



**PPH 607 rotary atomizer,
bellcup 65 EC
P/N 1516592**

User manual

**Robotic single circuit with regulator
metric fittings**

FRANCE

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Robotic single circuit with regulator metric fittings

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Please take note of all caution and warning statements to ensure your personal safety, as well as optimum system operation.



CAUTION :

- **Caution statements presents information to maintain optimum operation of the system. Failure to follow caution statements hinders paint production and may damage equipment.**



SAFETY :

- **Safety warning information for your personal protection. Failure to follow Safety Warnings may result in severe personal injury and even death. Follow all Safety Warnings while operating SAMES Technologies equipment.**
- **Before start-up, remove any loose items such as tools, rags, etc.**
- **When disassembling and assembling the rotary atomizer, make sure the atomizer cannot slip out of your hands. Take appropriate measures such as wearing rubber gloves and being assisted by a second person.**
- **Make sure the PPH 607 is correctly assembled before operating the equipment.**



WARNING :

- Always follow the procedures described below:
- Always wear safety glasses.
- No fire, smoking or sparks near equipment.
- Comply with all local, state and national safety regulations in regards to this type of applicator and equipment.



SAFETY :

- Do not stop rotary bellcup by hand or with any object.
- Protect yourself by following the proper “SHUT OFF” procedures in force in your facility. Refer to your supervisor for detailed instructions.
- Ensure high voltage is “shut off” when servicing in the spray booth.
- Prior to working on the PPH 607 make sure that the turbine has come to a complete stop. Make sure that no one can start the turbine while it is being worked on.
- Disassemble the atomizer only after all fluid and pneumatic tubes are depressurized and isolated from compressed air during repair.

1. Safety warnings and warranty limits

- Prior to cleaning the atomizer or undertaking any other work in the spraying area, power to the high voltage generator and system must be shut off and locked out.
- Metal containers, properly grounded, should be used for cleaning solvents.
- The mechanical and electrical properties of the SAMES Technologies high voltage electrostatic generators and atomizers are designed to reduce this risk of sparks. The HV applicator must maintain at least a 1 inch per 10kV, distance from ground.

Moreover, it is essential to ensure that all conductive and semi conductive parts less than 10 feet from the atomizer are properly grounded, otherwise it is possible to accumulate electrical charges which could generate a spark. The same rules apply to personnel however the wearing of antistatic footwear and gloves will limit this risk.

The spraying area must be fitted with an antistatic floor, such as unpainted concrete, metal grating, etc....



CAUTION : In all cases, the codes in force concerning spraying of paints and flammable liquids must be strictly observed.



WARNING : Always switch the power supply off before disconnecting the low voltage cable from the UHT 153 high voltage cascade.

Always make sure the UHT 153 high voltage cascade is connected before switching the power supply on.

Foreword

This paragraph contains information that an operator should know and understand before using the PPH 607. The purpose of this information is to indicate precautions that must be taken to prevent potentially serious damage to the atomizer.

Bearing air filtration

The air has to be suitably filtered to ensure a long lifetime and to prevent any contamination during paint application. Incorrectly filtered air can contaminate the bearing causing damage to the turbine. In particular, a filtering system has to be installed to stop particles bigger than 5 micron. Filter cartridges have to be regularly changed to ensure clean air. The filter has to be installed as near as possible to the atomizer.



CAUTION : The warranty does not cover damage caused by air improperly cleaned and filtered according to specifications.

The inside of the air hoses supplying the atomizer should be free of any paint or solvent contamination.



CAUTION : The warranty does not cover any damage caused by impurities (paint, solvent or any other foreign matter) introduced in the pneumatic circuits of the PPH 607.

Bearing air

The bearing air must always be «on» during operation otherwise serious damage to the turbine will occur. Once the turbine has coasted to a complete stop, it is safe to turn off the bearing air.

To turn off the bearing air:

- Turn off turbine drive air
- Wait until turbine stops (150 sec. minimum)
- Turn off bearing air

Bearing air pressure below 90 psi (6 bars) (at the atomizer inlet) can damage the bearing. The minimum dynamic air pressure is 90 psi (6 bars) (at the pneumatic control panel).

Minimum dynamic air pressure must be measured at the atomizer inlet. If the bearing pressure falls below 90 psi (6 bars) at the turbine inlet or at the atomizer inlet, stop turbine drive air.



CAUTION : The warranty does not cover damages to the turbine resulting from insufficient bearing air pressure.

Safety interlocks

Rotation - Recommendations:

Triggering paint or solvents at speeds < 15,000 rpm may result in fluids entering the turbine bearing and control circuit. Do not spray if the bellcup is not turning at a speed under 15,000 rpm. Therefore the trigger valve, the injector flush valve and the outside bellcup wash valve must be closed when the bellcup is not spinning



CAUTION : When the turbine is first started, the bellcup rotation speed must be rotating at least 15,000 rpm before opening the paint trigger valve.

Shaping air - Recommendations:

Do not spray if the shaping air is not at least 80 NI/mn (3 CFM). Inadequate shaping air flow can cause material to flow back and contaminate the outside and inside of the shaping air shroud and cover, causing application defects.

High voltage - Recommendations:

To avoid air ionization and possible accumulation of electrostatic charges in the spray booth, turn off the E.STAT when the trigger is turned off for any extended period of time (conveyor stops, absence of parts, etc.).

Maximum speed

Excessive speed can cause serious damage to the turbine. Do not run at more than 45,000 rpm maximum (loaded) and / or loaded.



CAUTION : The warranty does not cover damage caused by a rotation speed in excess of 45,000 rpm.

Vibrations:

If the **PPH 607** vibrates abnormally, this generally means the rotating parts are unbalanced. There may be dry paint deposits on the bellcup, or it might be physically damaged or dry paint might be trapped between the injector and the clip. There also may be paint on the groove receiving the clip or on the clip itself causing unbalance. If this happens, the problem **must be** corrected. Significant unbalance will damage the bearing surface and cause the turbine to fail.



CAUTION : The warranty does not cover damage caused by running an unbalanced turbine.

O-rings:

Only use o-rings as specified in this manual. In the case of solvent borne materials, wetted rings are chemically inert to prevent any swelling or chemical deterioration.
The proper operation of the **PPH 607** is warranted only if used with the right size and material rings.

Mechanical crash:

The warranty does not apply to damages resulting from environmental causes: for example in case of a robot crashing.

Warranty - Responsibility

SAMES Technologies agrees to correct any malfunction resulting from a fault in the design, the material or the fabrication within limitations listed below.

Any request that the warranty be applied must be made in writing and precisely state the claim.

SAMES Technologies never warranties any equipment which has not been operated, maintained and cleaned according to their recommendations.

In addition, **SAMES Technologies** does not warranty their equipment if outfitted with spare parts not approved by **SAMES Technologies**.

Specifically, the warranty does not cover damage resulting of:

- negligence or lack of supervision from the customer
- incorrect utilization
- improper procedure follow up
- use of non **SAMES Technologies** approved control system
- accident and/or collision
- acts of God
- bad air filtration (solid particles > 5 micron diameter)
- bad paint / solvent
- use of o-rings not complying with **SAMES Technologies** specifications
- **usage of turbine below minimum bearing air pressure (< 90 PSI (6 bars) at atomizer inlet and 90 psi at the pneumatic control panel)**
- **maximum speed exceeding 45,000 rpm limit**
- usage with unbalanced components (dry paint on bellcup, clip, rotor or damaged bellcups),
- air circuits contaminated by fluids or other substances

The **SAMES Technologies PPH 607** atomizer is covered by a 12-months warranty (two eight hours working shift).

In addition, the warranty covers 10,000 hours of operation for the **PPH 607** bearing air turbine.

The warranty does not apply to wearing parts such as bellcups, removable regulator components, clips, and o-rings.

The warranty starts from the date the customer provides Code : **RT 6301** acceptance (buy off).

Under no circumstances within the frame of this warranty will **SAMES Technologies** be held responsible for any bodily injury or loss of production.

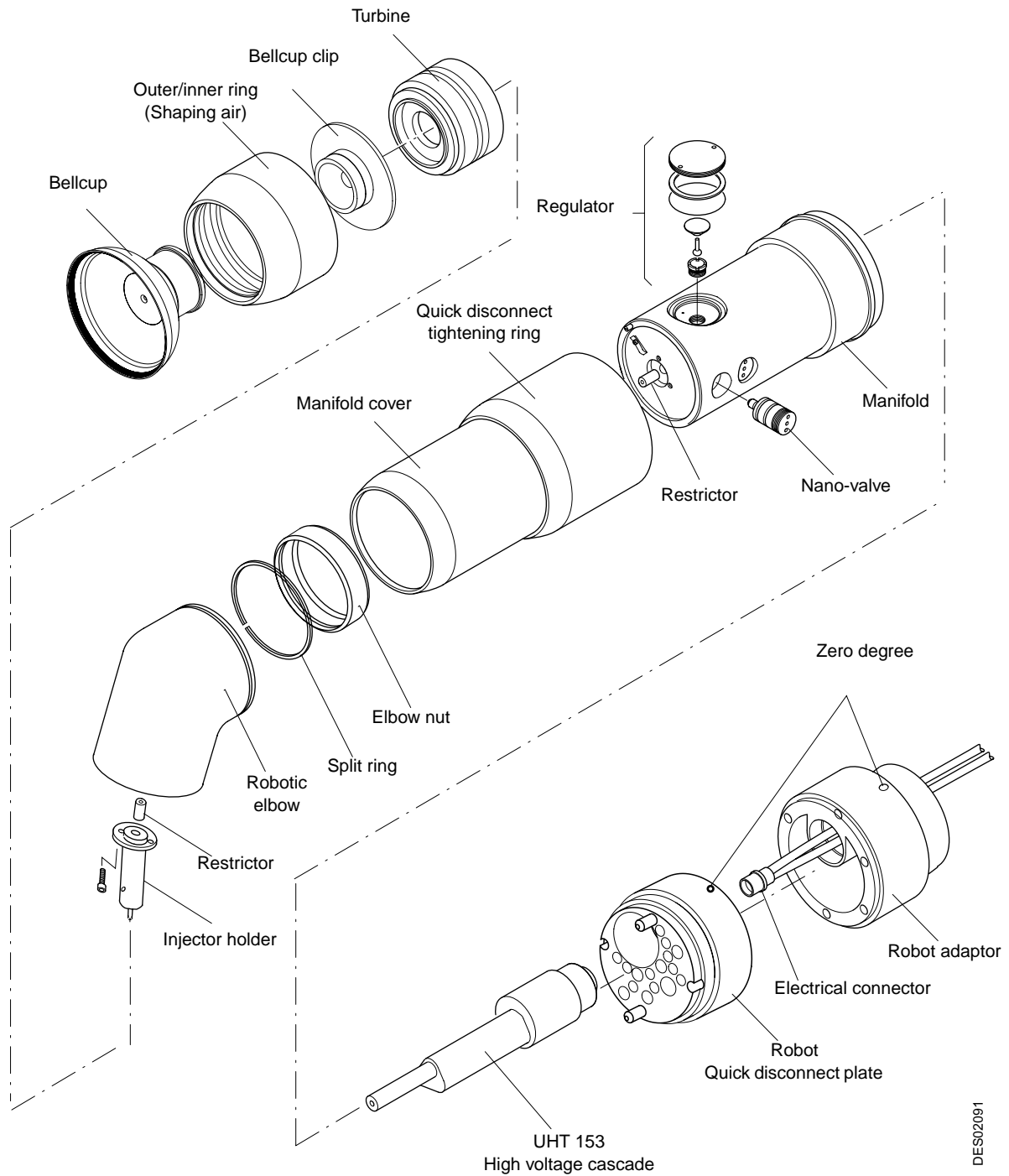
2. Introduction to atomizer

2.1. PPH 607, single circuit with regulator

The **PPH 607** rotary atomizer is designed for use in an automatic electrostatic spraying environment which requires equipment with fast and simple maintenance qualities.

Equipped with a magnetic air bearing turbine, the **PPH 607** is designed to atomize and apply various types of paints at a maximum loaded rotation speed of 45,000 RPM.

Main components:



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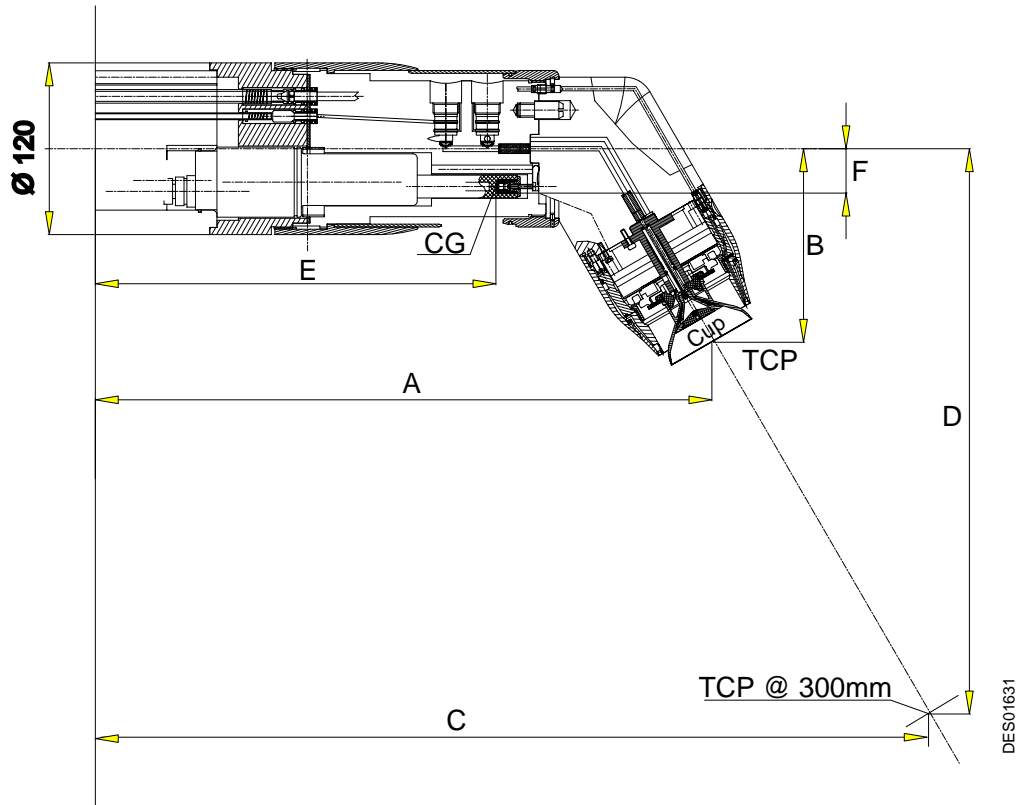
2. Introduction to atomizer (continued)

2.2. Parts description and functions

Parts	Function
Bellcup	Designed to atomize various types of paints. Specific bellcup design is selected by the type of product being sprayed.
Turbine motor	Designed as a high speed, durable, bearing-less drive motor; the turbine is responsible for rotating the bellcup. Atomization is achieved by the centrifugal forces generated by the bellcup rotation. The size of sprayed paint particles decrease as the speed of the turbine motor increases.
Manifold	It encloses all fluid circuits and provides housing for Nano-valves (air, paint, solvent) a paint regulator and a restrictor.
Cover / shaping air shroud (shaping air assy)	Designed to precisely direct compressed air to the outer edge of the bellcup. This air is used to form or shape the atomized paint particles into a controlled pattern that maximizes transfer efficiency. It also protects internal components and eases cleaning.
Robot quick disconnect plate	Provides a sealed interface without contamination for fluid/air supplies. It eases atomizer installation and removal.
UHT 153 High voltage cascade	Supplied with low voltage, the cascade is designed to generate a high voltage output which is used to charge atomized paint particles. Transfer efficiency increases with the use of high voltage.
Protective cover	Protects internal components from paint contamination and eases cleaning operations.
Quick disconnect tightening ring	Ensure a tight junction between robot atomizer quick disconnect plates.
Clip	Designed to attach the bellcup to the turbine motor. The under side also includes a half-moon groove. This groove is used by the speed feedback circuit to measure bellcup rotation.
Injector holder	Positions the injector in the center of the bellcup. Also incorporated in this small manifold or holder are microphone air supply and return passages.
Injector/restrictor	The injector/restrictor directs the fluid flow into the bellcup. Both the fluid output velocity and fluid back pressure are affected by the inner size (dia.) of the injector/restrictor. Proper size selection is determined by paint viscosity and film build desired.
Regulator	The regulator is used to precisely control fluid flow to the bellcup. Working in conjunction with a fluid flow meter, accurate "Closed Loop" fluid control can be achieved.
Robotic elbow	Provides a 60° angle to body.
Nano-valve	Air actuated, two positions, normally closed valves, which perform, varies operations; paint trigger, paint dump external cup wash, injector wash. Refer to operating sequences and diagrams for detailed paint, solvent and air paths section 3.

3. Technical characteristics

3.1. Dimensions (mm)



Installed cups	TCP @ cup		TCP @300 mm		GC	
	A	B	C	D	E	F
65 EC cup	431	135	581	395	280	31
60 mm, Negative edge	420	116	570	376	280	31
70 mm, Vortex	420	116	570	376	280	31

Note:

GC = gravity center

TCP = Tool center point

3. Technical characteristics (continued)

3.2. Working characteristics

Weight		US units	Metric units
	Atomizer without cables or hoses	7.716 lbs	3.5 kg
	Body only	2.97 lbs	1.35 kg
	Bellcup with deflector	0.09 lbs	0.04 kg
	Turbine	0.925 lbs	0.420 kg
	Nano-valve	0.013 lbs	0.006 kg
	UHT 153 cascade	0.718 lbs	0.326 kg
Voltage			
	Maximum operating voltage	90 kV	
Speed			
	Recommended rotation speed	15 to 45 KRpm	15 to 45 K tr/min.
Paint			
	Flow rate	0 to 500 cc/ min. Max (according to paint used)	
	Pressure normal setting	90 to 120 PSI	6 to 8 bar
	Pressure maximum setting	150 PSI	10 bar
	Viscosity range	20 to 40 seconds - FORD cup # 4	
Air pressure			
	Nano-valve pilot	90 - 150 PSI	6 bar min. - 10 bar max
	Bearing air	90 - 150 PSI	6 bar min. - 10 bar max @ 85 l/min.
	Shaping air	90 PSI constant	6 bar constant
	Microphone air	25 - 45 PSI	1.9 to 3 bar constant
Air quality			
	Filtration (bearing air) must be dry, oil and dust free		
	Solids	< 5 mg /m ³	
	Oil	< 2 mg / m3	
	Oil	< 0.1 p.p.m	

3. Technical characteristics (continued)

3.2 Working characteristics (continued)

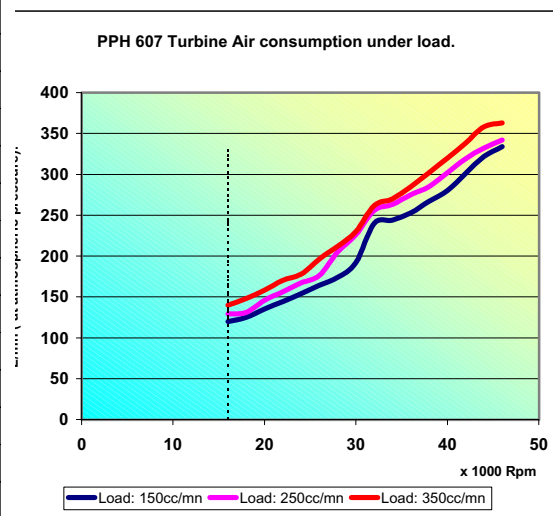
Air quality		US units	Metric units
	Water	< 2 mg/Nm ³	
	Dew point	<+14° F	< -10°C depressurized air
	Dew point	< 36° F air at 105 PSI	< 2°C air at 7 bar
	Particles diameter	< 5 micron	
Air consumption			
	Pilot	0.35 CFM	10L/min.
	Bearing air	4.41 CFM	125L/min.
	Shaping air	0 to 600 NI/min. (21.18CFM) according to type of shaping air ring being used	
	Turbine	Refer to the following charts	

Air use for PPH 607 with load (SLPM) with 65EC bellcup.

Solvent borne paint

Viscosity: 28 seconds - Ford cup # 4

x 1000 Rpm	Load: 150cc/min	Load: 250cc/min	Load: 350cc/min
15	120	129	140
18	125	131	148
20	135	146	158
22	144	156	170
24	154	167	178
26	164	176	196
28	174	205	212
30	192	226	230
32	240	256	262
34	244	263	270
36	253	275	285
38	267	285	302
40	280	302	320
42	301	319	338
44	322	332	358
46	334	342	363



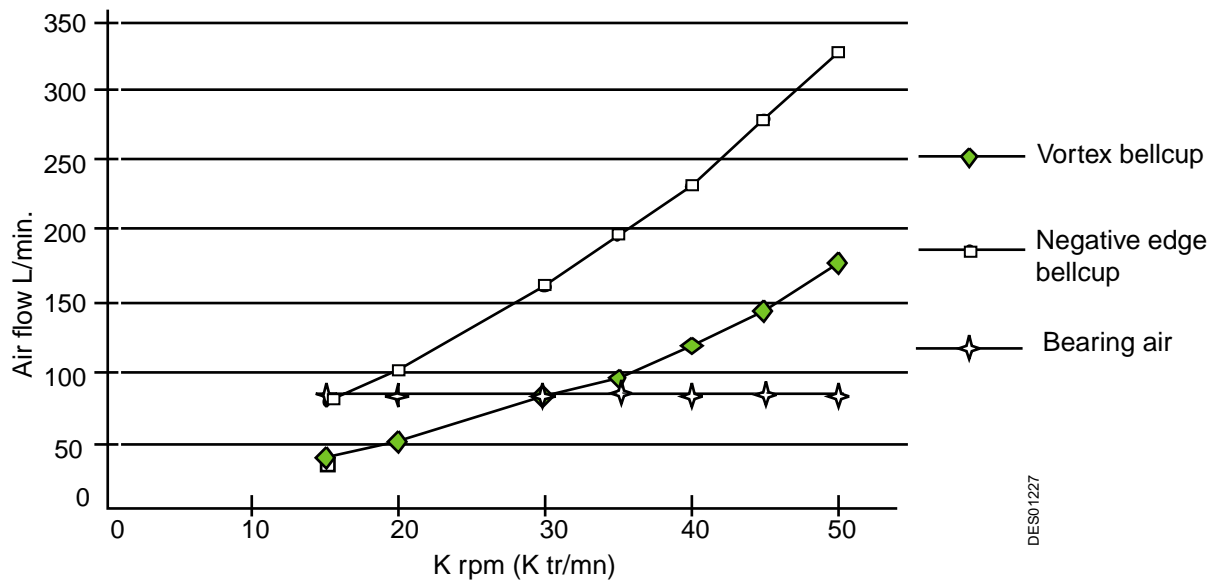
Note : the speed board card is 100% readable from 15.000 Rpm.

