



User manual

PPH 308 with high voltage cable for solvent-based paints

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PPH 308

with high voltage cable

for solvent-based paints

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1. Health and Safety Instructions

This manual contains links to the user manuals for the following:

- [see RT Nr 6285](#) for magnetic bell cups,
- [see RT Nr 6350](#) for the “Magnetic bell cup” type magnetic air turbine.
- [see RT Nr 6021](#) for the microvalve
- [see RT Nr 6190](#) for the microphone,
- [see RT Nr 7010](#) high-voltage unit UHT 188 EEx e.
- [see RT Nr 6213](#) GNM200 control module user manual,
- [see RT Nr 6364](#) for the electrical systems user manual,

1.1. Configuration of certified equipment

These user manuals define the configuration of certified equipment.

1.2. Markings on atomizer

SAMES KREMLIN Meylan France

CE 0080

PPH

P/N: *

ISseP06ATEX032X**



II 2 G

EEx > 350mJ

(Serial no.)

* ATEX PPH 308 configurations

Atomizer - P/N 910003350 Microvalves - P/N 1507375 Turbine - P/N 910000295	High-voltage unit UHT 188 EEx e - P/N 910001759 P/N without HV cable Note: refer to health and safety instructions for maximum lengths of electrical capacities	P/N PPH (*)	GNM 200A P/N 1517071
X	X	910003721	X

** '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 every operator must be familiar with and understand before using the PPH 308 atomizer. This information highlights situations that could result in serious damage and indicates the precautions that should be taken to avoid them.



WARNING : Before any use of the PPH 308 equipment, check that all operators:

- have previously be trained by the compagny SAMES KREMLIN, or by its distributors registered 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 KREMLIN are used.



WARNING :

This device must only be used in spraying areas that comply with European standards EN 50176, EN 50177, EN 50223 or equivalent ventilation conditions. Equipment must be used only in well-ventilated areas, in order to reduce health, fire and explosion hazards. The efficiency of the ventilation system must be verified on a daily basis.

In potentially explosive atmospheres generated by the spraying process, only the appropriate electrical equipment, protected against explosions, should be used.

Before cleaning or working on atomizers in the spraying area, the high voltage generator must be switched off and the HV circuit (atomizer) discharged to the ground.

Never point the pressurized product or the compressed air towards persons or animals.

Suitable measures must be taken to ensure there is no potential energy (liquid, air pressure or electricity) in the equipment during downtimes and/or periods when the equipment is not being used.

The use of personal protective equipment can limit the risks caused by contact with and/or inhalation of toxic products, gases, vapours, mist and dust likely to be generated by the equipment in use. The operator must follow the manufacturer's instructions for the coating product.

The electrostatic spraying device must be regularly serviced in accordance with the indications and instructions given by SAMES KREMLIN.

The equipment must be cleaned either in authorized areas equipped with a mechanical ventilation system, or using cleaning fluids with a flash point at least 5°C higher than the ambient temperature.

Cleaning fluids must be held in metal containers that are securely grounded.

No naked flames, incandescent objects, devices or items likely to produce sparks inside the paint booth.

No storage of inflammable products or their containers close to the booth or near the doors.

The surrounding area must be kept clear and clean.



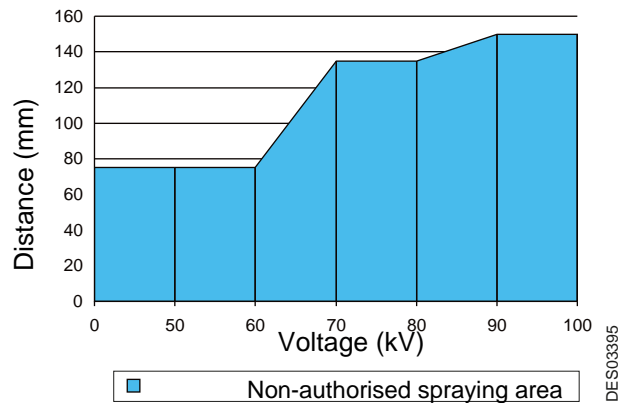
WARNING : The use of extra high voltage power increases the risk of sparks. SAMES KREMLIN atomizers and high-voltage electrostatic generators are designed to minimise this risk. Although the HV electrode is the only accessible part, a safety distance of X mm (see table below) must be maintained between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

PPH 308 with high voltage unit (HVU) 188 and 9m-long HV cable:

Authorised spraying distance

Voltage (kV)	Distance (mm)
0	75
50	
60	
70	135
80	
90	150
100	

Safety distance 'X' as a function of voltage



The authorised operating distances specified in this manual are calculated on the basis of the total length of high voltage cables (electrical capacities). The atomizer must be connected to the HV socket on the HVU only with a single length of HV cable, with no intermediate part.

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 properly grounded.

If not, electrical charges capable of causing sparks could build up on it. The same applies to operating staff, which is why antistatic shoes and gloves should be worn to protect against this hazard.

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

All conductive casing or lining of electrical equipment and conductive components in potentially explosive atmospheres must be grounded by connecting them to the grounding terminal.

Finally, and for the same reasons, the floor in the area in which the operator works must be anti-static (bare concrete, metal duckboard, etc.).

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

The correct operation of the overcurrent protection (di/dt) must be verified daily. This check must be carried out **in an area with no explosive atmosphere**, by placing a ground wire near the electrode, with the atomizer switched on (the operator must be grounded): the control module must switch to the fault state.

The associated apparatus 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. Do not exceed the maximum operating speed ([see § 3 page 20](#)).

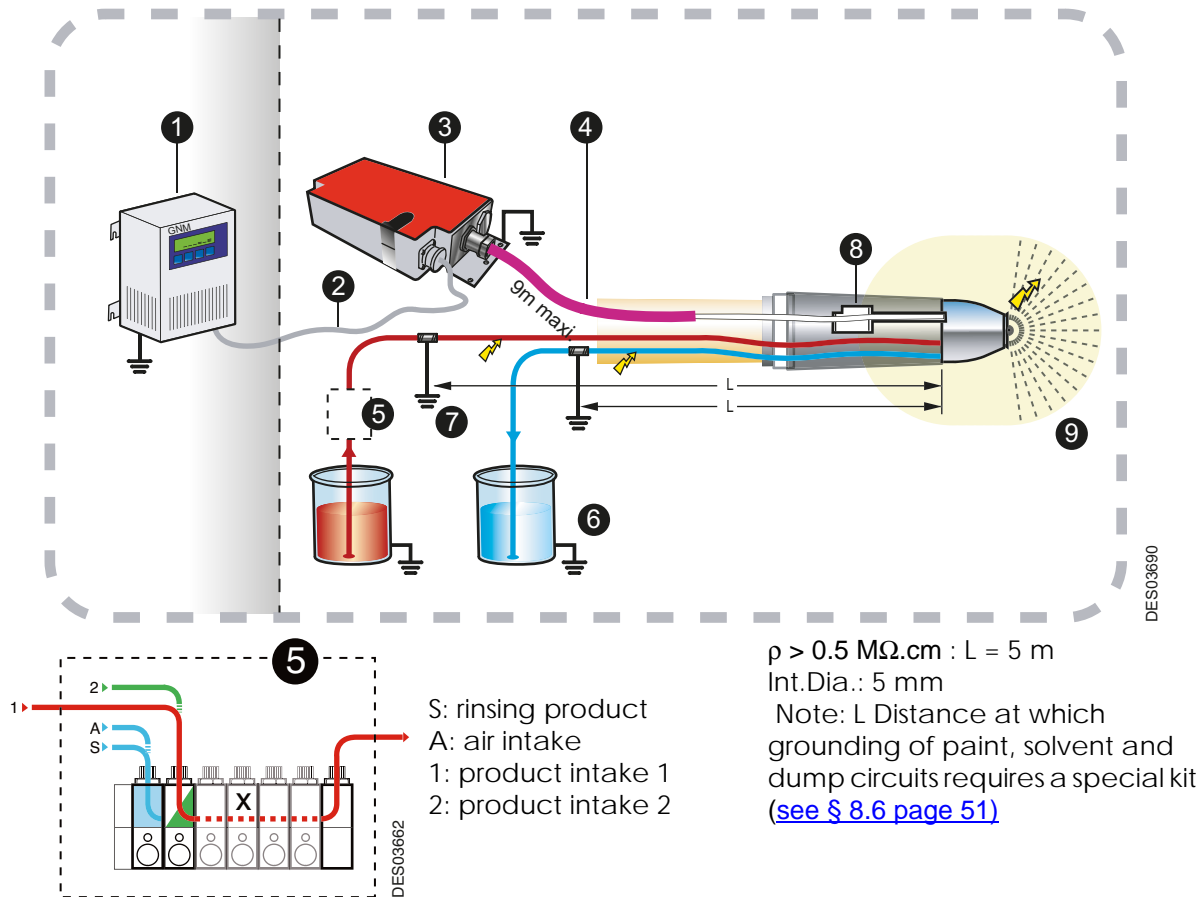
1.4.1. Installation rules

- To use an UHT 188, it must be connected to a **GNM 200** whose firmware is version **V 5.63** or later.
- **If UHT 188 is used to supply a single atomizer**, the HV cable must be no longer than 9m.
- **If UHT 188 is used to supply two atomizers**, the sum of the HV cable lengths must be no more than 8.5m.
e.g. If both atomizers are at the same distance from HVU 188, the allowable length of each HV cable is no more than 4.25 m ($8.5/2 = 4.25$ m).
If two atomizers are used, please note that as a part to be painted is brought close to one atomizer, the voltage to the second atomizer will simultaneously drop.



WARNING : The installation of any system that does not comply with the rules specified above and below is strictly prohibited.

PPH 308 for low resistivity solvent-based paints $\rho > 0.5 \text{ M}\Omega\cdot\text{cm}$



WARNING : All conductive parts must be grounded (metal Moduclean connectors, gear pumps, etc.)

Paint resistivity $> 0.5 \text{ M}\Omega\cdot\text{cm}$	
1	GNM 200 control module (to be installed in a non-ATEX zone)
2	Low voltage cable
3	High Voltage Unit HVU 188 EEx e
4	High voltage cable (Length: see § 1.4.1 page 10)
5	Paint and rinsing product feed lines, grounded
6	Dump circuit return outlet, grounded
7	Paint/rinsing product and dump connectors, grounded inside the atomizer by means of a grounding kit (see § 8.6 page 51)
8	Placebo with damping resistor
9	Safety distance (area around atomizer head - distance from high voltage components such as outer cover, bell cup etc.)

1.5. Important Recommendations

1.5.1. Compressed air quality

The air must be properly filtered to promote long service life and to prevent contamination during painting.

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

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

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

The warranty does not cover faults caused by unclean, unfiltered bearing area, where the above specifications have not been observed.



WARNING : If the air is not correctly filtered, the bearing may become fouled, resulting in a turbine operating fault. A filtering system must be set up, in particular to prevent particles larger than 5 µm diameter reaching the bearing.



WARNING : The warranty does not cover damage caused by foreign matter (paint, solvent or other foreign matter) entering the air circuits of atomizer PPH 308.

1.5.2. 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.

1.5.3. Bearing safety

The compressed air connection to the magnetic air bearing must be directly coupled to the feed circuit (no intermediate isolating valve).

The air bearing must be permanently pressurised in operation, otherwise significant damage may be caused. A sudden shutdown of the air supply could destroy the magnetic bearing of the turbine. Wait until the turbine has completely shut down before stopping the bearing air supply.

Procedure for shutting off air to the air bearing:

- Switch off the turbine rotation air supply
- Wait until the turbine has completely shut down (at least 150 sec.).
- Shut off the bearing air supply.

Damage may be caused to the bearing if the turbine is operated at bearing air pressure of less than 6 bar at the atomizer inlet. The standard bearing air pressure is 6 bar at the air control cabinet.

