of the air supply may cause partial damage to the turbine air bearing, possibly resulting in system shutdown.

In addition, a 25-liter air reserve should be available so that the turbine brakes gradually if the main air supply is cut off suddenly.



**WARNING :** The guarantee does not cover faults that occur if the turbine is operated with insufficient bearing air pressure.

#### 1.5.5. Locking

Do not atomize the product if the bell cup is not rotating at a speed of at least 15,000 rpm. At lower speeds, paint or solvent may enter the turbine, bearing and control circuits. Opening the head valve, the injector rinsing valve and the bell cup exterior rinsing valve must therefore be prohibited when the bell cup is not rotating. Only qualified personnel are authorised to by-pass this locking system for flow rate checks.



**WARNING :** If the turbine is not already operating, wait, after starting it up, until the bell cup reaches at least 15,000 rpm before opening the head valve. The recommended minimum waiting time is 2 seconds.

#### 1.5.6. Shaping air

Do not atomize the product until the guiding air rate is at least 150 NI/min. If it is less, a feedback of atomized product may occur, possibly fouling the outer shaping air shroud (and the inside surface of the inner shaping air shroud) and resulting in faulty application.

#### 1.5.7. High voltage

If atomizer PPH 707 SB M is not operating for a prolonged period (conveyor shutdown, unpainted objects, slack periods, etc.), switch off the high-voltage supply to prevent air ionisation.



**WARNING :** Rinsing cycles (bell cup exterior and injector) must be performed after previously cutting off the high-voltage supply.

#### 1.5.8. Maximum speed

Excessive turbine speed can result in serious damage to the turbine and loss of connection between the bell cup and turbine, presenting a risk to persons and equipment. The speed must not exceed 85,000 rpm.



**WARNING :** The guarantee does not cover damage resulting from a rotation speed greater than 85,000 rpm.

#### 1.5.9. Vibrations

If the atomizer vibrates abnormally, the cause is generally unbalanced rotating parts. If this is the case, the rotation speed will rapidly decrease, inevitably causing damage to the turbine. Paint deposits, damage or dry paint residues on the bell cup or fastening cone are the possible causes of a balancing defect. If significant vibration is observed, the problem must be immediately corrected. A significant imbalance of more than G 0.4 (1/1000 gr x 1cm radius) will inevitably deteriorate the turbine.



**WARNING :** The guarantee does not cover damage caused by imbalance of rotating parts.

#### 1.5.10. Ventilation

Do not begin applying paint with atomizer PPH 707 SB M before starting up the ventilation system in the spraying booth. If the ventilation is cut, toxic substances such as organic solvents or ozone may remain in the spraying booth, resulting in a risk of fire, poisoning or irritation.

#### 1.5.11. O-ring seals

Use the seals recommended in this manual. For solvent-based products, seals in contact with the product must be chemically inert seals resistant to swelling or chemical attack. The correct operation of atomizer PPH 707 SB M is only guaranteed if used with seals of sizes and materials in compliance with those specified in this manual.

#### 1.5.12. Residual pressure

Before all maintenance or repair operations, remove paint and solvent from the atomizer, switch off the high voltage power supply and cut the paint, solvent and air supplies, then release residual pressure in each supply system. Residual pressure may lead to component damage and expose personnel to serious injuries. Paint or solvent dispersion may also lead to poisoning or irritation.

#### 1.5.13. Safety devices

When implementing atomizer PPH 707 SB M, it is important to provide for safety devices allowing immediate cutoff of paint, solvent, air and HV power supplies in the event of a problem.

- Detection of control system faults.
- Detection of high voltage surges associated with the SAMES HV generator.
- Detection of air pressure drops.
- Detection of ventilation failure.
- Detection of fire.
- Detection of human presence.
- Detection of turbine rotation speed faults.

**Failure to install safety devices could result in a risk of fire, expose the personnel to serious injury and damage the equipment.**

#### 1.5.14. Mechanical collision

The guarantee does not cover damage resulting from the operating environment (for example: collision).

#### 1.5.15. Ambient temperature

The atomizer is designed to normally operate at an ambient temperature comprised between 0°C and +40°C.

For optimal application quality, operation at an ambient temperature of between +15°C and +28°C is recommended.

The storage temperature must never exceed +60°C.

#### 1.5.16. Sound level

The weighted equivalent continuous sound pressure level is equal to 62.7 dBA.

##### **Measurement conditions:**

The equipment has been operated under maximum conditions. Measurements were taken in the paint test booth (sealed booth with glass panels) at the Sames R&D laboratory in Meylan, France.

##### **Measurement method:**

The weighted equivalent sound pressure level (62.7 dBA) is an LEQ value measured during observation periods over at least 30 seconds.

#### 1.5.17. Special maintenance measures

All access to the booth near the atomizer must be controlled during atomizer operation by active devices ([see § 1.5.13 page 12](#)) designed to interrupt operation in case of personnel intrusion.

However, for maintenance purposes, these devices can be implemented with a view to allowing certain operations and inspections (by personnel trained and certified by Sames Technologies).

In all cases, turbine rotation with a bell cup will be prohibited when personnel are present nearby.

## 1.6. 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,
- inadequately filtered bearing air (solid particles more than 0.1 µm in diameter),
- inadequately filtered paint and solvent,
- use of seals not complying with **SAMES Technologies** recommendations,
- starting up turbine rotation without minimum bearing air pressure (5.5 bar),
- exceeding the maximum speed of 85,000 rpm under load,
- starting up rotating parts that are unbalanced (dry paint on bell cup / rotor or damaged bell cups),
- pollution of air circuits by fluids or substances other than air.

The **SAMES Technologies** atomizer **PPH 707 SB M** is covered by a one-year guarantee for use in two 8-hour shifts under normal operating conditions.

By concession, the guarantee is extended to 10000 hours on the air turbine of atomizer **PPH 707 SB M**. The guarantee does not apply to wearing parts such as atomizing bell cups, diaphragms, seals, etc.

The guarantee will take effect from the date of the first start-up or of the provisional acceptance report.

Under no circumstances, either in the context of this guarantee or in other contexts, will **SAMES Technologies** be held responsible for physical injury or intangible damage, damage to brand image and loss of production resulting directly from its products.

## 2. Description

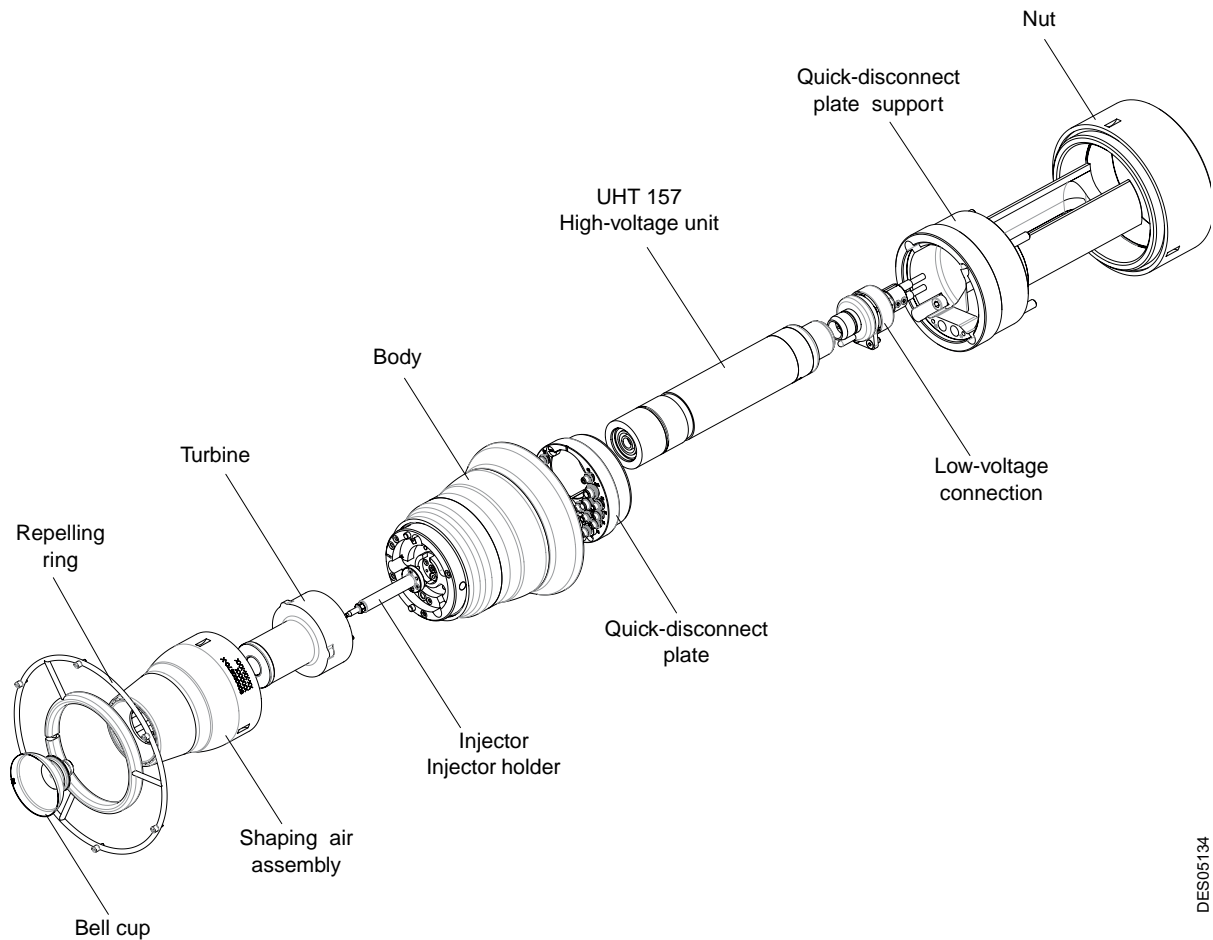
### 2.1. General

Atomizer PPH 707 SB M is a high-performance atomizer with rotating bell cup. It incorporates the advantages of previous generations, with added power. It is designed for high spray rates.

