



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



User manual

Recycling assembly PVV EasyCompact



SAS SAMES Technologies. 13 Chemin de Malacher 38243 Meylan Cedex
Tel. 33 (0)4 76 41 60 60 - Fax. 33 (0)4 76 41 60 90 - www.sames.com

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A catalogue is available on request. Choose from a wide range of courses to acquire the skills or knowledge that is required to match your production requirements and objectives.

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

Training department:

Tel. 33 (0)4 76 41 60 04

E-mail: formation-client@sames.com

SAS Sames Technologies operating manuals are written in French and translated into English, German, Spanish, Italian and Portuguese.

The French version is deemed the official text and Sames will not be liable for the translations into other languages.

Recycling assembly

PVV EasyCompact

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1. Safety

1.1. Associated documents

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

[see RT Nr 6336](#) For the "Mach-Jet Gun" spray gun

[see RT Nr 6366](#) For the "Auto Mach-Jet" automatic spray gun

See supplier's notice for the filtering unit

[see RT Nr 7022](#) For the PVV EasyCompact booth

[see RT Nr 6057](#) For assembling the sleeve in the sleeve valve

[see RT Nr 7015](#) For the PVV EasyCompact installation.

[see RT Nr 6368](#) For the CS 127 powder pump.

1.2. Safety Regulations

The powder recycling device is installed by SAMES.

It is essential to comply with the SAMES recommendations when modifying or installing the recycling device.



WARNING : It is essential for the operator to be aware of the back-end risks in using the equipment ([see § 1.4 page 6](#))

The rules below apply to the installation, maintenance and operation of the equipment.



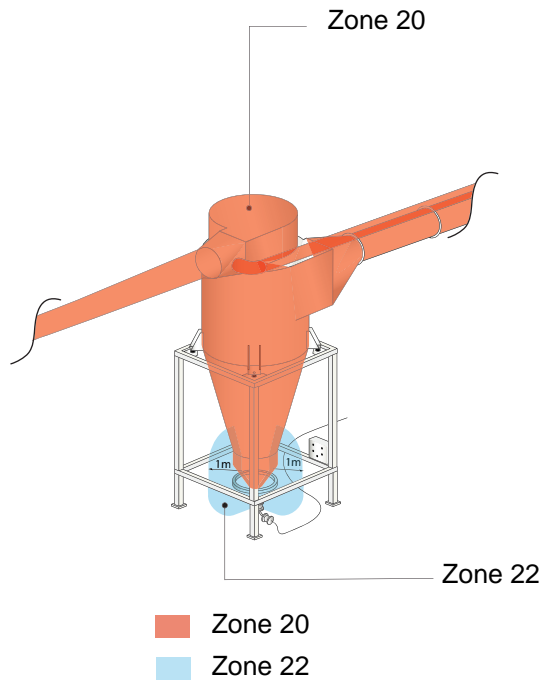
WARNING : The electrostatic paint spraying equipment must only be used by qualified personnel fully informed of the following safety rules:

- 1 A warning notice written a language which the operator understands and summarizing the safety rules laid out in the notice must be placed next the workstation where it can be clearly seen.
- 2 Operators must use antistatic shoes in compliance with publication ISO 2251. If gloves are required, only antistatic or palmless gloves should be used.
- 3 The floor in the working area must be anti-static (generally, ordinary bare concrete floors are anti-static).
- 4 Powder-spraying equipment must be maintained regularly according to SAMES' instructions. Repairs must be carried out in compliance with these instructions.
- 5 All conducting structures inside or near the work station should be connected electrically to the earth system protecting the electrical power supply (cyclone, sifter, etc.).
- 6 The floor underneath the cyclone should be resistant to over 400 kN/m².
- 7 Settings for the sifter (powder transport air pressure and vibration amplitude) must comply with SAMES' instructions [see § 3.1 page 11](#).
- 8 The temperature of any heat source in contact with the recycling system must not exceed 40°C.
- 9 The perforated plate and screen must be installed correctly.
- 10The sifter must be correctly positioned against the bottom of the cyclone.
- 11Check that the transport hose for the recycled powder is correctly connected to the sifter.
- 12The radius of curvature of the powder transport hose must be greater than 200mm.
- 13Check the equipotential earth connection to the sifter, cyclone and screen periodically.