3. Technical characteristics (continued)

3.2 Working characteristics (continued)

Turbine drive air consumption UNLOADED (relative to bellcup used)

Rev (k Rpm)	Vortex bellcup (L/min.)	Negative edge bellcup (L/min.)	Bearing air (L/min.)
15	40	77	85
20	51	106	85
30	85	165	85
35	94	192	85
40	120	234	85
45	145	275	85
50	180	330	85



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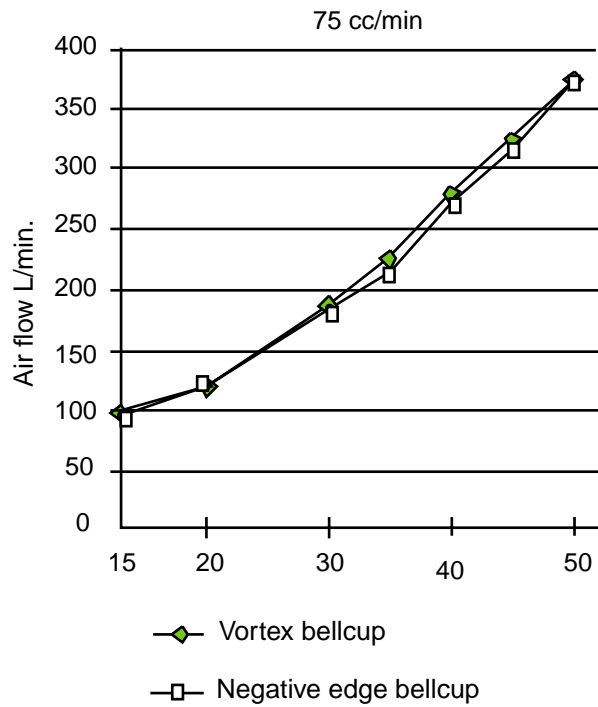
3. Technical characteristics (continued)

3.2 Working characteristics (continued)

Turbine drive air consumption LOADED as per bellcup used

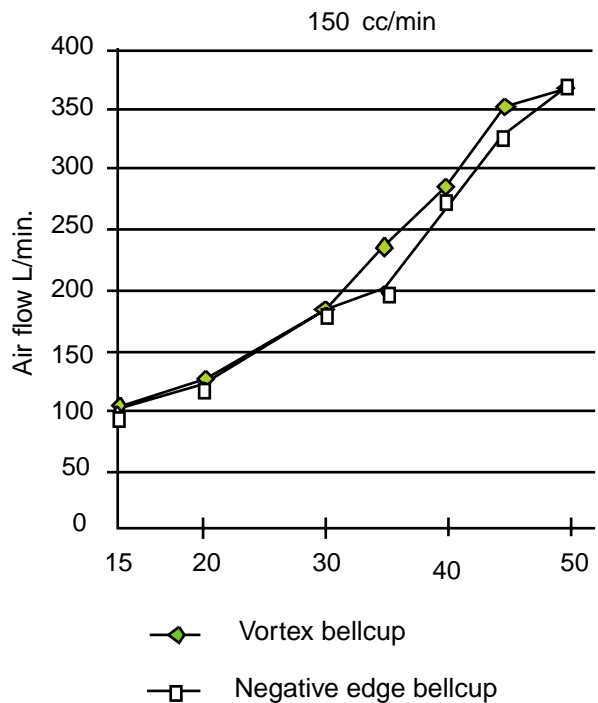
Viscosity: 60 seconds @ 80° F - Ford cup # 4

Fluid flow 75cc/min.		
Rev. (k Rpm)	Vortex bellcup l/min.	Negative edge bellcup l/min.
15	97	98
20	120	120
30	188	180
35	226	210
40	271	262
45	324	315
50	370	370



DES01228

Fluid flow 150cc		
Rev. (k Rpm)	Vortex bellcup l/min.	Negative edge bellcup l/min.
15	107	103
20	135	129
30	191	190
35	244	201
40	292	276
45	360	336
50	370	373

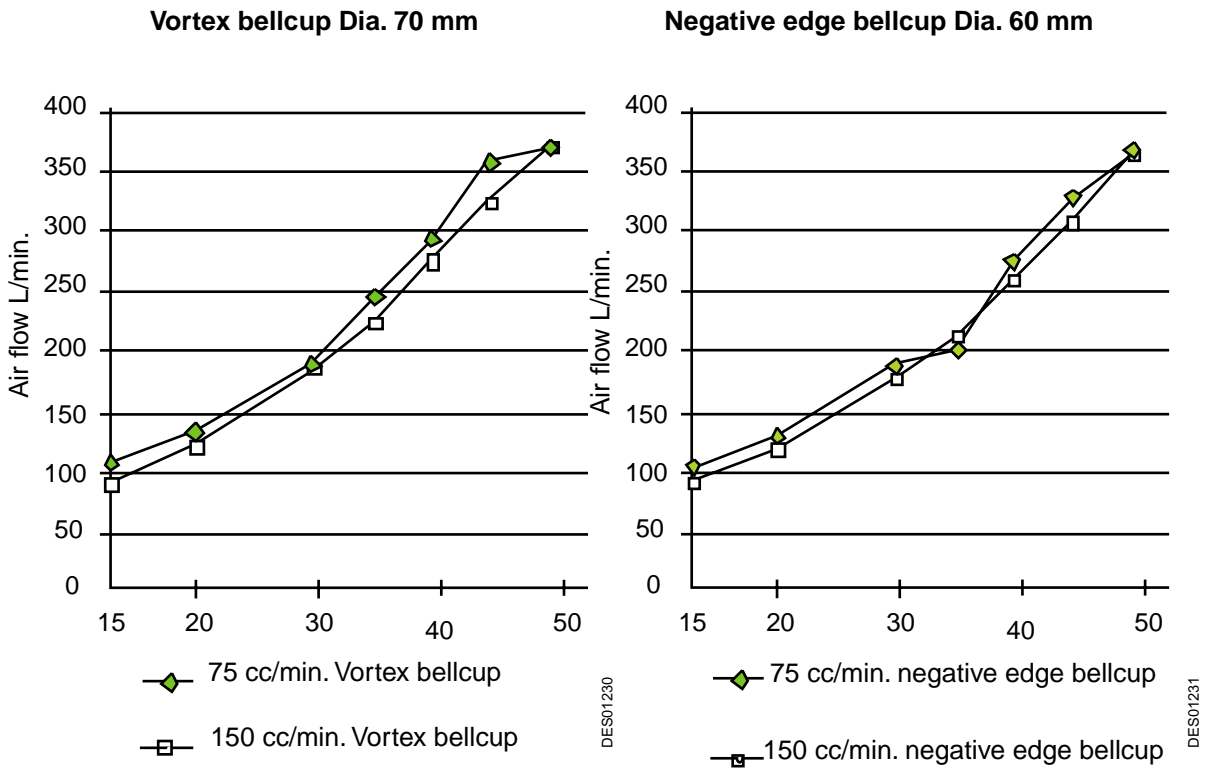


DES01229

3. Technical characteristics (continued)

3.2 Working characteristics (continued)

Turbine drive air consumption LOADED as per bellcup used
Viscosity: 60 seconds @ 80° F - Ford cup # 4

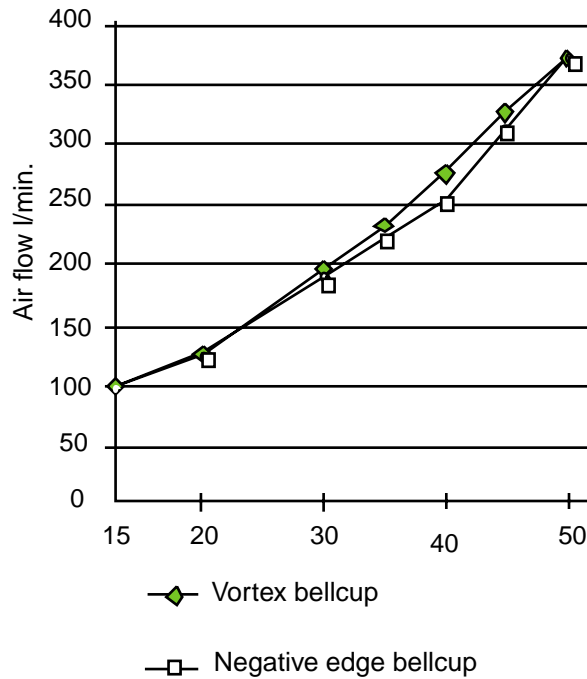


3. Technical characteristics (continued)

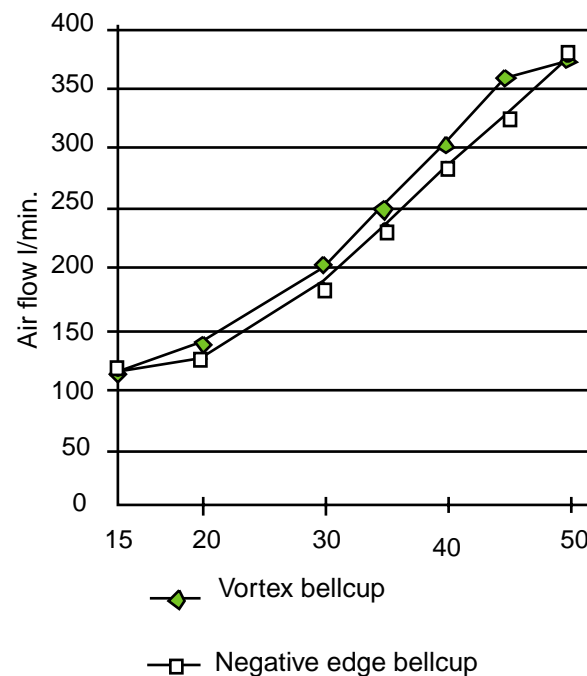
3.2 Working characteristics (continued)

Turbine drive air consumption LOADED relative as per bellcup used
 Viscosity: 25 sec. Ford cup # 4 @ 80°F (27°C)

Fluid flow 75cc/min.		
Rev. (k Rpm)	Vortex bellcup l/min.	Negative edge bellcup (l/min.)
15	97	94
20	123	120
30	192	180
35	230	220
40	270	250
45	324	314
50	370	370



Fluid flow 150cc/min.		
Rev. (k Rpm)	Vortex bellcup l/min.	Negative edge bellcup (l/min.)
15	108	109
20	140	132
30	200	185
35	245	230
40	302	280
45	360	325
50	375	370



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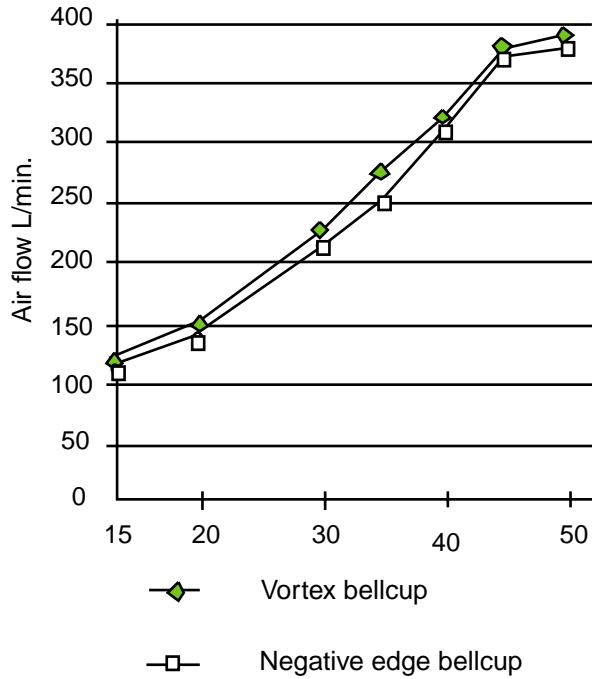
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3. Technical characteristics (continued)

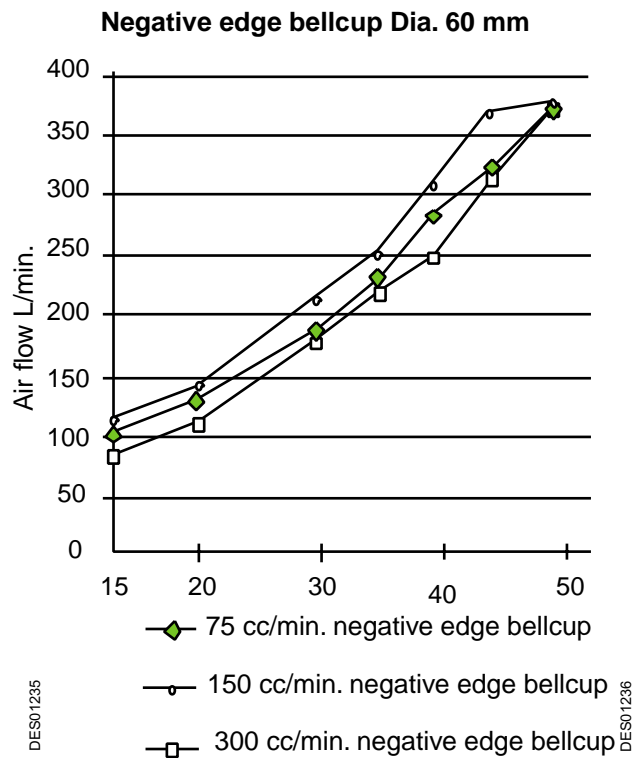
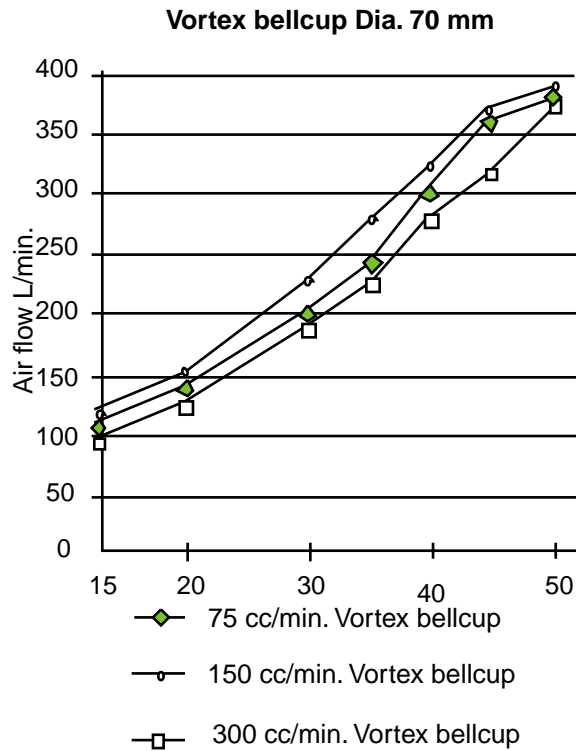
3.2 Working characteristics (continued)

Turbine drive air consumption LOADED as per bellcup used
 Viscosity: 25 sec. Ford cup # 4 @ 80°F (27°C)

Fluid flow 300cc /min.		
Rev. (k Rpm)	Vortex bellcup (l/min.)	Negative edge bellcup (l/min.)
15	126	116
20	153	147
30	230	220
35	280	256
40	335	310
45	373	370
50	389	373



DES01234



DES01235

DES01236

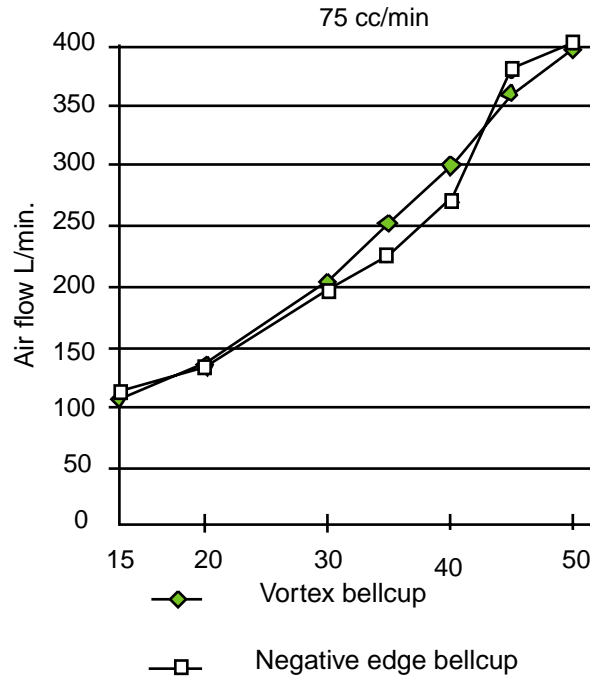
3. Technical characteristics (continued)

3.2 Working characteristics (continued)

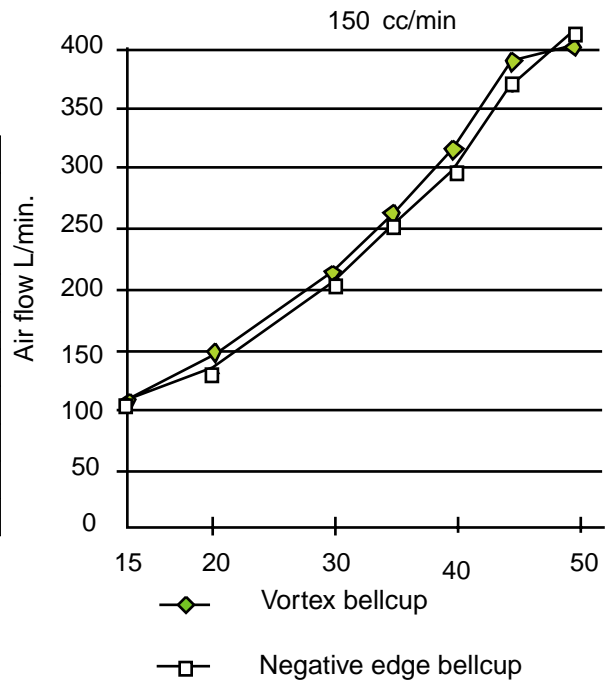
Turbine drive air consumption LOADED relative as per bellcup used

Viscosity: 44.7 sec. Ford cup # 4 @ 80°F (27°C)

Fluid flow 75cc/min.		
Rev. (k Rpm)	Vortex bellcup (l/min.)	Negative edge bellcup (l/min.)
15	105	108
20	133	130
30	206	198
35	251	220
40	302	273
45	360	374
50	400	405



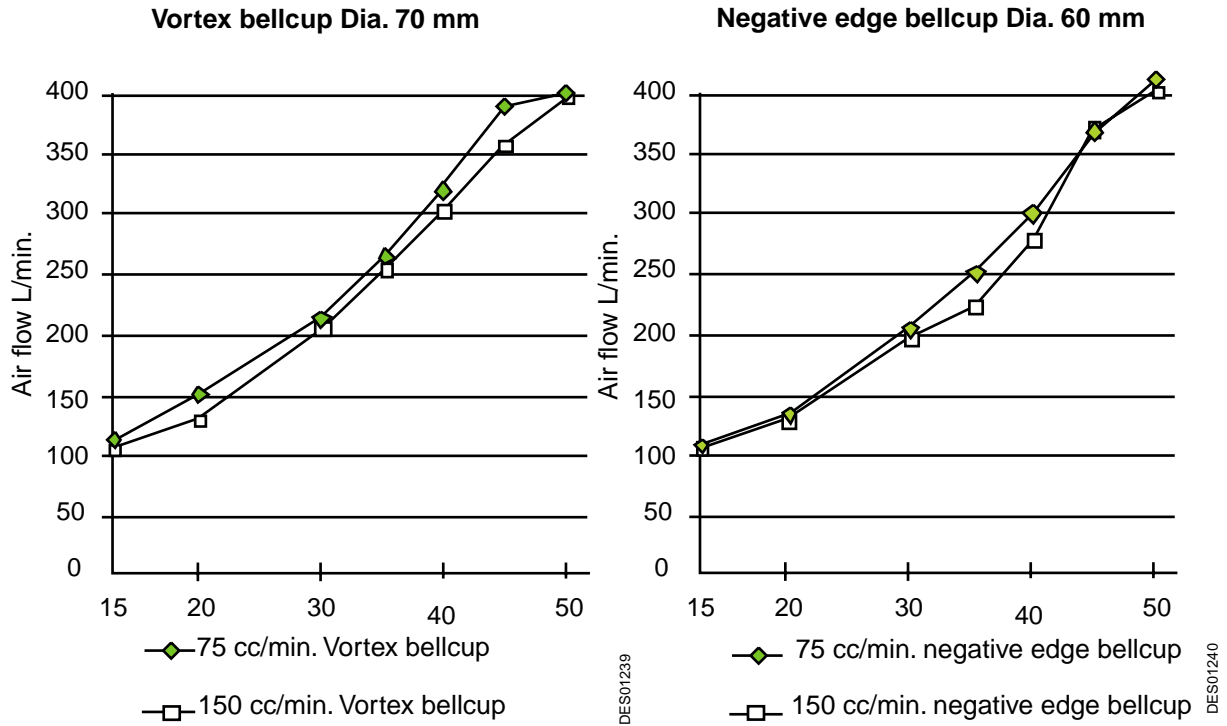
Fluid flow 150cc/min.)		
Rev. (k Rpm)	Vortex bellcup (l/min.)	Negative edge bellcup (l/min.)
15	110	110
20	150	138
30	211	205
35	266	250
40	320	299
45	390	370
50	401	410



3. Technical characteristics (continued)

3.2 Working characteristics (continued)

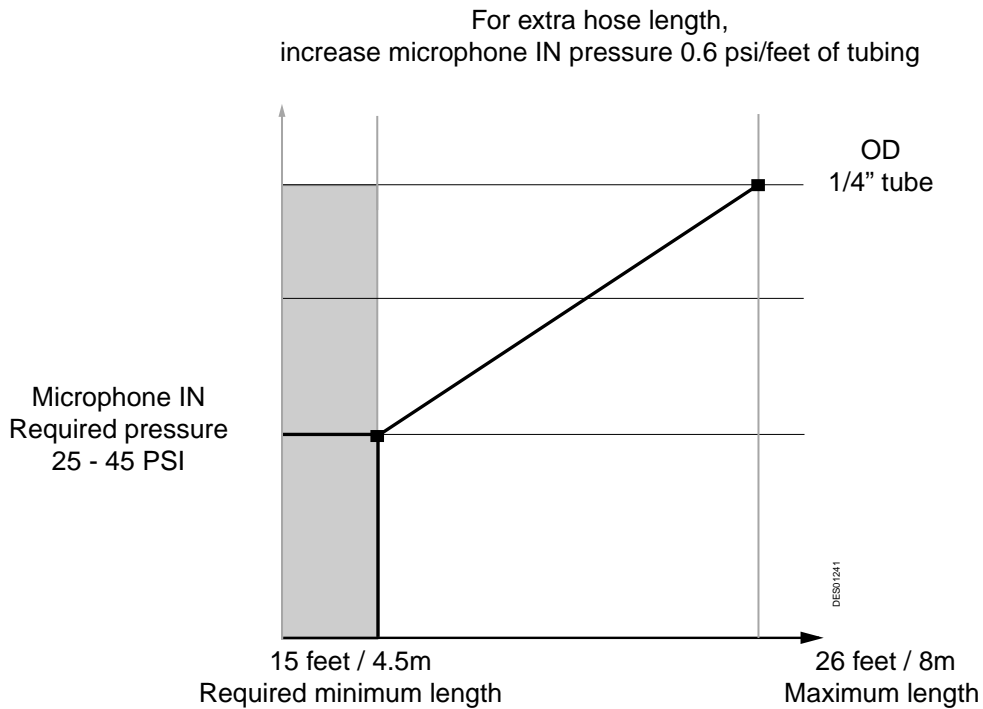
Turbine drive air consumption LOADED relative as per bellcup used (continued)
Viscosity: 44.7 sec. Ford cup # 4 @ 80°F (27°C)



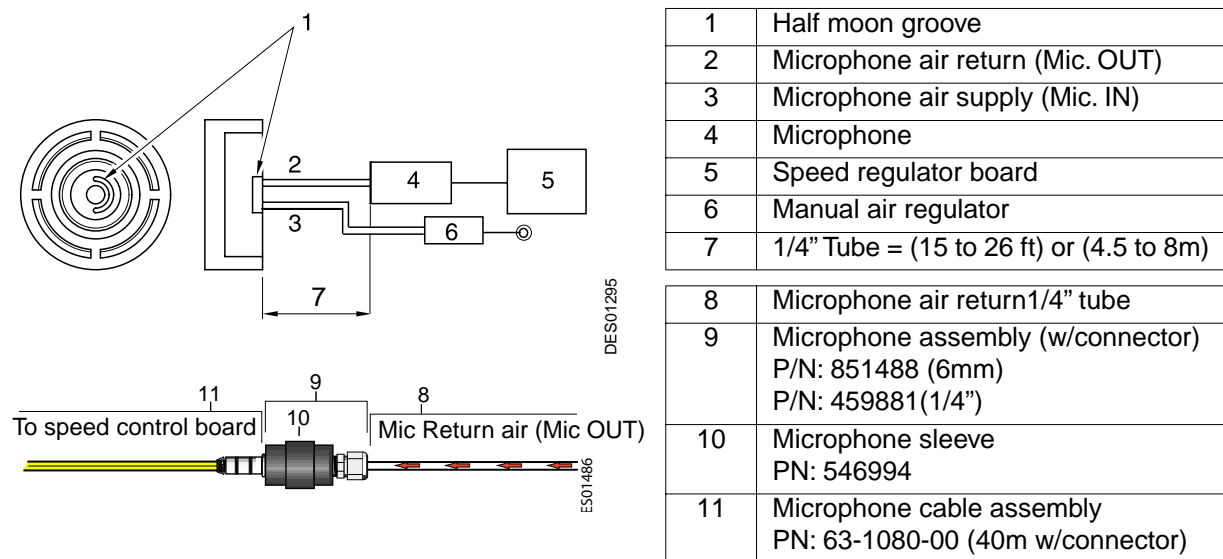
3.3. Operating principle

3.3.1. Turbine rotation speed

The reading is obtained using a microphone. The air supply arrives at the clip holding the bellcup. This clip is machined with a groove in which air passes with every rotation of the bellcup. This pressure variation causes a noise or "frequency signal", which is sent through the injector holder to a microphone. The microphone in turn converts this frequency signal into electrical variations which are sent to the speed regulation board.



3.3.2. Microphone

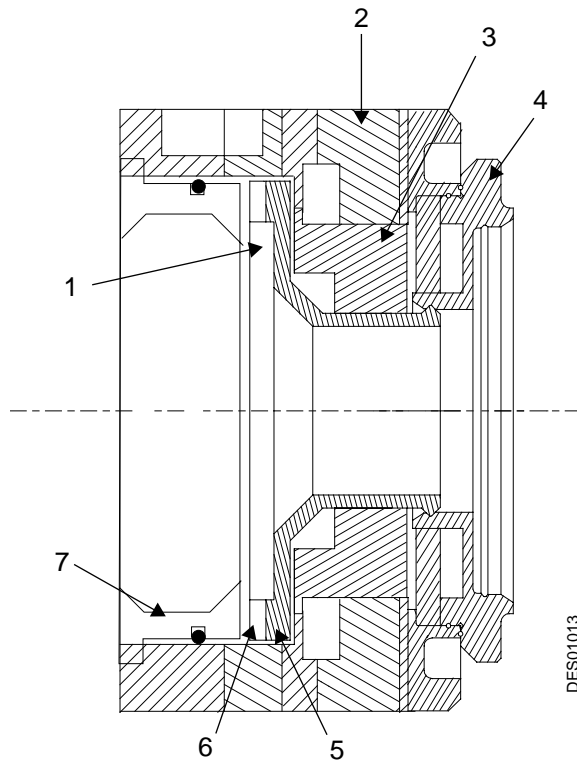


3.3 Operating principle (continued)

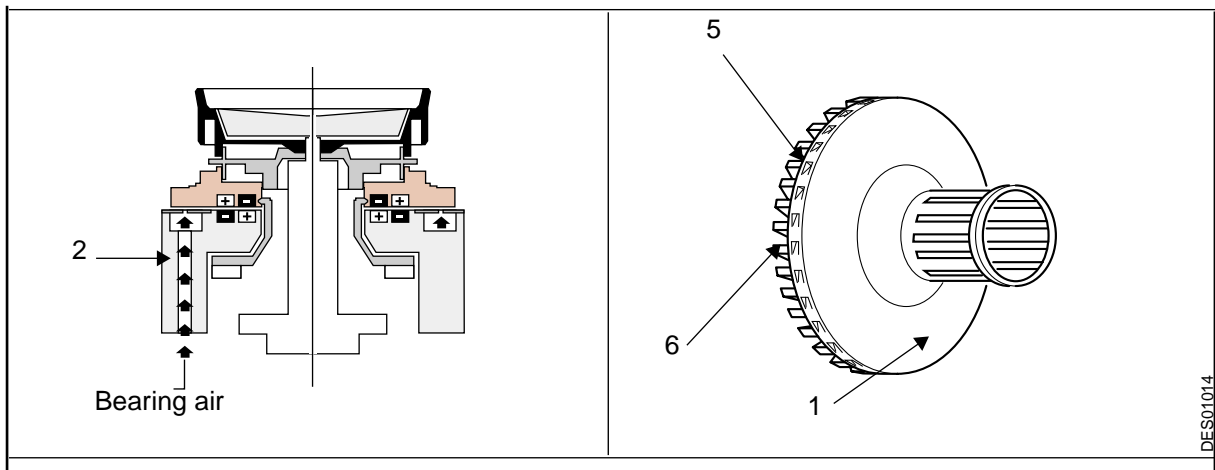
3.3.3. Turbine Motor

The bearing air flows uniformly to the surface of the stator creating an air cushion which separates the rotor from the stator. The balance between air pressure and electromagnetic forces enables the rotor to float freely while maintaining its center above the stator.

Drive air is used to accelerate the turbine through the turbine drive vane which is attached to the rotor. Brake air is used to slow down the turbine during an over-speed or shutdown condition.