All these pressure values are measured at the atomizer inlet. If bearing air pressure goes below 6 bar at the turbine or atomizer inlet, shut off air supply to the turbine.

In addition, a 25 l air reserve should be available to ensure that the turbine brakes gradually if the main air supply is suddenly cut off.



WARNING : The warranty does not cover faults caused by turbine operation when there is insufficient bearing air pressure.

1.5.4. Locking

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



WARNING : When the turbine is initially shut down, wait until the bell cup is rotating (min. 15,000 rpm) before opening the head valve. The recommended minimum waiting time is 2 seconds.

1.5.5. Shaping air

Do not spray if there is not a minimum of 80 NI/min shaping air (i.e. 0.3 bar at atomizer inlet) At lower pressures, the product may re-enter the device and foul the outer cover and the inner surfaces of the shaping air shroud, resulting in incorrect application.

1.5.6. High voltage

High voltage operation should be prohibited when atomizer PPH 308 is not spraying for an extended period (conveyor shutdown, objects not painted, holes etc.), to prevent air ionisation.



WARNING : High voltage power supply must be disconnected before performing rinsing cycles (bell cup exterior and injector).

1.5.7. Maximum speed

Excessive turbine speeds cause considerable damage to the turbine. The speed must not exceed 45,000 rpm.



WARNING : The warranty does not cover damage resulting from rotation speeds greater than 45,000 rpm.

1.5.8. Bell Cup / Turbine Fitting

The bell cup must be properly fitted to the turbine. A “click” should be heard when it is assembled. The two cylinder should rest one against the other, without any foreign body between them. If they are incorrectly assembled, they may come apart and the bell cup ejected while revolving, causing a hazard for people and equipment.

1.5.9. O-ring seals

Use the seals recommended in this manual. If solvent-based products are used, seals coming into contact with the product should be chemically-inert O-rings in order to prevent swelling or chemical corrosion. Correct operation of the PPH 308 is only guaranteed if it is used with seals whose dimensions and materials comply with those specified in the manual.

1.5.10. Ventilation

Do not start painting with the PPH 308 until the spraying booth ventilation system is operating. 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. Vibrations

If the atomizer vibrates more than usual, the cause is generally unbalanced rotating parts. There may be dry paint deposits on the bell cup or rotor. If any of these situations arise, it is essential to correct them. Excessive unbalance may damage the turbine resulting in failure to operate or even loss of the bell cup / turbine connection, presenting a risk for persons and equipment.



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

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

During installation of the PPH 308, it is important to set up safety devices enabling high voltage power, paint, solvent and air supplies to be cut immediately if there is 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 use such safety systems could cause a fire hazard, put operating staff at risk of serious injury and damage the equipment.

1.5.14. Mechanical collision

The warranty does not cover damage resulting from the operating environment (e.g.: collision with robot).

1.5.15. Ambient temperature

The atomizer is designed for normal operation at an ambient temperature of between 0°C and + 40°C.

To optimise the quality of application, recommended operating temperatures are between + 15°C and + 28°C.

The storage temperature must never exceed +60°C.

1.5.16. Noise level

The weighted equivalent continuous sound pressure level is 59.7 dB(A).

Measurement conditions:

The apparatus was operated to maximum capacity and the measurements taken in the paint test booth (sealed booth with glass panels) in the SAMES KREMLIN R&D laboratory in Meylan, France.

Measurement method:

The weighted equivalent sound pressure level of 59.7 dB(A) is an Leq (equivalent sound pressure) value measured over observation periods of at least 30 seconds.

1.5.17. Special maintenance provisions

All access to the booth near the atomizer must be controlled during atomizer operation by active devices ([see § 1.5.13 page 14](#)) designed to interrupt operation in case of personnel intrusion.

However, for maintenance purposes, these devices can be adapted to allow certain operations and inspections (by personnel trained by SAMES KREMLIN).

Nevertheless, turbine rotation with a bell cup must always be prohibited with people in the vicinity.

1.6. Warranty

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

The warranty claim must define the exact nature of the fault concerned, in writing. The SAMES KREMLIN warranty 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 specifically, the warranty 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 KREMLIN or a SAMES KREMLIN control system modified by a third party without written permission from an authorised SAMES KREMLIN technical agent,
- accidents such as a collision with external objects, or similar events,
- flooding, earthquake, fire or similar events,
- inadequately filtered bearing air (solid particles more than 5 mm in diameter),
- inadequately filtered paint and solvent,
- use of seals not complying with SAMES KREMLIN recommendations,
- turbine operation without minimum bearing air pressure (6 bar),
- exceeding the maximum speed of 45,000 rpm under load,
- operation of rotating parts that are unbalanced (dry paint on bell cup, damaged rotor attachment cone or bell cup(s)),
- contamination of air circuits by fluids or substances other than air.

The SAMES KREMLIN **PPH 308** atomizer is covered by a one-year warranty for use in two 8-hour shifts per day under normal operating conditions.

By concession, the warranty is extended to 10,000 hours on the air turbine of the PPH308. The warranty does not apply to wearing parts such as spraying bell cups, membranes, seals etc.

The warranty start date shall be deemed to be the date of first operation or of the provisional acceptance report.

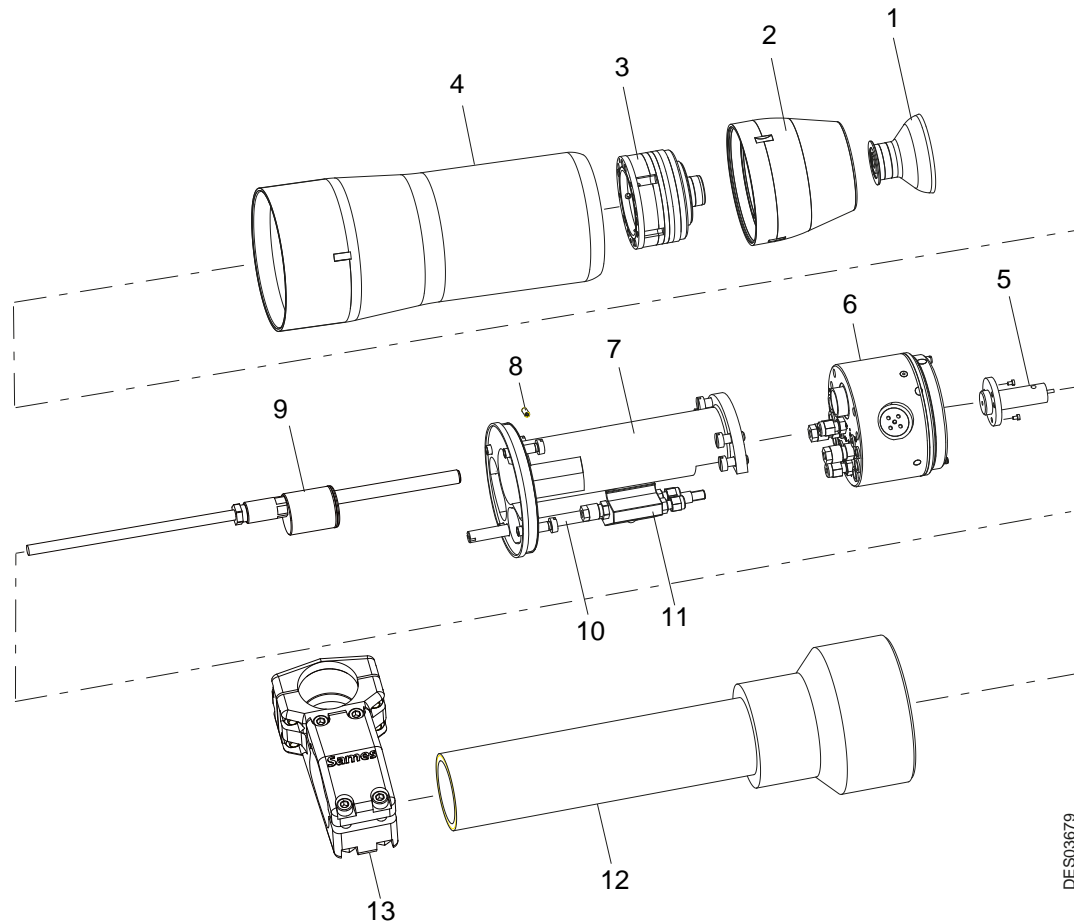
Under no circumstances, either in the context of this warranty or in other contexts, shall SAMES KREMLIN be liable for physical injury, property damage or related losses, damage to brand image and loss of production resulting directly from its products.

2. Description

The PPH 308 atomizer is used in automatic mode for the electrostatic spraying solvent liquid paints.

The PPH 308 is a complete atomizer with built-in painting and rinsing assemblies. It is fitted with an air-cushioned magnetic air bearing turbine capable of reaching a rotation speed of 45,000 rpm.

A careful study should be made of its design and tools, for quick and easy maintenance.



DES03679

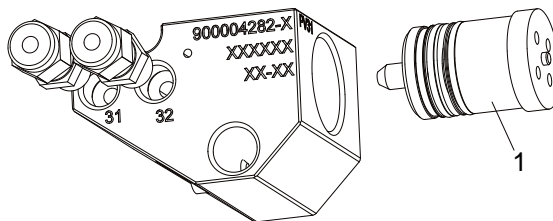
1	Bell cup (see RT Nr 6285)
2	Vortex air shroud assembly (see RT Nr 6285)
3	"Magnetic bell cup" type magnetic air bearing turbine (see RT Nr 6350)
4	Protective cover
5	Injector/ Injector holder
6	MANIFOLD block comprising three dual-channel product and dump microvalves
7	Placebo holder
8	Placebo locking screw
9	Placebo
10	Tie rod for the 1 PV block
11	Dual-channel air/solvent microvalve unit (1 PV block)
12	PPH support tube
13	Securing nut

2.1. Dual-channel air/solvent microvalve unit (1 PV block)

This unit includes one air/solvent microvalve:

1	Air/solvent microvalve (PV 31) for external bell cup rinsing
---	--

The dual-channel microvalves are air-controlled and are normally in closed position. They are involved in various operations, such as external bell cup rinsing, injector and paint supply rinsing, and paint rinsing (these latter three are located in the manifold block).

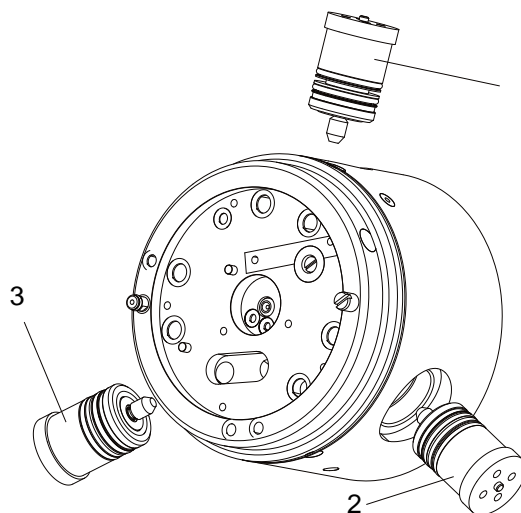


DES04177

2.2. MANIFOLD block

This assembly includes three microvalves:

1	Dump microvalve (PV 41)
2	Air/solvent microvalve (PV 32) for injector rinsing
3	Product microvalve (PV 11)



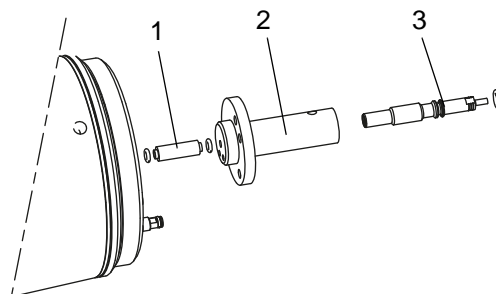
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2.3. Injector, injector holder and restrictor

1	Restrictor (1.2 mm diameter)
2	Injector holder
3	Injector (1.8 mm diameter)

The restrictor provides a suitable pressure drop for the required flow rate.