1.3. Compliance with the ATEX directive

Under Directive 1999/92 EC, the user is responsible for defining the ATEX zones. In accordance with standard EN 12981, Sames Technologies has designed the EasyCompact installation taking the following zones into account:

- **Cyclone and ducting:**
 - Zone 20.
- **Sifter:**
 - Zone 20 represented by the inner volume.
 - Zone 22 represented by the volume between 0 and 1 meters around its opening.



1.4. Back-end risks

It is essential for the operator to be aware of the back-end risks in using the equipment. These are shown in the table below:

Risk	Severity	Damage	Frequency and length of exposure	Methods applied to limit the damage
Noise (see RT Nr 7015) noise measurement sheet).	Serious	Several people	During cleaning phases	Personal protection (helmet, plugs, etc.).
Dust inhalation	Slight	Several people	During manual cleaning, i.e. 0 to 10 times a day	Protective mask.
Fall while working on the top part of the cyclone	Serious	One person	Rare	Suitable installation for working at cyclone height.

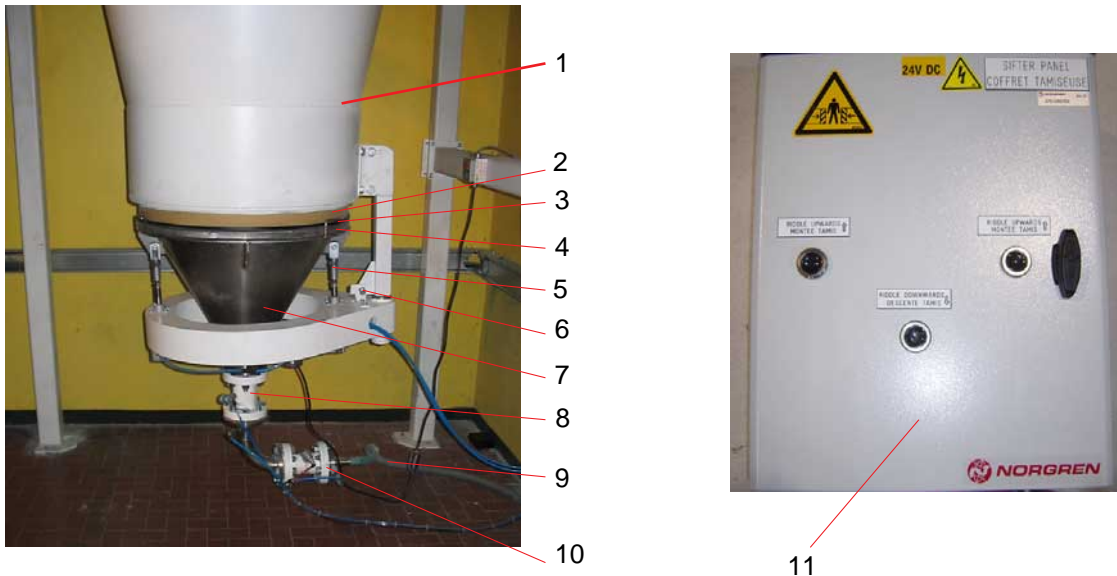
2. Description of the equipment

2.1. General description

The recycling installation, made up of the cyclone (1) and sifter (2) is used to recycle powder deposited in the booth. The recycling system operates during the booth's powdering and cleaning phases.

The air laden with excess powder is sucked out using a motorized fan and led to the cyclone (1).

The screen filters the powder from the cyclone which is then sent to the powder feed centre to be used again. The air from which the powder has been removed is filtered in the filtration unit then circulated back into the workshop.