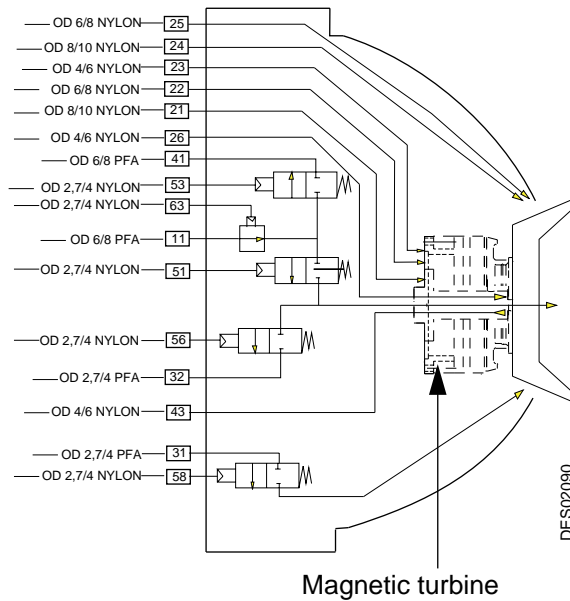


1	Turbine wheel for braking and drive
2	Turbine body (Stator) supplying air to: - Bearing air - Turbine drive and brake - Shaping air
3	Stator magnet
4	Rotor
5	Turbine brake holes
6	Turbine drive indentations
7	Deflector with o-ring



4. Diagrams

4.1. General

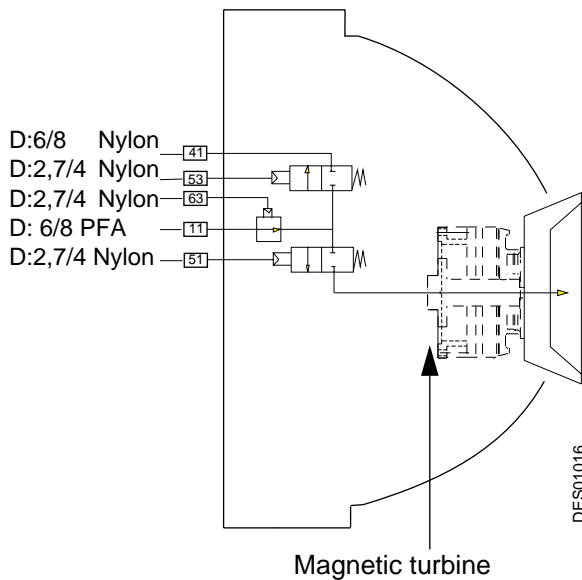


25	Compensation air
24	Shaping air
23	Bearing air
22	Turbine brake
21	Turbine drive
26	Microphone IN
41	Dump valve 1
53	Dump valve pilot 1
63	Regulator pilot
11	Paint supply 1
51	Paint valve pilot 1
56	Injector wash pilot
32	Injector wash solvent or air
43	Microphone OUT
31	External bellcup wash solvent or air
58	External bellcup wash pilot air

Note: PFA = teflon tubing should not be replaced with nylon tubing.

4.2. Paint circuit

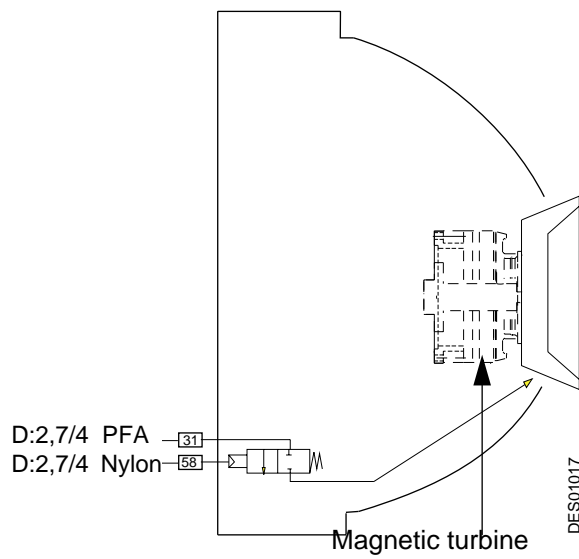
Circuit cleaning (typically color change)



41	Dump 1
53	Dump valve pilot
63	Regulator pilot
11	Paint supply 1
51	Paint valve pilot 1

4. Diagrams (continued)

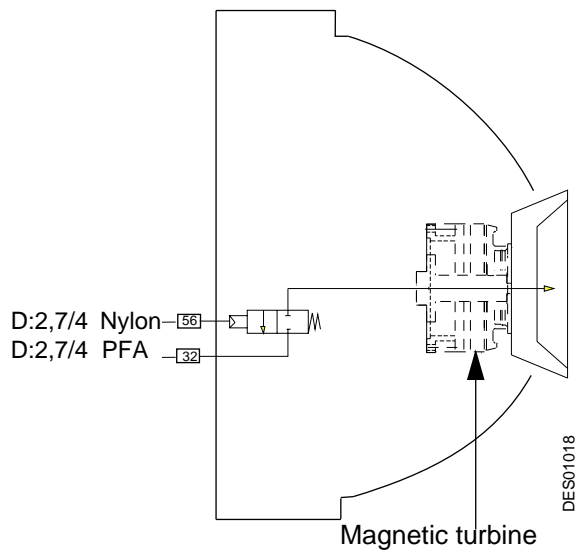
4.3. External bellcup wash



31	External bellcup wash solvent or air
58	External bellcup wash pilot air

31: Bellcup wash, solvent/air supply, cleans the bellcup.

4.4. Injector wash



56	Injector wash pilot
32	Injector wash solvent or air

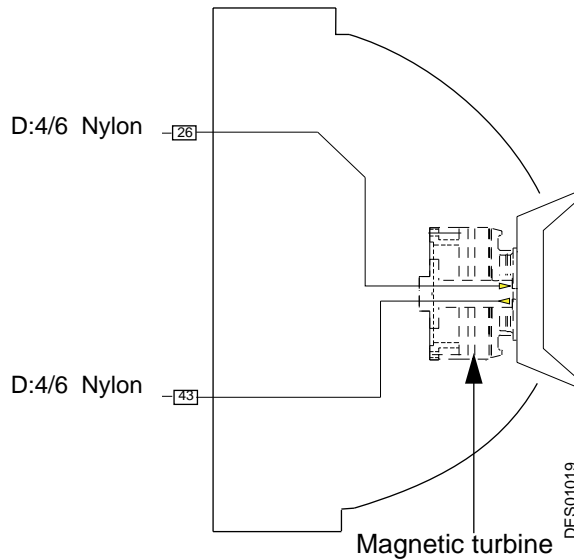
32: Solvent/air supply cleans the paint supply passage to the bellcup.

Note: PFA = (teflon) tubing should not be replaced with nylon tubing.

4. Diagrams (continued)

4.5. Microphone air

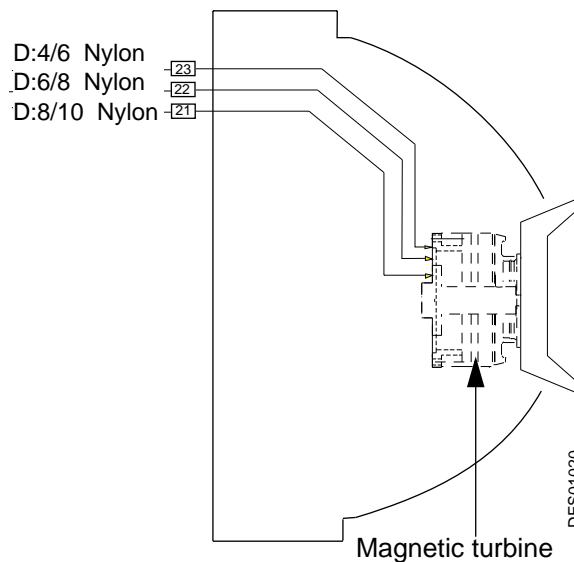
Microphone supply air is set by use of a remote regulator.



26	Microphone IN
43	Microphone OUT

4.6. Turbine drive

Turbine drive air is controlled through a remote transducer.



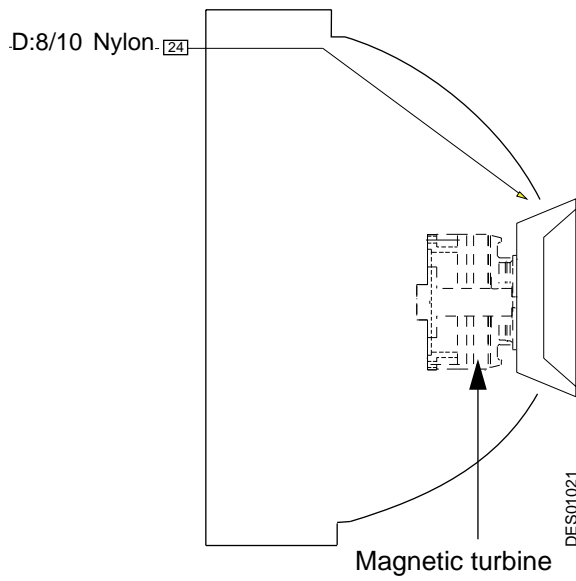
23	Bearing air
22	Turbine brake air
21	Turbine drive air

- 23: The bearing air separates the rotor from the stator.
- 22: Supplies air for turbine brake.
- 21: Supplies air for turbine drive.

The bellcup speed controller activates #21 through a remote transducer and #22 through a solenoid.

4. Diagrams (continued)

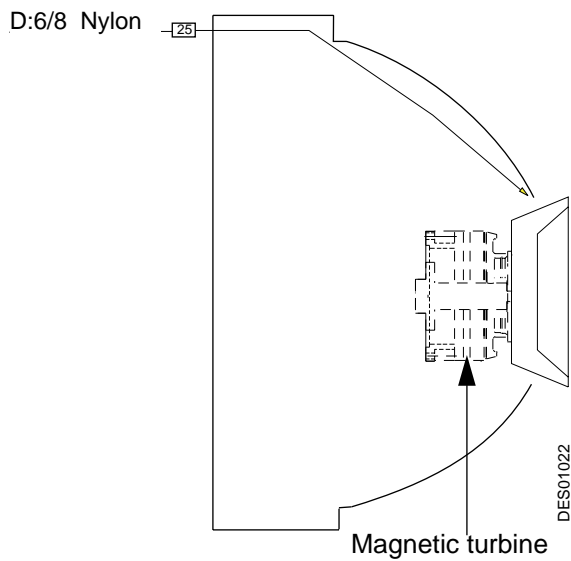
4.7. Shaping air



24	Shaping air
----	-------------

24: The shaping air supply controls the pattern size diameter and is controlled through a remote transducer.

4.8. Compensation air



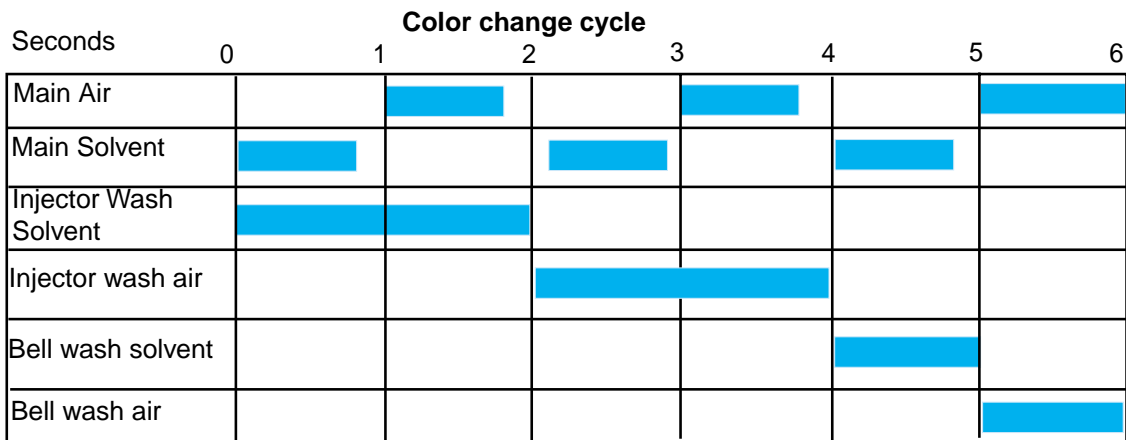
25	Compensation air
----	------------------

25: Compensation air stops shaping air shroud contamination and is controlled through a remote regulator.

4. Diagrams (continued)

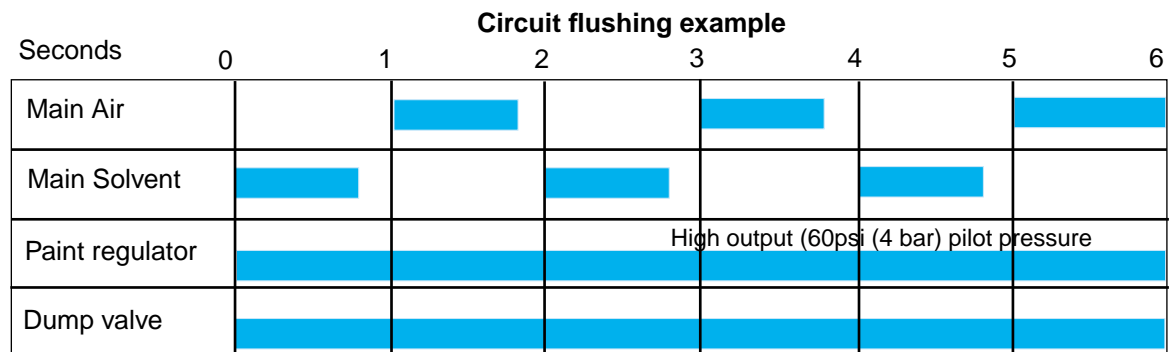
4.9. Color change and circuit flushing examples

- Standard conditions: 90 psi (6 bars) air, solvent and paint.
- Color change block and rinsing block distance to the atomizer (3 to 5 ft - 1 to 1.5 meter).



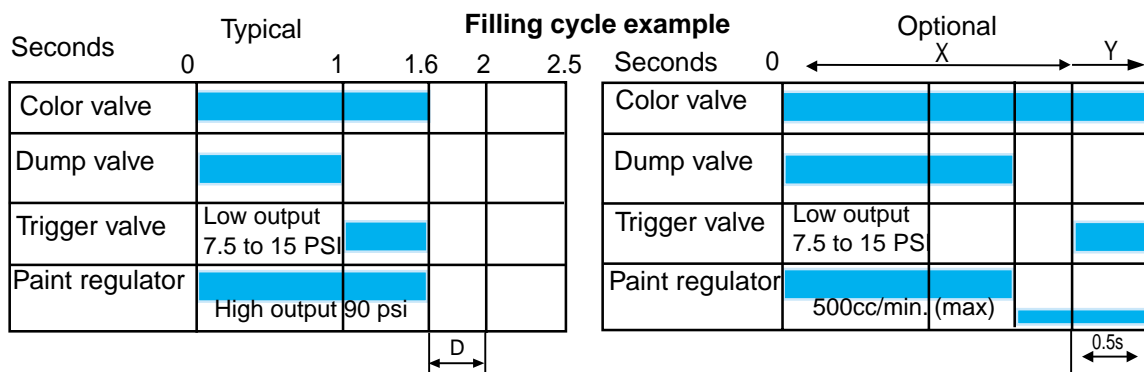
DES01243

- Typical solvent consumption: 30cc
- Recommended injector solvent flow rate: 300 cc/min.
- Bellcup wash solvent flow rate: 250 cc/min.
- The use of restrictors is recommended if solvent flow rates are greater than specified above.
- The last air pulse is used to blow out and dry the exterior bell wash circuit in order to avoid solvent spitting.



DES01244

- Typical solvent consumption: 100 cc



DES01245

Typical paint flow when trigger is on: 150 cc/min.

D = Delay to decrease the pilot air pressure of the paint regulator before opening the trigger.

X = Time for paint to flow from the color changer to bellcup

Y = Time of paint output from bellcup

NOTE: The optional fill cycle is normally used in situations where high voltage tracking through the dump line becomes an issue.

5. Maintenance

5.1. Shut down / Start up procedures

Important recommendations

Follow the compressed air settings as described in section 3.2.

The rotor and the stator will be damaged if the bearing air is turned off.

Bearing air must be set at 90 PSI (6 bars) minimum at the quick disconnect plate.

(*For tubing lengths over 15', measure air pressure at the quick disconnect to determine correct setting.)

Make sure that there is a signal emitting from the speed board.

5.1.1. Shut-down procedures

Important steps to follow:

Step 1 - Stop atomizing

Step 2 - High voltage supply OFF

Step 3 - Circuit flushing cycle

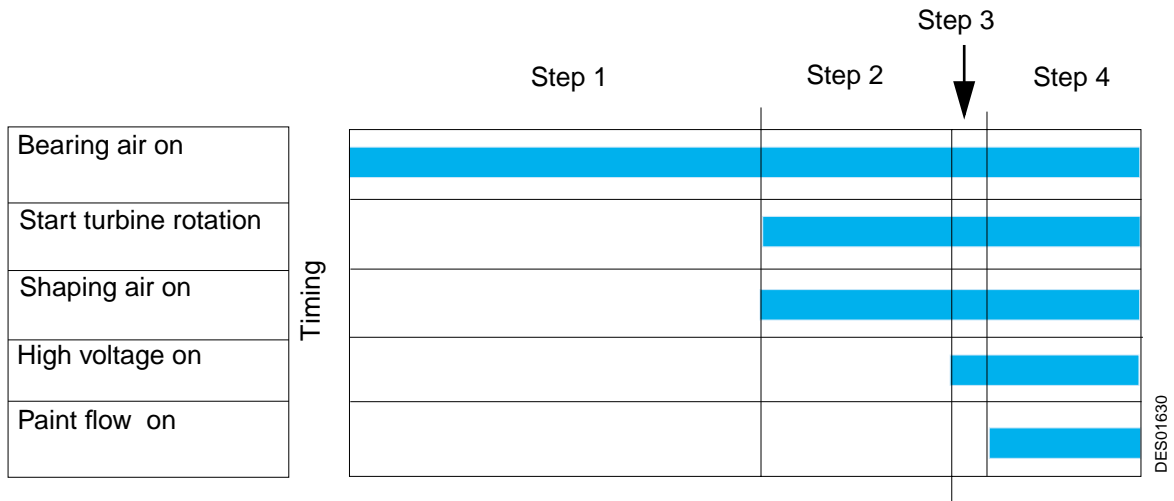
Step 4 - Stop shaping air flow

Step 5 - Stop turbine drive and wait until Rpm = 0

Step 6 - Stop bearing air

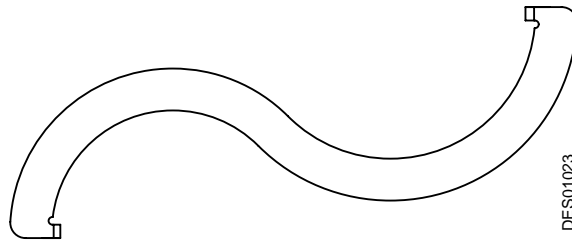
5.1.2. Start-up procedures

Important steps to follow:



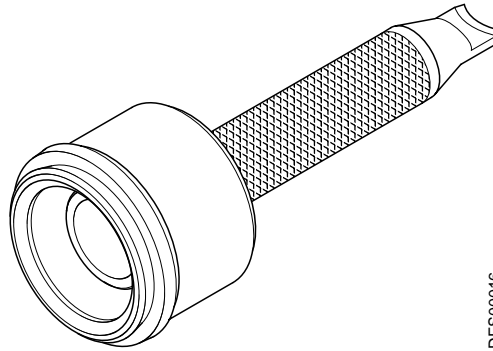
5. Maintenance (continued)

5.2. Tools



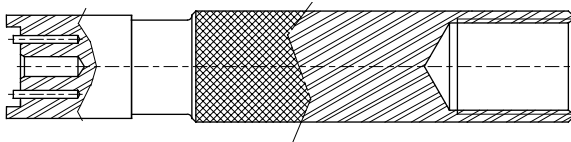
DES01023

USA P/N	Sames P/N	Tool description	Qty	Sale unit
1308689	1308689	Tool, aluminium cover, nut and quick disconnect tightening ring removal	1	1

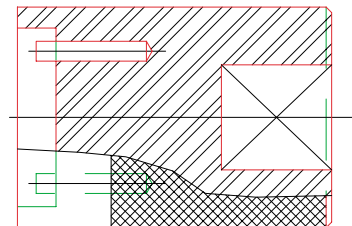


DES00016

USA P/N	Sames P/N	Tool description	Qty	Sale unit
72-1107-00	1517728	Tool, 65EC bellcup and clip removal	1	1



DES01025

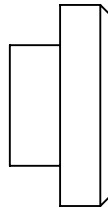


DES01641

USA P/N	Sames P/N	Tool description	Qty	Sale unit
1301832	1301832	Tool, nano-valve removal	1	1
1403498	1403498	Tool, nano-valve torque	1	1

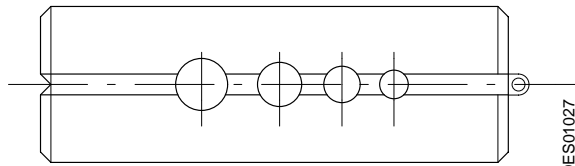
5. Maintenance (continued)

5.2 Tools (continued)



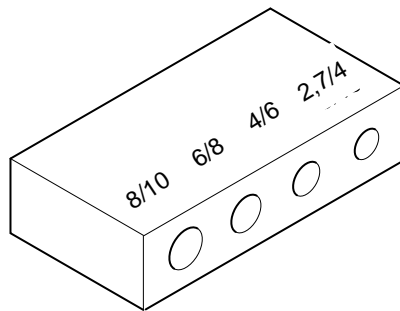
DES01026

USA P/N	Sames P/N	Tool description	Qty	Sale unit
1308679	1308679	Tool, drive vane removal	1	1



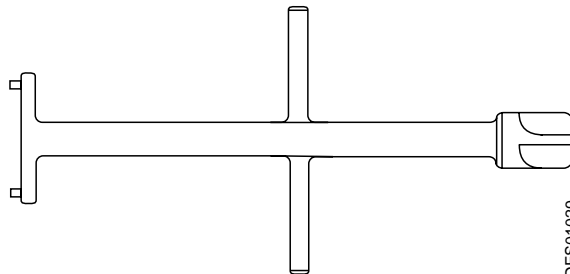
DES01027

USA P/N	Sames P/N	Tool description	Qty	Sale unit
1305453	1305453	Tool, fittings	2	1



DES01028

USA P/N	Sames P/N	Tool description	Qty	Sale unit
1406390	1406390	Tube depth gauge	1	1

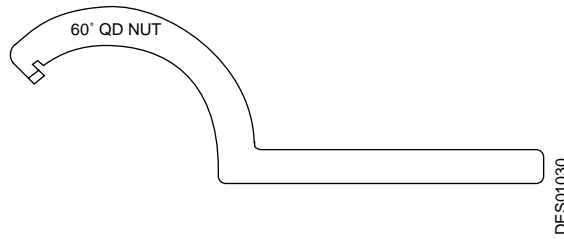


DES01029

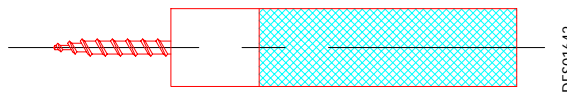
USA P/N	Sames P/N	Tool description	Qty	Sale unit
1308680	1308680	Tool, regulator cover + seat removal	1	1

5. Maintenance (continued)

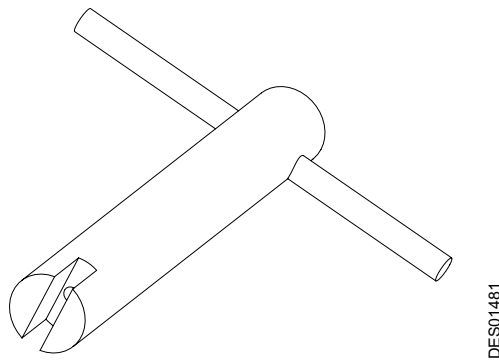
5.2 Tools (continued)



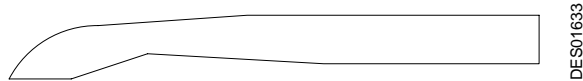
USA P/N	Sames P/N	Tool description	Qty	Sale unit
1308678	1308678	Adaptor, wrench, 60°	1	1



USA P/N	Sames P/N	Tool description	Qty	Sale unit
1408598	1408598	Tool, restrictor removal	1	1



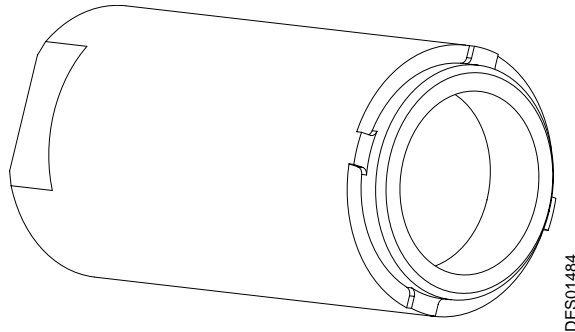
USA P/N	Sames P/N	Tool description	Qty	Sale unit
1408599	1408599	Tool, injector	1	1



USA P/N	Sames P/N	Tool description	Qty	Sale unit
72-0581-00	-	Tool, diaphragm removal	1	1

5. Maintenance (continued)

5.2 Tools (continued)



DES01484

USA P/N	Sames P/N	Tool description	Qty	Sale unit
72-1126-00	1408335	Tool, 65EC shaping air nut removal and installation	1	1

Other tools and accessories required

- Plastic mallet
- 6 mm steel rod

5. Maintenance (continued)

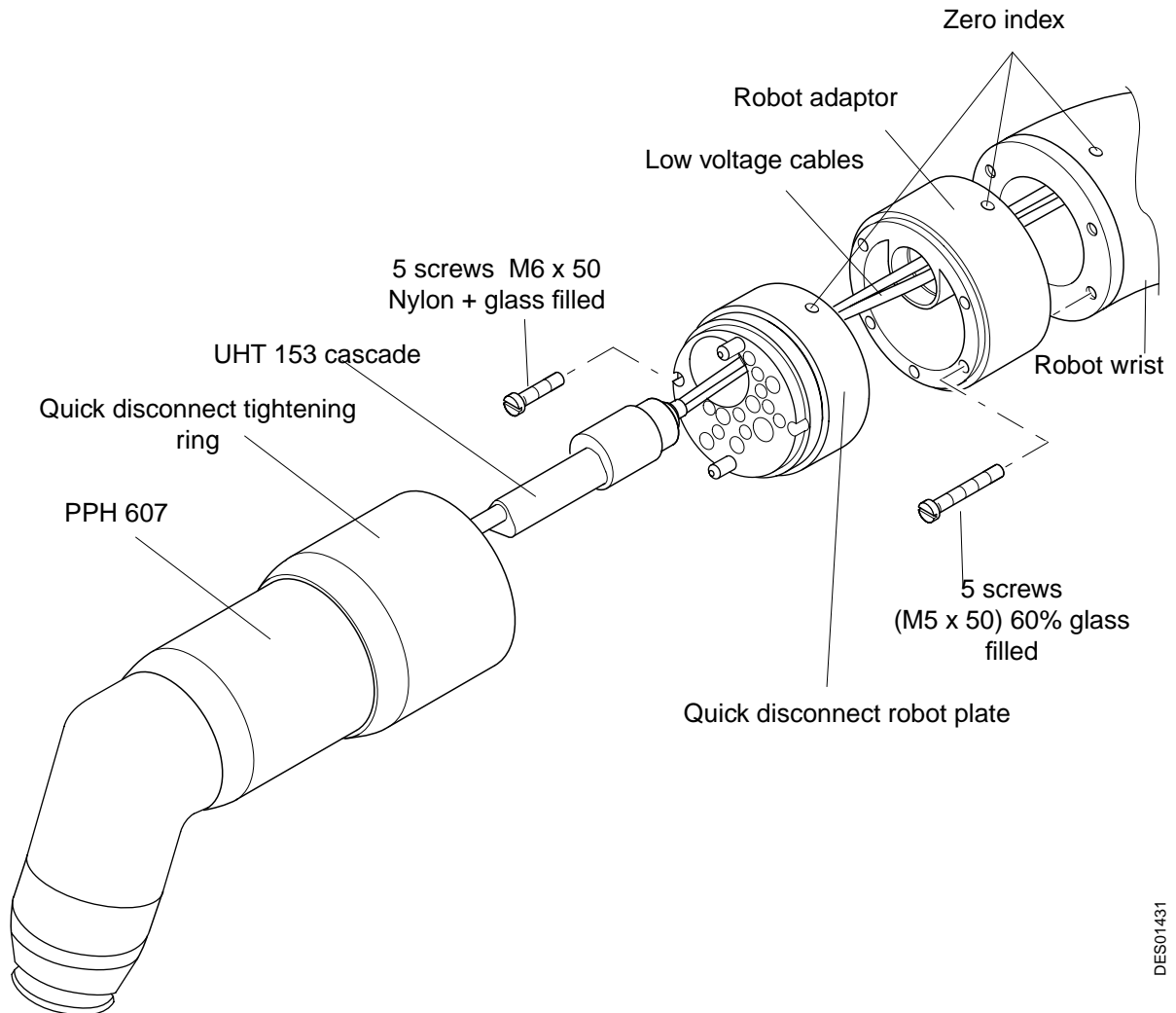
5.3. Installation

(see § 8.1 page 71 for details.)