The injector holder is permanently secured to the body of the PPH 308. It is fitted with an injector whose restrictor can be changed according to the pressure drop required for the paint spraying equipment and product used.



DES01307

2.4. "Magnetic bell cup" type magnetic air bearing turbine

[see RT Nr 6350](#)

The bell cup is rotated by means of a pneumatic motor. Paint is sprayed due to the centrifugal forces generated by rotation of the bell cup. The higher the rotational speed, the smaller the particles that are sprayed.

2.5. Shaping air

The air supply circuit can be used to alter the spraying pattern. If the shaping air pressure is increased, the pattern is narrower and likewise, if it is decreased the pattern is wider.

The shaping air arrives on the turbine side, flows through the holes on outside of the shaping air assembly and is then directed towards the bell cup.

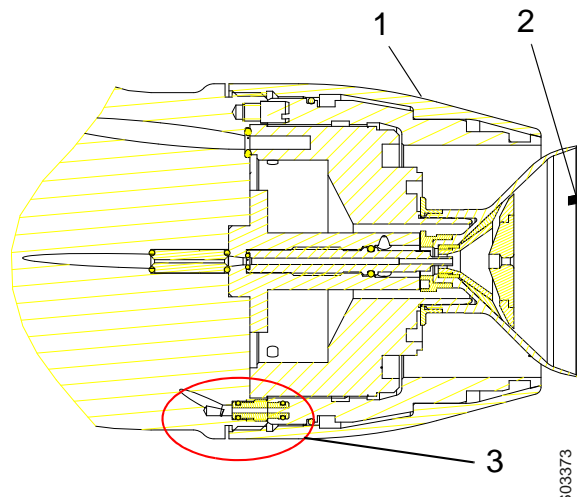
2.6. Outer cover

The outer air shroud acts as a cover, and also facilitates cleaning of the atomizer.

2.6.1. Rinsing the outside of the bell cup

1	Shaping air assembly
2	Bell cup
3	Solvent pipette

The solvent flows through a nozzle and uses one of the openings in the air shroud to rinse the outside of the bell cup.



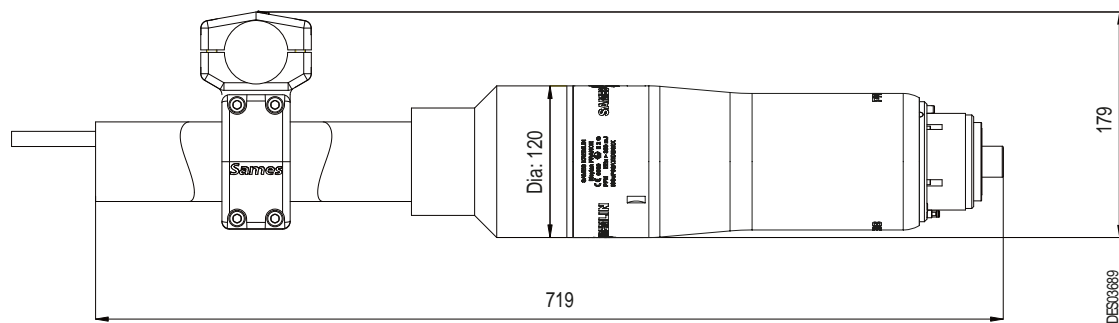
2.7. Bell cups

[see RT Nr 6285](#)

The bell cup atomises all particle-base paint types . Select the appropriate bell cup according to the type of product used.

3. Technical characteristics

3.1. Dimensions (mm)



3.2. Operating characteristics

Weight		
	PPH 308 without hoses or cables	2.5 kg
Current		
	Maximum operating voltage	100 kV
	Maximum operating current	200 μ A
Speed		
	Recommended rotation speed	10,000 to 45,000 rpm
Paint		
	Paint flow rate	30 to 500 cc/min max. (depending on paint)
	Normal supply pressure	6 to 8 bar
	Maximum pressure	10 bar max.
	Viscosity	12 to 40 seconds - FORD cup # 4
	Viscosity	12 to 45 seconds - AFNOR cup # 4
	Paint resistivity	$\rho \geq 0,5 \text{ M}\Omega \cdot \text{cm}^*$
Air pressure		
	Microvalve pilot	6 to 10 bar max.
	Bearing air	6 to 7 bar max.
	Microphone air	1.9 to 3 bar constant
	Shaping air	6 bar maximum
Compressed Air quality		
	Filtered (bearing air), dry, oil and dust-free according to standard NF ISO 8573-1	
	Maximum dew point at 6 bar (87psi)	Class 4, i.e + 3° C (37° F)
	Maximum oil concentration	Class 4, i.e 2 mg / m₀^{3**}
	Maximum particle size of solid contaminants	Class 3, i.e 5 μm
	Maximum concentration of solid contaminants	5 mg / m₀^{3**}
Air consumption		
	Pilot	10 NI/min
	Bearing air	125 NI/min
	Shaping air	0 to 600 NI/min according to the shaping air assembly used
	Turbine	see RT Nr 6350

* Resistivity values measured with Resistivohmeter AP 1000 (SAMES P/N: 910005790). For lower values, contact SAMES KREMLIN.
For values greater than 6 M Ω .cm, you are advised to use the PPH 308 with integrated high voltage unit.

** m₀³ values given for a temperature of 20 °C at 1013 mbar atmospheric pressure.

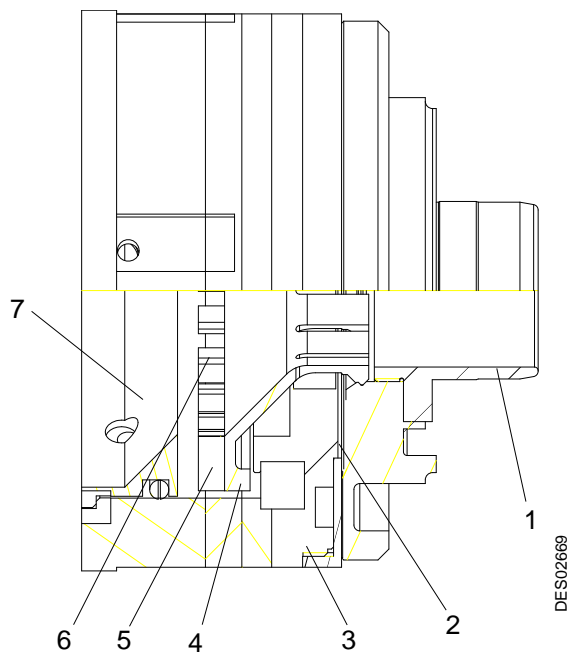
3.3. Operating principle

3.3.1. Turbine [see RT Nr 6350](#)

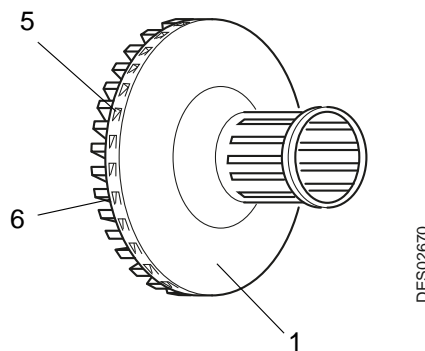
This turbine has no mechanical shaft and is kept aligned simply by the polarity difference between the bearing magnets. This system also completely eliminates friction.

The bearing air, which is uniformly distributed across the stator surface generates an air cushion, separating rotor and stator. The rotor can turn freely, held in place by the balance of the pressure and magnetic forces. The air directed onto the turbine blades makes it possible to rotate or brake the rotor.

The product is sprayed due to the centrifugal forces generated by the bell cup rotation. To a certain extent, the size of the particles sprayed decreases as the rotation speed increases.



1	Rotor
2	Stator magnet
3	Turbine body (stator) with a supply of: - Bearing air - Turbine rotation and braking air - Shaping air
4	Openings for turbine braking
5	Teeth for turbine rotation
6	Drive vane for braking and rotation
7	Deflector fitted with seal



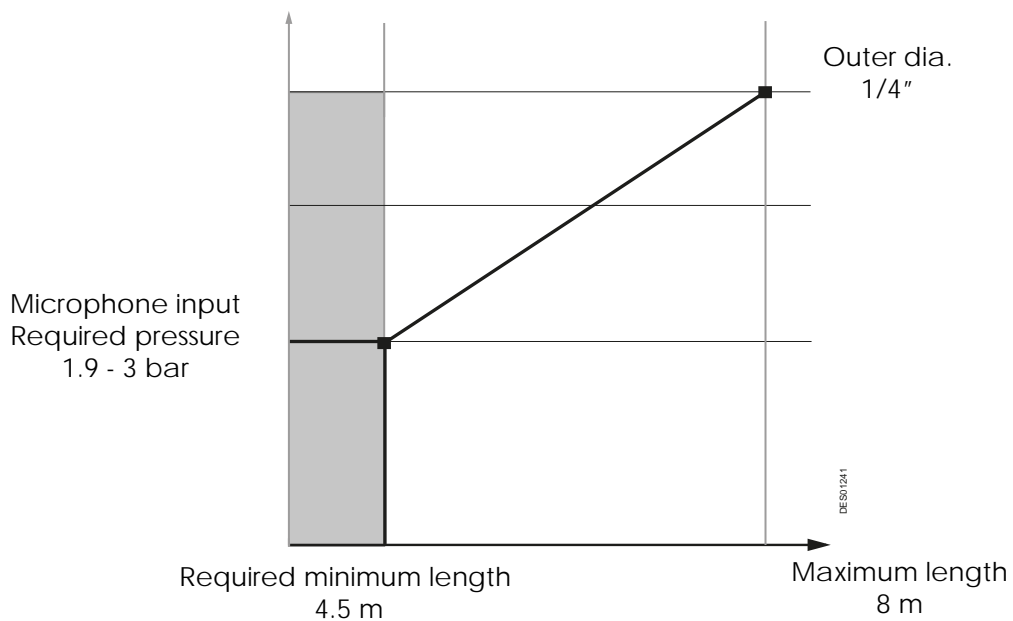
3.3.2. Turbine Rotation Speed

Measurement of rotation speed is based on an acoustic principle.

Air enters via the injector holder. The machined groove in the "microphone reader" on the bell cup allows rotational air through.

This pressure variation generates a noise, or "frequency signal", which travels through the injector holder and is picked up by a microphone.

The microphone converts the acoustic signal into an electrical frequency signal in order to be processed by the turbine speed regulation module. One pulse is emitted for each revolution.



3.3.3. Microphone

[see RT Nr 6190](#)

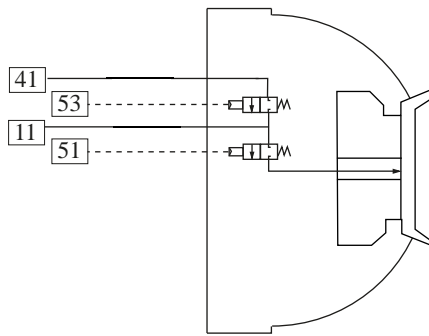
The microphone is linked to a SAMES KREMLIN frequency/voltage control to convert the analogue frequency signal into an analogue level signal (0 - 10 V) or digital signal (pulse).

Please contact SAMES KREMLIN for the appropriate part number for use with your set-up.

4. Fluid Diagram of the Various Circuits

4.1. Paint flow diagram

For use of the rinsing circuit (generally used to change colours)



DES01309

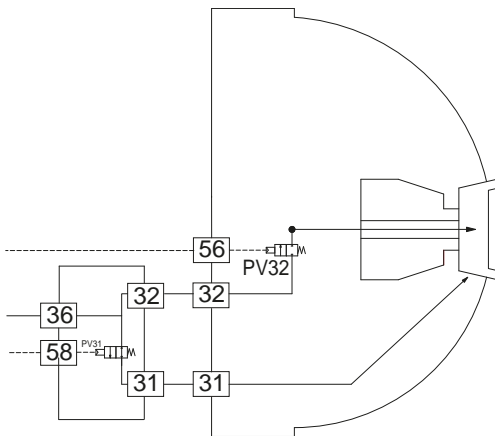
11	Paint supply - Dia. 5 x 8 PTFE
41	Dump - Dia 5 x 8 PTFE
51	Paint supply pilot - Dia 2.7 x 4 - Polyamide
53	Dump pilot - Dia 2.7 x 4 - Polyamide

The "11" and "41" hoses (5/8 PTFE) should be sheathed with 9/12 PTFE hoses.

