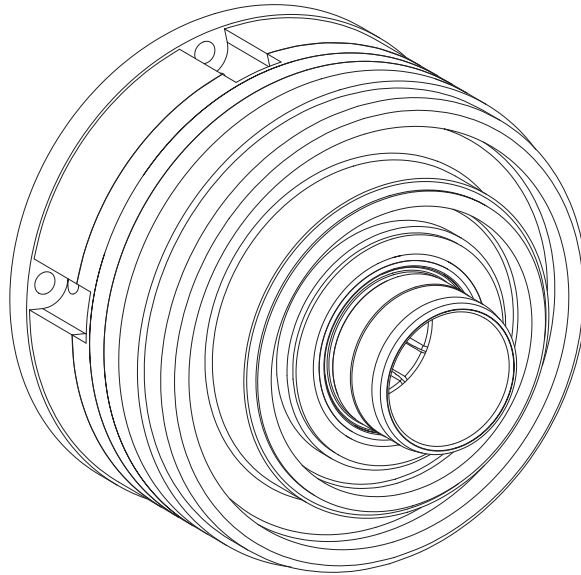




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DES02657

# User manual

## S6, S9, S12 Magnetic air turbines type "BTM" for bellcups with magnetic fixing

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# S6, S9, S12 Magnetic air turbines type "BTM" for bellcups with magnetic fixing

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# 1. Health and Safety Instructions

## 1.1. Precautions for Use

This document contains information that all operators should be aware of and understand before using the turbine. This information highlights situations that could result in serious damage and indicates the precautions that should be taken to avoid them. The equipment must only be used by personnel trained by SAMES Technologies

## 1.2. Warnings



**WARNING :** Safety may be jeopardized if this equipment is not operated, disassembled and reassembled in compliance with the instructions given in this manual and in any European Standard or national safety regulations in force.



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

## 1.3. Important Recommendations

### 1.3.1. Compressed Air Quality

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

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

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

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

The guarantee does not cover faults caused by unclean, unfiltered bearing air resulting from disregard of the previous recommendations.



**WARNING :** If the air is not correctly filtered, the bearing may become fouled resulting in a turbine operating fault. The filtering system used must prevent particles greater than 5 µm in diameter from reaching the bearing.

### 1.3.2. Bearing Safety

The compressed air connection to the air bearing must be made directly to the supply circuit without the use of an isolating valve.

During operation, the air bearing must be continuously under pressure, otherwise considerable damage may be caused. A sudden cut in the air supply could destroy the air bearing of the turbine.

Procedure for cutting off air to the air bearing:

- Switch off the turbine air supply
- Wait until the turbine has stopped completely (at least 150 s).
- Switch off the bearing air supply.

Running the turbine with bearing air pressure of less than 6 bar at the atomizer inlet can damage the bearing. The standard bearing air pressure is 6 bar at the air control cabinet.

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

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



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



**WARNING :** If the turbine is not already operating, wait, after starting it up, until the bellcup reaches at least 15000 rpm before opening the head valve. The recommended minimum waiting time is 2 seconds.

### 1.3.3. Maximum Speed

Excessive turbine speed can result in serious damage to the turbine and loss a connection between the bellcup and the turbine, presenting a risk to persons and equipment. The speed must not exceed 45 000 rpm.

It is necessary to install safety devices, detection anomaly speed in order to avoid any racing beyond this limit. The absence of these safety devices can expose the personnel to serious wounds and damage the equipment.



**WARNING :** The guarantee does not cover damage resulting from a rotation speed greater than 45000 rpm.



**WARNING :** Turbine should never rotate without bellcup. Damage to the rotor can occur if the turbine is operated without the bellcup, as the speed feedback device is located in the bellcup.

**The warranty does not cover damage that occur if the turbine is operated without the bellcup.**

#### 1.3.4. Fitting Bellcup / Turbine

After each reassembly of bellcup, make sure that the bellcup turns freely without false excessive round. The bellcup must be correctly fitted on the turbine during assembling, a clack must be heard. The two cylinders must fit on top of each other without any foreign matter between them. If fitting is incorrect, the connection may be lost and the bellcup thrown out still spinning, presenting a risk for persons and equipment.