The robot quick disconnect plate is used to hold the atomizer onto the robot wrist.

The **UHT 153** is installed in the robot quick disconnect plate as illustrated.

The quick disconnect tightening ring holds the body onto the quick disconnect robot plate.

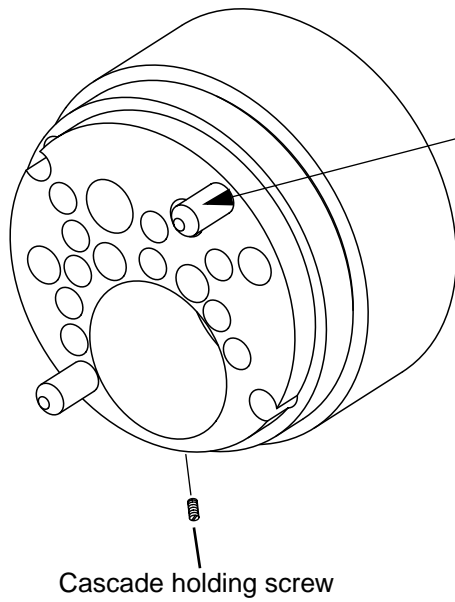


DES01431

5. Maintenance (continued)

5.3.1. Quick disconnect robot plate

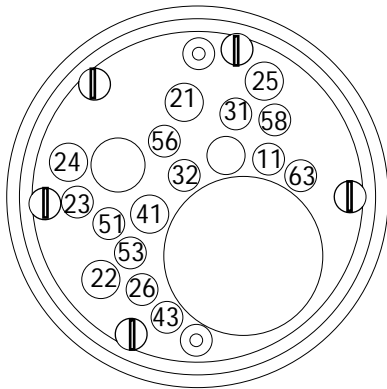
Please [see § 8.7 page 81](#) for details.



DES01032



Tube fittings:
Please refer to sections 8.1 and 8.9

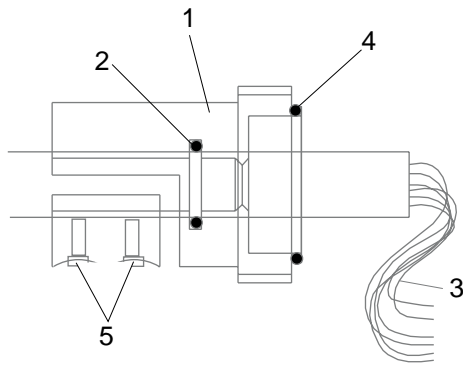


DES01114

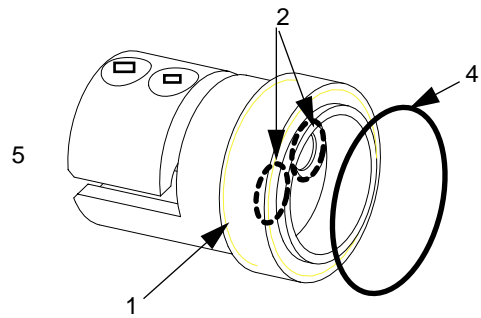
11	Paint supply
21	Turbine drive
22	Turbine brake
23	Bearing air
24	Shaping air
25	Compensation air
26	Microphone IN
31	External bellcup wash solvent or air
32	Injector wash solvent or air
41	Dump valve
43	Microphone OUT
51	Paint valve supply
53	Dump valve pilot
56	Injector wash pilot
58	External bellcup wash pilot air
63	Regulator pilot

5. Maintenance (continued)

5.3.2. Low voltage connector



DES01036

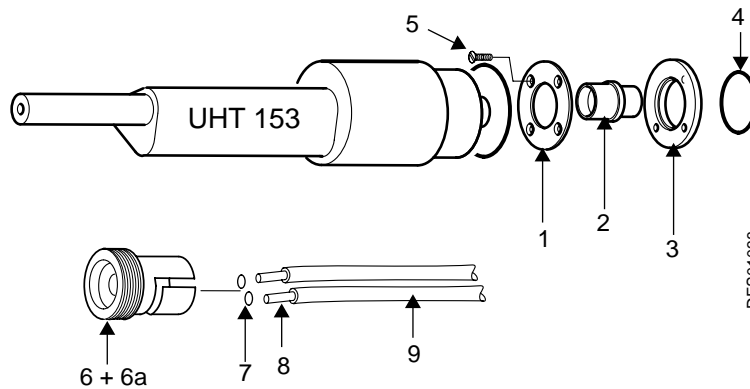


DES01037

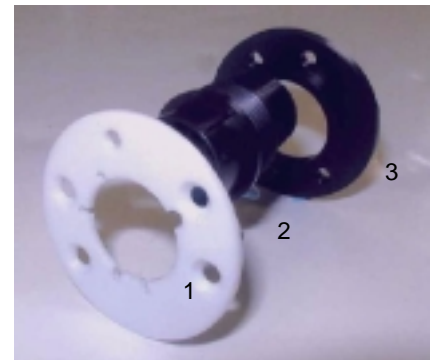
Item	Description	Qty
1	Low voltage connector	1
2	O-ring 7.65 x 1.68	2
3	Low voltage cable	2
4	O-ring 23.52 x 1.78	1
5	Screw M4 x 12 s/s	2

Note: [see § 8.1 page 71](#), for Sames spare part list for details.

5.3.3. Low voltage connection



DES01038



Item	Description	Qty
1	Washer UHT 153 position plug	1
2	Electrical male connector	1
3	Washer UHT 153	1
4	O-ring 23.52 x 1.78	1
5	Screw M3 x 10 nylon	4
6	Low voltage connector	1
6a	Screw M4 x 12 s/s	2
7	O-ring 7.65 x 1.68	2
8	Low voltage cable	2
9	5/16" nylon tubing	2

Note: [see § 8.1 page 71](#) for Sames spare part list for details.

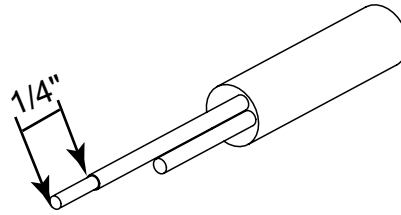
5. Maintenance (continued)

5.3.4. Low voltage cable wiring instructions

Assembly

Step 1:

Strip insulation back 1/4" on each of the 3 wires. Repeat operation on the second low voltage cable.



DES01300

Step 2:

Crimp pins on each of the 3 wires on the low voltage cable. Tag cable #1 using a solvent resistant marker at other end.



DES01297

DES01301

Step 3:

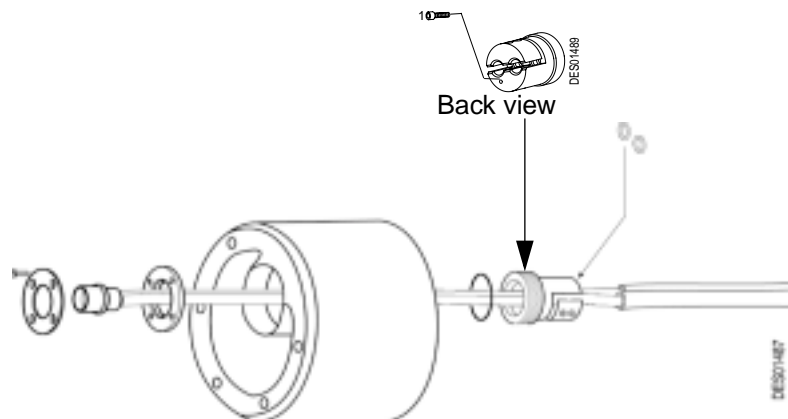
Crimp pins on the red, black and white wires on the 2nd low voltage cable. Tag #2 cable using a solvent resistant marker at other end.



DES01301

Step 4:

Feed cable ends through the connector assembly and the robot adaptor. The two seals are previously inserted into the connector assembly.



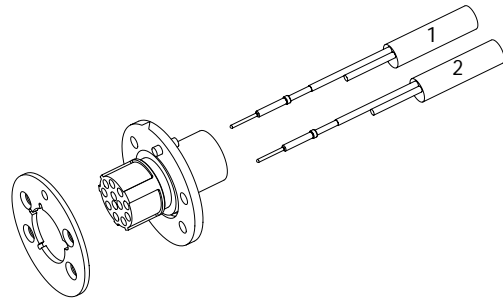
Note: * Screw (M3 x 8) ([see § 9.5 page 88](#)) not included with connector assembly, necessary only if grounded method is required. Contact your Sames representative for more details.

5. Maintenance (continued)

5.3.4 Low voltage cable wiring instructions (continued)

Step 5:

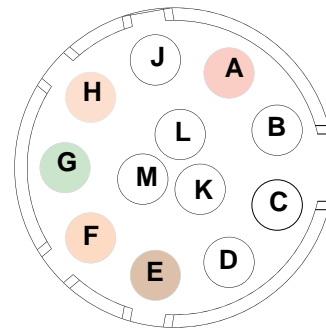
Insert low voltage cable assemblies into the connector body using the wiring diagram below.



DES01482

Pin	Wire	Cable
L	Red	1
J	White	
K	Black	
D	Shield	
B	Red	2
C	White	
M	Black	

Note: Holes A, E, F, G, & H are not used.

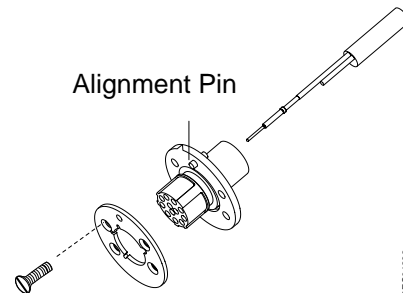


Wiring diagram

DES01303

Step 6:

Feed the low voltage cable ends through the positioning plug washer with its flat side and pin facing out, then through the PPH 607 quick disconnect assembly.



DES01298

Step 7:

Assemble the two washers and electrical male connector together making sure all parts are correctly aligned and the mating is flush.

Step 8:

Position the above mentioned assembly into the UHT well by pulling on the cables and using two fingers to hold the assembly together.

Step 9:

The three o-rings must be in place before tightening connections (please refer to section 5.3.3. for details).

Step 10:

Tighten the assembly into the robot adaptor.

5. Maintenance (continued)

5.3.4 Low voltage cable wiring instructions (continued)

Step 10:

Secure the electrical connector assembly with the (4) plastic screws.

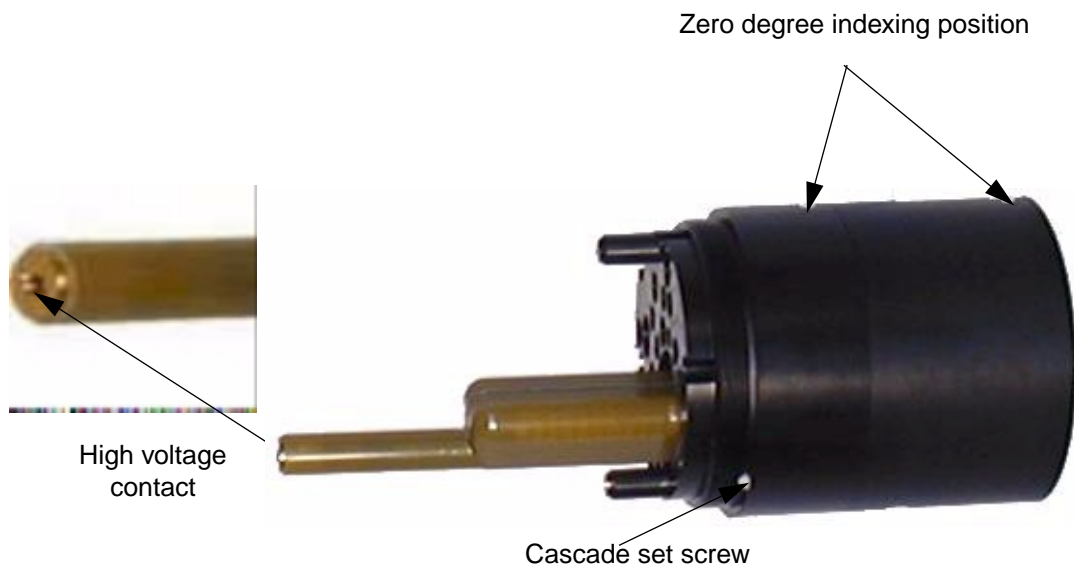
Step 11:

Feed cable ends through the 5/16" nylon tubing.

Step 12:

Place the nylon tubing inside the connector and secure with connector and 2 S/S screws.

5.3.5. UHT 153 Cascade



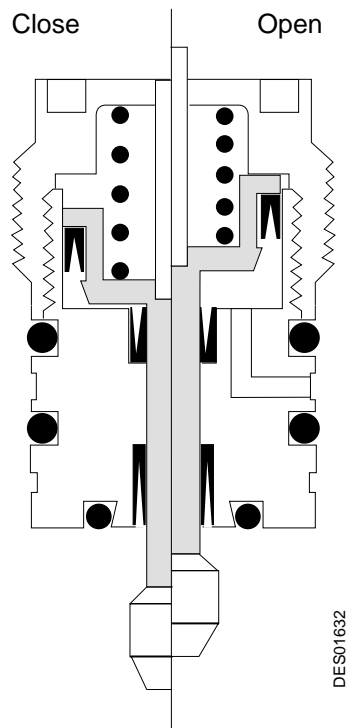
Note:

- After installing the UHT 153 into the quick disconnect, apply a light film of dielectric grease to the rod and high voltage contact before installing the PPH 607 manifold.
- Be sure to tighten the cascade set screw to prevent the cascade from falling out and breaking.

5. Maintenance (continued)

5.3.6. Nano-valve

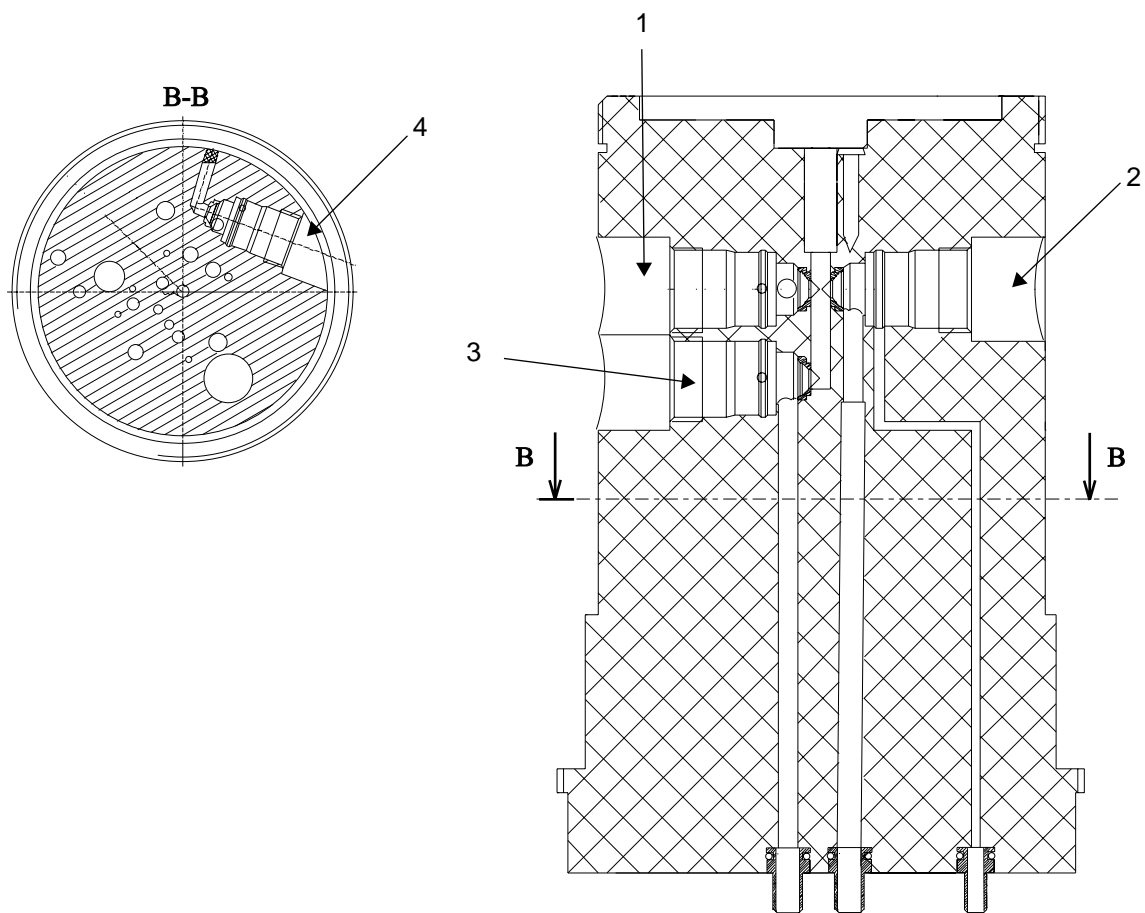
The compact size of SAMES nano-valves means they can be positioned near to the atomizer, reducing paint and solvent consumption and color changing time.



CAUTION : Valve not repairable, only replaceable as a whole unit.

5. Maintenance (continued)

5.3.6 Nano-valve (continued)



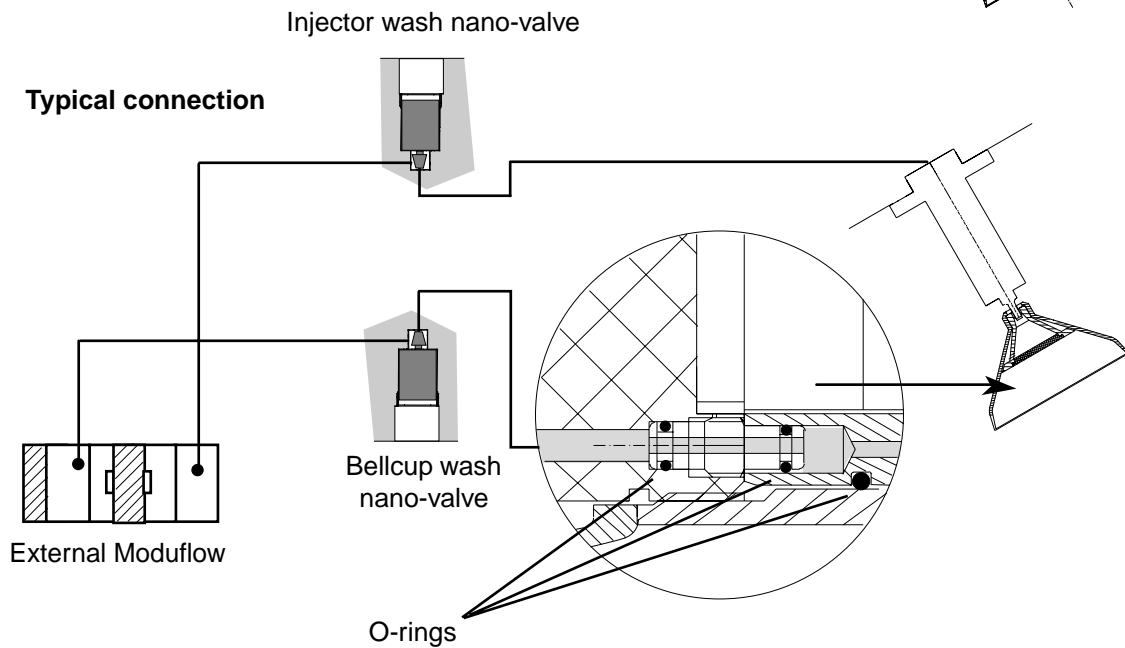
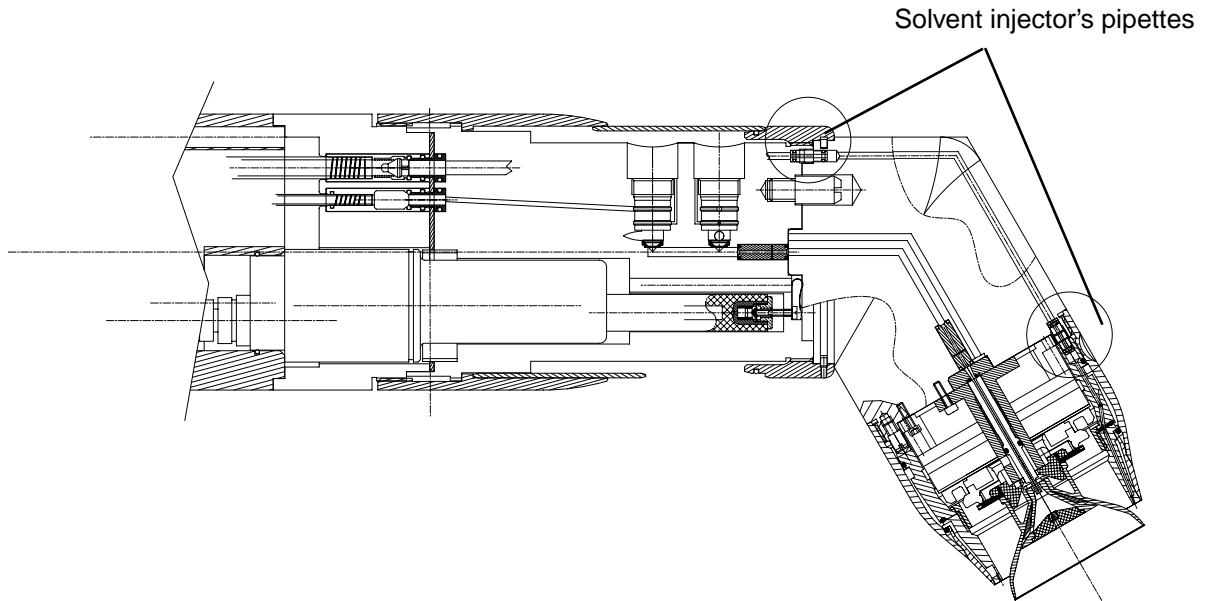
DES01654

Item	Function	Qty
1	Paint trigger nano-valve (11)	1
2	Dump nano-valve (41)	1
3	Injector wash nano-valve (32)	1
4	Bellcup wash nano-valve (31)	1

5. Maintenance (continued)

5.3.7. Injector and bellcup wash

- **Injector wash:** the solvent passes directly through the injector.
- **External bellcup wash:** the solvent passes through a hole in the shaping air shroud to wash the external surfaces of the bellcup.



CAUTION : Inspect to make certain the o-rings on the solvent injector's pipette and on the shaping air shroud are in place before installing the aluminium cover.

5. Maintenance (continued)

5.3.8. Turbine repair procedures

Tools required:

- 400 grit wet sandpaper
- 600 or finer grit wet sandpaper
- Lapping surface / flat marble stone / flat glass surface
- Compressed air line

Clean all components with solvent, and follow the steps described below:

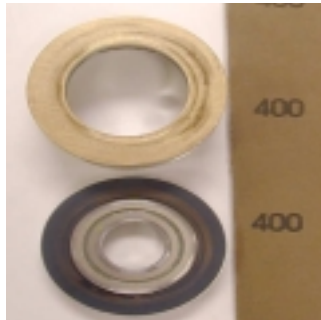


Wet sanding method:

Step 1:

Place a 5 x 5 inches lapping surface in a basin or a sink and cover with at least 1/4" of water.

Note: Best results are obtained if sanding is done under running water.



Step 2:

The first sanding is done with a 400 grit paper.

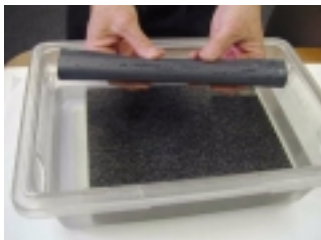
Note: Be certain that the paper, the water and the slab remain clean at all time to avoid damage to the surfaces.



Step 3 and 4:

Place the paper under water over the lapping surface and smooth out the paper with the fingers to remove any air bubbles.

Note: Roll up paper if edges curl upward in the water.



5. Maintenance (continued)

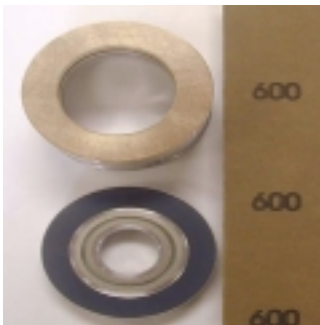
5.3.8 Turbine repair procedures (continued)



Step 5:

Hold the part (stator or rotor) flat on the sanding paper applying even pressure and slide in a figure 8 without lifting the part while sanding, change sand paper if required then proceed with sanding the part until all surfaces are free of imperfections, repeat if necessary.

Note: Always use fresh water and new sand paper after each sanding operation.



Step 6:

Final sanding is done using sand paper 600 or finer until all surfaces are well polished, this time starting with the rotor.



Step 7, 8 and 9:

(Make sure there is no water or grit left in the bearing holes). Dry all components with compressed air then wipe with a clean soft cloth. Reassemble the turbine according to instruction [see § 6.4.2 page 58](#).



5. Maintenance (continued)

5.3.9. Speed settings

Note: These settings are typical examples. For more precise or different configurations, please contact your SAMES Technologies representative.