Note: PTFE hoses must never be replaced by polyamide hoses.

Blue hoses are used for the various different types of air supply.
Clear hoses are used for product.

4.2. Bell cup and injector rinsing diagram



DES04173

31	Solvent / air rinsing - Outside of bell cup - Dia. 2 x 4 PTFE
32	Solvent / air rinsing - Injector - Dia. 2 x 4 PTFE
56	Solvent / air rinsing pilot - Injector - Dia. 2.7 x 4 - Polyamide
58	Solvent / air rinsing pilot - Outside of bell cup - Dia. 2.7 x 4 - Polyamide

31: Bell cup rinsing - the bell cup is rinsed via the air/solvent inlet.

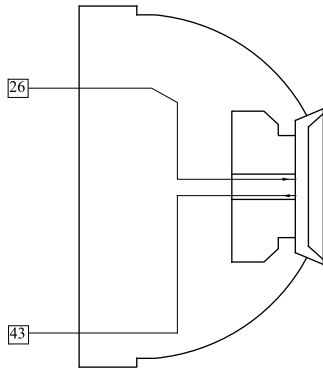
32: The air/solvent supply rinses the paint supply line up to the bell cup.

The "36" hose (4/6 PTFE) should be sheathed with 7/10 PTFE hose.



WARNING : The rinsing cycle must end with a compressed air sequence, circuits 31,32 and 36 must be purged and dried during 1 to 2 seconds before restarting the high voltage.

4.3. Microphone air diagram

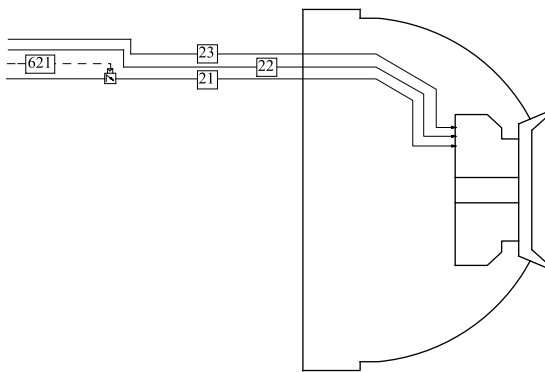


DES00004

The microphone air is controlled by a remote regulator.

26	Microphone air - Dia. 4 x 6 - Polyamide
43	Microphone return supply - Dia. 4 x 6 - Polyamide

4.4. Turbine rotation diagram



DES00007

21	Turbine rotation - Dia. 7 x 10 - Polyurethane
22	Turbine braking - Dia. 6 x 8 - Polyamide
23	Bearing air - Dia. 4 x 6 - Polyamide
621	Turbine rotation control/regulation - Dia 2.7 x 4 - Polyamide

23: The bearing air separates the rotor from the stator.

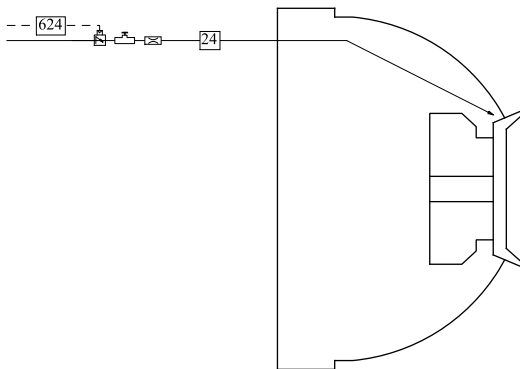
22: Supplies turbine braking air.

21: Supplies turbine rotation air.

22 via a solenoid valve.

The bell cup speed control module activates circuit 21 via a proportional air valve and circuit

4.5. Shaping air diagram



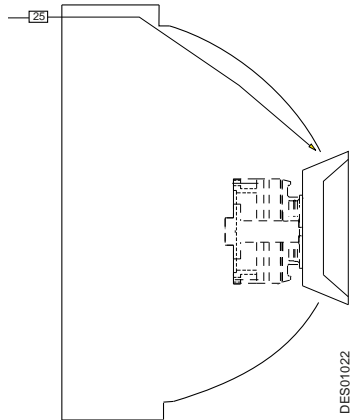
DES00040

24	Shaping air - Dia. 6 x 8 - Polyamide
624	Shaping air control/regulation - Dia. 2.7 x 4 - Polyamide

24 : The shaping air supply controls the pattern diameter.

Shaping air is controlled via a proportional air valve.

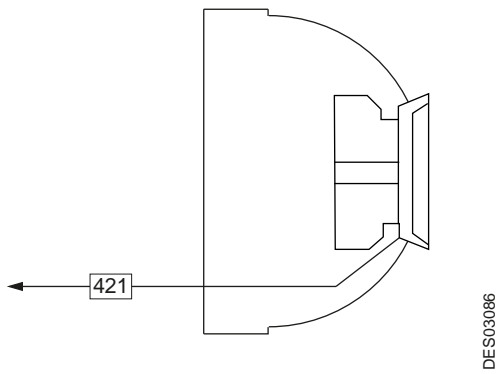
4.6. Compensation air diagram



25	Compensation air - Dia. 6 x 8 - Polyamide
----	---

25 : The compensation air prevents any contamination of the inner shaping air shroud and is controlled via a remote regulator.

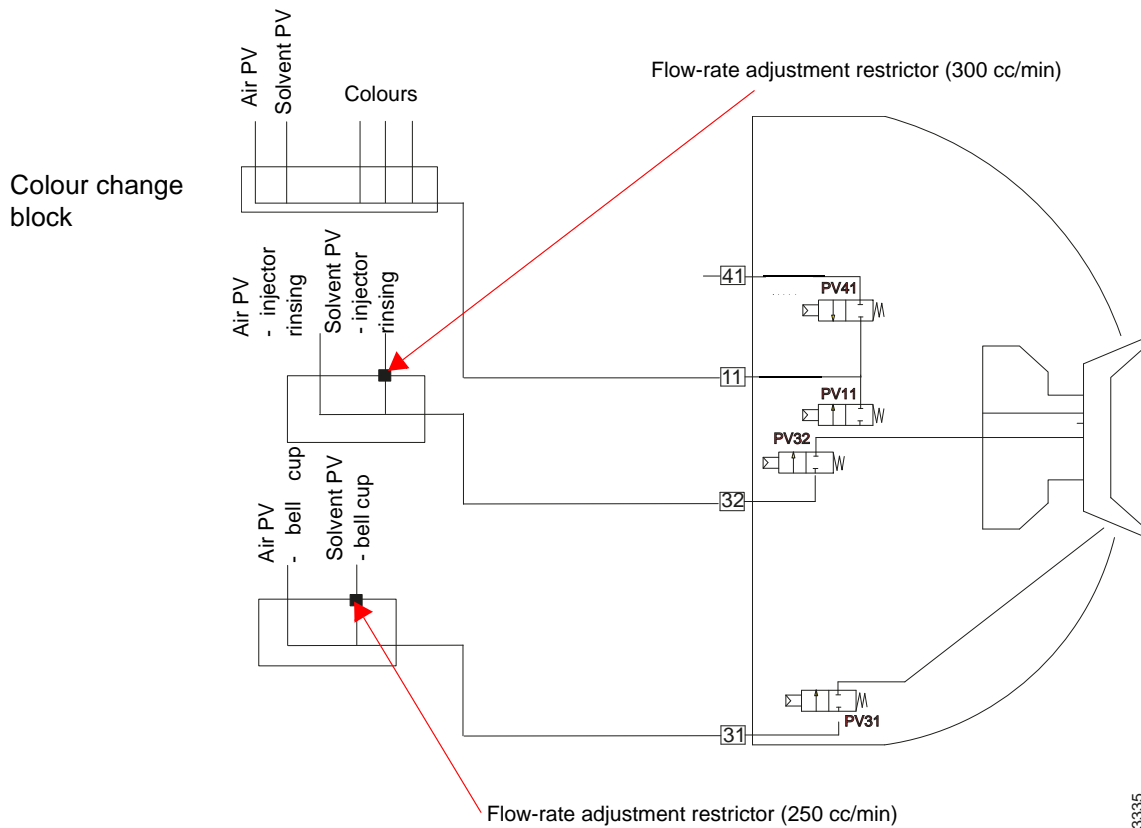
4.7. Turbine exhaust diagram



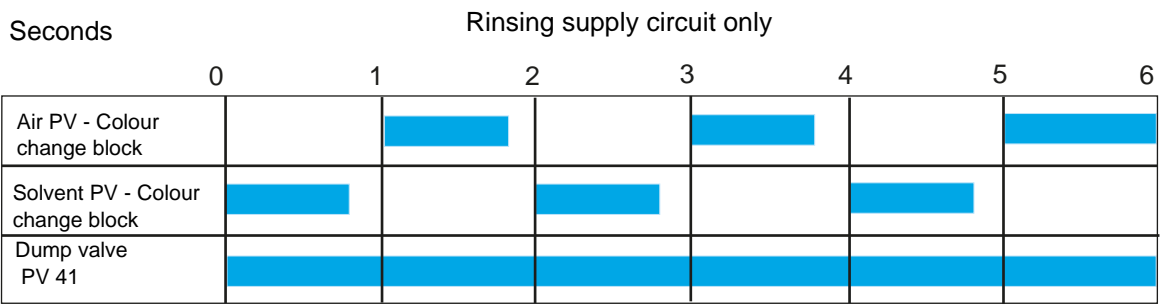
421	Turbine exhaust - Dia. 8 x 10 - Polyamide
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4.8. Colour change and rinsing cycles

Example of atomizer integration



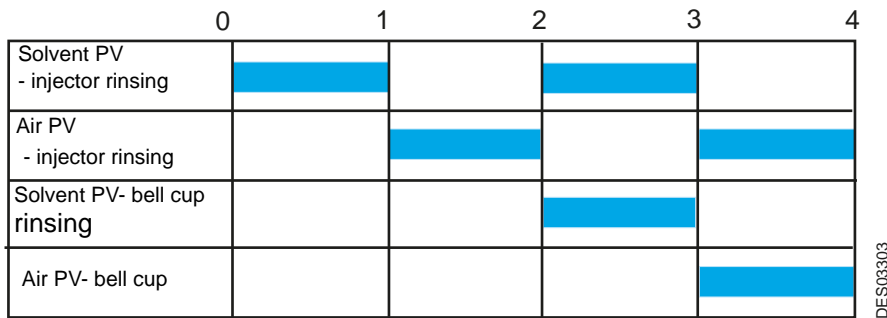
DES03335



- Standard conditions: 6 bar, air, solvent and paint.
- Colour change block and rinsing block operated 1 to 1.5 metres away from atomizer.