Equipped with an air bearing turbine for a magnetic-resistant bell cup, atomizer PPH 707 SB M is used to atomize and apply various types of solvated paints at a maximum rotation speed of 80,000 rpm.

Its modular design allows rapid installation and easy maintenance.

#### Main components:



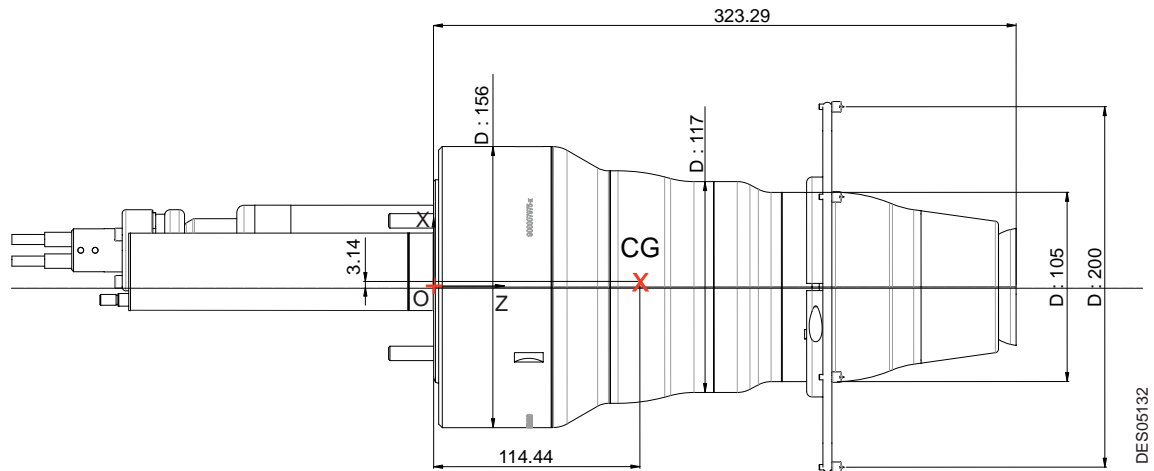
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## 2.2. Function of the parts

Part	Function
Bell cup	The bell cup atomizes all types of paint. It is selected according to the type of product used and the type of application.
Shaping air assembly (Outer cover / Shaping air shroud)	These parts control the size and pattern diameter and transfer the particles to the parts to be painted. They protect internal components and allow easy cleaning.
Turbine	The rotation of the bell cup is produced by a pneumatic motor. Atomization results from the centrifugal forces generated by rotation of the bell cup.
Injector / Injector holder	The injector transfers products to the bell cup. The holder retains the injector and allows it to be rinsed.
Body assembly	This part houses all fluid circuits and air/solvent microvalves and nanovalves. It supports the turbine and the shaping air shroud assembly. It is connected to the high-voltage unit and is used to charge the paint particles.
Nanovalve and microvalve	Air-controlled, 2-way, normally closed valves used for various operations: paint supply, paint rinsing, bell cup exterior rinsing, injector rinsing.
Quick-disconnect plate	Provides a sealed interface for intake of fluids and air preventing any contamination. Allows quick installation and removal of the atomizer during production.
Cover nut	Protects the internal components against fouling by paint and allows easy cleaning.
Quick-disconnect plate support	Retains the quick-disconnect plate. Houses the high-voltage unit, the low-voltage connection.
Nut	Retains the quick-disconnect plate support on the machine.
High-voltage unit UHT 157	Receives a low voltage supply that it converts into high voltage for charging the atomized paint particles; these are attracted to the surface to be painted, which has a ground connection.
Repelling ring	Anti-fouling system. Used with top machines, the repelling ring prevents the deposits of paint on the beam.

### 3. Technical characteristics

#### 3.1. Dimensions (mm)



Output C.S: Wrist Payload CG location

**Note:**

**Weight :** 6.87 kg

**Gravity center (CG) in millimeters**

X = 3.14

Y = - 0.11

Z = 114.44

**Main inertia axis and moments (kg x mm<sup>2</sup>) measured to the gravity center:**

lx = (0.04, 0.00, -1.00)	Px = 13714.39
ly = (0.14, 0.99, 0.01)	Py = 103620.79
lz = (0.99, -0.14, 0.04)	Pz = 103720.31

**Inertia moments (kg x mm<sup>2</sup>) measured to the output C.S :**

lxx = 193599.40	lxy = 13.87	lxz = - 1294.42
lyx = 13.87	lyy = 193728.88	lyz = -160.93
lzx = - 1294.42	lzy = - 160.93	lzz = 13940.03



### 3.2. Operating characteristics

<b>Weight</b>		
	Atomizer without cable or hose	6.87 kg
<b>Voltage</b>		
	Maximum operating voltage	100 kV
	Maximum operating current	200 $\mu$ A
<b>Speed</b>		
	Recommended rotation speed	15 to 80 Krpm.
<b>Paint</b>		
	Flow rate	30 to 1000 cm <sup>3</sup> /mn max. (depending on paint)
	Normal supply pressure	6 to 8 bar
	Maximum pressure	10 bar
	Viscosity	20 to 40 seconds - FORD cup n° 4
	Viscosity	20 to 45 seconds - AFNOR cup n° 4
	Paint resistivity (*)	> 3 MOhm.cm
<b>Air pressure</b>		
	Nanovalue pilot	8 bar (min.) - 10 bar (max.)
	Microvalve pilot	6 bar (min.) - 10 bar (max.)
	Bearing air	5.5 bar (min.) - 7 bar (max. at 130 l/min)
	Shaping air	6 bar maximum
	Microphone air	0,5 to 1 bar constant
<b>Compressed Air quality</b>		
	<b>Filtered air (bearing air) must be dry and free of oil and dust as per DIN ISO 8573-1</b>	
	Maximum dewpoint at 5.5 bar (80 psi)	Class 2 i.e - 40°C (-40°F)
	Maximum particle size of solid contaminant (Bearing air)	Class 0 i.e $\varnothing$ 0,1 $\mu$ m
	Maximum particle size of solid contaminant (Turbine rotation)	Class 1 i.e $\varnothing$ 1 $\mu$ m
	Maximum particle of solid contaminants (Others)	Class 3 i.e $\varnothing$ 5 $\mu$ m
	Maximum concentration of oil	Class 1 i.e 0,01 mg / m <sub>0</sub> <sup>3</sup> **
	Maximum concentration of solid contaminants	1 mg / m <sub>0</sub> <sup>3</sup> *
<b>Air consumption</b>		
	Pilot	10 NI/min
	Bearing air	125 NI/min
	Shaping air 1	100 to 600 NI/min
	Shaping air 2	100 to 600 NI/min
	Turbine	<a href="#">see RT Nr 6354</a>

\* measured with resistivity meter AP 1000 (P/N 910005790). For values below 3 MOhm.cm, contact Sames Technologies.

\*\* m<sub>0</sub><sup>3</sup> values given for a temperature of 20°C (68°F) and an atmospheric pressure of 1,013 mbar.

### 3.3. Operating principle

#### 3.3.1. Turbine

[see RT Nr 6354](#)

The turbine is equipped with an air bearing that separates the transmission shaft and drive vane from the main body of the turbine. This eliminates friction between the various components, ensuring long component life and allowing high rotation speeds.

The air directed onto the turbine blades controls the rotation or braking of the turbine.

Atomisation of the product takes place thanks to the centrifugal forces created by the rotation of the bell cup. The size of the atomised particles decreases as the rotation speed increases.