65 EC bellcup for Metallic base coat

- Viscosity : 18 s Ford cup #4 @ 80° F
- Weight solids : 32 %
- Target distance : 9.5 inches
- Estat : 90 kV

Settings	Flow rates (cc/min)	Shaping air (l/min)	Bellcup speed (kRpm)	Tip speed (mm/s)	Pattern Width (inch)	Film build (mils)
Low	100	100	29	75	23	0.43
Medium	135	130	35	75	21	0.52
High	160	155	42	75	21	0.65

60 mm negative edge bellcup for Base coat (solid)

- Viscosity : 34 s Ford cup #4 @ 80° F
- Weight solids : 44 %
- Target distance : 9.5 inches
- Estat : 90 kV

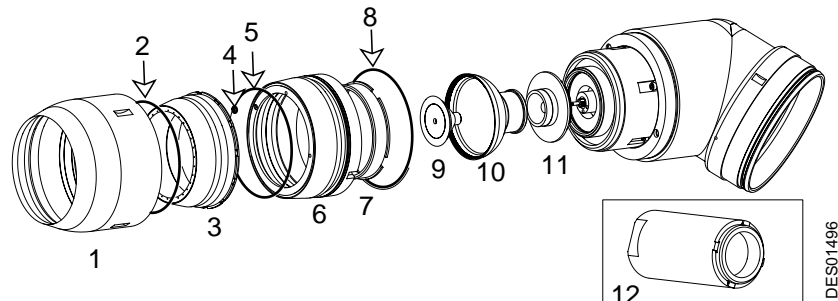
Settings	Flow rates (cc/min)	Shaping air (l/min)	Bellcup speed (k Rpm)	Tip speed (mm/s)	Pattern Width (inch)	Film build (mils)
Low	150	120	29	75	27	0.75
Medium	190	150	36	75	24	0.9
High	230	180	43	75	26	1.1

6. Assembly / disassembly

6.1. Aluminium cover and shaping air shroud 65EC version

6.1.1. Disassembly

- **Step 1:** Make sure that the high voltage is OFF.
- **Step 2:** Remove the aluminium cover with the wrench P/N # 1308689.



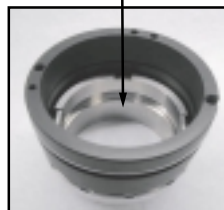
Item	Description	Qty
1	Aluminium cover	1
2	O-ring 84 x 2 teflon encapsulated - viton	1
3	Shaping air insert OD: 65mm	1
4	O-ring 2.0 x 1.25 chemically inert	1
5	O-ring 82 x 1.6 teflon encapsulated - viton	1
6	Shaping air shroud	1
7	Shaping air nut OD: 65mm	1
8	O-ring 88.62 x 1.78 mm teflon encapsulated - viton	1
9	Deflector	1
10	Bellcup 65 EC, body	1
11	Clip	1
12	Shaping air nut removal and installation tool	1

Note: see § 8.2 page 76 for Sames spare parts lists.

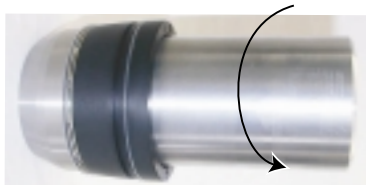
Shaping air nut



Fig. 1



To remove



• Step 2:

The shaping air shroud and shaping air insert are fastened together (see fig.1) with the shaping air nut and can be disassembled using the tool P/N # 72-1126-00 as illustrated

• Step 3:

Remove the o-rings (item 4-5-8) from the shaping air shroud (item 6).

• Step 4:

Remove bellcup and clip assembly (see § 6.2.1 page 50)

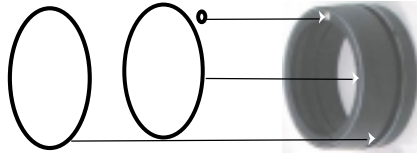
6. Assembly and disassembly (continued)

6.1 Aluminium cover and shaping air shroud 65EC version (continued)

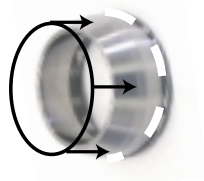
6.1.2. Assembly

Clean all components and inspect for damage, replace if necessary ([see § 7 page 65.](#))

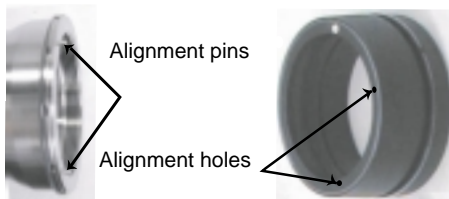
Note: O-ring kit available [see § 9.1 page 84.](#)



- **Step 1:** Place the o-rings onto the shaping air shroud (item 4-5-8)



- **Step 2:** Slide o-ring over the shaping air insert until it sits in its groove.



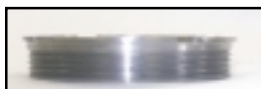
- **Step 3:** Align the shaping air insert to the shaping air shroud, be careful not to damage the o-rings.

Alignment pins

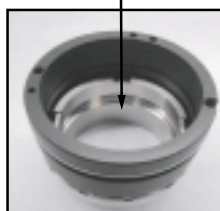


- **Step 4:** Secure the shaping air insert to the shaping air shroud by placing the shaping air nut evenly inside the shaping air shroud as illustrated and tighten lightly with fingers.

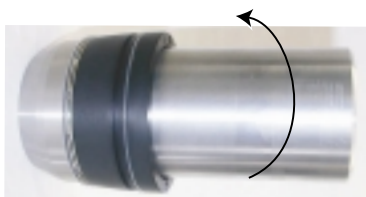
Shaping air nut



- **Step 5:** Secure in place with shaping air nut removal and installation tool P/N 72-1126-00.



- **Step 6:** Align the whole assembly to the robotic elbow, place the aluminium cover over the assembly, secure it by hand then tighten it with the wrench 1308689.

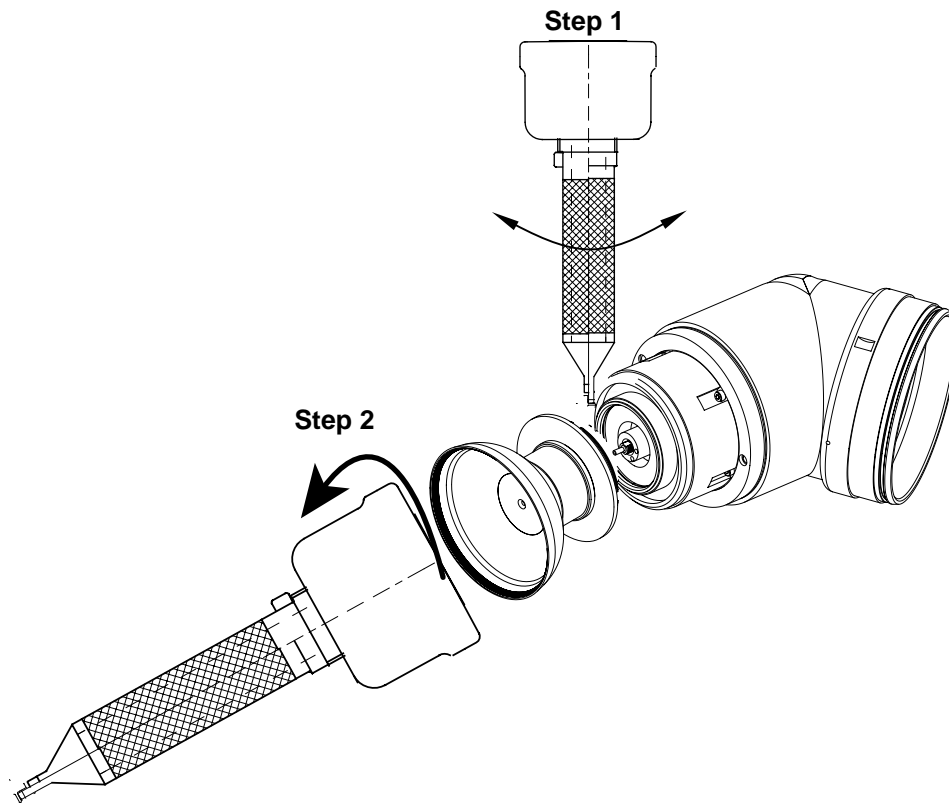


6. Assembly and disassembly (continued)

6.2. Bellcup, clip and distributor 65EC version

6.2.1. Disassembly (bellcup clip assembly)

Note: To disassemble the bellcup and clip assembly, use the tool P/N 72-1107-00.



SAFETY :

- Wear rubber gloves or use a rag to protect your hands from the sharp edges of the bellcup,
 - Bearing air must be turned OFF.
 - Avoid damage to the bellcup and clip.
-
- Place the opened clamp around the bellcup and turn handle clockwise to tighten the clamp around it. Turn the clamp counterclock-wise to unscrew bellcup from the clip.
 - Hold clip firmly and unscrew the clip with the tool

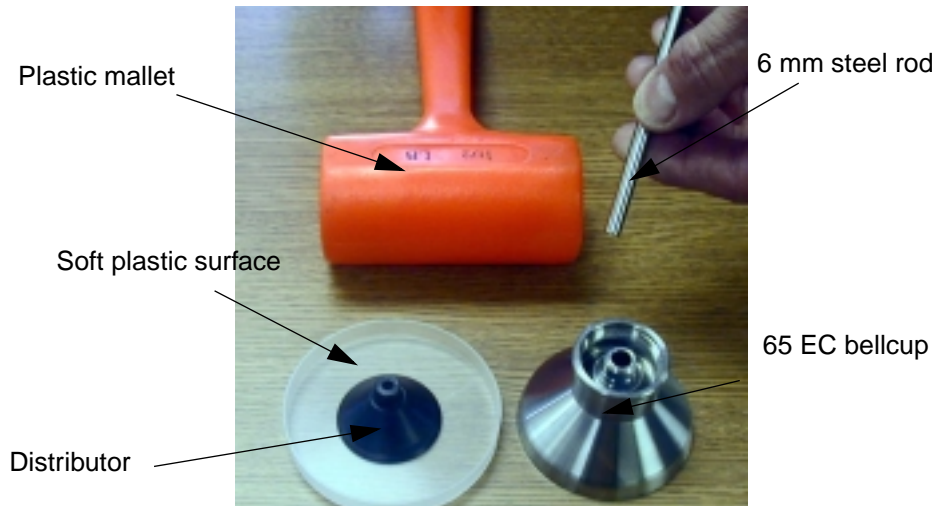
6. Assembly and disassembly (continued)

6.2 Bellcup, clip and distributor 65 EC version (continued)

6.2.2. Distributor removal

- **Step 1:** Separate the clip from the bellcup as described before.

Required accessories to remove distributor from bellcup:



- **Step 2:** Place bellcup upside down as illustrated above on a soft surface to avoid damage to the bellcup.
- **Step 3:** Insert the rod into the bellcup as illustrated below and hit the 6 mm rod with the mallet to release the distributor.



6.2.3. Distributor reinstallation

- **Step 1:** Place the distributor into the bellcup (well centered).
- **Step 2:** Push with fingers.

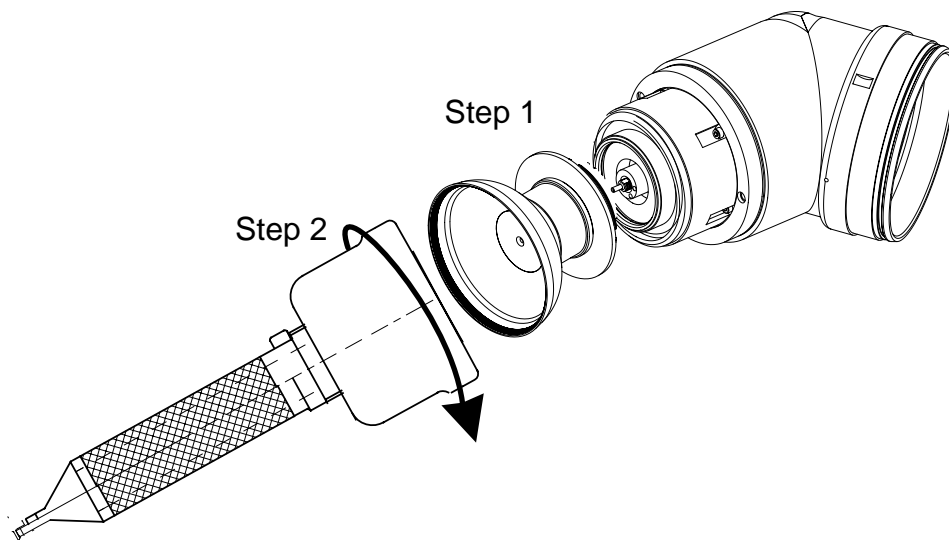
6. Assembly and disassembly (continued)

6.2 Bellcup, clip and distributor 65 EC version (continued)

6.2.4. Assembly (bellcup and clip)



SAFETY : To avoid injury, it is recommended to wear rubber gloves or to use a rag to install the bellcup and clip assembly.



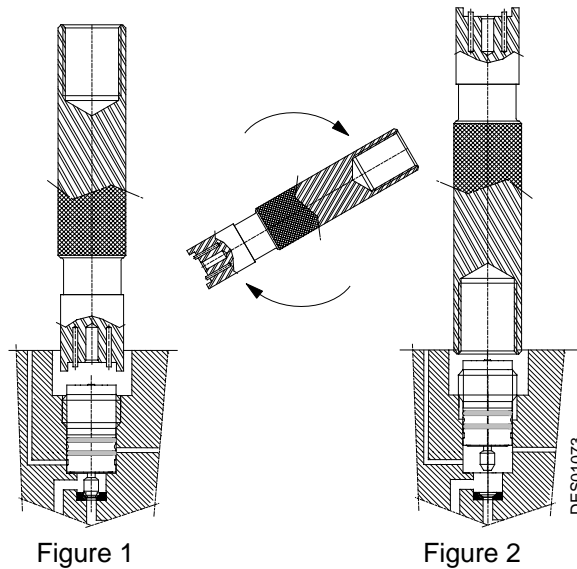
DES01503

- **Step 1:** Secure the clip to the bellcup by turning the tool clockwise by hand.
- **Step 2:** Place the opened clamp to close the grip around the bellcup and tighten the bellcup onto the clip.
- **Step 3:** Press the bellcup and clip assembly to the turbine motor making sure it is well secured.

6. Assembly and disassembly (continued)

6.3. Nano-valve

6.3.1. Removal



- **Step 1:** Use tool P/N 1301832.
- **Step 2:** Loosen the nano-valve by turning counterclock wise until it is released from the threads (see fig. 1)
- **Step 3:** Flip the tool around (fig.2) and completely screw the tool onto the nano-valve and pull to remove.

6.3.2. Assembly

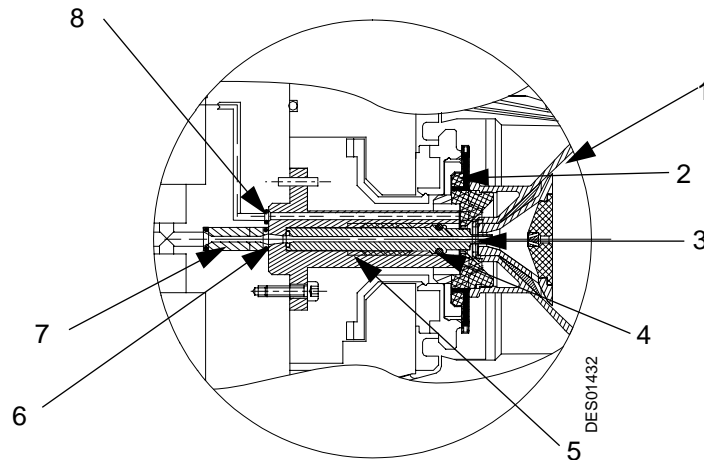
Inspect nano-valve and components for damage and replace if necessary.

- **Step 1:** Clean all components ([see § 7.4 page 70](#)).
- **Step 2:** Apply a light film of dielectric grease (pure vaseline P/N H1GMIN017) to the nano-valve, then insert the nano-valve into the manifold.
- **Step 3:** Insert the nano-valve tool onto the nano-valve and with the tool P/N 1403498 turn clockwise to a maximum torque of 1.8 ft/lbs (2,5 Nm).

6. Assembly and disassembly (continued)

6.4. Turbine motor, injector, restrictor

6.4.1. Disassembly

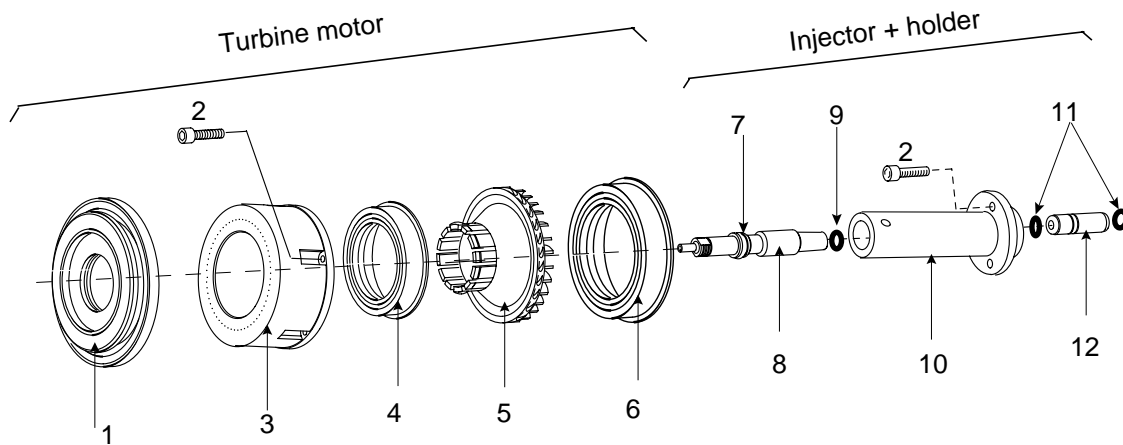


Item	Description	Qty
1	Bellcup	1
2	Clip	1
3	Injector D: 1.8 mm	1
4	Injector o-ring 5.28 x 1.78 chemically inert	1
5	Injector holder	1
6	Injector o-ring 2.0 x 1.25 chemically inert	1
7	Restrictor (dia. 3mm) equipped with two o-rings size 3.1 x 1.6 chemically inert	1
8	Microphone o-ring 2.75 x 1.6 chemically inert	2
Note: see § 8.1 page 71, see § 8.9 page 83, for Sames spare parts list for details.		

6. Assembly and disassembly (continued)

6.4. Turbine motor, injector, restrictor (continued)

6.4.1 Disassembly (continued)



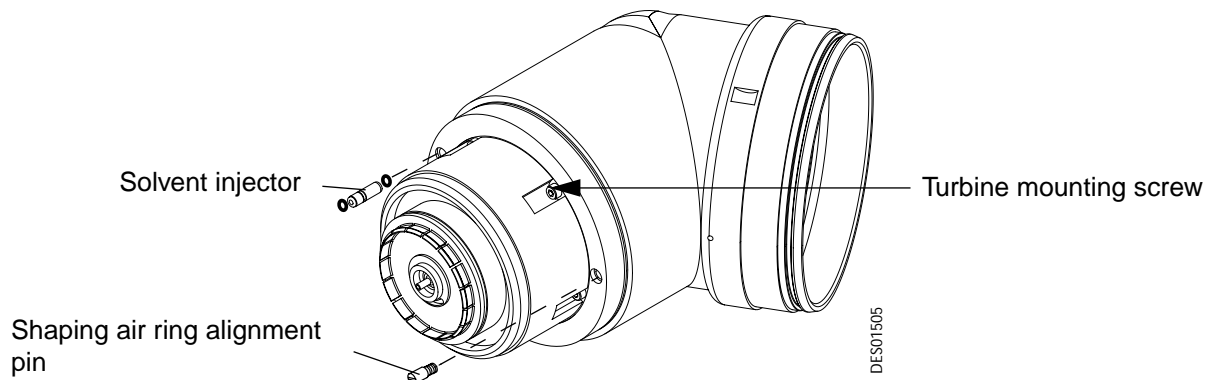
DES01504

Item	Description	Qty
1	Rotor	1
2	Screw M3 x 12 socket head s/s	8
3	Stator	1
4	Stator magnet	1
5	Drive wheel	1
6	Deflector with o-ring size 52.07 x 2.62 viton	1
7	O-ring 5.28 x 1.78 chemically inert	1
8	Injector 1.8 mm	1
9	O-ring 2.0 x 1.25 chemically inert	2
10	Injector holder	1
11	O-ring 3.1 x 1.6 chemically inert	2
12	Restrictor 3.0 mm	1

Note: see § 8.1 page 71 , see § 8.8 page 82 for Sames spare parts lists

Turbine motor

- **Step 1:** Remove the 5 screws holding the turbine to the robotic elbow using a 2.5 mm allen wrench then remove injector solvent and shaping air alignment pin.

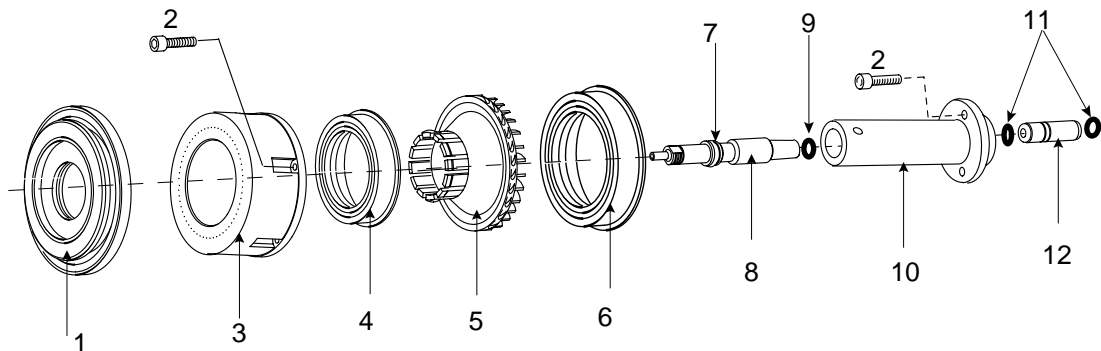


DES01505

6. Assembly and disassembly (continued)

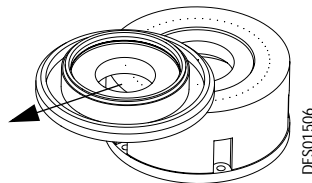
6.4 Turbine motor, injector, restrictor (continued)

6.4.1 Disassembly (continued)



DES01504

- **Step 2:** Remove the deflector (6) with its seal by sliding it with your thumbs .
- **Step 3:** Remove the drive wheel (5) using the tool (P/N. 1308679) .
- **Step 4:** Remove the rotor (1) by sliding it straight across the stator (3).



DES01506

- **Step 5:** Remove the magnet (4).
- **Step 6:** Measure with a calliper the stator assy thickness. The reading should be between 35 mm mini and 35.45 mm maxi.



CAUTION : Below 35 mm, the stator assy has to be replaced. Between 35 mm and 35.45 mm, the stator can be repaired ([see § 5.3.8 page 45](#)).

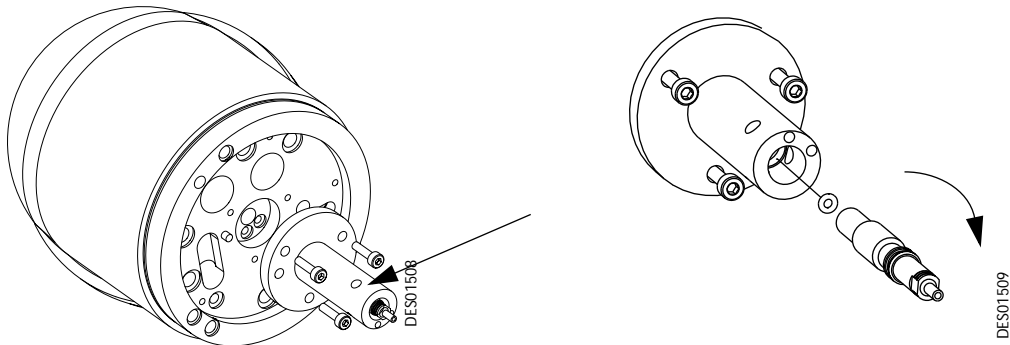
6. Assembly and disassembly (continued)

6.4 Turbine motor, injector, restrictor (continued)

6.4.1 Disassembly (continued)

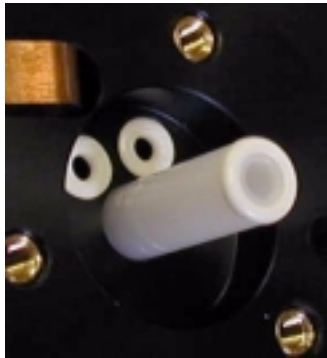
Injector and injector holder

- **Step 1:** Remove the 3 screws holding the injector holder in place with an allen wrench size 2.5mm.



Note: Left hand threads injector.

- **Step 2:** Remove the injector using the injector tool P/N 1408599 (left hand threads), being careful not to damage the injector and/or the o-rings.



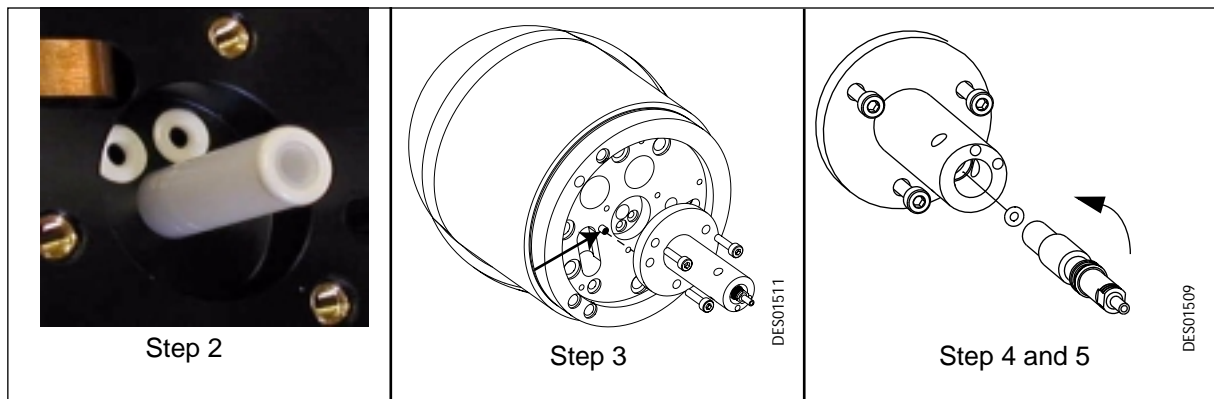
- **Step 3:** With the restrictor tool P/N 1408598 pull the restrictor out from the manifold. Be careful not to damage the o-rings.

Note: The o-ring located at the bottom of the restrictor may remain stuck in the manifold housing after removing the restrictor, make sure it is retrieved.