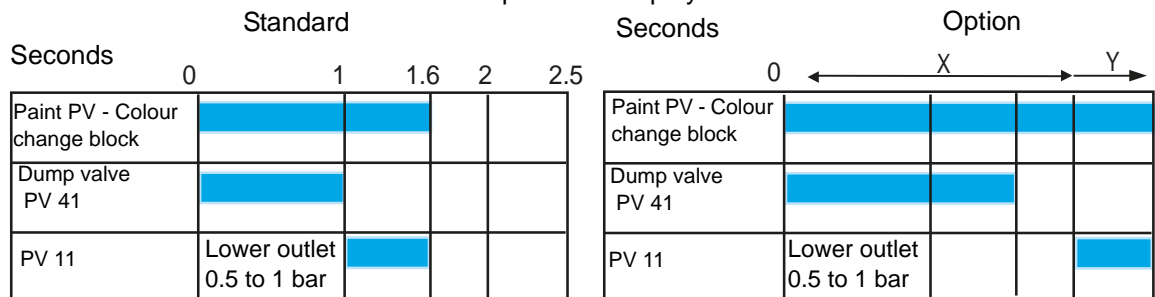
Seconds

Rinsing bell cup only



DES03303

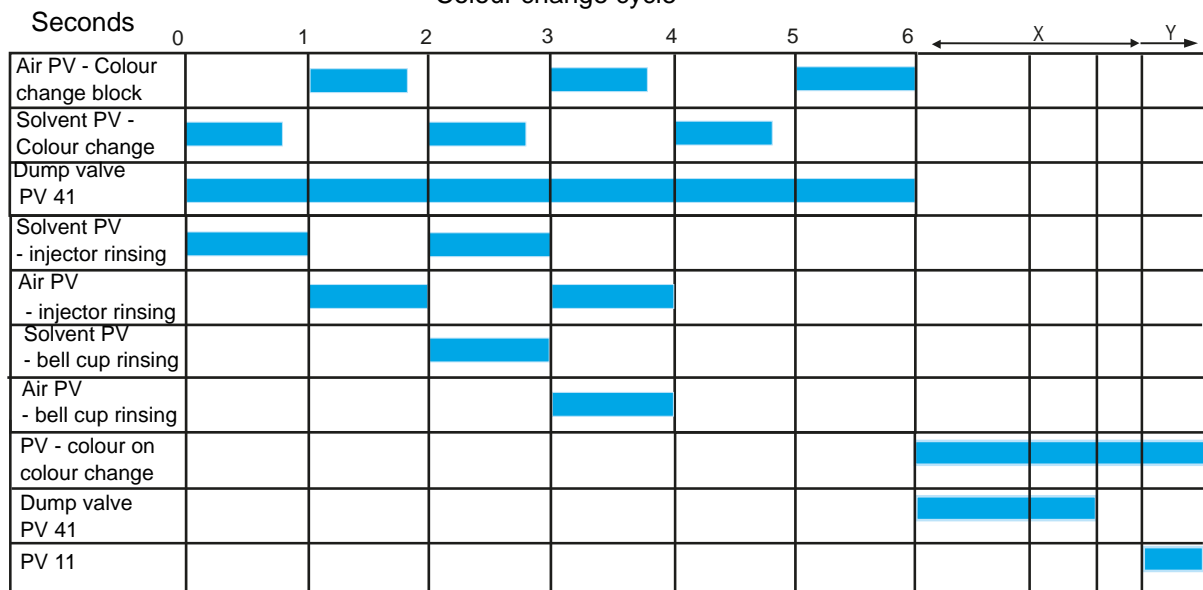
Example of start-up cycle



DES01057

- Normal paint flow rate with valve activated: 150 cc/min
- X: Time required for the paint to flow from the colour change block to the bell cup.
- Y: Time required for paint to leave the bell cup.

Colour change cycle



- Recommended solvent flow rate for injector: 300 cc/min
- Recommended solvent flow rate for bell cup rinsing: 250 cc/min
- Always use restrictors if the flow rate exceeds the values above.
- The final pneumatic pulse clears and dries the rinsing circuit for the outside of the bell cup in order to prevent any solvent being sprayed.

5. Maintenance

5.1. Shut-down and start-up procedures

Important recommendations

Comply with the air settings given in Section 3.2.

The rotor and stator become inoperable if the bearing air is cut off during rotation.

The bearing air pressure must be at least 6 bar at the quick-disconnect plate.

(*For hose lengths greater than 4.5 m, the correct air pressure value is determined by taking the measurement at the quick-disconnect plate).

Check that the speed regulating module transmits a signal.

5.1.1. Shut-down Procedure

Important steps to follow:

- **Step 1:** Stop spraying (PV 51 shut)
- **Step 2:** Switch off the high-voltage power supply,
- **Step 3:** Perform a circuit rinse cycle*,
- **Step 4:** Cut off the shaping air,
- **Step 5:** Cut off turbine rotation air and wait until the turbine comes to a complete stop (0 rpm),
- **Step 6:** Cut off the bearing air.



WARNING : * The rinsing cycle must end with a compressed air sequence, circuits 31,32 and 36 must be purged and dried before restarting the high voltage.



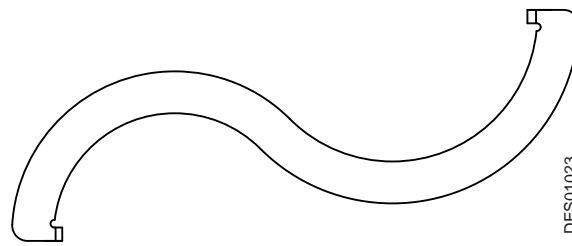
WARNING : The turbine must never be stopped by cutting off the bearing air supply. Wait until the turbine has come to a complete stop before cutting off the bearing air.

5.1.2. Start-up Procedure

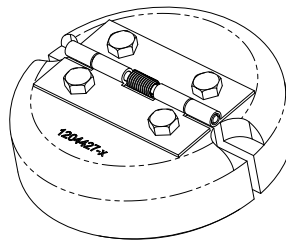
Important steps to follow:

- **Step 1:** Switch on the bearing air supply (6 bar),
- **Step 2:** Start up turbine rotation,
- **Step 3:** Switch on the shaping air supply,
- **Step 4:** Switch on the high voltage supply,
- **Step 5:** Start up atomisation.

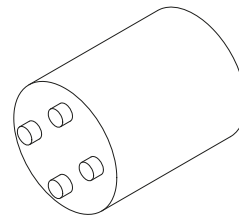
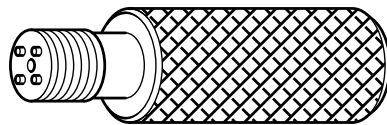
5.2. Tools



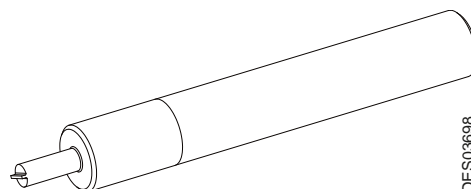
Part number	Description	Qty	Unit of sale
1308689	Outer cover removal/reassembly tool	1	1



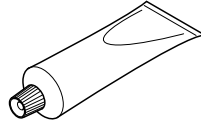
Part number	Description	Qty	Unit of sale
1204427	Removal tool for magnetic bell cup 65 EC	1	1
900000803	Removal tool for magnetic bell cup 50 EC	-	1
900000804	Removal tool for magnetic bell cup 35 EC	-	1



Part number	Description	Qty	Unit of sale
1303689	Microvalve removal/reassembly tool	1	1
1403478	Automatic microvalve tightening tool	1	1



Part number	Description	Qty	Unit of sale
900002675	Placebo resistor assembling tool	1	1



DES00685

Part number	Description	Qty	Unit of sale
H1GMIN017	Vaseline (100 ml)	1	1
H1GSYN037	Dielectric grease (100 ml)	1	1

5.3. Installing the Atomizer

For installation rules: [see § 1.4.1 page 10](#).

- **Step 1:** Secure the support tube onto the painting apparatus using the securing nut.
- **Step 2:** Position the placebo assembly (with high voltage cable) in the atomizer sheath. Lock placebo in place using the M 4x 10 screw, but do not fully tighten.
- **Step 3:** Connect air and product hoses to the manifold block.



WARNING : The 36 hose (4/6 PTFE) must first be sheathed with a 7/10 PTFE hose, the paint (11) and dump (41) hoses (5/8 PTFE) by a 9/12 PTFE hose. Screw a sealing union at each end of the sheath (P/N 910006017 for the 36 hose and P/N 910006552 for 11 and 41 hoses). Total sheath length should be approximately 5 cm less than the hose length. The product hose (5/8 PTFE) must also be sheathed with a 9/12 PTFE hose.

- Thread the hoses and high voltage cable through the support tube.
- Secure atomizer PPH 308 to the support tube with four M 8 x 30 screws.
- Screw the cover on to the atomizer.
- Fit the shaping air shroud, outer cover and bell cup.

6. Atomizer Maintenance



WARNING : These operations are to be performed only by trained persons.

6.1. Removing and re-installing the PPH 308

6.1.1. Disassembly

Rinse the PPH 308 before disassembly.

- Switch off the high-voltage power supply.
- Unlock the cover with the special tool (P/N 1308689).
- Unscrew and remove the cover.
- Loosen the screw that lock the placebo into its sheath ([see § 2 page 17](#)).
- Disconnect all hoses entering the Manifold block and 1 PV block (except hoses connected between the 1 PV block and Manifold block).
- Loosen the 4 screws securing PPH 308 to holder.



WARNING : Do not remove the clamps from the MANIFOLD block to make sure they are not lost.

6.1.2. Reassembly

- Secure PPH 308 to support with the 4 screws.
- Reconnect all hoses to the MANIFOLD block and 1 PV block.
- Manually refit the cover and lock with the special tool (P/N 1308689).

6.2. Bell cups

For assembly and disassembly instructions [see RT Nr 6285](#)

6.3. Shaping air assembly (shroud and cover)

For assembly and disassembly instructions for the shaping air assembly [see RT Nr 6285](#)

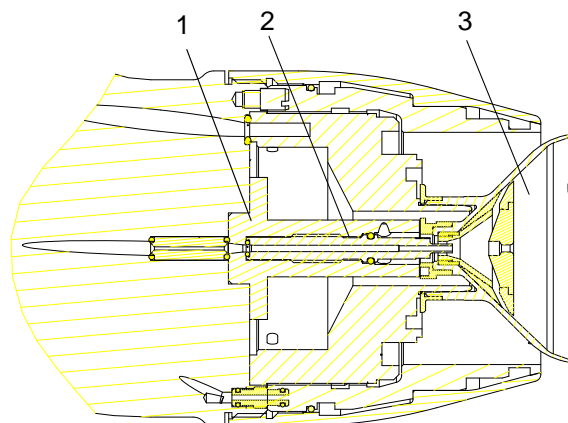
6.4. Turbine

[see RT Nr 6350](#) see attached manual.

6.5. Injector holder

The injector holder is secured to the body of the PPH 308 by three M3 x 10 screws. Its positioning pin ensures correct positioning.

1	Injector holder
2	Injector
3	Bell cup



DES003373

6.6. Injector

6.6.1. Disassembly

- Switch off the machine.
- Remove bell cup ([see RT Nr 6285](#)).
- Remove outer cover.
- Remove shaping air shroud.
- Use a 2.5 mm Allen key to remove the five screws securing the turbine. Remove turbine.
- Use a 2.5 mm Allen key to remove the three screws securing the injector holder.
- Unscrew the injector (clockwise) using a 5 mm open-ended spanner, and remove it carefully, to avoid damaging the injector and its two o-rings.
- Clean ([see § 7 page 39](#)).

6.6.2. Reassembly

- Clean ([see § 7.2.3 page 42](#)) the components and check their condition. Replace if necessary.
- Insert the microphone seals into the manifold block.
- Put in place the injector holder with the alignment pin and tighten the three screws using a 2.5 mm Allen key.
- Fit both seals on the injector.
- Place the injector on the injector holder and tighten anticlockwise (figure 4) to a torque of 3.5 Nm.
- Secure the turbine onto the elbow using the five screws and tighten to a torque of 1.5 Nm.
- Refit the shaping air shroud.
- Clip the bell cup onto the turbine.
- Put the outer cover in place, manually tighten then complete the tightening using the special tool (P/N 1308689).
- Reconnect the power supply.