#### 3.3.2. Rotation speed measurement with microphone

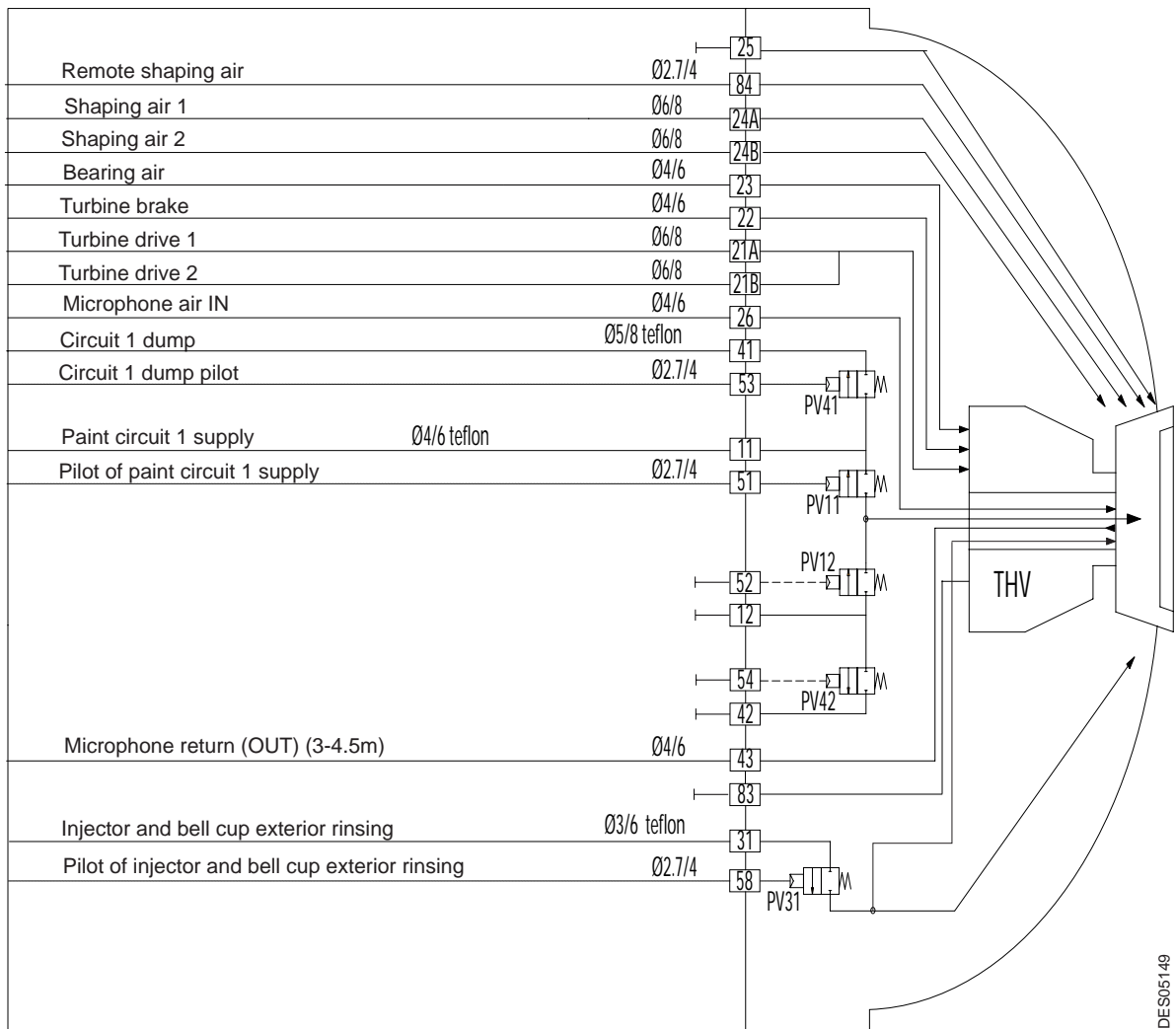
The rotation speed is measured acoustically. Air is supplied between the rear flange and the shaft. Each bell cup rotation, air passes through a groove machined on the shaft. This variation in pressure generates a signal whose frequency is proportional to the rotation speed and which is returned to the microphone through the turbine (via the atomizer body). The microphone ([see RT Nr 6190](#)) converts this signal into electrical pulses that are in turn transmitted to a control board.



**WARNING :** The 'microphone return' hose must be less than 4.5 m long to avoid loss of acoustic signal at the microphone.

Due to the high speed of the turbine, a resonance frequency may be generated in a hose longer than 4.5 m. The resonance frequency causes a stationary wave that inhibits the acoustic signal at the microphone.

## 4. Fluid diagram



Marking no.	Function	Hose characteristics
11	Paint circuit 1 supply	4 /6 Teflon
12	Paint circuit 2 supply	Not used
21A	Turbine rotation 1	6/8 Rilsan
21B	Turbine rotation 2	6/8 Rilsan
22	Turbine braking	4/6 Rilsan
23	Bearing air	4/6 Rilsan
24A	Shaping air 1	6/8 Rilsan
24B	Shaping air 2	6/8 Rilsan
25	Shaping air 3	Not used
26	Microphone air IN	4/6 Rilsan
31	Injector and bell cup exterior rinsing air/solvent	3 /6 Teflon
41	Circuit 1 dump	5 /8 Teflon
42	Circuit 2 dump	Not used
43	Microphone return (OUT)	4/6 Rilsan
51	Pilot of paint circuit 1 supply	2.7/4 Rilsan
52	Pilot of paint circuit 2 supply	Not used
53	Circuit 1 dump pilot	2.7/4 Rilsan
54	Circuit 2 dump pilot	2.7/4 Rilsan
58	Pilot of injector and bell cup exterior rinsing air/solvent	2.7/4 Rilsan
83	Remote bell cup (RBC)	Not used
84	Remote shaping air (RSA)	2.7/4 Rilsan



**WARNING :** Teflon hoses must never be replaced with Rilsan hoses. Only polyamide hoses can be used for air connections. Polyurethane hoses are prohibited.

**Note:**

**Blue colored hoses are used for the various types of air supply.  
Non-colored hoses are used for products.**

**RSA (Remote Shaping Air) function:** Inlet 84 is a shaping air pressure tap used to check flow rate/ pressure conformity during operation.

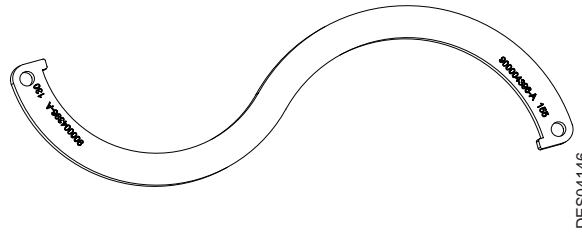
For a given flow rate D1, there must be a corresponding pressure P1 (identification / mapping of shaping air flow rate as a function of RSA pressure).

During production, the RSA pressure can be monitored as a fonction of the shaping air flow rate:

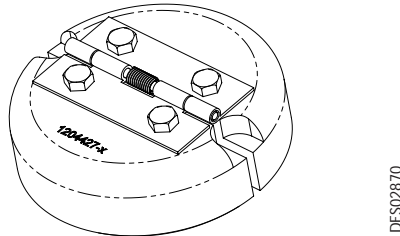
- RSA pressure < P1: air leak (shroud incorrectly fastened, punctured hose, etc.)
- RSA pressure > P1: clogged shaping air holes or bent hose

## 5. Startup

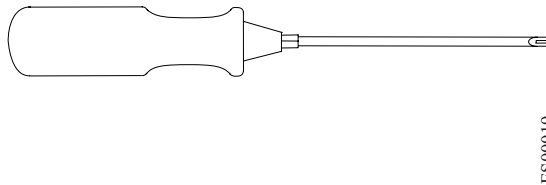
### 5.1. Tools



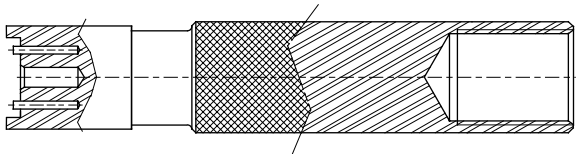
P/N	Description	Qty	Unit of sale
900004396	Installation/removal tool for outer cover and quick disconnect nut	1	1



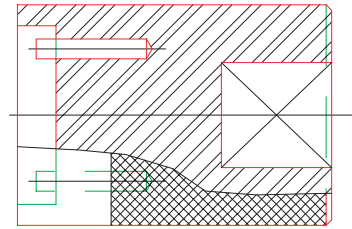
P/N	Description	Qty	Unit of sale
1204427	Removal tool for EC 65 magnetic bell cup	1	1



P/N	Description	Qty	Unit of sale
547112	Screwdriver for assembling and removing needle screws of the repelling ring	1	1

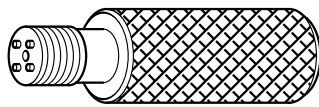


DES01025

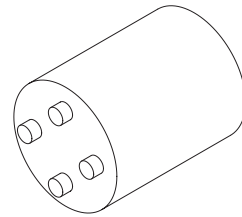


DES01641

P/N	Description	Qty	Unit of sale
1301832	Removal tool for nanovalve	1	1
1403498	Automatic tightening tool for nanovalve	1	1

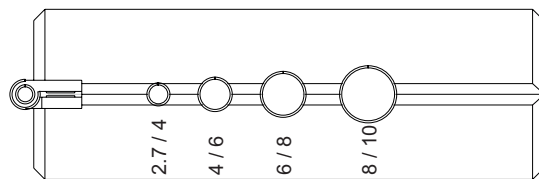


DES00039



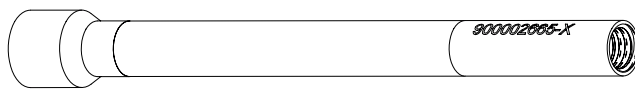
DES01673

P/N	Description	Qty	Unit of sale
1303689	Removal tool for microvalve	1	1
1403478	Automatic tightening tool for microvalve	1	1



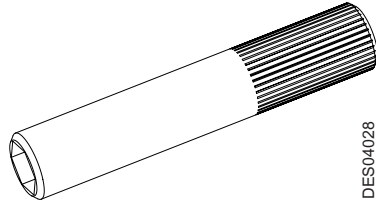
DES03489

P/N	Description	Qty	Unit of sale
1313955	Installation tool for fittings	1	1



DES03969

P/N	Description	Qty	Unit of sale
900002665	Trapezoidal tool for clipped fittings	1	1



P/N	Description	Qty	Unit of sale
910000700	Removal tool for injector	1	1

**Additional tools and accessories required:**

The tools listed below should be available for product installation and maintenance operations.