6. Assembly and disassembly (continued)

6.4 Turbine motor, injector, restrictor (continued)

6.4.2. Assembly

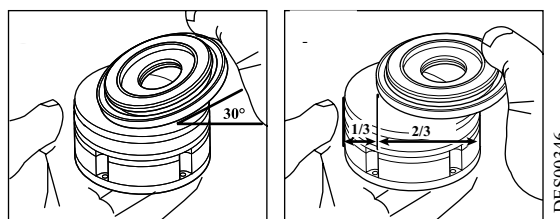


Injector and injector holder

- **Step 1:** Clean and inspect all components for damage, replace if necessary.
- **Step 2:** Insert the microphone o-rings into the manifold. Assemble the restrictor with the correct size o-rings to the correct size restrictor ([see § 8.9 page 83](#) for Sames spare parts lists), and push into the manifold until completely inserted as illustrated.
- **Step 3:** Align the injector holder to the alignment pin on the manifold and secure with the 3 screws using an 2.5 mm allen wrench.
- **Step 4:** Install the injector equipped with the o-rings.
- **Step 5:** Place the injector assembly into the injector holder and tighten by turning counterclock wise (left hand thread) with the injector tool to a maximum torque of 12.3ft/lbs (7 N.m). ([see § 8.9 page 83](#) for Sames spare parts lists).

Turbine motor

- **Step 1:** Slide the rotor onto the stator as illustrated and avoid sudden impact which could cause damage to the rotor.



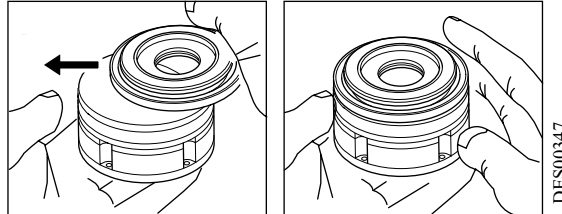
WARNING : A sudden impact to the rotor will damage the turbine.

6. Assembly and disassembly (continued)

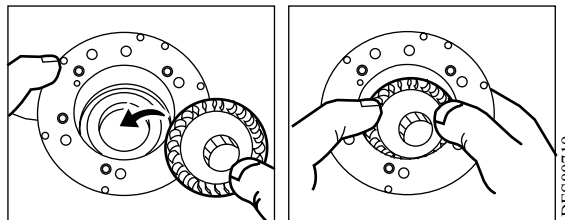
6.4 Turbine motor, injector, restrictor (continued)

6.4.2 Assembly (continued)

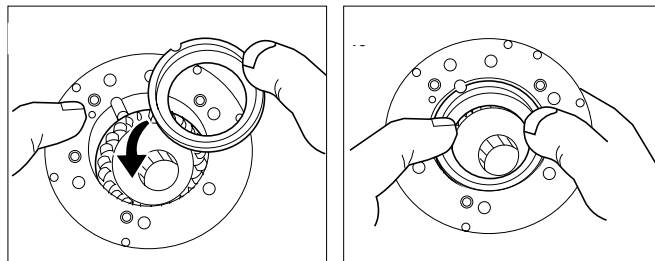
- **Step 2:** Center the rotor to the stator.



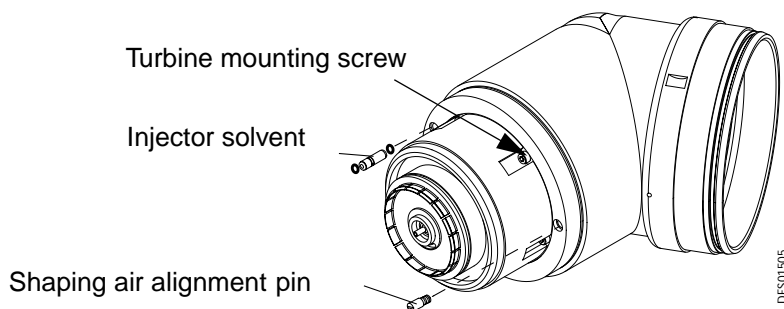
- **Step 3:** Insert the stator magnet into the stator.
- **Step 4:** Insert the turbine wheel into the stator and push in with the thumbs as illustrated. A click should be heard if correctly in place.



- **Step 5:** Insert the deflector equipped with the o-ring and press in with the thumbs as illustrated.



- **Step 6:** Install the assembled turbine onto the manifold and secure with the 5 turbine mounting screws, then install the solvent injector with o-rings and the shaping air alignment pin.



6. Assembly and disassembly (continued)

6.5. Regulator

(Option available for by-pass [see § 9.4 page 88](#) for details)

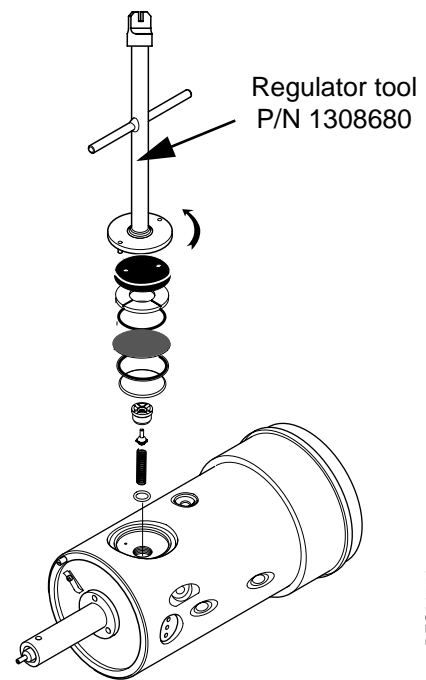
6.5.1. Disassembly

- **Step 1:** Proceed with the circuit flushing cycle.
- **Step 2:** Turn off all pneumatic and high voltage supplies
- **Step 3:** Slide out the cover.
- **Step 4:** Use tool P/N 1308680, and remove the regulator cover.
- **Step 5:** Remove the regulator assembly (all components).

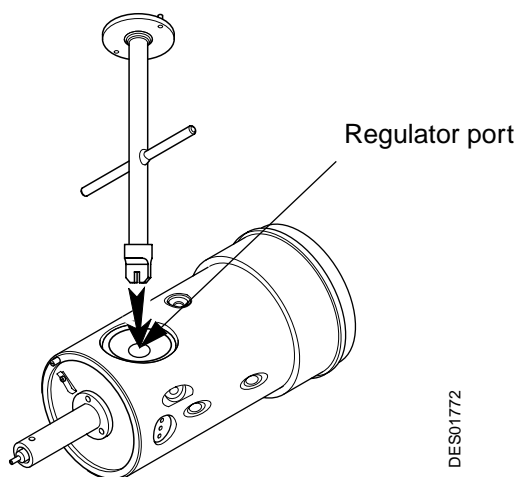
Note: Do not damage the inner lip use the tool P/N 72-0581-00 or a plastic object when removing the diaphragm.

6.5.2. Assembly

- **Step 1:** Insert a new o-ring.
- **Step 2:** Insert the spring.
- **Step 3:** Insert the poppet, making sure the poppet is free to move
- **Step 4:** Place the seat and tighten with the regulator tool.
- **Step 5:** Place the diaphragm pusher.
- **Step 6:** Place o-ring into manifold.
- **Step 7:** Place the diaphragm with the black side out make sure it is flat and properly placed.
- **Step 8:** Place o-ring into air pilot disk.
- **Step 9:** Place the air pilot disk with o-ring side down.
- **Step 10:** Place the cover and tighten with the wrench as illustrated above.



DES01771



DES01772

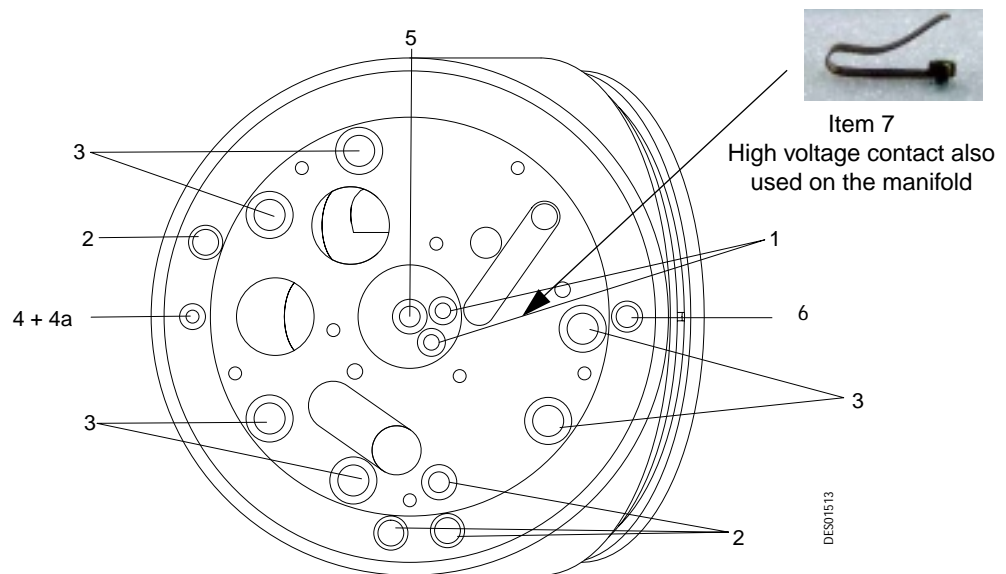
	Cover P/N 543894
	Disk, air pilot P/N 543891
	O-ring 40 x 2.5 P/N J2FTDF410
	Diaphragm P/N 543893
	O-ring 41 x 1.78 P/N J2FTDF416
	Diaphragm pusher 38mm P/N 543892
	Seat P/N 930624
	Poppet P/N 641770
	Spring P/N 742759
	O-ring 10.5 x 2.0 P/N J3TTCN007

Replace only if rebuilding the regulator →

6. Assembly and disassembly (continued)

6.6. Robotic elbow

6.6.1. Disassembly



Item	Description	Qty
1	O-ring 2.75 x 1.6 - chemically inert (Microphone air)	2
2	O-ring 3.68 x 1.78 - chemically inert (Bearing and compensation air)	4
3	O-ring 6.07 x 1.78 - chemically inert (Turbine drive and brake air)	6
4	O-ring 2.9 x 1.2 - chemically inert for injector	2
4a	Solvent injector	1
5	O-ring 3.1 x 1.6 - chemically inert for restrictor	2
6	Shaping air alignment pin	1
7	High voltage contact and screw	1
Note: see § 8.1 page 71 and see § 8.3 page 77 for Sames spare parts list		

- **Step 1:** Remove all o-rings
- **Step 2:** Remove shaping air alignment pin.
- **Step 3:** Remove solvent injector and remove the two o-rings.
- **Step 4:** Remove high voltage contact.

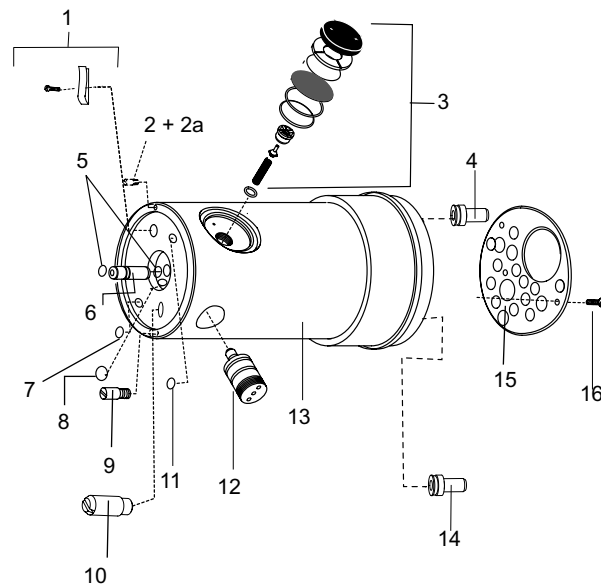
6.6.2. Assembly

- **Step 1:** Install all o-rings.
- **Step 2:** Install shaping air alignment pin.
- **Step 3:** Apply a light film of dielectric grease on the solvent injector and install the two o-rings.
- **Step 4:** Install the high voltage contact and secure in place with one brass screw.

6. Assembly and disassembly (continued)

6.7. Manifold

6.7.1. Disassembly



DES02089

Item	Description	Qty
1	High voltage contact assembly	1
2	Solvent injector	1
2a	O-ring 2.9 x 1.2 - chemically inert	2
3	Regulator assembly	1
4	Pipette 6mm	9
5	O-ring 3.1 x 1.6 - chemically inert for restrictor	2
6	Restrictor Dia. 3.0mm	1
7	O-ring 6.07 x 1.78 - chemically inert (Turbine drive and brake air)	6
8	O-ring 2.75 x 1.6 - chemically inert (Microphone air)	2
9	Shaping air alignment pin	1
10	Alignment pin Dia. 12	2
11	O-ring 3.68 x 1.78 - chemically inert (Bearing and compensation air)	4
12	Nano-valve	4
13	Manifold body	1
14	Pipette 8mm	6
15	Pipette bracket	1
16	Screw nylon M4 x 10	3
Note: see § 8.1 page 71 for Sames spare parts list		

6. Assembly and disassembly (continued)

6.7. Manifold (continued)

6.7.1. Disassembly (continued)

- **Step 1:** Remove all o-rings
- **Step 2:** Remove the solvent injector (item 2) then remove the two o-rings (item 2a) from the solvent injector
- **Step 3:** Remove the restrictor (item 6) and then remove the two o-rings (item 5) from the restrictor.
- **Step 4:** Remove shaping air alignment pin (item 9).
- **Step 5:** Remove the alignment pins (item 10).
- **Step 6:** Remove the high voltage contact and screw assembly (item 1).
- **Step 7:** Remove the nano-valves (item 12), ([see § 6.3.1 page 53](#) for details).
- **Step 8:** Remove the regulator (item 3), ([see § 6.5.1 page 60](#) for details).
- **Step 9:** Remove the three screws (item 16), holding the pipette bracket.
- **Step 10:** Remove the pipette bracket (item 15).
- **Step 11:** Remove pipettes (item 4 and 14).

6.7.2. Assembly

Note: Clean all components and inspect for damage, replace if necessary.

- **Step 1:** Install o-rings coated with a light film of dielectric grease.
- **Step 2:** Install the solvent injector (item 2) equipped with the two o-rings (item 2a)
- **Step 3:** Install the restrictor (item 6) equipped with the two o-rings (item 5).
- **Step 4:** Install the shaping air alignment pin (item 9).
- **Step 5:** Install the alignment pins (item 10).
- **Step 6:** Install the high voltage assembly. (item 1).
- **Step 7:** Install the nano-valves (item 12), ([see § 6.3.2 page 53](#) for details).
- **Step 8:** Install the regulator (item 3), ([see § 6.5.2 page 60](#) for details).
- **Step 9:** Install the pipettes (item 4 and 14) equipped with their o-rings.
- **Step 10:** Install the pipette bracket (item 15), fit and secure with the three nylon screws (item 16).

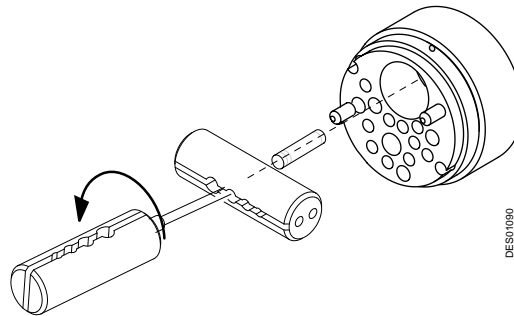
6. Assembly and disassembly (continued)

6.8. Fittings and hoses

6.8.1. Fittings removal

Remove fittings and hoses from the atomizer robot adaptor

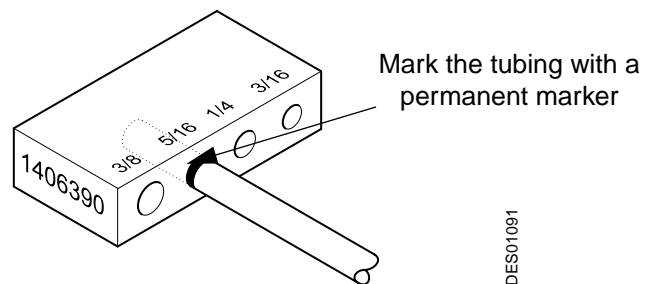
- **Step 1:** Use one tool P/N 1305453 and to hold the hose
- **Step 2:** Place the second tool P/N 1305453 and turn counterclock wise to remove.
- **Step 3:** Install new hoses on fittings



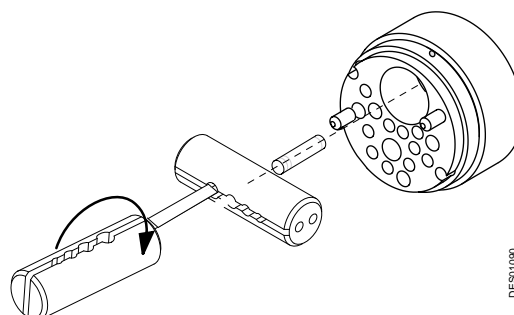
6.8.2. Assembly

Note: Make sure to shorten hose by 0.6 Inch (15 mm) if previously used.

- **Step 1:** Fit hose in the tool P/N 1406390 mark as shown
- **Step 2:** Place tool and fitting onto hose and turn clockwise to tighten until it reaches the mark



WARNING : Do not apply too much force while tightening. If hose turns, cut again and re-install the fitting. For correct tube fittings and o-rings [see § 8.7 page 81](#).



- **Step 3:** Reconnect the fitting and hose on the quick disconnect robot plate

7. Cleaning procedures

At the end of each shift or as required by plant practices, activate the purge cycle.

- Stop and shut down the system.
- Clean the atomizer using dump solvent rag.



CAUTION : On no account should the atomizer or any of its component be sprayed with solvent or high/low pressure water.

SAMES Technologies does not recommend the use of covers. Although, if the plant chooses to protect atomizers with covers, do not use “anti-static quality” plastic films as these are conductive, and can short-circuit the high voltage.

A thin layer of dielectric grease (pure vaseline P/N # H1GMIN017) applied before covering the parts, facilitates removal of the cover.



WARNING : Always wear safety glasses or goggles
Always wear rubber gloves when handling solvent
Work in well ventilated area when handling solvent.

Procedure	Components	Frequency
A	Tightening ring, outer ring, outer bellcup surface	8 hours
B	Bellcup, inner and outer ring, outer injector surface, outer bellcup surface, outer clip surface	120 hours
C	Clip	480 hours



WARNING : Do not soak the turbine in solvent or use a solvent spray gun. Use a rag and soft bristle brush using an approved cleaning solution.

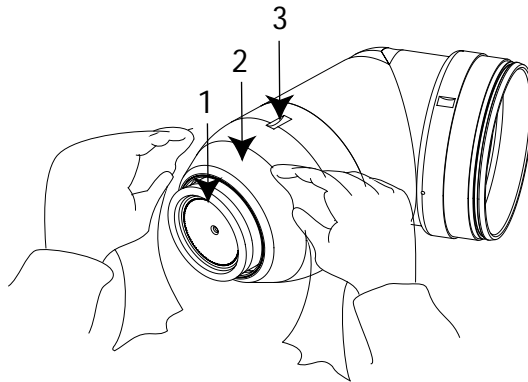
7. Cleaning procedures (continued)

7.1. Procedure A



WARNING : Turbine must be OFF. Bearing air and shaping must remain under pressure in order to stop solvent flow between the bellcup and the inner ring.

- **Step 1:** Clean the tightening ring, the aluminium cover and the outer bellcup surface with a clean rag.
- **Step 2:** Make sure that the grooves of the aluminium cover are clean
- **Step 3:** Dry with compressed air



DES01515

1	Bellcup
2	Aluminium cover
3	Aluminium cover groove

7. Cleaning procedures (continued)

7.2. Procedure B

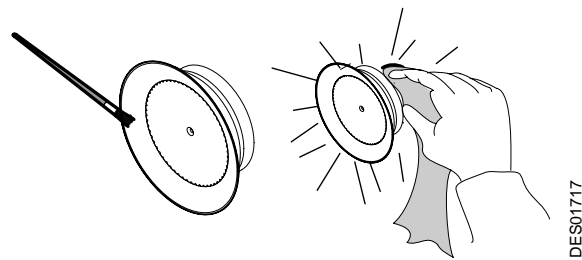
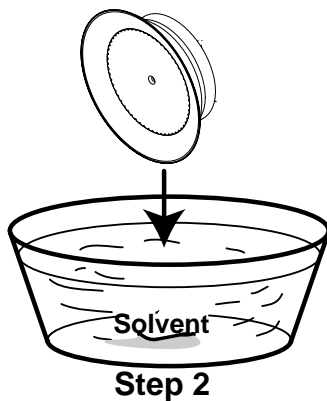


SAFETY : Stop turbine and shaping air.

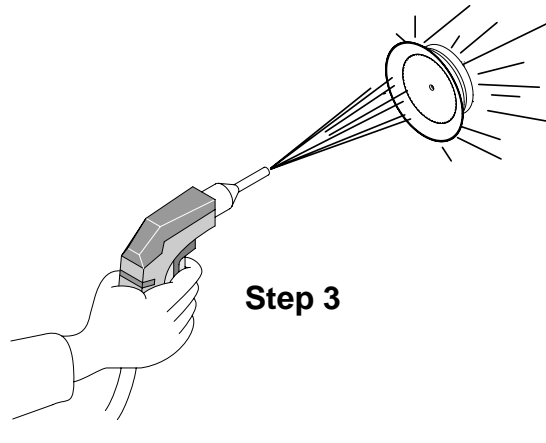
7.2.1. Bellcup

- **Step 1:** Remove the bellcup [see § 6.2.1 page 50](#)
- **Step 2:** Soak one hour in ethanol only and clean with a clean rag and a soft bristle brush.

Note: Make certain that all surface is clean and free of any contaminant to ensure proper fitting onto the clip.



- **Step 3:** Dry well using compressed air

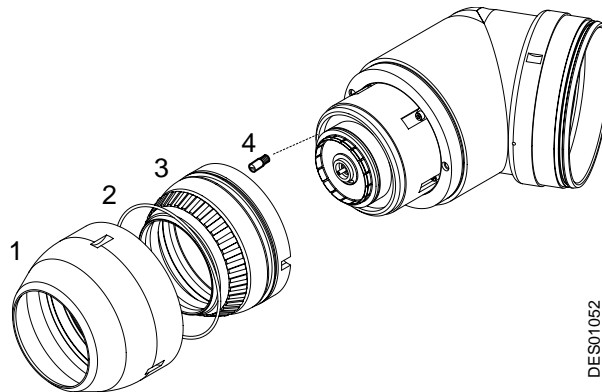


Note: It may be necessary to disassemble in order to clean the bellcup completely [see § 6.2.1 page 50](#). Use the appropriate tool for specific bellcup .

7. Cleaning procedure (continued)

7.2.2. Shaping air shroud

- **Step 1:** Remove the aluminium cover to remove the shaping air shroud



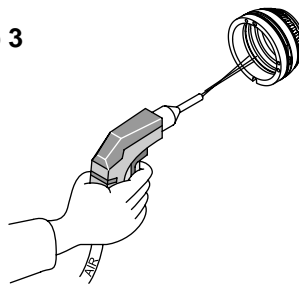
1	Aluminium cover
2	O-ring 88.62 x 1.78 teflon encapsulated
3	Shaping air shroud
4	Injector solvent with o-ring 2.9 x 1.2 chemically inert

- **Step 2:** Clean outside and inside surfaces with a rag dipped in solvent and a nylon brush.
- **Step 3:** Dry well with compressed air and a clean dry rag.

Step 2



Step 3



7.2.3. Injector and injector holder

- **Step 1:** Remove injector as per instruction ([see § 6.4.1 page 54](#))
- **Step 2:** Soak 1 hour in approved cleaning solution
- **Step 3:** Dry with compressed air

7. Cleaning procedures (continued)

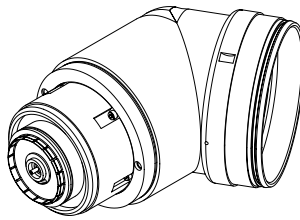
7.3. Procedure C



SAFETY : Switch off all electrical supply.