#### 1.3.5. Safety devices

During installation of the equipment, it is important to set up safety devices enabling high voltage power, paint, solvent and air supplies to be cut immediatly if there is a problem.

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

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

#### 1.3.6. Storage Temperature

The storage temperature will never exceed +60°C.

#### 1.3.7. Specific maintenance provisions

The access of the booth, near the atomizer in operation, will have to be proscribed and controlled by safety devices ([see § 1.3.5 page 6](#)) which will have to stop the equipment in case of intrusion of people in the area.

Nevertheless, for maintenance operation, these safety devices will have to be arranged in order to allow certain operations and checks (only for persons trained and entitled by Sames Technologies).

The turbine rotation with a bellcup, in all the cases, will be prohibited with personnel in the area.

## 2. Characteristics

Description	Value
Pressure	6 bar mini. to 7 bar maxi. (90 to 105 psi)

Bearing air filtration

Description	Value
Oil content	2 mg / m <sub>0</sub> <sup>3</sup> (*)
Water content	0,76 g / m <sub>0</sub> <sup>3</sup> *
Dewpoint	- 20,8 °C (- 4 °F)
Dewpoint at 7 bar (105 psi)	3 °C (37,4 °F)
Diameter of particles	< 5 µm

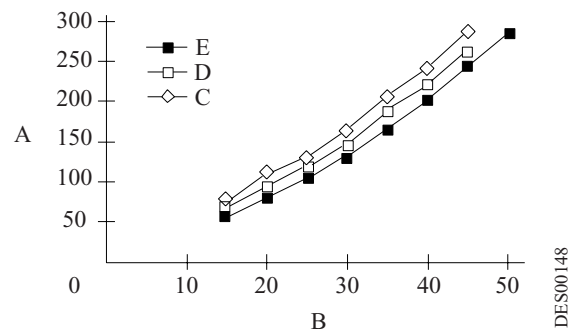
(\*) m<sub>0</sub><sup>3</sup> values given for a temperature of 0 °C at atmospheric pressure.

Description	Value
Weight	460 gr
Size	Dia. 76 - H 61.60 mm

### 2.1. Air consumption

#### 2.1.1. S6 Turbine

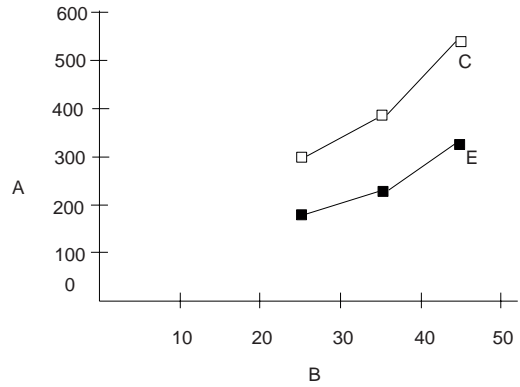
Item	Description
A	Flow in NI/min
B	Rotation speed in K rpm
C	Paint flow 300 cc/mn
D	Paint flow 200 cc/mn
E	Paint flow, turbine unload



Rotation speed K rpm	Turbine Unload	Turbine 200 cc/mn	Turbine 300 cc/mn
25	100	125	130
35	160	180	200
45	240	260	280

2.1.2. S9 Turbine

Item	Description
A	Flow in NI/min
B	Rotation speed in K rpm
C	Paint flow 450 cc/min
E	Paint flow, turbine unload

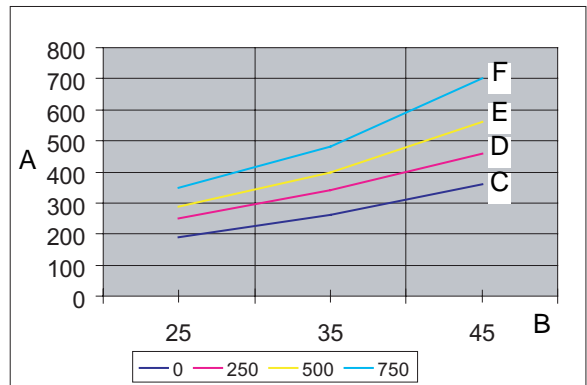


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Rotation speed K rpm	Turbine Unload	Turbine 450 cc/min
25	173	300
35	233	390
45	327	545