- Hose cutter (P/N W3SCTU002)
- Screwdriver (small and medium)
- Allen wrenches (3 and 4 mm)
- Torque wrench
- Fine brush
- Flat wrenches (9 and 12 mm)
- Cylindrical brush

## 5.2. Installation

- **Step 1:** Place the nut (P/N 900007975) on the quick disconnect plate support.



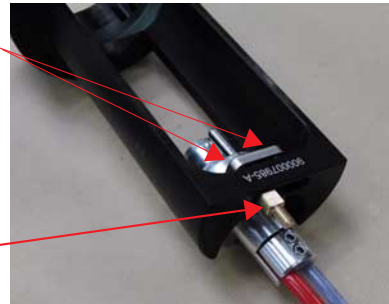
**Step 1**

- **Step 2:** Fasten the low-voltage connection to the support using the two M5x12 screws and the M5 nuts. Fix a ground braid to a nut and connect to the ground.

M5 x 12 screw  
(2)

**Step 2**

M5 nut and  
M6 screw (2)



- **Step 3:** Install the four M8x50 screws in the quick disconnect plate support and fix to the machine flange.



**Step 3**

- **Step 4:** Screw the quick disconnect plate to the support (two fastening screws (M5x15)).

**Step 4**





- **Step 5:** Pass one by one the hoses through the quick disconnect plate by respecting their location.

- **Step 6:** Install the fittings on the hoses.  
**Air fitting:** Push the hose into the fitting and tighten securely (for fittings P/N 910002946, 910002947 and 910002948).



Step 6

- **Product fitting:** For screwed fittings (P/N 910003345, 910003413 and 940004923), fit the nut on the hose, push the hose onto the fitting body until the shoulder, and tighten the nut



Fitting body Nut

- **Step 7:** Clip each fitting on the quick disconnect plate.

- **Step 8: Installation of high-voltage unit:** Slide the high-voltage unit into the support (through the quick-disconnect plate), rotate it slightly until it is aligned with the connector locating pin, then push it in all the way and fasten the fastening screw (clockwise).

Step 8



Locking screw

- **Step 9:** Fit the body assembly on the support, tighten manually.



Step 9

- **Step 10:** Secure with tool (P/N 900004396).

Step 10



- **Step 11:** Install the repelling ring on the atomizer using the M4 x16 screw at the level of the grooves of the outer cover.

Step 11



### 5.3. Shutdown and start-up procedures

Important recommendations:

Comply with the air settings given in Section 3.2.

The bearing air pressure must be at least 5.5 bar at the quick-disconnect plate.

Check that the speed regulating module transmits a signal.

#### 5.3.1. Shutdown procedure

Important steps be observed:

		Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Stop atomising	Sequence chart						
Switch off the high-voltage power supply							
Run a rinsing cycle							
Run a blowing cycle of paint and solvent hoses							
Cut off the shaping air							
Cut off the turbine rotation air (*)							
Cut off the bearing air							



**WARNING :** \* Wait until the turbine has stopped completely stop: 0 rpm.

#### 5.3.2. Start-up Procedure

Important steps to be observed:

		Step 1	Step 2	Step 3	Step 4
Switch on the bearing air supply	Sequence chart				
Start up turbine rotation					
Switch on the shaping air supply					
Switch on the high voltage supply					
Start up atomisation					

## 6. Maintenance

### 6.1. Summary table of maintenance operations

Procedure	Description	Preventive	Corrective	Duration	Frequency
A	Cleaning of atomizer exterior, outer shaping air shroud, and bell cup exterior	X		5 min.	8 hours
B	B1 Cleaning of bell cup	X		2 min.	40 hours
	B2 Cleaning of outer cover	X		8 min.	40 hours
	B3 Cleaning of injector exterior	X		4 min.	40 hours
C	C1 Cleaning of turbine	X		2 min.	520 hours
	C2 Cleaning of injector and injector holder	X		2 min.	520 hours
	C3 Cleaning of needle screws	X		2 min.	520 hours
	<b>Body maintenance</b>				
D	D1 Body installation/removal		X	< 5 min.	
	D2 Replacement of o-rings		X	15 min.	>10000 hours
	D3 Replacement of solvent pipette		X	5 min.	>10000 hours
	D4 Replacement of nanovalves		X	5 min.	2.5 million cycles
	D5 Replacement of microvalves		X	5 min.	3 million cycles
	D6 Replacement of high-speed turbine		X	< 5 min.	>10000 hours
	<b>Maintenance of quick-disconnect plate</b>				
E	E1 Hose replacement		X	10 min.	12 to 24 months
	E2 Replacement of fitting		X	5 min.	>10000 hours
	E3 Replacement of high-voltage unit		X	5 min.	>10000 hours
	E4 Replacement of quick-disconnect plate		X	30 min.	
	<b>Maintenance of quick disconnect plate support</b>				
F	F1 Replacement of high-voltage unit connection		X	10 min.	12 to 24 months

## 6.2. Preventive maintenance

These maintenance operations can be performed online. Always refer to the health and safety instructions before carrying out any work ([see § 1.4 page 6](#)).

### 6.2.1. Procedure A: Atomizer exterior

At regular intervals during frequent use, and at the end of each cycle:

- Run a rinsing cycle, stop the atomizer and switch off the power supply.



**WARNING :** Always wear safety goggles.

Whenever solvent is handled, gloves made of an appropriate resistant material must be worn. Work in a well-ventilated area whenever solvent is used.



**WARNING :** Prior to cleaning, it is essential to eliminate all electrostatic charges on the atomizer using a cloth soaked with water, a soft brush and an approved cleaning product. Do not use a manual solvent gun.

Under no circumstances must the atomizer or any of its components be sprayed with solvent or water at high or low pressure.



**WARNING :** SAMES does not recommend the use of protective plastics.

If, despite this warning, plastic sheets are used to protect atomizers, do not choose "anti-static" sheets as these conduct electricity and will short-circuit the high voltage if they are used to protect insulating parts such as the atomizer body.

Sames recommends the use of a textile cover or insulating grease.



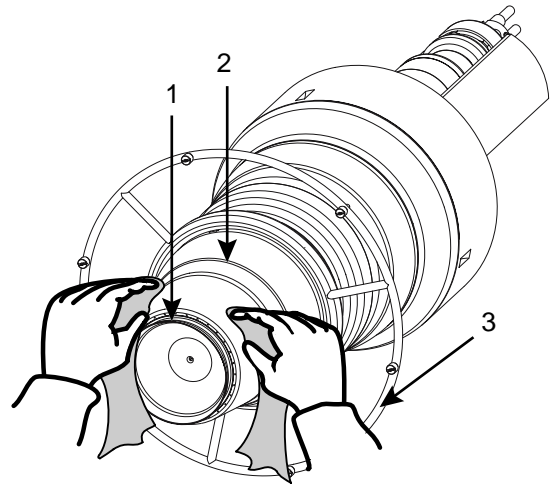
**WARNING :** In any case, insulating protection means must be used to prevent the slightest risk of current overconsumption.

The insulating protection means must be renewed on a regular basis to maintain a leak current acceptable for the high-voltage generator (HV faults may occur in case of excessive paint accumulation).



**WARNING :** Switch off the turbine. The bearing air and shaping air remain under pressure to block the solvent flow between the bell cup and inner shaping air shroud.

1	Bell cup
2	Outer cover
3	Repelling ring



DIES05135

- Clean the outer cover and the bell cup exterior with a clean cloth.
- Check that the repelling ring and the needles are clean.
- Dry carefully with compressed air.

6.2.2. Procedure B1: Magnetic bell cup



**WARNING :** All bell cup maintenance or handling operations must be performed with extreme care, since the bell cup is balanced.