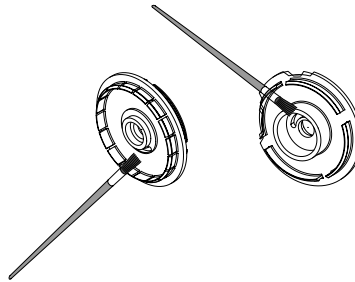
- **Step 1:** Remove the shaping air assembly (do not damage o-ring) [see § 6.1.1 page 48](#).
Remove bellcup [see § 6.2.1 page 50](#) .
- **Step 2:** Remove clip [see § 6.2.1 page 50](#).
- **Step 3:** Clean the clip with a nylon brush and solvent (MEK). Never soak the clip into solvent

Note: Make sure that the clip is not damaged



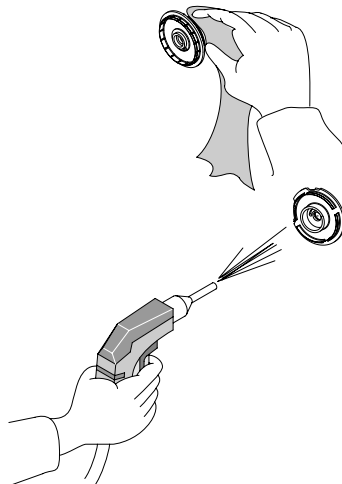
DES01100

- **Step 4:** Clean both sides of the bellcup



DES01101

- **Step 5:** Dry with compressed air



DES01103

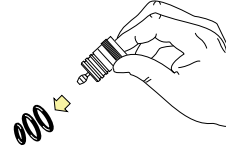
7. Cleaning procedures (continued)

7.4. Nano-valve clean up

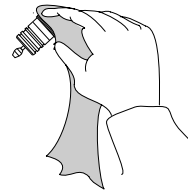


CAUTION : Do not soak the nano-valve in solvent

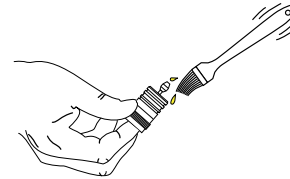
- **Step 1:** Remove all o-rings



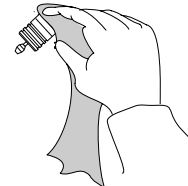
- **Step 2:** Wipe nano-valve with a moistened rag



- **Step 3:** Clean nano-valve with a stiff nylon brush

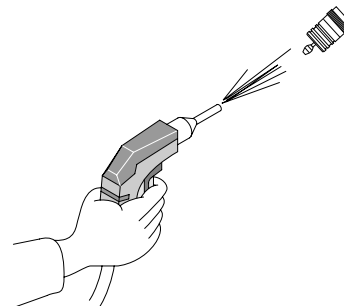


- **Step 4:** Wipe again with a dry rag



- **Step 5:** Blow out with clean compressed air

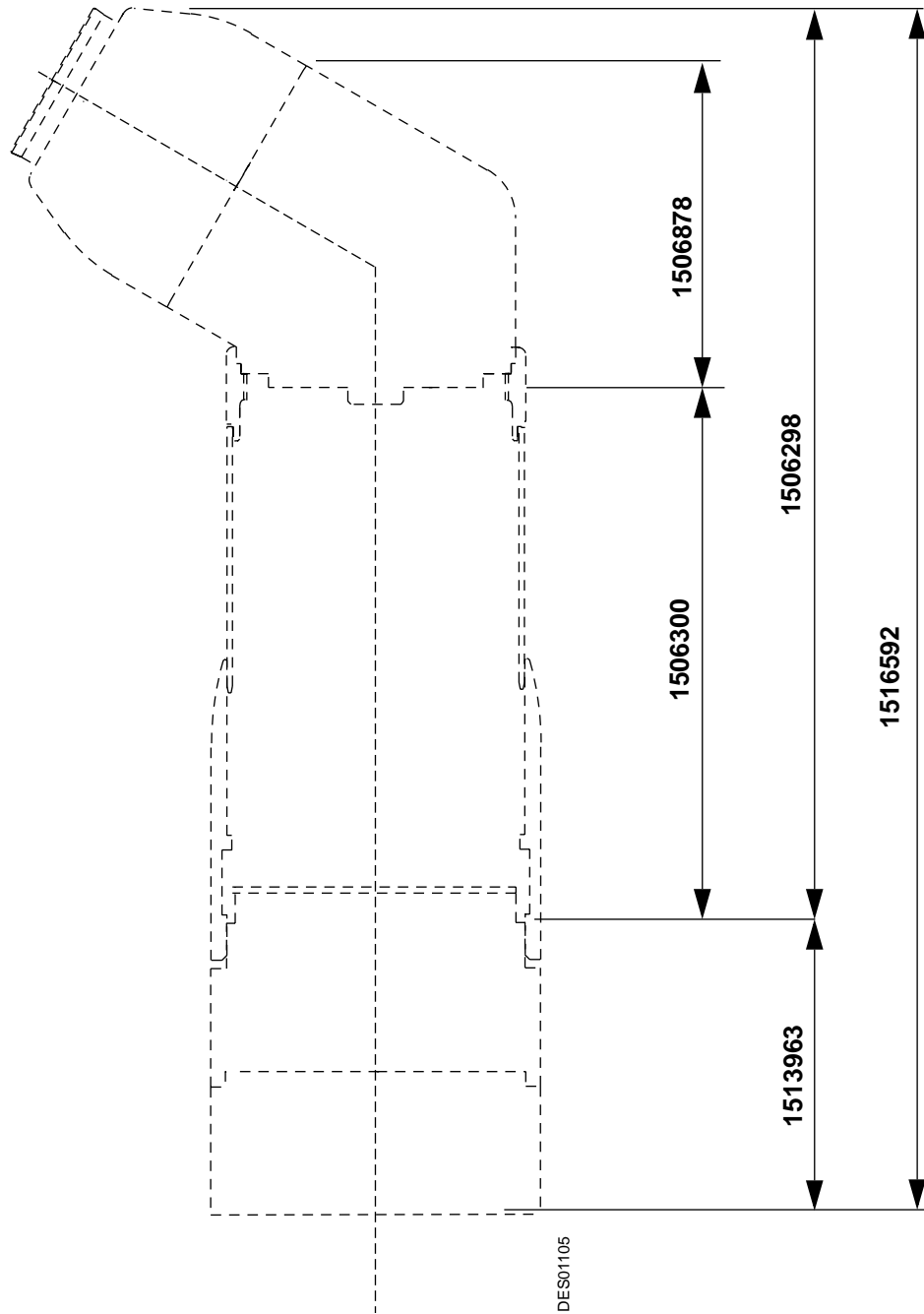
Note: for assembly [see § 6.3.2 page 53](#)



DES01634

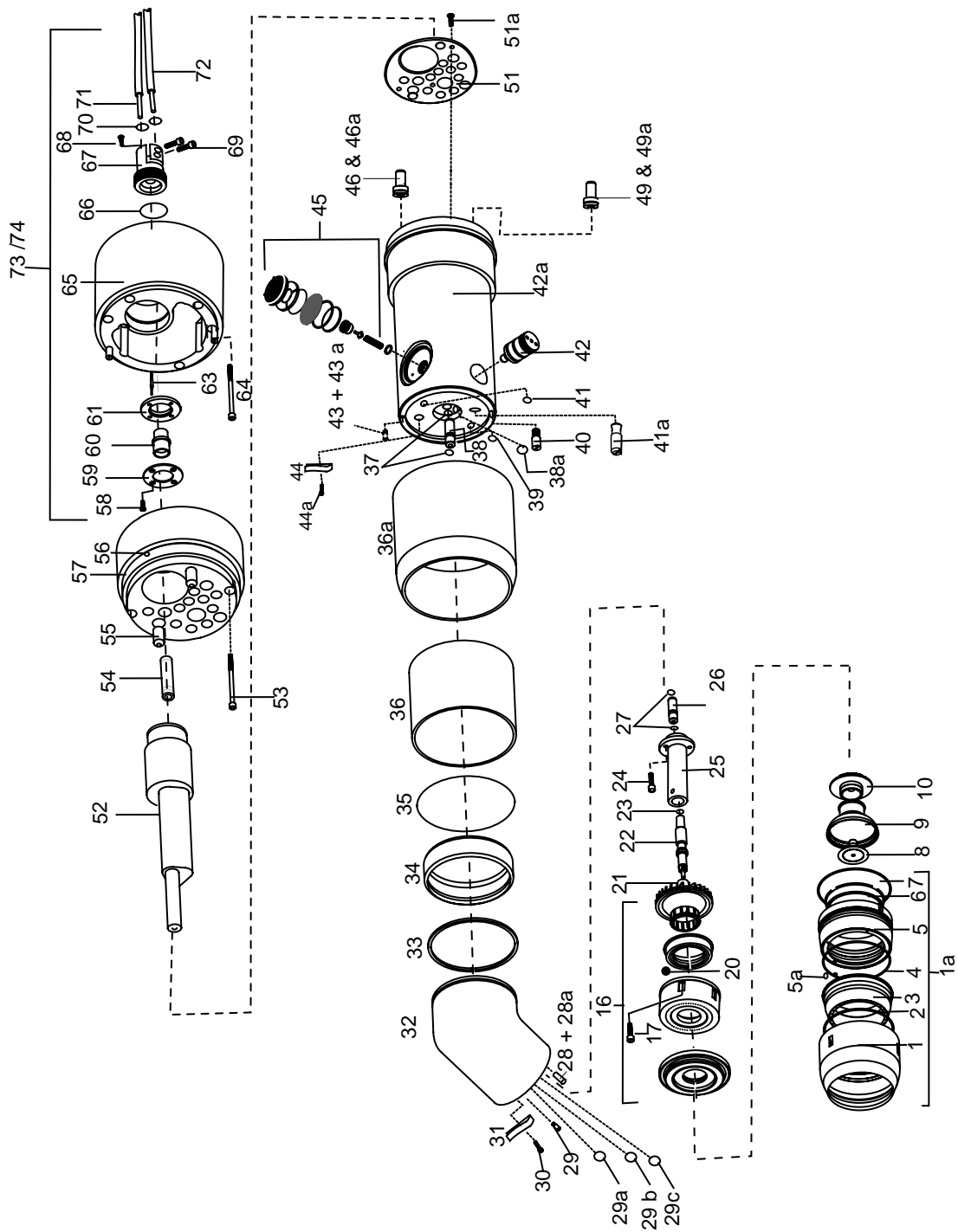
8. PPH 607 SCAR metric spare parts list

8.1. Robotic mount P/N 1516592 (65 EC bellcup not included)



8. PPH 607 SCAR metric spare parts list (continued)

8.1 Robotic mount, 65 EC version (continued)



8. PPH 607 SCAR metric spare parts list (continued)

8.1 Robotic mount, 65 EC version (continued)

Item	USA P/N	Sames P/N	Description	Qty
1	72-1124-01	1202996	Aluminium cover	1
1a	62-1137-00	1514409	Shaping air assembly	1
2	82-0993-05	J2FENV386	O-ring 84 x 2 teflon encapsulated - viton	1
3	72-1039-02	1202570	Shaping air insert OD: 65mm	1
4	82-0993-04	J2FENV385	O-ring 82 x 1.6 teflon encapsulated	1
5	72-1125-00	1202995	Shaping air shroud	1
5a	82-0410-31	J3STKL014	O-ring 2.5 X 1.25 chemically inert	1
6	72-1123-00	1310370	Shaping air nut OD: 65mm	1
7	J2FENV622	J2FENV622	O-ring 88.62 x 1.78mm, teflon encapsulated	1
8	1309562	1309562	Deflector	1
9	1202905	1202905	Bellcup 65 EC	1
10	1308547	1308547	Clip , 65EC	1
16	1505874	1505874	Turbine motor (see § 8.8 page 82.)	1
17	X4FVSY068	X4FVSY068	Screw Chc - M3 x 12 stainless steel socket head	5
20	K6RKBL361	K6RKBL361	Ball bearings see § 6.4.1 page 54 and see § 8.8 page 82)	41
21	82-0410-19	J3STKL005	O-ring 5.28 x 1.78 chemically inert (see § 8.9 page 83)	1
22	738635	738635	Injector, 1.8mm 4 grooves (see § 8.9 page 83)	1
23	82-0410-31	J3STKL014	O-ring 2.0 x 1.25 - chemically inert (see § 8.9 page 83)	1
24	X4FVSY068	X4FVSY068	Screw Chc - M3 x 12 stainless steel socket head	3
25	738354	738354	Injector holder	1
26	640464	640464	Restrictor dia 3.0mm (see § 8.9 page 83)	1
27	82-0410-18	J3STKL002	O-ring 3.1 x 1.6 mm, chemically inert (see § 8.9 page 83)	2
28	1405145	1405145	Solvent injector - stainless steel	1
28a	82-0410-24	J3STKL027	O-ring 2.9 x 1.2 - chemically inert (see § 8.3 page 77)	2
29	1409802	1409802	Alignment Pin dia.12 (shaping air) - stainless steel	1
29a	82-0410-23	J3STKL026	O-ring 2.75 x 1.6 - chemically inert (Mic. IN/OUT)	2
29b	82-0884-26	J3STKL035	O-ring 3.68 x 1.78 - chemically inert	4
29c	82-0884-10	J3STKL078	O-ring 6.07 x 1.78 - chemically inert	6
30	X7CVCB069	X7CVCB069	Screw M3 x 16 brass	1
31	1401208	1401208	High voltage contact	1
32	1506878	1506878	Equipped robotic elbow	1
33	1302692	1302692	Split ring	1
34	1304309	1304309	Elbow nut	1
35	J2FENV638	J2FENV638	O-ring 94.97 x 1.78 mm teflon encapsulated.	1

8. PPH 607 SCAR metric spare parts list (continued)

8.1 Robotic mount, 65 EC version (continued)

Item	USA P/N	Sames P/N	Description	Qty
36	1305059	1305059	Manifold cover extended	1
36a	1201454	1201454	Nut, quick disconnect tightening ring	1
37	82-0410-18	J3STKL002	O-ring 3.1 x 1.6 mm, chemically inert	2
38	640464	640464	Restrictor dia 3.0mm (see § 8.9 page 83.)	1
38a	82-0410-23	J3STKL026	O-ring 2.75 x 1.6 - chemically inert (see § 9.3 page 86)	2
39	82-0884-26	J3STKL035	O-ring 3.68 x 1.78 - chemically inert	4
40	1402691	1402691	Alignment pin shaping air - nylon	1
41	82-0884-10	J3STKL078	O-ring 6.07 x 1.78 - chemically inert	6
41a	1403825	1403825	Pin, alignment dia.12	2
42	1508317	1508317	Nano-valve with o-rings (see § 6.3.1 page 53 and see § 8.5 page 79)	4
42a	1506300	1506300	Equipped manifold body	1
43	1402690	1402690	Solvent injector - nylon	1
43a	82-0410-24	J3STKL027	O-ring 2.9 x 1.2 - chemically inert	2
44	1401208	1401208	High voltage contact	1
44a	X7CVCB069	X7CVCB069	Screw M 3 x 16, brass	1
45	759968	759968	Regulator (rebuilding kit only). see § 6.5.1 page 60 and see § 8.6 page 80 , and see § 9.4 page 88 . for option kit - "By-pass"	1
46	1403758	1403758	Pipette, 6 mm (see § 8.4 page 78)	10
46a	82-0884-10	J3STKL005	O-ring 5.28 x 1.78 chemically inert	10
49	1403759	1403759	Pipette, 8 mm (see § 8.4 page 78)	6
49a	82-0884-12	J3STKL094	O-ring 7.65 x 1.78	6
51	1305033	1305033	Bracket, pipette	1
51a	X9NVFP118	X9NVFP118	Screw M4 x10, cheese head, nylon	3
52	1508750	1508750	UHT 153, high voltage cascade	1
53	X9SVCB232	X9SVCB232	Screw, CH M6 x 50, nylon/fiber glass filled	5
54	-	-	Tubes fittings and o-rings (see § 8.7 page 81)	16
55	1403825	1403825	Pin, alignment dia. 12	2
56	X9NSFA706	X9NSFA706	Cascade set screw M6 x 7 nylon, Alternate M6 x 8 grub slot set (see § 5.3.5 page 41)	1
57	1513090	1513090	Equipped quick disconnect robot plate	1

8. PPH 607 SCAR metric spare parts list (continued)

8.1. Robotic mount, 65 EC version (continued)

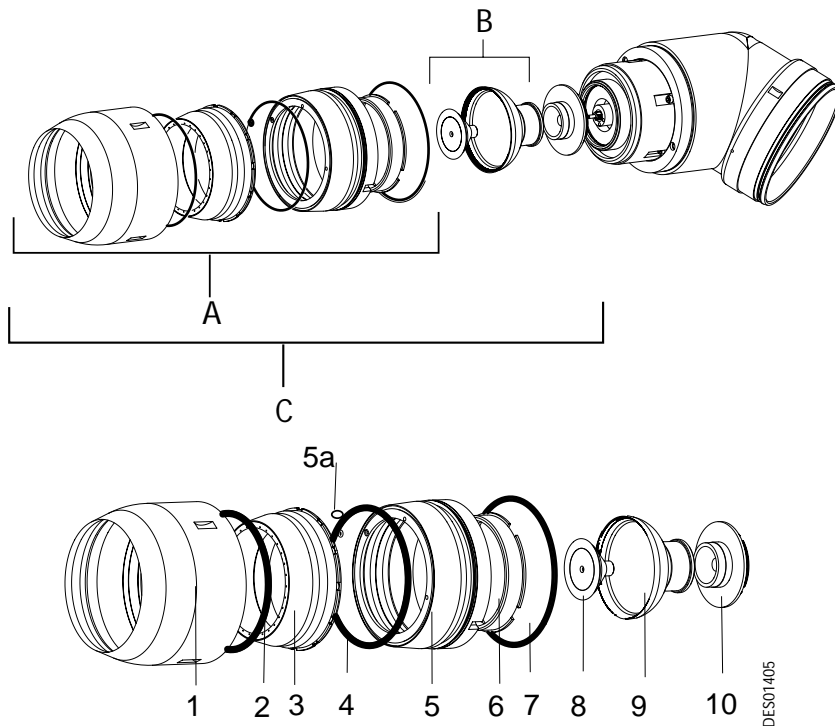
Item	USA P/N	Sames P/N	Description	Qty
58	X9NVFP067	X9NVFP067	Screw M3 x 10 nylon	4
59	1404599	1404599	Orientation washer plug UHT 153	1
60	E4PTFS481	E4PTFS481	Male connector, 12 cts	1
61	1404600	1404600	Washer UHT 153	1
63	E4PTFD482	E4PTFD482	Pin, male contact	12
64	82-2169-00	X9SVCB192	Screw, M5 x 50 CH, nylon, 60% glass filled	5
65	1102291	1102291	PPH 607 adaptor SCAR / robot	1
66	J2FENV288	J2FENV288	O-ring 23.52 1.78 teflon encapsulated	1
67	1305414	1305414	Low voltage connector	1
68	X4FVSY066	X4FVSY066	Screw M3 x 8 socket head s/s (see § 5.3.4 page 39 and see § 9.5 page 88)	1
69	X4FVSY119	X4FVSY119	Screw M4 x 12 socket head s/s	2
70	82-0884-11	J3STKL094	O-ring 7.65 x 1.78	2
71	84-0038-04	-	Low voltage cable 198 O.D. used on robot	2 *
72	85-0128-15	-	Nylon tubing 5/16" O.D. x .233 I.D.	2 *
73	63-1128-01	-	Low voltage cable assy	1
74	63-1128-00	-	Low voltage cable assy (with item 65 robot adaptor)	1

Note : * x length as required

8. PPH 607 SCAR metric spare parts list (continued)

8.2. Bellcup, clip, shaping air assembly, 65 EC version

Recommended for metallic base coat and clear coat and cut-in applications



Item	USA P/N	Sames P/N	Description	Qty
A	62-1137-00	1514409	65EC shaping air assembly	1
B	1516662	1516662	Bellcup and distributor	1
C	1518056	1518056	65 EC complete assembly	1
1	72-1124-01	1202996	Aluminium cover	1
2	82-0993-05	J2FENV386	O-ring 84 x 2 teflon encapsulated - viton	1
3	72-1039-02	1202570	Shaping air insert OD: 65mm	1
4	82-0993-04	J2FENV385	O-ring 82 x 1.6 teflon encapsulated - viton	1
5	72-1125-00	1202995	Shaping air shroud	1
5a	82-0410-31	J3STKL014	O-ring 2.5 X 1.25 chemically inert	1
6	72-1123-00	1310370	Shaping air nut OD: 65mm	1
7	J2FENV622	J2FENV622	O-ring 88.62 x 1.78mm, teflon encapsulated	1
8	1309562	1309562	Deflector	1
9	1202905	1202905	Bellcup EC 65mm, body	1
10	1308547	1308547	Clip	1

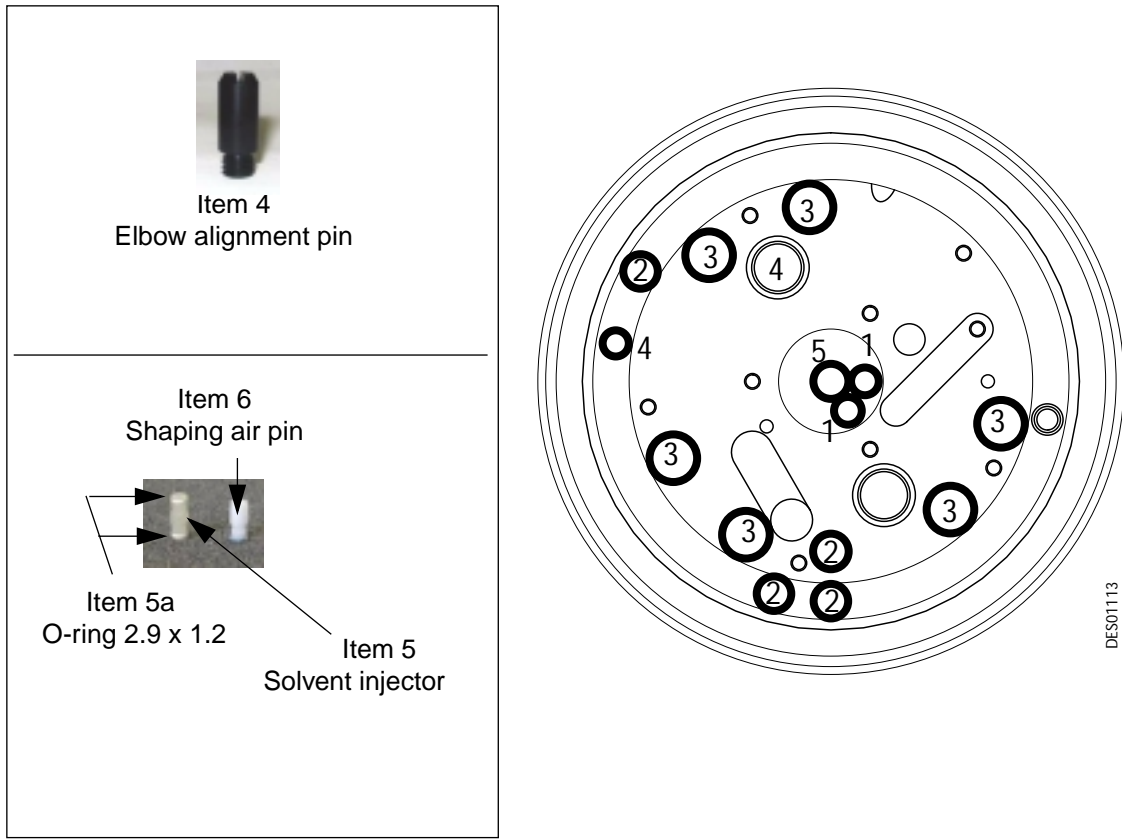
Note: O-ring kit available [see § 9.1 page 84](#).



WARNING : When using shaping air assembly 65 EC version # 1514409, the stainless steel solvent pipette # 1405145 will replace the nylon genuine one (# 1402690).

8. PPH 607 SCAR coil spare parts lists (continued)

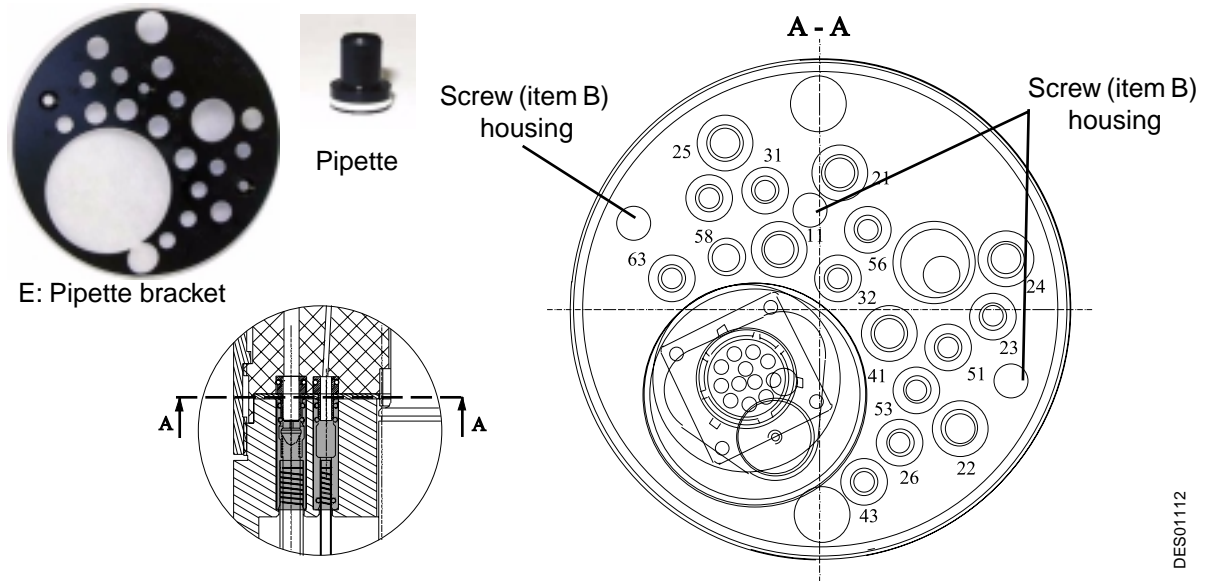
8.3. Manifold o-rings-atomizer side



Item	USA P/N	Sames P/N	Description	Qty
1	82-0410-23	J3STKL026	O-ring 2.75 x 1.6 - chemically inert (Microphone air)	2
2	82-0884-26	J3STKL035	O-ring 3.68 x 1.78 - chemically inert (Bearing and compensation air)	4
3	82-0884-10	J3STKL078	O-ring 6.07 x 1.78 - chemically inert (Turbine drive and brake air)	6
4	1403825	1403825	Alignment pin dia. 12	2
5	1402690	1402690	Solvent injector	1
5a	82-0410-24	J3STKL027	O-ring 2.9 x 1.2 - chemically inert for solvent injector	2
6	1402691	1402691	Shaping air pin	1
7	X7CVCB064	X7CVCB064	Screw M 3 x 16, brass	1
8	1401208	1401208	High voltage contact	1

8. PPH 607 SCAR metric spare parts list (continued)

8.4. Manifold o-rings / pipette robot side



DES01112

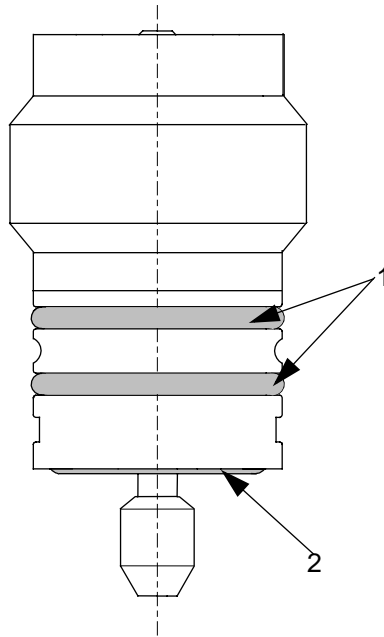
Item	USA P/N	Sames P/N	Description	Qty
B	X9NVFP118	X9NVFP118	Screw M4 x 10 nylon flat head	3
E	1305033	1305033	Pipette bracket	1

Couterbored holes	USA P/N	Sames P/N	Description	Qty
11, 21, 22, 24, 25, 41	82-0884-11	J3STKL094	O-ring 7.65 x 1.78 chemically inert	6
23, 26, 31, 32, 43, 51, 53, 56, 58, 63	82-0410-19	J3STKL005	O-ring 5.28 x 1.78 chemically inert	10

Couterbored holes	USA P/N	Sames P/N	Description	Qty
11, 21, 22, 24, 25, 41	1403759	1403759	Pipette 8 mm	6
23, 26, 31, 32, 43, 51, 53, 56, 58, 63	1403758	1403758	Pipette 6 mm	10

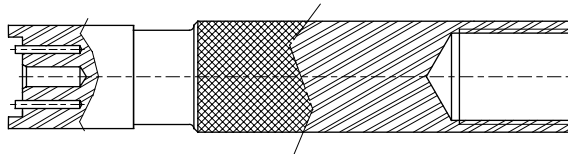
8. PPH 607 SCAR metric spare parts list (continued)