2.1.3. S12 Turbine

Item	Description
A	Flow in NI/mn
B	Rotation speed in K rpm
C	No paint
D	Paint flow 250 cc/mn
E	Paint flow 500 cc/mn
F	Paint flow 750 cc/mn



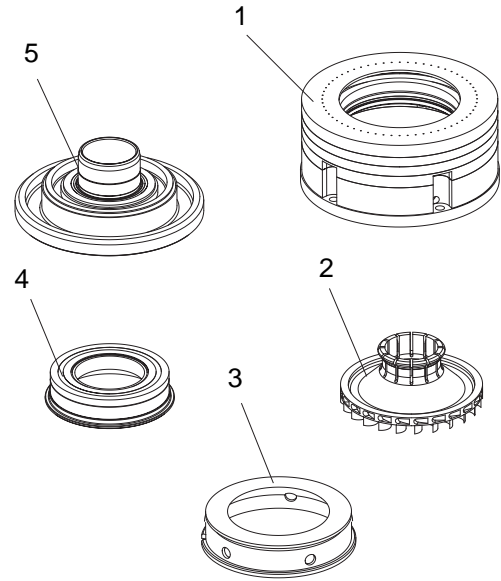
Rotation speed K rpm	Turbine Unload	Turbine 250 cc/min	Turbine 500 cc/min	Turbine 750 cc/min
25	190	250	290	350
35	260	340	400	480
45	360	460	560	700



### 3. Description

Item	Description
1	Stator
2	Drive wheel
3	Deflector with O-ring
4	Stator magnet holder
5	Rotor

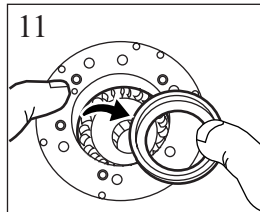
Each turbine consists of 5 components, which can not be disassembled any further.



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#### 4. Disassembly

- Remove the deflector fitted with its seal by sliding it out with the thumbs (Fig n° 11).



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- Remove the drive wheel using the tool (P/N 900000671).



- Step 1:** Place the support of the tool (shoulder on the bottom) on a plane surface and place the turbine on the support.



Step 1

- Step 2:** Insert the extractor (shoulder on the top) in the turbine. Using a plastic mallet, hit on the extractor as illustrated.



Step 2

- Step 3:** The drive wheel is now separated from the turbine.

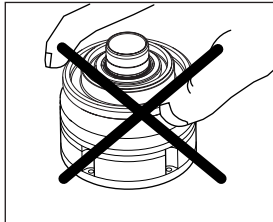


Step 3

- The rotor can be dismantled by exerting a firm pression with the thumbs in order to make it slide in a radial way. Then lift it pivoting it around on the outer side of the stator (Figs 4 and 3 in reverse order from the assembly)  
**OR** to separate the rotor from the stator, place the turbine in the tool (P/N # 1522542) and squeeze handles together.



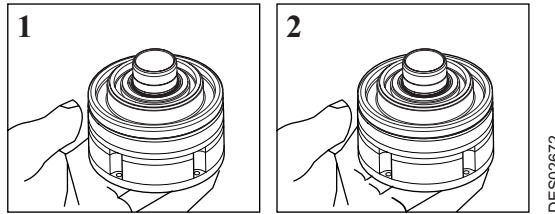
**WARNING : Never place the elements in "direct"contact. Never place the magnetics parts on metal masses (working surfaces, desks etc.).**



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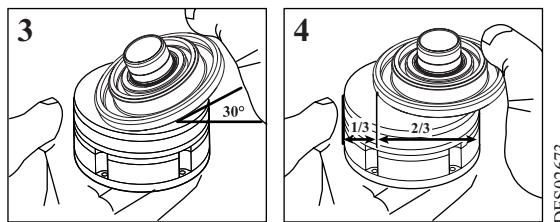
## 5. Assembly

When assembling the stator magnet, ensure the 2 magnetic faces are properly aligned. Exert a slight pressure on the magnet, from beneath, to hold it in place (Figs n° 1 and 2).