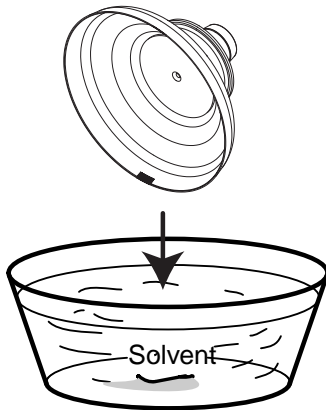


**WARNING :** Stop the turbine and cut off the shaping air. The bearing air remains pressurized.

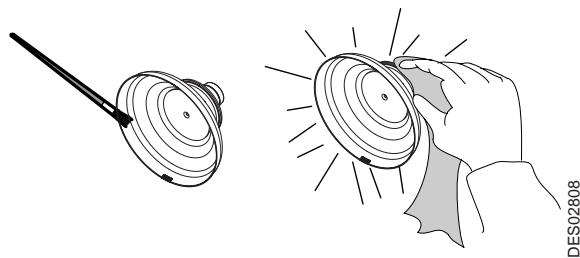
- Remove the magnetic bell cup using tool P/N 1204427 ([see RT Nr 6357](#))
- Carry out a visual inspection.
- Let the bell cup soak for one hour in an appropriate solvent, then clean with a clean cloth and soft brush.



**WARNING :** Make sure that all surfaces are clean and completely free of impurities, particularly the inner and outer surfaces of the bell cup fastening cylinder.

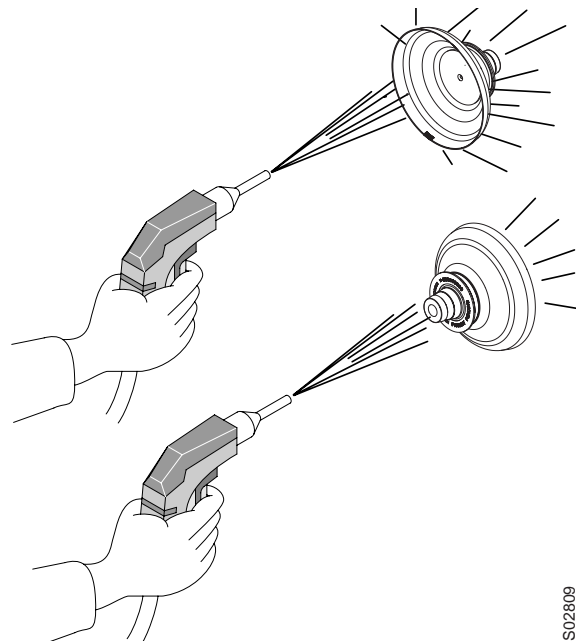


DES02807



DES02808

- Dry carefully with compressed air.



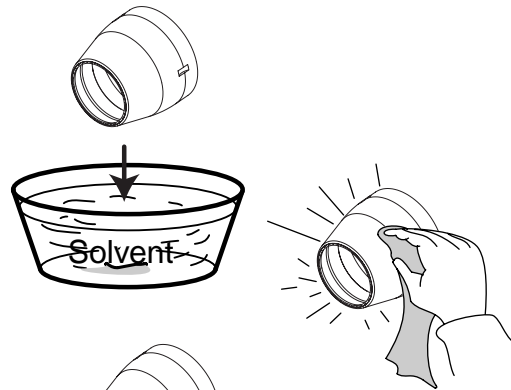
S02809

- Reinstall the bell cup on the atomizer.

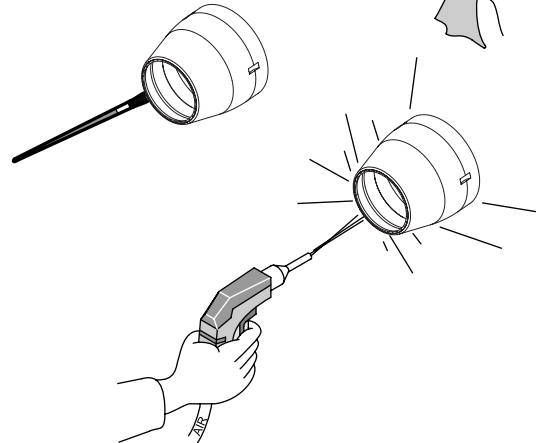
### 6.2.3. Procedure B2: Shaping air assembly

- The bell cup has been previously removed.
- Begin to loosen the outer cover with tool (P/N 900004396), then continue manually [see RT Nr 6357](#).
- Remove the outer cover, then remove the inner shaping air shroud.
- Carry out a visual inspection of the three components (outer cover and inner shaping air shroud and O-ring), replace if necessary, then clean the outer cover:

- **Step 1:** Let the outer cover soak in solvent for one hour, then clean the outer and inner surfaces with a clean cloth soaked in solvent.



- **Step 2:** Use a nylon brush to clean the holes on the front face of the outer cover.



- **Step 3:** Clean carefully with compressed air (concentrating on the holes to eliminate paint residues), then wipe with a clean, dry cloth.

- Check the condition of the inner shaping air shroud and, if necessary, clean it with a cloth soaked in solvent.

- Reinstall the shaping air assembly ([see RT Nr 6357](#)).



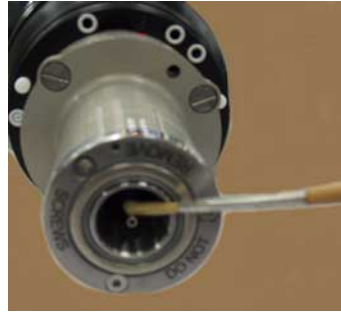
**WARNING :** Keep the threading between the outer cover and the body clean. Coat the threading with vaseline to facilitate the reinstallation of the outer cover.

DES03378

#### 6.2.4. Procedure B3: Injector exterior

Proceed with the bell cup and shaping air shroud assembly previously removed.

- Use a brush slightly soaked in solvent to clean the injector exterior.



- Dry carefully with a clean, dry, non-fluffy cloth.

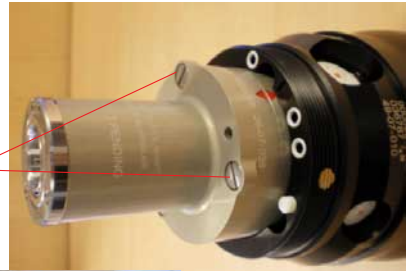


### 6.2.5. Procedure C1: Turbine

- Proceed with the bell cup and shaping air assembly previously removed.

- Loosen the three turbine fastening screws.

3 captive screws



- Clean the turbine interior with a cylindrical brush.



- Clean the turbine exterior with a soft, non-fluffy cloth.



**WARNING : Do not soak the turbine in solvent.**

- Prior to reinstalling the turbine on the body, check the condition of the O-rings, replace them if necessary, and make sure that they are all presents.

- Position the turbine on the body by aligning the marking on the turbine (red arrow) with that on the body.  
Tighten the three fastening screws (tightening torque: 2.2 Nm).



#### 6.2.6. Procedure C2: Injector / Injector holder

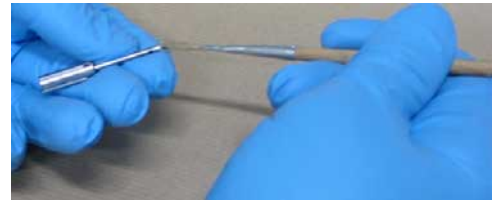
- Proceed with the bell cup, shaping air assembly and turbine previously removed.

- Use a 9-mm flat wrench to loosen the injector/diffuser assembly. Withdraw the injector from the diffuser by pushing it carefully.



**WARNING : All operations on the injector must be performed carefully.**

- Clean the injector and diffuser with a soft brush previously soaked in solvent.
- In case of very significant soiling: Let the injector soak for one hour in an appropriate solvent and dry carefully with compressed air.
- Remove the injector holder, if necessary (three M3x8 screws).
- Check the condition of the injector O-rings. Replace if necessary.
- Position the injector holder (aligning it with the locating pin) and fasten it using the three M3x8 screws (tightening torque: 1.7 Nm).
- Insert the injector and o-ring into the diffuser, do not tighten securely, place the o-ring on the diffuser, place the assembly in the injector holder, then tighten manually.



- Screw the injector in the injector holder using installation tool P/N 91000700 and a torque wrench (tightening torque: 2.2 Nm).



Tool P/N 91000700



#### 6.2.7. Procedure C3: Needle screws

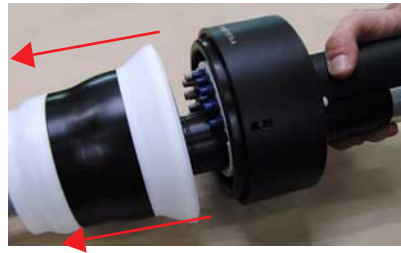
- Clean carefully the needle screws using a brush soaked in solvent.
- Wipe carefully with a dry and clean cloth.
- Dry carefully with compressed air.
- If necessary, unscrew the needle screw(s) using tool (P/N 547112) and replace.

### 6.3. Corrective maintenance

The following operations are preferably performed in a workshop.

#### 6.3.1. Procedure D1: Body installation/removal

- **Remove the body:** hold the body, and using the tool (P/N 900004396) loosen the nut. Pull the body assembly along the axis.



- **Reinstall the body:** Secure the body on the support ([see § 5.2 page 24](#)).