8.5. Nano-valve assembly - P/N 1508317



DES01117

Nano-valve removal tool: P/N 1301832

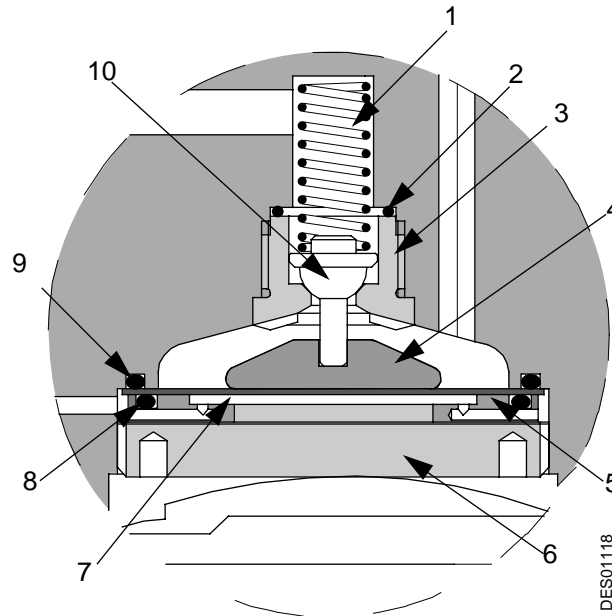


DES01025

Item	USA P/N	Sames P/N	Description	Qty
1	82-0884-14	J3STKL160	O-ring 12.42 x 1.78 - chemically Inert	2
2	J3STKL121	J3STKL121	O-ring 9.52 x 1.78 - chemically Inert	1
	H1GMIN017	H1GMIN017	Dielectric grease (pure vaseline)	1

8. PPH 607 SCAR metric spare parts list (continued)

8.6. Regulator P/N 757968



Item	USA P/N	Sames P/N	Description	Qty
	757968	757968	Regulator rebuilding kit	1
1	742759	742759	Regulator spring	1
2	J3TTCN007	J3TTCN007	O-ring 10.5 x 2.0 - teflon	1
3	930624	930624	Seat	1
4	543892	543892	Diaphragm pusher Dia. 38 x 3.9 DP mm, black or white	1
5	543891	543891	Air pilot disk	1
6	543894	543894	Regulator cover	1
7	543893	543893	Diaphragm Dia. 47mm	1
8	J2FTDF410	J2FTDF410	O-ring 40 x 2.5 viton	1
9	J2FTDF416	J2FTDF416	O-ring 41 x 1.78 viton	1
10	641770	641770	Poppet with carbide insert	1

8. PPH 607 SCAR metric spare parts list (continued)

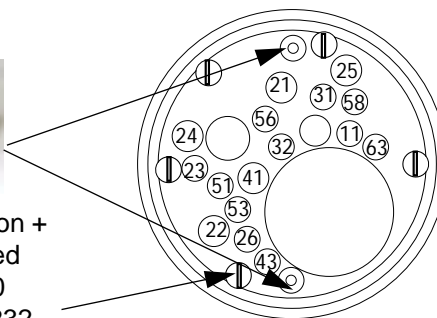
8.7. Tube fittings/o-rings



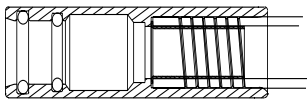
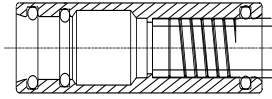
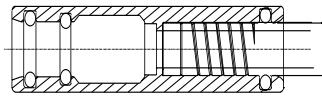
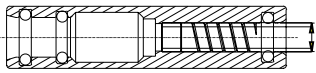
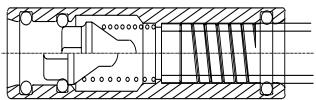
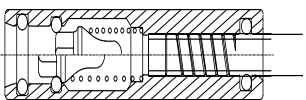
Alignment pin
P/N 1403825
Qty 2



Screws nylon +
glass filled
M6 x 50
X9SVCB232

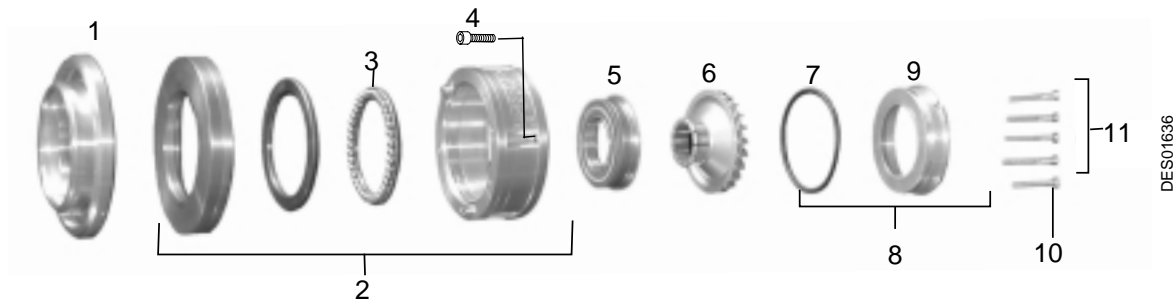


ES0114

Counterbored holes	P/N	Description
21 and 24 	1406543 F6RXZX068 82-0884-11 USA (J3STKL094) Sames	Fitting 8/10 Stainless steel sleeve O-ring 7.65 x 1.78 (Qty 2)
22 and 25  <small>DES01290</small>	1406542 82-0884-11 USA (J3STKL094) Sames	Fitting 6/8 O-ring 7.65 x 1.78 (Qty 3)
23,26 and 43  <small>DES01291</small>	1406541 82-0410-19 USA (J3STKL005) Sames	Fitting 4/6 O-ring 5.28 x 1.78 (Qty 3)
51,53,56,58 and 63  <small>DES01292</small>	1406540 82-0410-19 USA (J3STKL005) Sames 82-0884-26 USA (J3STKL035) Sames	Fitting 2,7/4 O-ring 5.28 x 1.78 (Qty 2) O-ring 3.68 x 1.78 (Qty 1)
31 and 32  <small>DES01293</small>	1406544 82-0410-19 USA (J3STKL005) Sames 82-0884-26 USA (J3STKL035) Sames	Fitting 2,7/4 w/check valve O-ring 5.28 x 1.78 (Qty 2) O-ring 3.68 x 1.78 (Qty 1)
11 and 41  <small>DES01294</small>	1406545 82-0884-11 USA (J3STKL094) Sames	Fitting 6/8 w/check valve O-ring 7.65 x 1.78 (Qty 3)

8. PPH 607 SCAR metric spare parts list (continued)

8.8. Turbine P/N 1505874

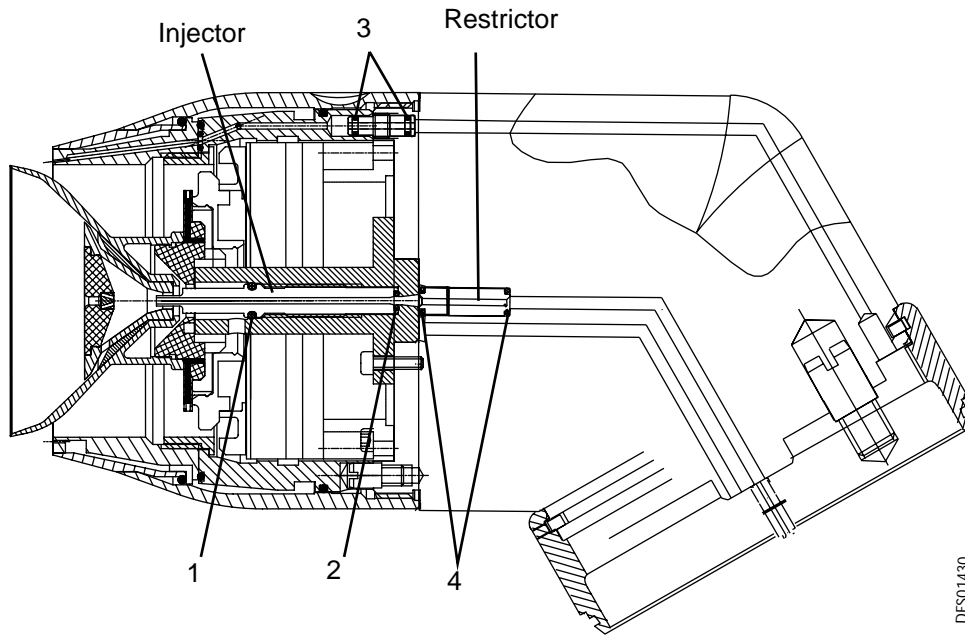


Item	USA P/N	Sames P/N	Description	Qty
	1505874	1505874	Turbine assembly	1
1	1200681	1200681	Rotor	1
2	1508460	1508460	Stator, assembly	1
3	K6RKBL361	K6RKBL361	Ball bearing	41
4	X4FVSY068	X4FVSY068	Screw M3 x 12 socket head s/s	5
5	1301793	1301793	Stator magnet	1
6	739980	739980	Drive wheel	1
7	J2FTDF480	J2FTDF480	Deflector seal 52.07 x 2.62 viton	1
8	1508461	1508461	Deflector with seal	1
9	1303016	1303016	Deflector	1
10	X4FVSY072	X4FVSY072	Screw M3 x 20, socket head s/s	1
11	X4FVSY073	X4FVSY073	Screw M3 x 25, socket head s/s	4

Note : The stator assembly is shown as is for disassembly and cleaning but it is sold as one part.

8. PPH 607 SCAR metric spare parts list (continued)

8.9. Turbine o-rings/restrictors and injectors



Restrictors				
USA P/N	Sames P/N	Restrictor	Qty of grooves	Color
640400	640400	Dia. 0.8 mm	-	Black
640401	640401	Dia. 0.9 mm	1	Black
640402	640402	Dia. 1.0 mm	2	Black
640403	640403	Dia. 1.2 mm	-	White
640456	640456	Dia. 1.5 mm	1	White
640464	640464	Dia. 3.0 mm	2	White

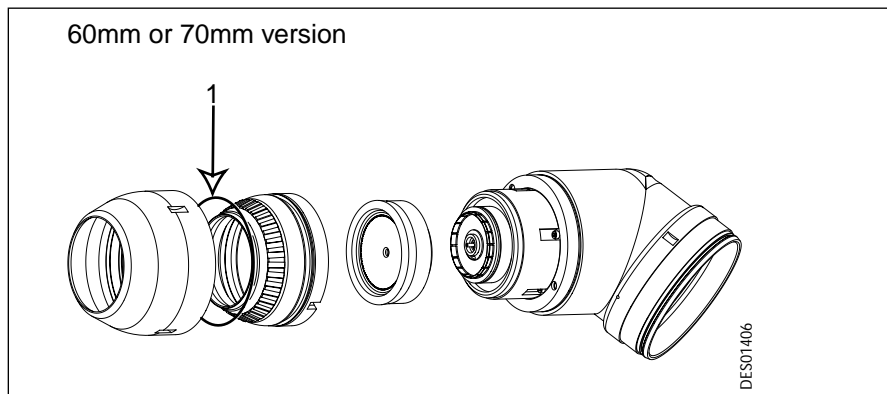
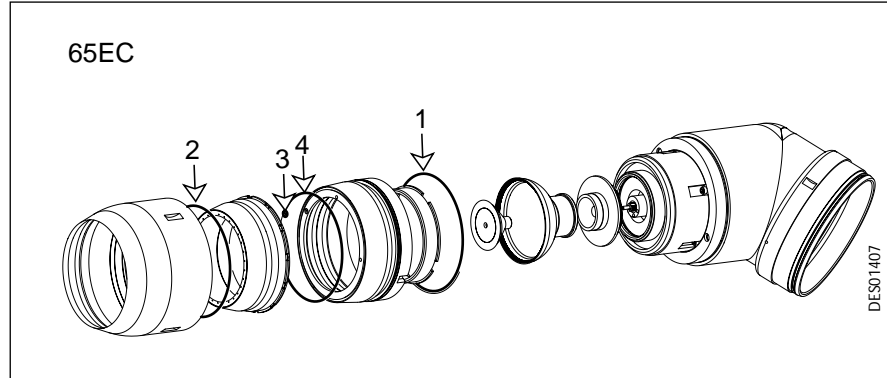
Injectors			
USA P/N	Sames P/N	Injector	Qty of grooves
738632	738632	Dia. 0.9 mm	1
738353	738353	Dia. 1.2 mm	2
738634	738634	Dia. 1.5 mm	3
738635	738635	Dia. 1.8 mm	4

O-rings				
Item	USA P/N	Sames P/N	Description	Qty
1	82-0410-19	J3STKL005	O-ring 5.28 x 1.78 - chemically inert	1
2	82-0410-31	J3STKL014	O-ring 2.0 x 1.25 - chemically inert	1
3	82-0410-24	J3STKL027	O-ring 2.9 x 1.2 - chemically inert	2
4	82-0410-18	J3STKL002	O-ring 3.1 x 1.6 - chemically inert	2

9. Optional spare parts list

9.1. O-ring kit for 65EC and 60-70mm versions shaping air assembly

P/N 82-2179-02

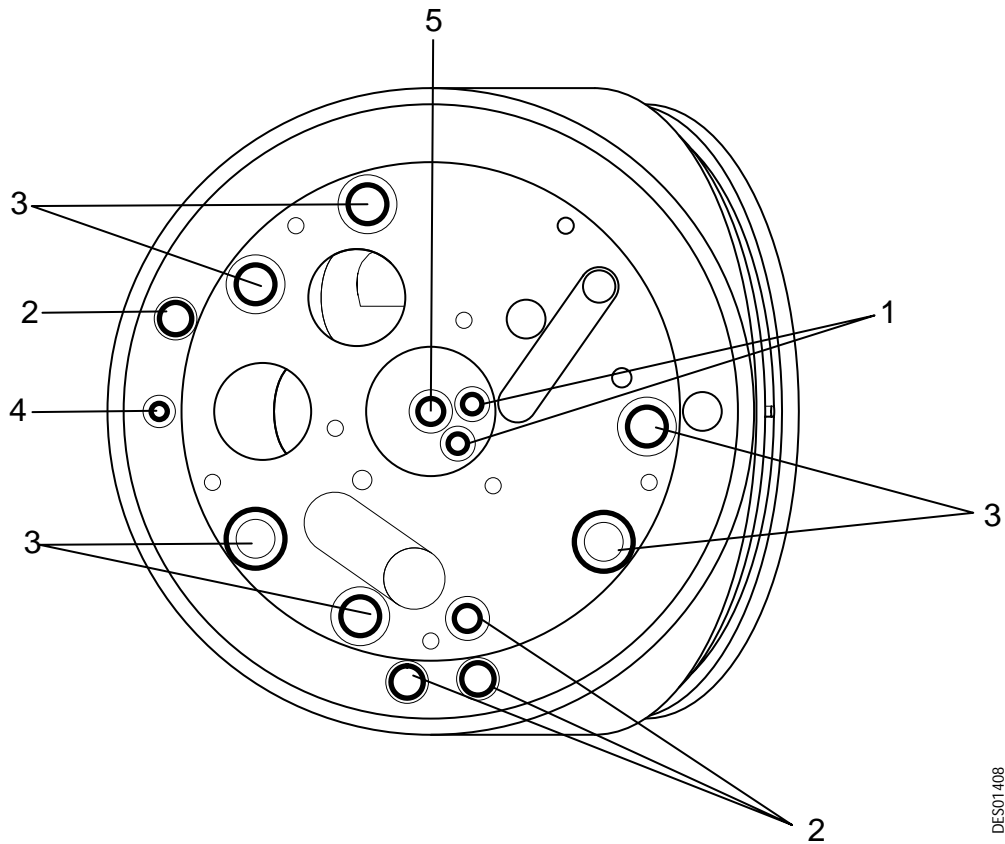


Item	USA P/N	Sames P/N	Description	Qty
	82-2179-02		O-ring kit shaping air assembly for 65EC and 60 or 70 mm versions	1
Includes the following items				
1	J2FENV622	J2FENV622	O-ring 88.62 x 1.78mm, teflon encapsulated	2
2	82-0993-05	J2FENV386	O-ring 84 x 2 teflon encapsulated	1
3	82-0410-31	J3STKL014	O-ring 2.0 x 1.25 chemically inert	1
4	82-0993-04	J2FENV385	O-ring 82 x 1.6 teflon encapsulated	1

9. Optional spare parts list (continued)

9.2. O-ring kit, robotic elbow/ turbine side

P/N - 82-2179-00



DES01408

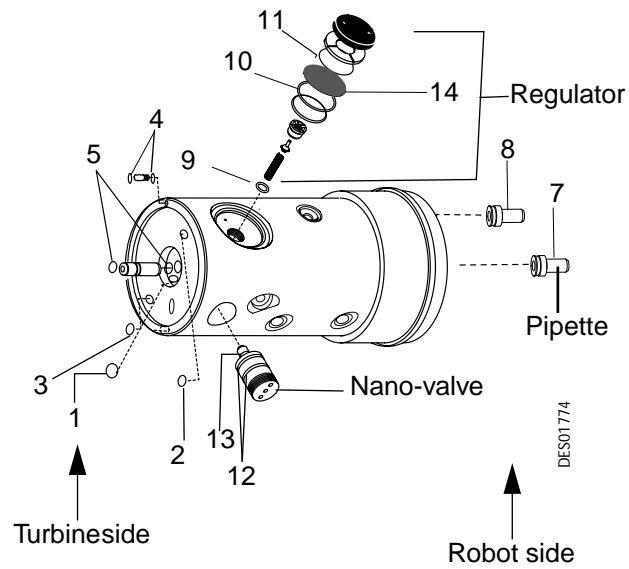
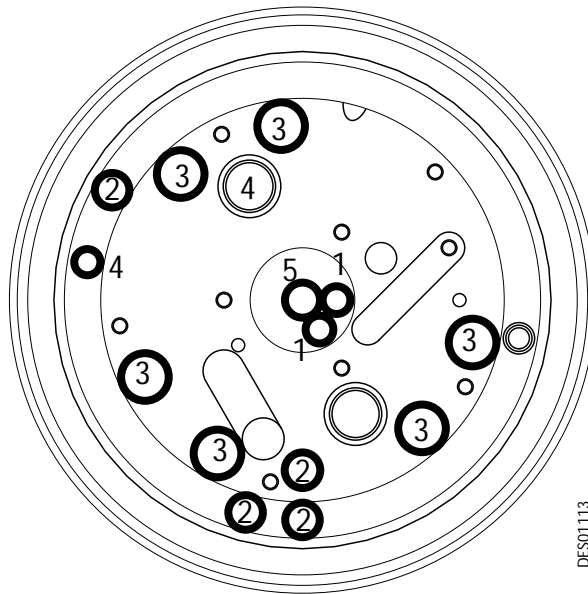
Item	USA P/N	Sames P/N	Description	Qty
	82-2179-00		O-ring kit, robotic elbow/ turbine side	1
Includes the following items				
1	82-0410-23	J3STKL026	O-ring 2.75 x 1.6 - chemically inert (Microphone air)	2
2	82-0884-26	J3STKL035	O-ring 3.68 x 1.78 - chemically inert (Bearing and compensation air)	4
3	82-0884-10	J3STKL078	O-ring 6.07 x 1.78 - chemically inert (Turbine drive and brake air)	6
4	82-0410-24	J3STKL027	O-ring 2.9 x 1.2 - chemically inert (for solvent injector)	2
5	82-0410-18	J3STKL002	O-ring 3.1 x 1.6 - chemically inert (for restrictor)	2

9. Optional spare parts list (continued)

9.3. O-ring kit, manifold/turbine side and robot side

P/N 82-2179-01 Also includes regulator o-rings, diaphragm and nano-valves o-rings.

Manifold turbine side



9. Optional spare parts list (continued)

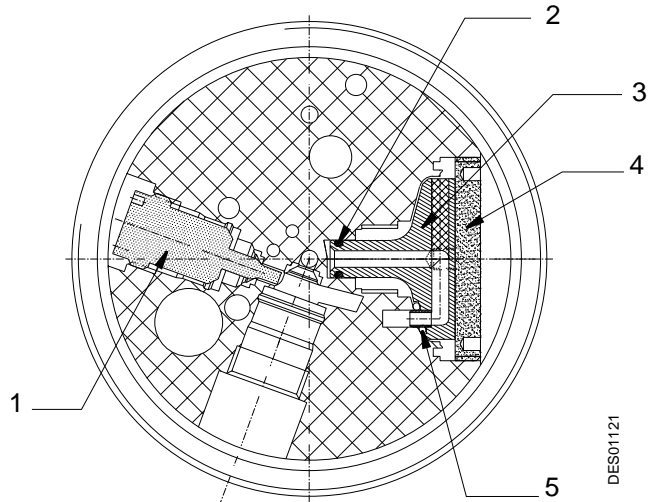
9.3. O-ring kit, manifold/turbine side and robot side (continued)

P/N 82-2179-01 Also includes regulator o-rings, diaphragm and nano-valves o-rings.

Item	USA P/N	Sames P/N	Description	Qty
	82-2179-01		O-ring kit manifold/turbine side and robot side	1
Includes the following items				
1	82-0410-23	J3STKL026	O-ring 2.75 x 1.6 - chemically inert (Microphone air)	2
2	82-0884-26	J3STKL035	O-ring 3.68 x 1.78 - chemically inert (Bearing and compensation air)	4
3	82-0884-10	J3STKL078	O-ring 6.07 x 1.78 - chemically inert (Turbine drive and brake air)	6
4	82-0410-24	J3STKL027	O-ring 2.9 x 1.2 - chemically inert (for solvent injector)	2
5	82-0410-18	J3STKL002	O-ring 3.1 x 1.6 - chemically inert (for restrictor)	2
7	82-0410-19	J3STKL005	O-ring 5.28 x 1.78 chemically inert	10
8	82-0884-11	J3STKL094	O-ring 7.65 x 1.78 - chemically inert	6
9	J3TTCN007	J3TTCN007	O-ring 10.5 x 2 - teflon (Regulator)	1
10	J2FTDF410	J2FTDF410	O-ring 40 x 1.78 - viton (Regulator)	1
11	J2FTDF416	J2FTDF416	O-ring 41 x 1.78 - viton (Regulator)	1
12	82-0884-14	J3STKL160	O-ring 12.42 x 1.78 -chemically Inert	8
13	J3STKL121	J3STKL121	O-ring 9.52 x 1.78 - chemically Inert	4
14	543893	543893	Diaphragm (Regulator)	1

9. Optional spare parts list (continued)

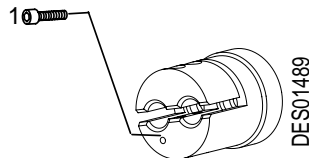
9.4. Regulator by-pass and dump valve



Item	USA P/N	Sames P/N	Description	Qty
1	1307176	1307176	Nano-valve dump plug	1
2	82-0410-05	J3STKL008	O-ring 5.7 x 1.9 chemically inert	1
3	1307174	1307174	Regulator by-pass	1
4	1405005	1405005	Regulator nut	1
5	82-0884-26	J3STKL035	O-ring 3.68 x 1.78 chemically inert	1

9.5. Screw for grounding method of UHT 153 Cascade

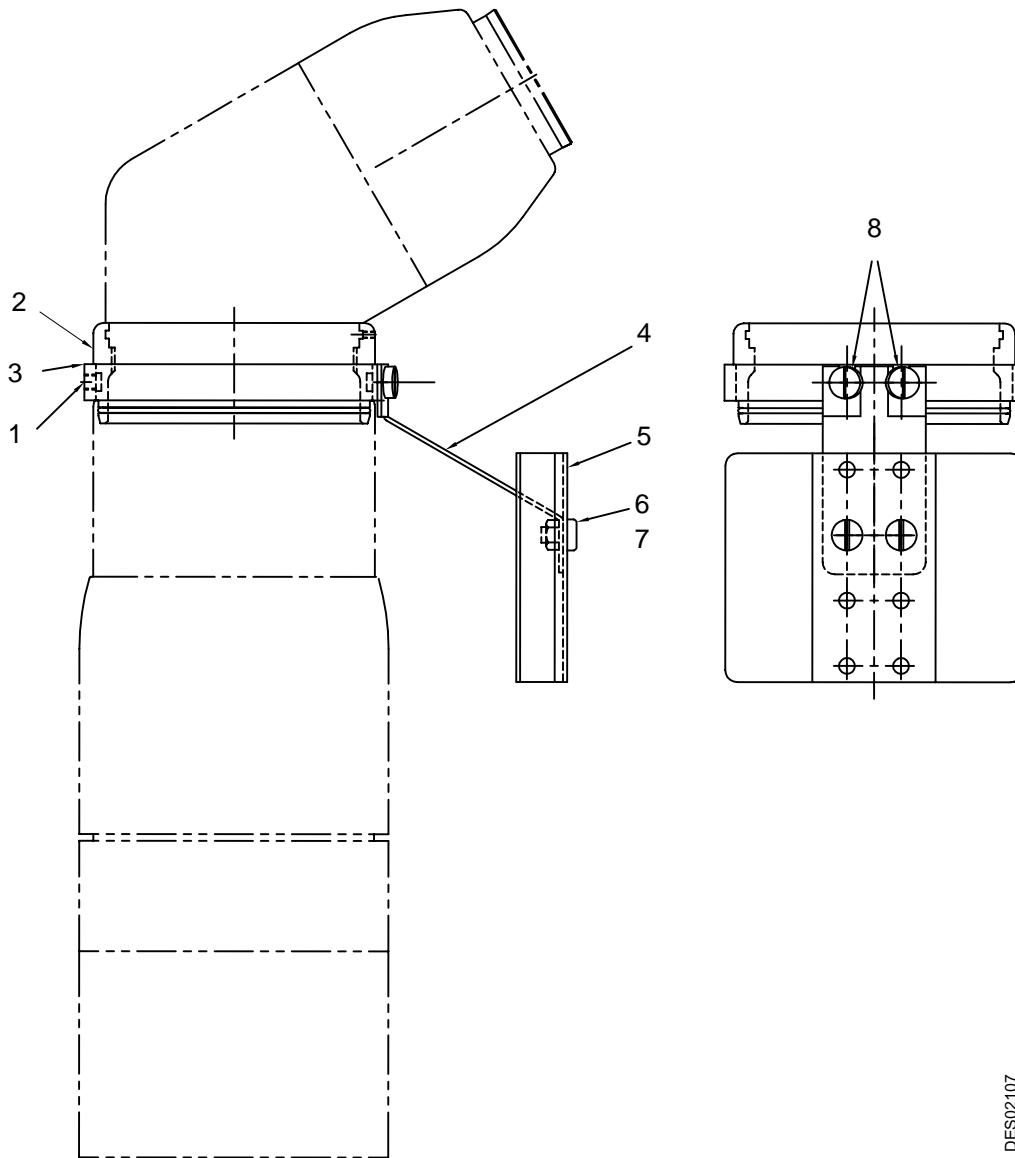
Note: Low voltage connector not included



Item	USA P/N	Sames P/N	Description	Qty
1	X4FVSY066	X4FVSY066	Screw M 3 x 8 socket head S/S	1

9. Optional spare parts list (continued)

9.6. Repelling shield assy



DES02107

Item	USA P/N	Sames P/N	Description	Qty
1	82-1171-06	-	Screw, set M6 x 6	1
2	72-1173-00	-	Collar, threaded	1
3	72-1172-01	-	Ring, slip	1
4	72-1174-06	-	Shield support	1
5	72-1174-07	-	Shield, PPH 607	1
6	85-0119-47	-	Screw, M6 x 10 pan head	2
7	X9NEHU006	-	Nut, hex M6	2
8	85-0119-46	-	Screw, M6 x 8 pan head	2