6.7. 1 PV Block and Manifold Block

6.7.1. Disassembly

- Remove PPH 308.
- Loosen the screw securing the 1 PV block onto the tie-rod.
- Disconnect the hoses between 1 PV block and Manifold block.
- Unscrew the tie-rod ([see § 2 page 17](#)).
- Unscrew tie-rod from Manifold block.
- Extract tie-rod from 1 PV block.
- If necessary, remove Manifold block restrictor (this requires the injector / injector holder assembly to have been removed).

6.7.2. Reassembly

- Refit or replace the restrictor, depending on the product viscosity.
 - Check the condition of the Manifold block components (seals, solvent nozzle, coupling) and change if required.
- Check that there are no cracks on the 1PV block and especially around fitting 31.



WARNING : If the plastic coupling is replaced, PTFE tape will need to be wrapped around the thread of the new plastic coupling (2 to 3 turns approx). Beware to avoid overlapping the tape onto the coupling surface.

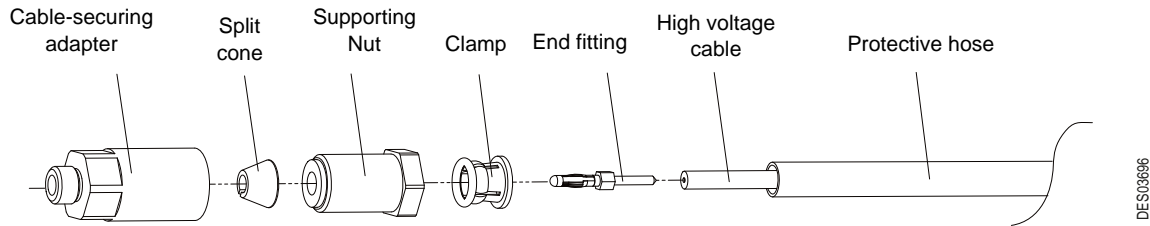
- Check that all seals are in place on the Manifold block.
- Insert tie-rod into 1 PV block and screw onto Manifold block.
- Lock tie-rod to support, tightening the screw fully in.
- Connect the hoses between 1 PV block and Manifold block.
- Lock 1 PV block to tie-rod, by tightening the nylon screw M5 x 10.

6.8. Microvalves

[see RT Nr 6021](#)

6.9. High Voltage Connection

6.9.1. Preparing the high voltage connection

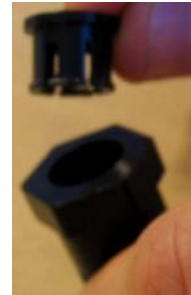


WARNING : Ensure that insulation is not damaged. Any scratch or start of a cut on the surface of the insulating material will result in breakdown of the high voltage cable.

- **Step 1:** Strip back approximately 22.5 cm of the purple insulation from high voltage cable with a wire stripper. A "Stanley knife" type cutting tool must not be used. Next strip back approximately 19 cm of the semi-conductive sheath (black sleeve) and cut it with cutting pliers.
- **Step 2:** Insert seal and clamp into the nut.
- **Step 3:** Slide the nut assembly, split cone and the cable-securing adapter onto the cable. Then screw the nut onto the adapter.



Step 1



Step 2



Step 3

- **Step 4:** Insert the end fitting into the high voltage cable and screw on manually, then with a 6 mm open-ended spanner. Tighten fully.

- **Step 5: Lubrication**

- Coat the high voltage cable end fitting with a layer of dielectric lubricant.



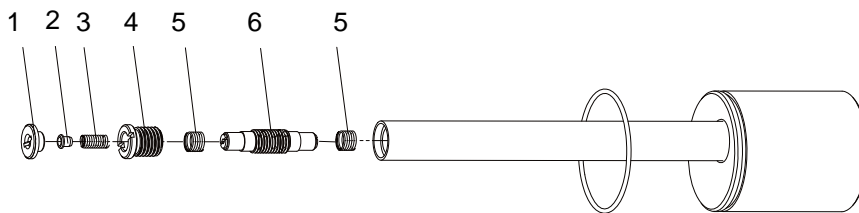
- **Step 6:** Insert high voltage cable into placebo and push it fully in.



- **Step 7:** Coat placebo thread with IS401 adhesive and screw the cable-securing adapter onto placebo.



6.9.2. Assembling / disassembling the internal resistor in the placebo



DES03703

6.9.2.1. Disassembly

- **Step 1:** Unscrew high voltage cable stopper (item 1) with a flathead screwdriver.
- **Step 2:** Remove HV contact disc (item 2) and spring (item 3).
- **Step 3:** Unscrew HV contact housing (item 4).
- **Step 4:** Unscrew resistor (item 6) assembly with its two springs (item 5) with a flathead screwdriver.

6.9.2.2. Reassembly

- **Step 1:** Coat all components with a thin layer of dielectric lubricant.
- **Step 2:** Assemble resistor (item 6) with its two springs (item 5), then screw into the placebo using the special tool (P/N 900002675).
- **Step 3:** Screw on HV contact housing (item 4).
- **Step 4:** Place spring and HV contact disc into the placebo.
- **Step 5:** Screw in high voltage cable stopper.

6.9.3. Installation on atomizer

- **Step 1:** Insert placebo assembly into PPH 308 sheath ([see § 8.1 page 43](#) item 10).
- **Step 2:** Screw in securing screw ([see § 8.1 page 43](#) item 12), but do not fully tighten.

7. Cleaning Procedures

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

- Stop the atomizer and switch off power supply.

Always refer to the health and safety instructions before carrying out any work [see § 1.4 page 7](#).



WARNING : Always wear safety goggles.
Whenever solvent is handled, rubber gloves must be worn.
Work in a well-ventilated area whenever solvent is used.



WARNING : Prior to cleaning, it is essential to wipe the atomizer using a cloth soaked in water, a soft brush and an approved cleaning product. Do not use a manual solvent gun.



WARNING : Do not soak the turbine in solvent.

The atomizer and its components must never be sprayed with solvent or water under any circumstances, whether at high or low pressure.



WARNING : SAMES KREMLIN **disadvise**s the use of anti-static plastic films to protect bodies and insulating covers of the atomizers. These films are conductive and can short-circuit the high voltage.

SAMES KREMLIN **forbids** the use of adhesives on the insulating parts of the atomizers. The glue of the adhesives is conductive and thus can short-circuit the high voltage.

SAMES KREMLIN **also forbids** the use of absorbent textile cover to protect bodies and insulating covers of atomizers. Textile covers retain the cleaning products and paint what can generate problems of high voltage (drilling, ionization, degradation of the material...).

Thus, SAMES KREMLIN **recommends** the use of insulating grease for protection of the atomizers.

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

This is why, insulating protection means must be renewed on a regular basis.

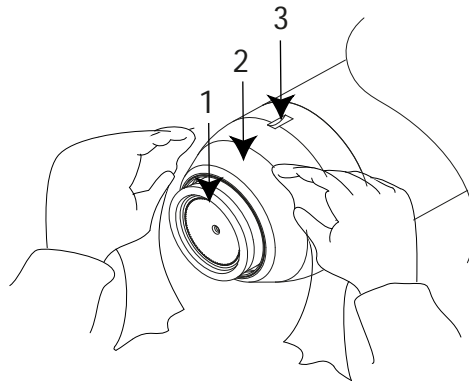
Procedure	Components	Frequency
A	Outer cover, outside of bell cup	8 hours
B	Bell cup, shaping air shroud, outer cover, outside of injector, outside of bell cup	120 hours

7.1. Procedure A



WARNING : Switch off the turbine. The bearing air and shaping air remains pressurised in order to prevent solvent passing between the bell cup and shaping air shroud.

- Clean the outer cover and outside of the bell cup with a clean cloth, dampened with solvent.
- Check that the grooves on the outer cover are clean.
- Dry carefully with a clean, dry cloth.



DES02097

1	Bell cup
2	Outer cover
3	Grooves on outer cover

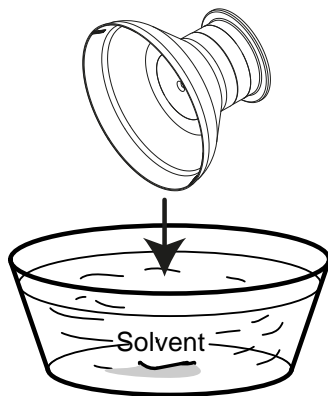
7.2. Procedure B



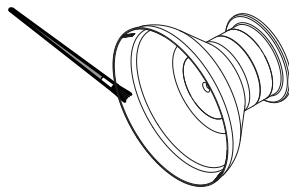
WARNING : Stop the turbine and cut off the shaping air

7.2.1. Bell cup

- Remove the bell cup using the specific tool.
- Leave the bell cup soaking in solvent for one hour then clean with a clean cloth and soft brush.

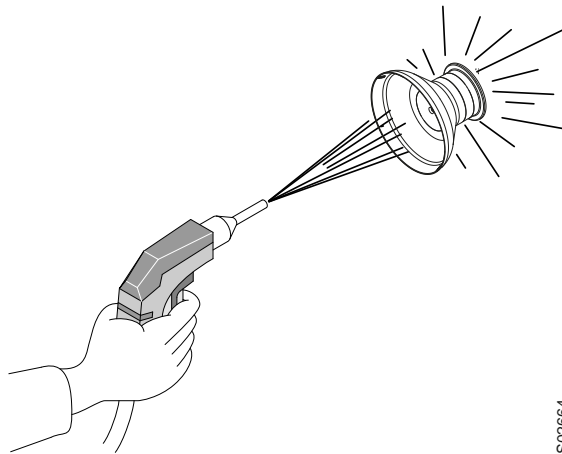


DES02662



DES02663

- Dry carefully with compressed air.

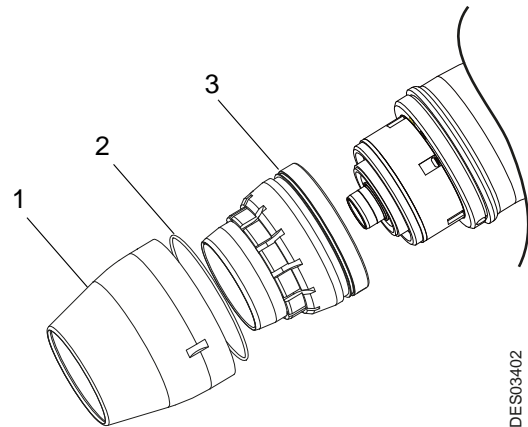


DES02664

7.2.2. Outer cover

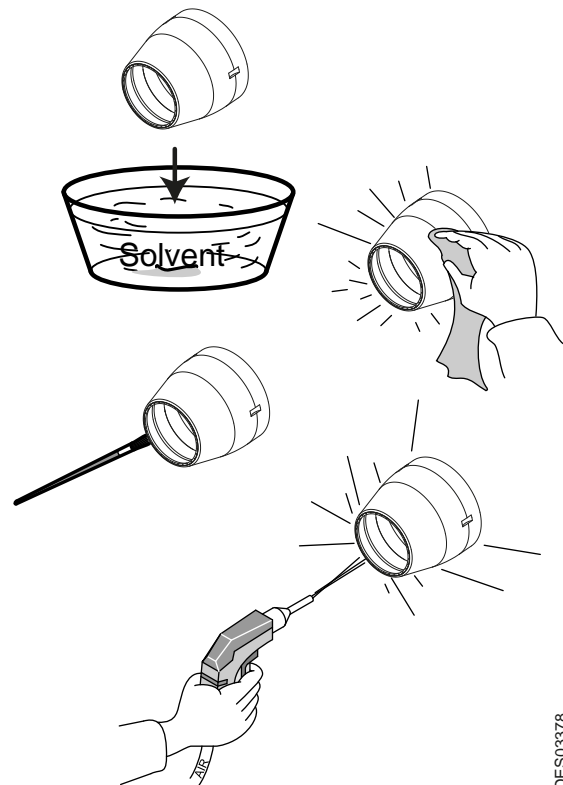
- Remove the shaping air assembly

1	Outer cover
2	O-ring
3	Shaping air shroud



DES03402

- Step 2: Leave the outer cover to soak in solvent for one hour then clean the outer and inner surface with a cloth soaked in solvent.
- Step 3: Clean all holes on the front of the outer cover with a nylon brush.
- Step 4: Dry carefully with compressed air, particularly focussing on the holes, to ensure any paint residue is removed, then wipe with a clean, dry cloth.
- Step 5: Check the condition of the inner shaping air shroud and, if necessary, clean it with a cloth soaked in solvent.