#### 6.3.2. Procedure D2: Replacement of body o-rings

- Check the condition of the o-rings on both faces of the body and replace if necessary.  
O-ring kit (turbine side) P/N 910003415  
O-ring kit (quick-disconnect plate side) P/N 910003416



Body turbine side



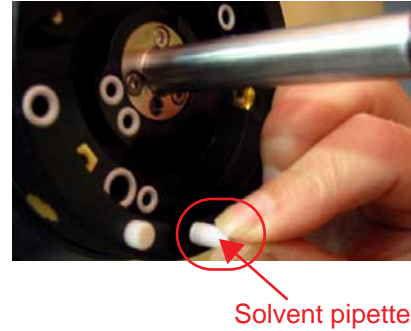
Body quick-disconnect plate side



**WARNING :** Prior to reinstalling the body, make sure all the o-rings are presents.

### 6.3.3. Procedure D3: Replacement of solvent pipette

- **Remove the solvent pipette:**  
This operation automatically destroys the solvent pipette.  
If absolutely necessary, remove the solvent pipette using an M1.6 x 0.35 screw.  
Replace the solvent pipette and install it in the body.



### 6.3.4. Procedure D4: Replacement of nanovalves

- **Remove the nanovalves:**  
[see RT Nr 6258](#) for the operations listed below.  
Remove the nanovalves using tool P/N 1301832.  
Check their condition, clean them, and replace if necessary.



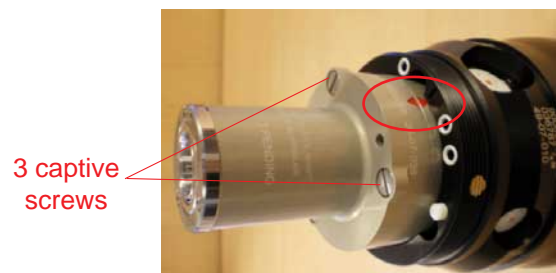
### 6.3.5. Procedure D5: Replacement of microvalves

- **Remove the microvalves:**  
[see RT Nr 6021](#) for the operations listed below.  
Remove the microvalves using tool P/N 1303689.  
Check the condition of the microvalves (paint supply microvalves PV11 and PV12), clean them, and replace if necessary.



### 6.3.6. Procedure D6: Replacement of high-speed turbine

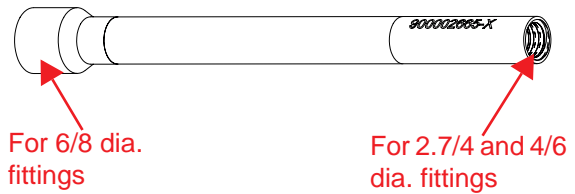
- **Remove the turbine:**  
Loosen the three captive screws. Pull the turbine along the axis.
- **Install the turbine:**  
Position the turbine on the body by aligning the marking on the turbine (red arrow) with that on the body.  
Tighten the three fastening screws (tightening torque: 2.2 Nm).



### 6.3.7. Procedure E1: Hose replacement

- **Hose replacement:**

It is not necessary to separate the quick-disconnect plate from the rear support in order to access the fittings or hoses or remove the cover.



- Position tool P/N 900002665 on the fitting. Screw.



- Withdraw the fitting by pulling it along the axis using the tool.



- **To replace the hose**, use the old hose as a needle and pull the assembly until the new hose protrudes from the quick-disconnect plate.



**WARNING :** When replacing a hose, ensure that there is sufficient length for disassembly at a later stage. The hoses must be secured so that they cannot be torn out.



**WARNING :** Replace all hoses every 12 to 24 months, depending on the amount of use.

### 6.3.8. Procedure E2: Replacement of fittings

- **Remove the air fitting from the hose:** Hold the hose using tool P/N 1313955, insert the hose in the orifice corresponding to the hose diameter, and loosen using a flat wrench with diameter corresponding to the fitting diameter.



- **Remove the product fitting:** Loosen the nut while holding the fitting with two flat wrenches, then withdraw the fitting from the tube by pulling along the axis (slightly rotating the fitting).

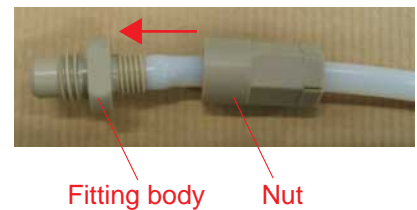


- To merely replace the fitting, cut the hose approximately 20 mm from its end using the tube cutter (P/N W3SCTU002). Caution: The cutting plane must be perfectly perpendicular to the hose.



#### Reinstallation of fittings:

- **Air fitting:** Push the hose into the fitting and tighten securely (for fittings P/N 910002946, 910002947 and 910002948).
- **Product fitting:** For screwed fittings (P/N 910003345, 910003413 and 940004923), fit the nut on the hose, push the hose onto the fitting body until the shoulder, and tighten the nut.



### 6.3.9. Procedure E3: Replacement of high-voltage unit

- **Separate the body assembly from the quick disconnect plate support:** unscrew the nut using the tool (P/N 910004396), then manually unscrew the body.

- To withdraw high-voltage unit UHT 157, loosen the fastening screw.



- Pull the high-voltage unit along the axis to disconnect it.



- Position the new high-voltage unit after previously coating the high-voltage well with dielectric grease. Slightly rotate the unit until it is aligned with the connector locating pin, then push it in all the way and fasten the fastening screw (clockwise).

### 6.3.10. Procedure E4: Replacement of quick-disconnect plate

- Loosen the two fastening screws (M5x15) and withdraw the quick-disconnect plate.



- Remove the fittings from each hose ([see § 6.3.8 page 38](#)).

- Position the new quick-disconnect plate and the hoses, then reinstall the fittings ([see § 6.3.8 page 38](#)).

Place the quick-disconnect plate on the support and tighten the two screws.

### 6.3.11. Procedure F1: Replacement of high-voltage unit connection

- **Replacement of high-voltage unit connection:**

Loosen the low-voltage connection fastening screws (two M5x12 screws). Unscrew the 2 nuts. To replace the low voltage connection, proceed in reverse order ([see § 5.2 page 24](#)).



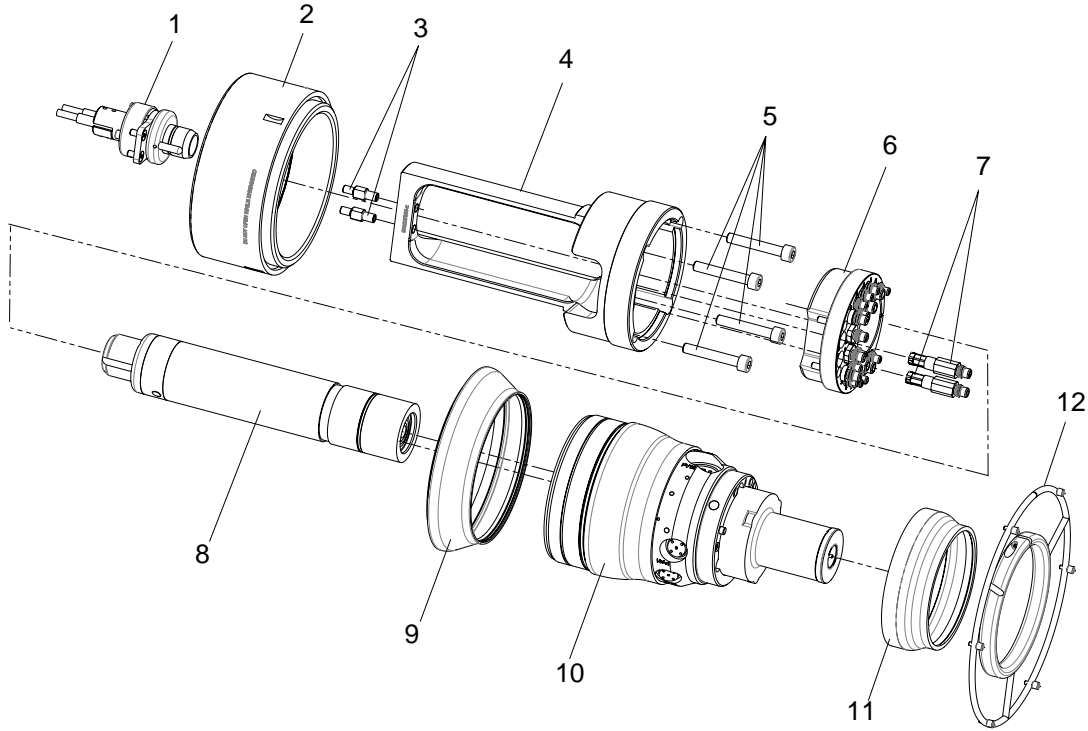
**WARNING :** Replace the low-voltage connection every 12 to 24 months, depending on the amount of use.