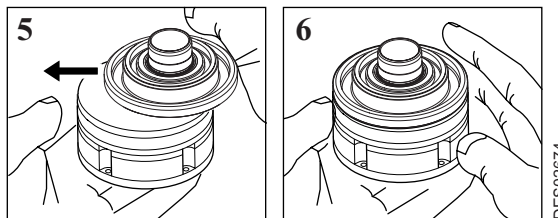


**WARNING :** To place the 2 parts in contact (stator and rotor), follow the procedure below.

- Slant the rotor (30° angle approx.) with respect to the stator (Fig n° 3).
- Position the rotor above the stator at 2/3 from the outer diameter of the stator (Fig n° 4), in order to avoid a "violent impact" which could damage the magnets.



- Then lower the rotor onto the stator.
- Slide it towards the center with slight hand pressure (Figs n° 5 and 6) in order to center the 2 parts.



Difference in magnet polarity ensures automatic centring.

**Drive wheel reassembly:**

- **Step 1:** To reassemble the drive wheel, turn over the tool support, the shoulder is now on the top.



Step 1

- **Step 2:** Place the drive wheel on the shoulder and put in place the turbine.



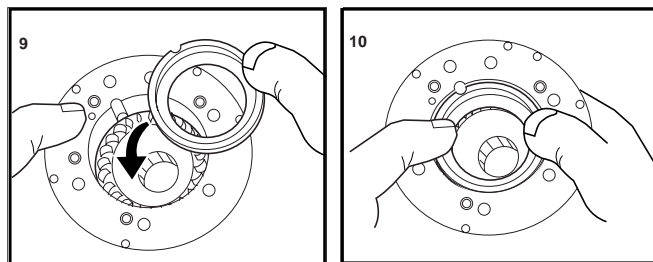
Step 2

- **Step 3:** Using the palms of the two hands, press strongly on the assembly turbine/tool support. A "clac" noise should be heard, the drive wheel is now in place.

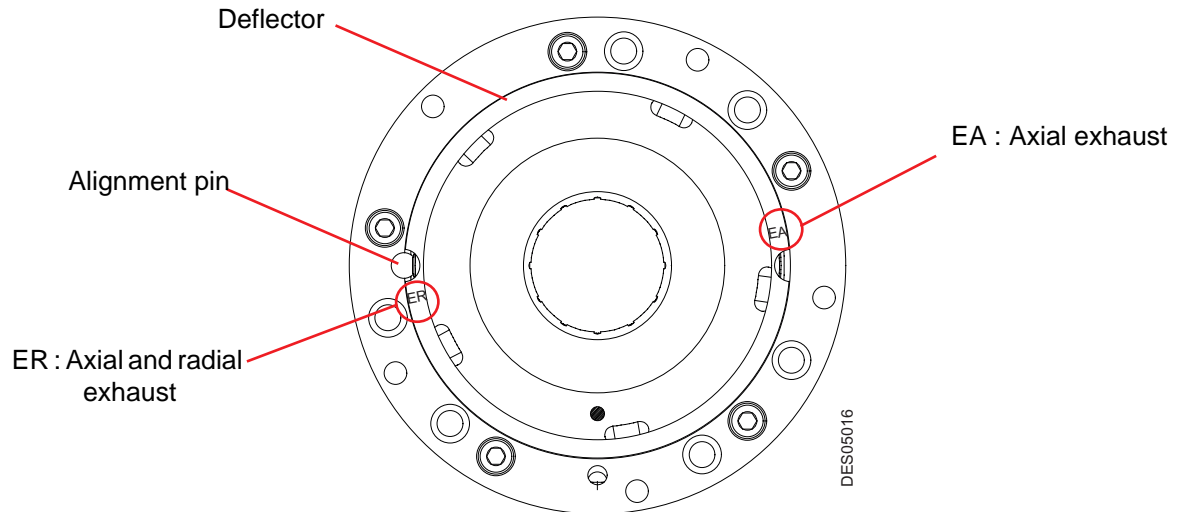


Step 3

- Finally, slide the deflector with its locking seal behind the drive wheel by pushing it to the bottom of its seat (Figs 9 and 10).