1	Cyclone	Separates the excess powder from the transport air
2	Seal	Provides a leak-proof seal between the cyclone and the sifter
3	Perforated plate	Speed reduction device to prevent the powder fusing on the screen.
4	Screen*	Screens the powder before it is used again
5	Locking cylinders	To position the sifter at the bottom of the cyclone
6	Sifter end stop	To position the sifter
7	Vibrator	Makes the powder flow more easily in the hopper.
8	Upper sleeve valve	
9	Powder transport hose	Removes the powder to the powder station
10	Lower sleeve valve	
11	Control cabinet	Adjusts the powder transport air. Controls the opening and closing of the sifter.

***The following meshes can be used: 150 µm, 390 µm**

2.1.1. Pneumatic characteristics required:

Max. input pressure	10 bar (150 psi)
Min. input pressure for a flow rate of 17 m ³ / h	4 bar (60 psi)
Max. compressed air consumption*	17 m ₀ ³ /h
Characteristics of the compressed-air supply according to standard NF ISO 8573-1	
Dew point*	Class 4, i.e. +3°C (37°F)
Max. particle size of solid pollutants	Class 3, i.e. 5 µm
Max. concentration of solid pollutants*	Class 3 i.e. 5 mg / m ₀ ³
Max. oil concentration*	Class 1 i.e. 0.01 mg / m ₀ ³

*: m₀³: values given for a temperature of 0 °C (32°F), at atmospheric pressure (1,013 mbar).

2.1.2. Electrical characteristics

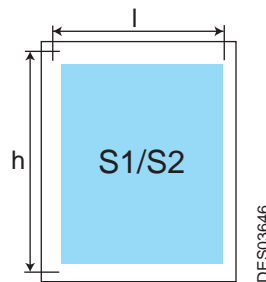
2.1.2.1. Sifter vibrator

Protection mode	EEx II 3D / IP G x
Power-supply voltage	380 V three-phase
Frequency	50/60 Hz.

2.1.2.2. Characteristics of the sifter, its housing and the transport pump

Power-supply voltage	24 V - DC
Supply pressure	6 bar +/- 1 bar
Screen size	250 µm - 390 µm

2.1.2.3. Characteristics of the cyclone



Air flow rate (m³/h)	12000	16000	20000	24000
"S1" air outlet section l x h (mm)	300 x 600	330 x 750	350 x 800	360 x 800
"S2" air outlet section l x h (mm)	361 x 453	512 x 409	569 x 453	638 x 507
Total height H of frame (mm)	4409	4866	5934	6013
Height Hs1 (mm)	3503	3845	4845	4850
Overall dimensions of frame (mm)	1475 x 1475	1636 x 1636	1830 x 1830	2030 x 2030
Weight with frame (kg)	650	700	850	950

2.2. Operation

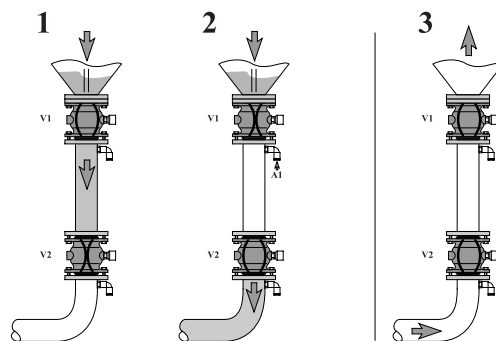
2.2.1. Recycling and powder transport

The excess powder deposited inside the powdering booth is sucked out through a suction tube by a motorized fan and sent to the cyclone (1). In the cyclone (1), the air laden with powder particles swirls round and travels from the top to the bottom of the cyclone. When it arrives on the perforated plate, the speed of the powder-laden air is considerably reduced. As the speed of the air is no longer high enough to carry the particles of powder, these fall into the sifter while the air from which most of the powder has been removed is sucked out from the top of the cyclone to the filtration unit.

The powder is then sifted by oscillating screen (4) driven by the vibrator and falls into the hopper of the sifter.