## 7. Spare parts list

### 7.1. Atomizer PPH 707 SB M

**Note:** The bell cup and shaping air assemblies are not included.



DES05133

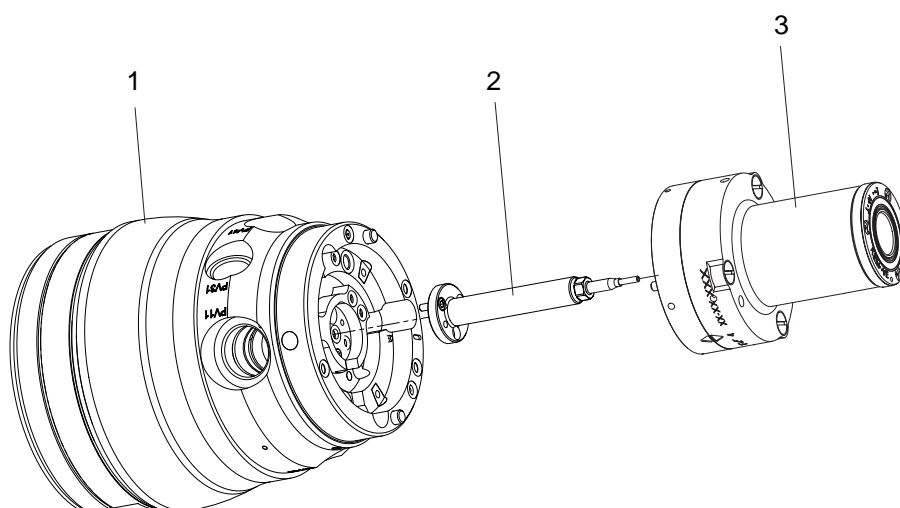
Item	P/N	Description	Qty	Unit of sale	Maintenance level for spare part (*)
	<b>910011220</b>	<b>PPH 707 SB M atomizer</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>1</b>	<b>910004015</b>	<b>Low voltage connection (cable length: 8m)</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>2</b>	<b>910011903</b>	<b>Nut</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>3</b>	900007984	M5 Nut and M6 screw	2	1	3
<b>4</b>	900007985	Quick disconnect plate support	1	1	3
<b>5</b>	X9SVSY289	Fiber-glass nylon Chc M8 x 50 screw	4	1	1
<b>6</b>	<b>910003409</b>	<b>Quick-disconnect plate assembly PPH 707 (see § 7.3 page 47)</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>7</b>	<b>910002950</b>	<b>4/6 product fitting</b>	<b>2</b>	<b>1</b>	<b>1</b>
<b>8</b>	<b>910002870</b>	<b>High-voltage unit UHT 157 (see RT Nr 7038)</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>9</b>	900004093	Rear cover	1	1	3
<b>10</b>	<b>910005624</b>	<b>Complete body assembly (see § 7.2 page 42)</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>11</b>	900002645	Valve cover	1	1	3
<b>12</b>	<b>910011299</b>	<b>Repelling ring assembly (see § 7.4 page 48)</b>	<b>1</b>	<b>1</b>	<b>3</b>

(\*) Level 1: Standard preventive maintenance

Level 2: Corrective maintenance

Level 3: Exceptional maintenance

## 7.2. Complete body assembly



DES04088

Item	P/N	Description	Qty	Unit of sale	Maintenance level for spare part (*)
	<b>910005624</b>	<b>Complete body assembly</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>1</b>	<b>910005623</b>	<b>Equipped Body</b> (see § 7.2.1 page 43)	<b>1</b>	<b>1</b>	<b>3</b>
<b>2</b>	<b>910000618</b>	<b>Injector / injector holder assembly</b> (see § 7.2.2 page 46)	<b>1</b>	<b>1</b>	<b>3</b>
<b>3</b>	<b>1525849</b>	<b>High-speed turbine</b> (see RT Nr 6354)	<b>1</b>	<b>1</b>	<b>3</b>

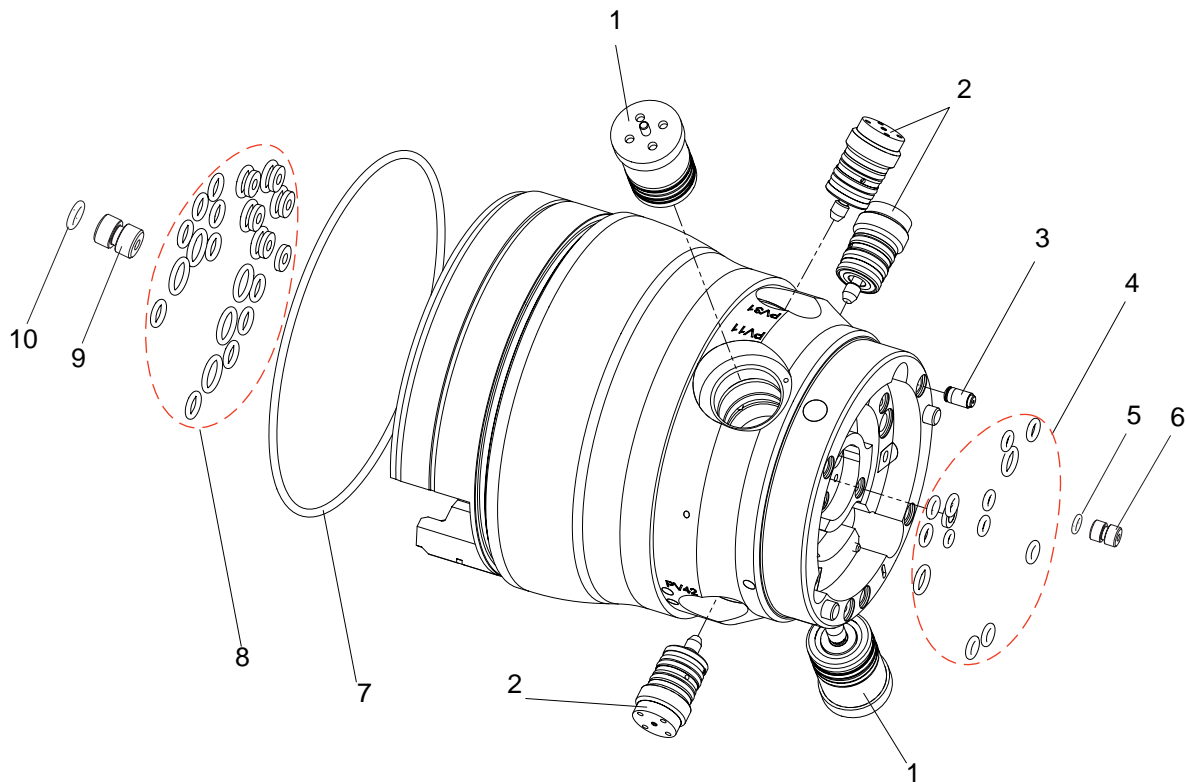
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**Level 1: Standard preventive maintenance**

**Level 2: Corrective maintenance**

**Level 3: Exceptional maintenance**

## 7.2.1. Equipped Body



DES05130

Item	P/N	Description	Qty	Unit of sale	Maintenance level for spare part (*)
	<b>910005623</b>	<b>Equipped body</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>1</b>	<b>1507375</b>	<b>Microvalve, orange indicator, chemically inert o-rings</b> (see <a href="#">RT Nr 6021</a> )	<b>2</b>	<b>1</b>	<b>1</b>
<b>2</b>	<b>1510004</b>	<b>Nanovalve, orange indicator, chemically inert o-rings</b> (see <a href="#">RT Nr 6258</a> )	<b>3</b>	<b>1</b>	<b>1</b>
<b>3</b>	<b>910000369</b>	<b>Solvent pipette</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>4</b>	<b>910003415</b>	<b>O-ring kit (high-speed turbine side)</b> (see § 7.2.1.1 page 44)	<b>1</b>	<b>1</b>	<b>1</b>
5	J3STKL005	O-ring - chemically inert	1	1	1
6	900003305	Fiber optic plug (high speed turbine side)	1	1	1
7	J2FENV694	O-ring (FEP)	1	1	1
<b>8</b>	<b>910003416</b>	<b>O-ring kit (quick-disconnect plate side)</b> (see § 7.2.1.2 page 45)	<b>1</b>	<b>1</b>	<b>1</b>
9	900003304	Fiber optic plug (quick disconnect plate side)	1	1	1
10	J3STKL121	O-ring - chemically inert	1	1	1

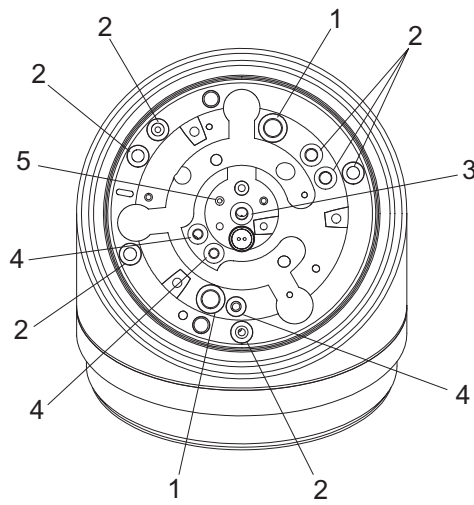
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**Level 1: Standard preventive maintenance**