## Positioning of the deflector



### Two positions for the deflector:

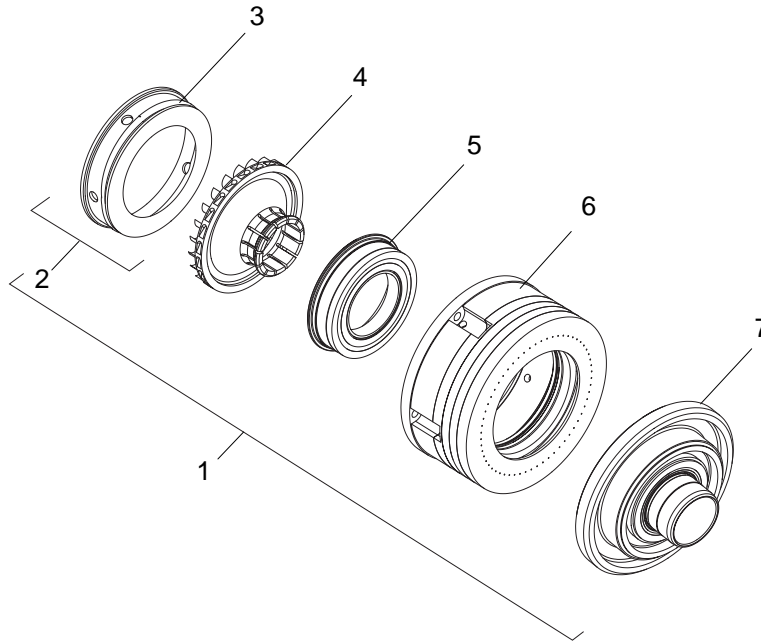
- Marking "ER" positioned near the alignment pin, exhaust is channeled forwards and backwards.
- Marking "EA" positioned near the alignment pin, exhaust is channeled at 100 % forwards



**WARNING :** Warranty does not cover any defects resulting from assembling different from the above procedure.

## 6. Spare parts

### 6.1. Magnetic bearing airTurbines type "BTM" for bellcups with magnetic fixing



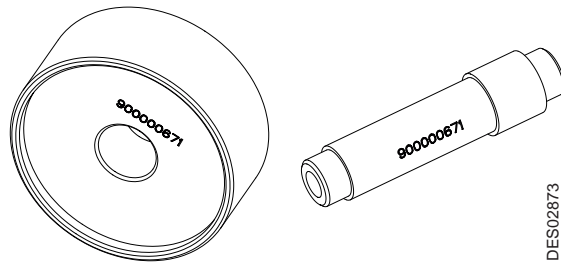
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Item	Part number	Description	Qty	Sale unit
1	910000295	S6 Turbine assembly type "BTM"	1	1
2	1508461	Deflector with o-ring	1	1
3	J2FTDF480	O ring - Nitrile (included in item 2)	1	1
4	739980	Drive wheel	1	1
5	1301793	Stator magnet holder	1	1
6	1508460	Stator	1	1
7	1105758	Rotor	1	1

Item	Part number	Description	Qty	Sale unit
1	910000861	S9 Turbine assembly type "BTM"	1	1
2	1508461	Deflector with o-ring	1	1
3	J2FTDF480	O ring - Nitrile (included in item 2)	1	1
4	739980	Drive wheel	1	1
5	1301793	Stator magnet holder	1	1
6	910000859	Stator	1	1
7	1105758	Rotor	1	1

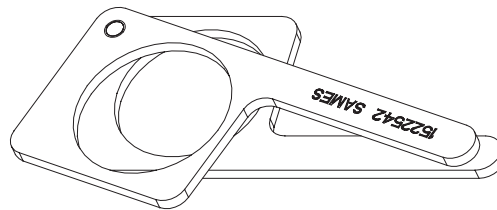
Item	Part number	Description	Qty	Sale unit
1	1525802	S12 Turbine assembly type "BTM"	1	1
2	1508461	Deflector with o-ring	1	1
3	J2FTDF480	O ring - Nitrile (included in item 2)	1	1
4	739980	Drive wheel	1	1
5	1301793	Stator magnet holder	1	1
6	1523699	Stator	1	1
7	1105758	Rotor	1	1

## 7. Tools



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Part number	Description	Qty	Sale unit
90000671	Drive wheel extracting tool	1	1



DES02847

Part number	Description	Qty	Sale unit
1522542	Tool, magnet separator, turbine	option	1