DES03378

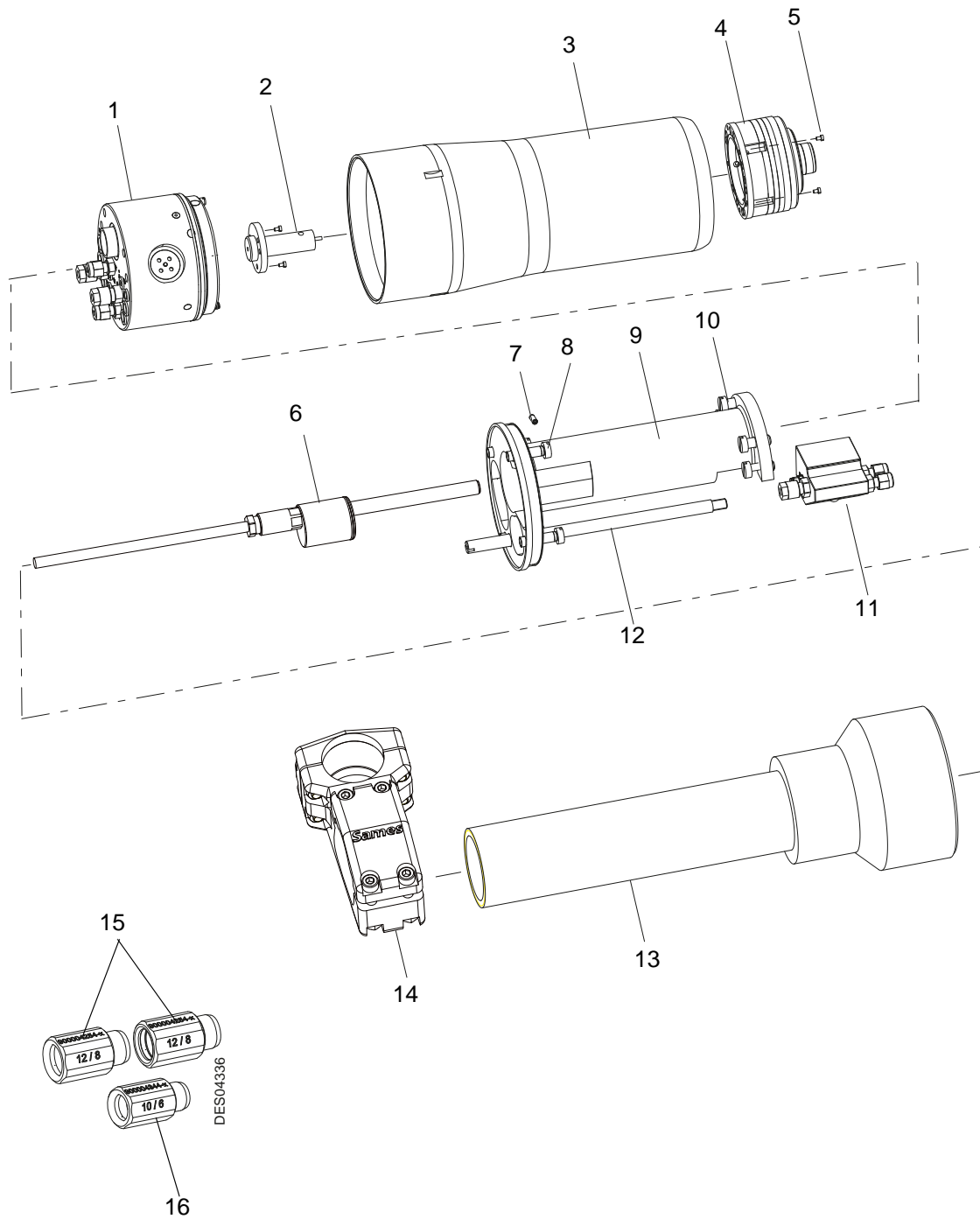
7.2.3. Injector and Injector Holder

- Remove injector [see § 6.6 page 34](#)
- Leave to soak for one hour in MEK solvent (methylethylketone).
- Dry carefully with compressed air.
- Reassemble in reverse order.

8. Spare Parts List

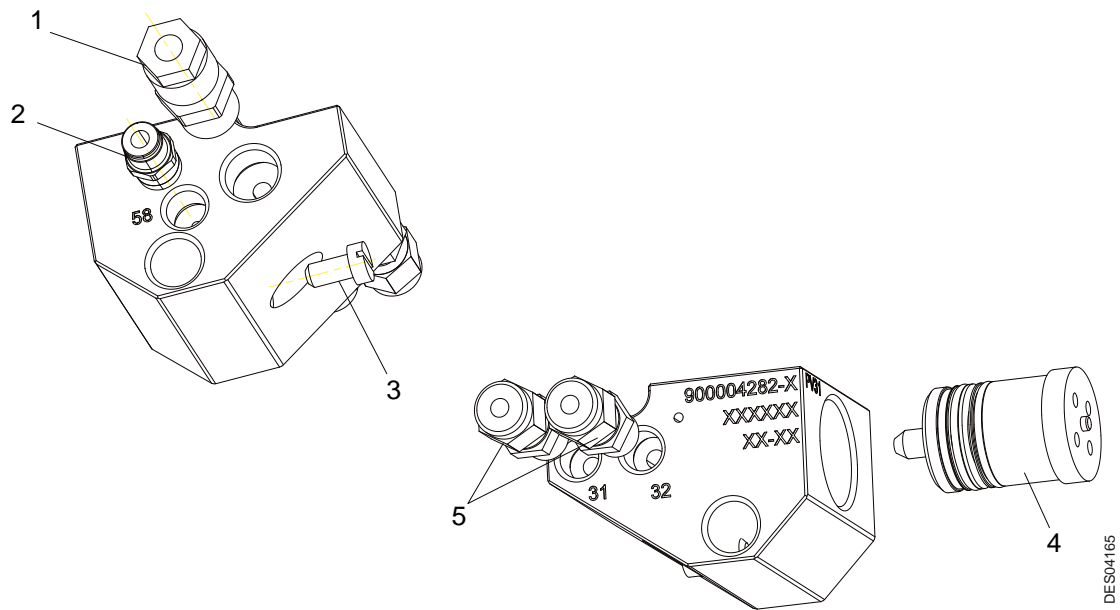
8.1. Single-circuit PPH 308 for solvent-based paints of resistivity $0.5 < \rho \leq 6 \text{ M}\Omega\cdot\text{cm}$

Bell cup and shaping air assembly not included.



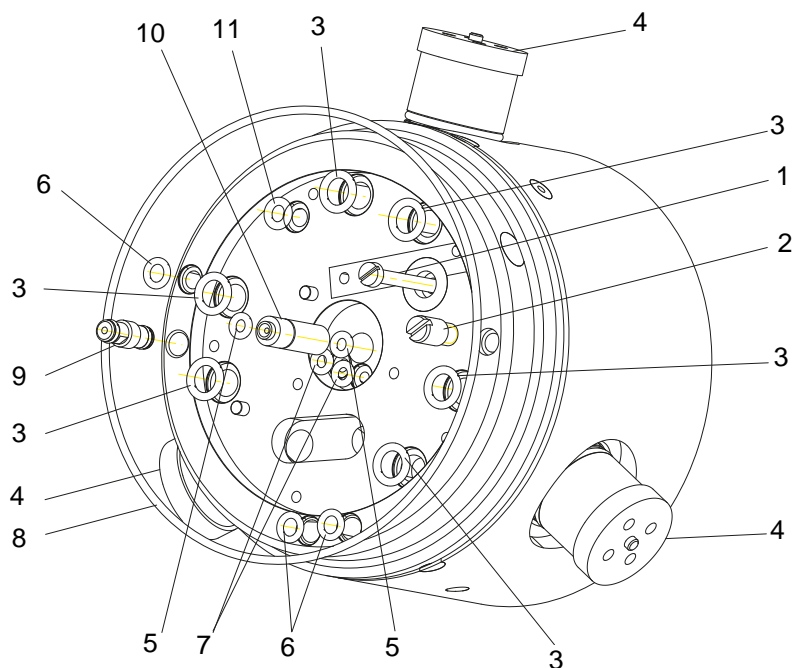
Item	Part number	Description	Qty	Unit of sale	First priority	Wear
	910003350	Single-circuit PPH 308 without regulator	1	1	-	-
1	910003632	MANIFOLD block (see § 8.3 page 46)	1	1	X	
2	910001130	Injector / Injector holder assy (see § 8.4 page 48)	1	1	X	
3	910003398	Cover	1	1	-	-
4	910000295	S6 Turbine with magnetic bell cup (see RT Nr 6350)	1	1	X	
5	X4FVSY067	CHC (Allen head) screws M5x20 (stainless steel)	5	1	-	-
6	910003213	PPH 308 ATEX Placebo	1	1	X	
7	X9NSFA118	Headless screws, C M4 x 10 (nylon)	1	1	-	-
8	X9SVCB285	Screws, C M 8 x 50 (nylon + glass fibre)	4	1	X	
9	1202048	Sheath for HVU placebo	1	1	-	-
10	X9SVCB283	Screws, C M 8 x 50 (nylon + glass fibre)	4	1	X	
11	910005997	1 PV block (see § 8.2 page 45).	1	1	X	
12	1405874	Tie rod for 2 PV block	1	1	-	-
13	1203616	PPH 308 Tube holder - D:63	1	1	-	-
14	1204441	Nut for tube	1	1	-	-
15	910006552	Sealing screwed union for 12/8-hose	2	1	-	X
16	910006017	Sealing screwed union for 10/6-hose	1	1	-	X
Not shown						
-	910003399	Grounding kit	1	1	-	-

8.2. 1 PV Block

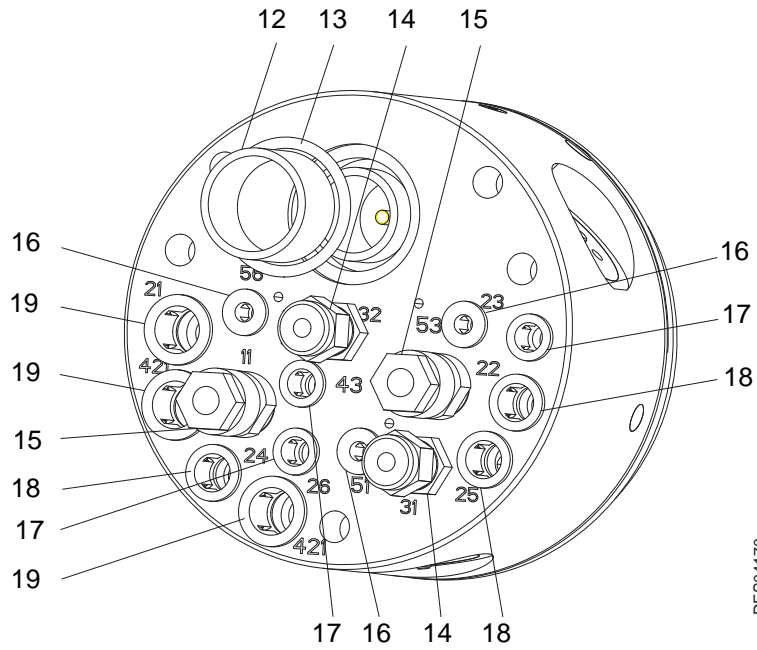


Item	Part number	Description	Qty	Unit of sale	First priority	Wear
	910005997	1 PV Block	1	1	X	
1	F6RPUK317	Male straight union 1/4 BSP for 4/6 hose	1	1		X
2	F6RLUS268	Male union	1	1		X
3	X9NVCB181	Nylon screw C M 5 x 10	1	1		X
4	1507375	Microvalve (see RT Nr 6021)	1	1		X
5	F6RPUQ062	Male union, 4 1/8"	2	1		X