**Level 2: Corrective maintenance**

**Level 3: Exceptional maintenance**

7.2.1.1. O-ring kit (high-speed turbine side)



DES03870

Item	P/N	Description	Qty	Unit of sale	Maintenance level for spare part (*)
	<b>910003415</b>	<b>O-ring kit (high-speed turbine side)</b>	<b>1</b>	<b>1</b>	<b>1</b>
1	J3STKL082	O-ring (chemically inert)	2	1	1
2	J3STKL046	O-ring (chemically inert)	7	1	1
3	160000028	Flat seal	1	1	1
4	J3STKL035	O-ring (chemically inert)	3	1	1
5	J3STKL002	O-ring (chemically inert)	1	1	1

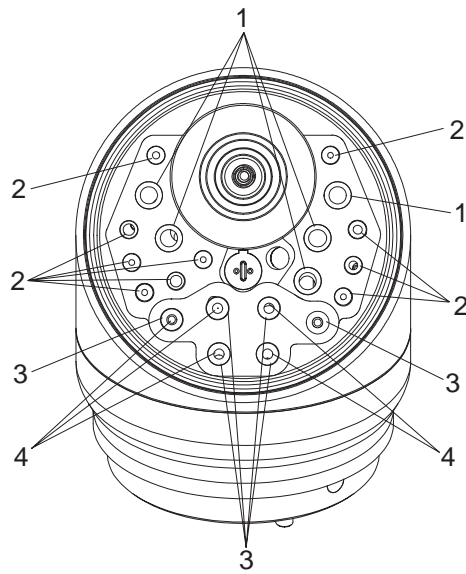
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**Level 1: Standard preventive maintenance**

**Level 2: Corrective maintenance**

**Level 3: Exceptional maintenance**

7.2.1.2. O-ring kit (quick-disconnect plate side)



DES03871

Item	P/N	Description	Qty	Unit of sale	Maintenance level for spare part (*)
	<b>910003416</b>	<b>O-ring kit (quick-disconnect plate side)</b>	<b>1</b>	<b>1</b>	<b>1</b>
1	J3STKL121	O-ring (chemically inert)	5	1	1
2	J3STKL078	O-ring (chemically inert)	10	1	1
3	160000027	Flat seal	6	1	1
4	J3STKL094	O-ring (chemically inert)	5	1	1

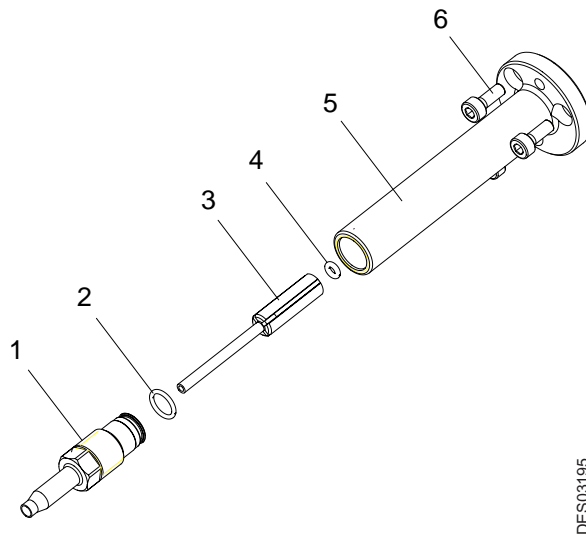
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**Level 1: Standard preventive maintenance**

**Level 2: Corrective maintenance**

**Level 3: Exceptional maintenance**

7.2.2. High-speed turbine injector / injector holder assembly



Item	P/N	Description	Qty	Unit of sale	Maintenance level for spare part (*)
	<b>910000618</b>	<b>Injector / injector holder assembly</b>	<b>1</b>	<b>1</b>	<b>3</b>
1	900000159	Diffuser	1	1	1
2	J3STKL069	O-ring (chemically inert)	1	1	1
3	900000158	Injector (slot dia. 1.8)	1	1	1
4	J3STKL014	O-ring (chemically inert)	1	1	1
5	900000157	High-speed turbine injector holder	1	1	3
6	X4FVSY066	C M3x8 screw (stainless steel)	3	1	1
<b>Option</b>					
3	900008257	Injector (slot dia. 2)	1	1	1

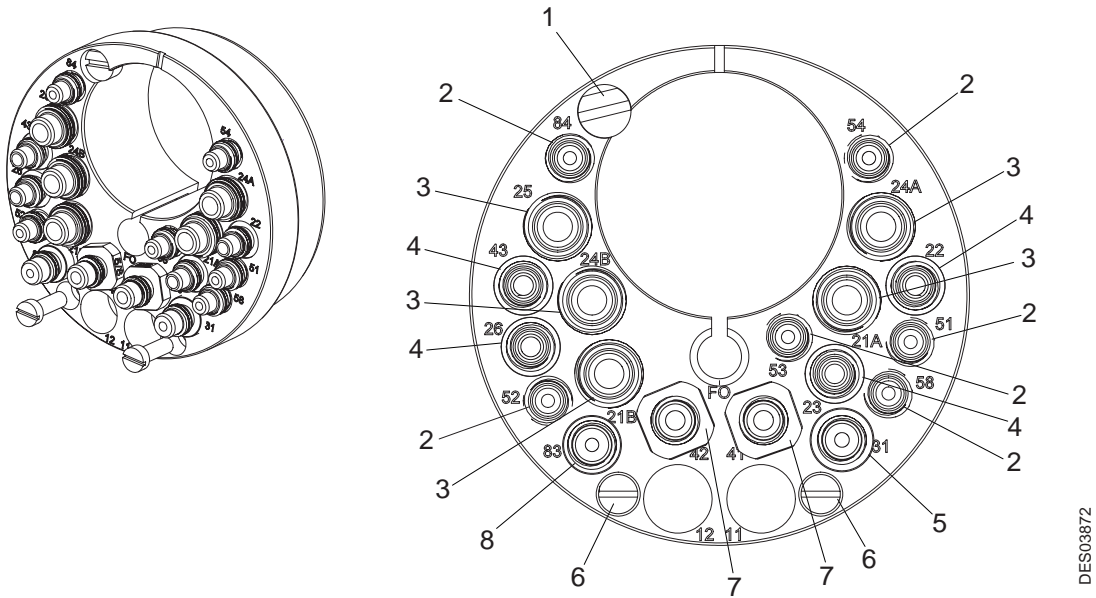
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**Level 1: Standard preventive maintenance**

**Level 2: Corrective maintenance**

**Level 3: Exceptional maintenance**

### 7.3. Quick-disconnect plate assembly



Item	P/N	Description	Qty	Unit of sale	Maintenance level for spare part (*)
	<b>910003409</b>	<b>Quick-disconnect plate assembly</b>	<b>1</b>	<b>1</b>	<b>3</b>
1	900003914	High-voltage unit locking screw	1	1	1
2	<b>910002946</b>	<b>2.7/4 air fitting</b>	<b>6</b>	<b>1</b>	<b>1</b>
3	<b>910002948</b>	<b>6/8 air fitting</b>	<b>5</b>	<b>1</b>	<b>1</b>
4	<b>910002947</b>	<b>4/6 air fitting</b>	<b>4</b>	<b>1</b>	<b>1</b>
5	<b>910003413</b>	<b>3/6 product fitting</b>	<b>1</b>	<b>1</b>	<b>1</b>
6	X9SVCB183	C M5x15 screw (fiber-glass nylon)	2	1	1
7	<b>910003345</b>	<b>5/8 anti-rotation fitting</b>	<b>2</b>	<b>1</b>	<b>1</b>
8	<b>910004923</b>	<b>2.7/4 product fitting (screwed)</b>	<b>1</b>	<b>1</b>	<b>1</b>

(\*)

Level 1: Standard preventive maintenance

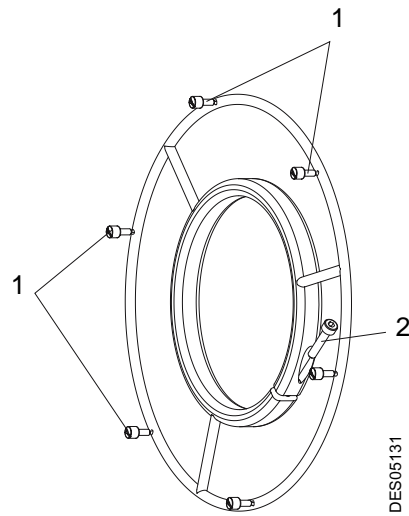
Level 2: Corrective maintenance

Level 3: Exceptional maintenance

Position of fittings:

Item	Location
2	51, 52, 53, 54, 58 and 84
3	21A, 21B, 24A, 24B and 25
4	22, 23, 26 and 43
5	31
7	41 and 42
8	83

#### 7.4. Repelling ring assembly



Item	P/N	Description	Qty	Unit of sale	Maintenance level for spare part (*)
	<b>910011299</b>	<b>Repelling ring assembly</b>	<b>1</b>	<b>1</b>	<b>3</b>
1	549903	Needle screw	6	1	1
2	X4FVSY121	Stainless steel Chc M4 x 16 screw	1	1	3

(\*)

**Level 1: Standard preventive maintenance**

**Level 2: Corrective maintenance**

**Level 3: Exceptional maintenance**