8.3. MANIFOLD Block



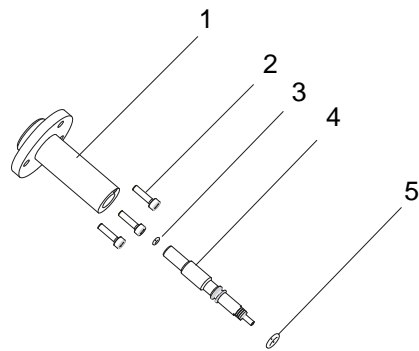
Item	Part number	Description	Qty	Unit of sale	First priority	Wear
	910003632	Manifold block	1	1	X	
1	1405931	Slotted screw, C M3 x 50 (brass)	1	1	-	-
2	1402691	Cover positioning device	1	1	-	-
3	J3STKL078	Chemically-inert O-ring	6	1		X
4	1507375	Microvalve (see RT Nr 6021)	3	1		X
5	J3STKL002	Chemically-inert O-ring	2	1		X
6	J3STKL039	Chemically-inert O-ring	3	1		X
7	J3STKL026	Chemically-inert O-ring	2	1		X
8	J2FENV638	O-ring	1	1		X
9	1519555	Solvent pipette assembly	1	1	-	-
	J3STKL027	Chemically-inert O-ring	2	1		X
10	640403	Restrictor - Dia. 1.2	1	1	X	
11	J3STKL035	Chemically-inert O-ring	1	1		X



DES04170

Item	Part number	Description	Qty	Unit of sale	First priority	Wear
12	449707	Spacer	1	1	-	-
13	J2FTCF051	O-ring	1	2	-	X
14	F6RPUQ062	Male union	2	1	-	X
15	910001739	1/4 Rack coupling for 5/8 hose	2	1	-	X
16	F6RXZG081	Stainless steel clamp and seal	3	1	-	-
17	F6RXZG082	Stainless steel clamp and seal	3	1	-	-
18	F6RXZG083	Stainless steel clamp and seal	3	1	-	-
19	F6RXZG084	Stainless steel clamp and seal	3	1	-	-

8.4. Injector / Injector holder assembly

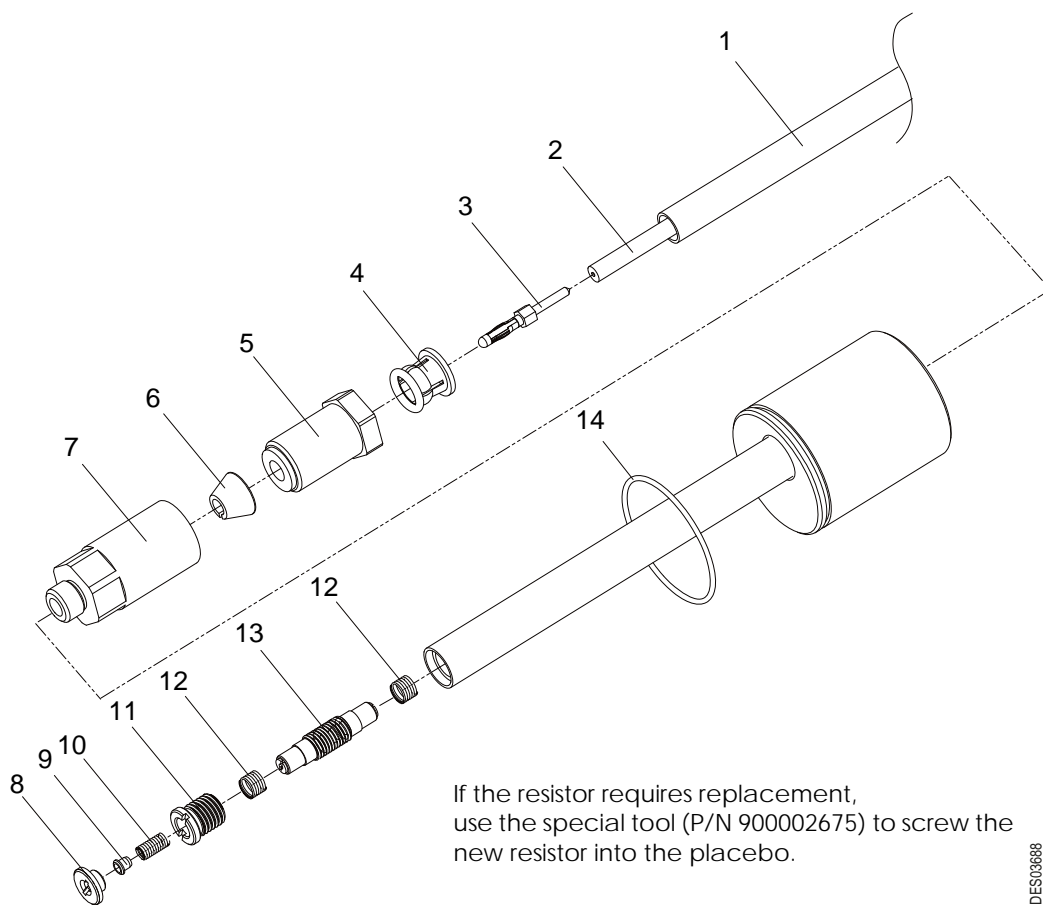


DES02117

Item	Part number	Description	Qty	Unit of sale	First priority	Wear
	910001130	Injector / Injector holder assembly	1	1	X	
1	738354	Injector holder	1	1	-	-
2	X4FVSY067	Stainless steel screw C M 3 x 10	3	1	-	-
3	J3STKL014	O-ring - chemically inert	1	1		X
4	738635	Injector Dia: 1,8	1	1	X	
5	J3STKL005	O-ring - chemically inert	1	1		X

8.5. Placebo and resistor

8.5.1. To connect to one PPH 308 atomizer

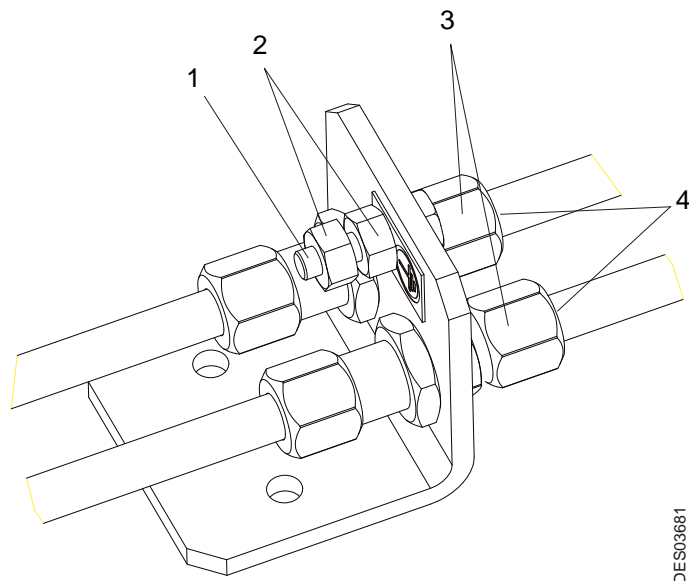


Item	Part number	Description	Qty	Unit of sale	First priority	Wear
	910003213	Placebo and resistor	1	1	X	
1	U1CBBR057	Protective hose, HV cable, D:10/12 clear polyamide	9 m	m	-	-
2	E2DAVD101	High voltage cable (100kV)	9 m	m	-	-
3	E4CSHT181	HV cable screw-on end-fitting	1	1	-	-
4	F6RXZG085	Stainless steel clamp and seal	1	1	-	-
5	1315058	Clamp nut	1	1	-	-
6	1411689	Split cone	1	1	-	-
7	900002154	Cable-securing adapter	1	1	-	-
8	548304	HV cable stopper	1	1	-	-
9	548303	HV contact disc	1	1	-	-
10	Q2HRDC095	Spring	1	1	-	-
11	900002471	HV contact housing	1	1	-	-
12	200000004	Spring	2	1	-	-
13	1315102	22 Mohm Resistor	1	1		X
14	J2FTDF416	O-ring	1	1		X

8.5.2. To connect two PPH 308 atomizers to a single HVU (optional)

Item	Part number	Description	Qty	Unit of sale	First priority	Wear
	910003563	Placebo and resistor	1	1	X	
1	U1CBBR057	Protective hose for HV cable, D:10/12 clear polyamide	4.25 m	m	-	-
2	E2DAVD101	High voltage cable (100kV)	4.25 m	m	-	-
3	E4CSHT181	HV cable screw-on end-fitting	1	1	-	-
4	F6RXZG085	Stainless steel clamp and seal	1	1	-	-
5	1315058	Clamp nut	1	1	-	-
6	1411689	Split cone	1	1	-	-
7	900002154	Cable-securing adapter	1	1	-	-
8	548304	HV cable stopper	1	1	-	-
9	548303	HV contact disc	1	1	-	-
10	Q2HRDC095	Spring	1	1	-	-
11	900002471	HV contact housing	1	1	-	-
12	200000004	Spring	2	1	-	-
13	1315102	22 Mohm Resistor	1	1		X
14	J2FTDF416	O-ring - Viton	1	1		X

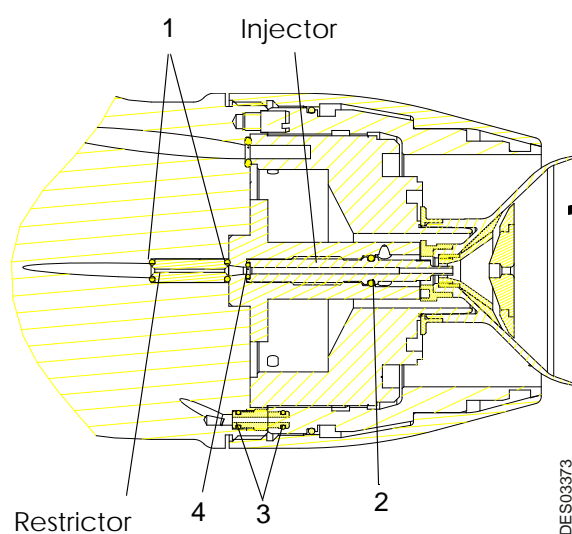
8.6. Grounding kit



DES03681

Item	Part number	Description	Qty	Unit of sale	First priority	Wear
	910003399	Grounding kit	1	1	-	-
1	X7CVHA226	Bolt, H M6 x 20 (brass)	1	1	-	-
2	X7CEHU006	Nut, H M 6 (brass)	2	1	-	-
3	F6RXGQ056	Bulkhead union	2	1	-	-
4	F6RXZX061	Stainless steel sheath	4	1	-	-

8.7. Turbine, injector and restrictor seals



Part number	Restrictor	Number of grooves	Colour
640400	D: 0.8 mm	-	Black
640401	D: 0.9 mm	1	Black
640402	D: 1.0 mm	2	Black
640403	D: 1.2 mm	-	White
640456	D: 1.5 mm	1	White
640464	D: 3.0 mm	2	White

Part number	Injector	Number of grooves
738632	D: 0.9 mm	-
738353	D: 1.2 mm	2
738634	D: 1.5 mm	3
738635	D: 1.8 mm	4

Item	Part number	Description	Qty
1	J3STKL005	Chemically-inert O-ring	1
2	J3STKL014	Chemically-inert O-ring	1
3	J3STKL002	Chemically-inert O-ring	2
4	J3STKL027	Chemically-inert O-ring	2