When the powder reaches the hopper, two sleeve valves control its return to the powder feed centre by a sequence of alternate opening and closing operations and the injection of powder transport air.

Phase	Valve 1 (V1)	Powder transport air 1 (A1)	Valve 2 (V2)	Powder transport air 2 (A2)	Effect
Recycling (1 + 2)	Open	0	Closed	1	The powder falls into the buffer area between V1 and V2. The powder under V2 moves down the recycling hose
	Closed	1	Open	0	The powder falls under valve V2.
Cleaning (3)	Open	1	Open	1	The cleaning air arrives at the supply unit then crosses both sleeve valves.



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2.2.2. Cleaning the sifter

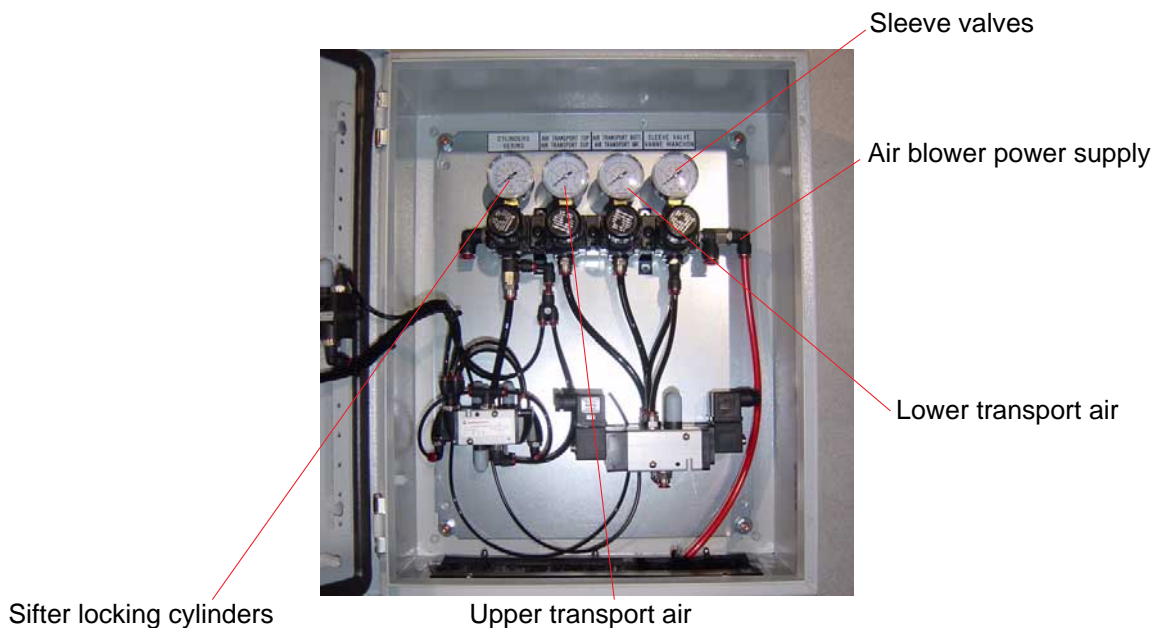
While the sifter is being cleaned, the bottom of the cyclone is open and only the powder present in the sifter is recycled.

The powder still present in the booth at this time is not recycled. It is therefore important to clean the sifter after cleaning the booth to limit powder losses.

2.3. Installing the sifter

2.3.1. Installation

- Install the screen and the perforated plate on the sifter.
- Lock the perforated plate on the hopper.
- Pivot the sifter under the cyclone up to the end stop.
- Position the sifter under the cyclone by adjusting the locking cylinders from the control panel (see diagram below).
- Connect the recycled powder carrier hose



2.3.2. Positioning

- The sifter must be installed so as to give a perfect leak-proof connection with the seal situated on the cyclone outlet ring.
- The amplitude of the sifter vibrations is obtained using the vibrator. The recycling device is then ready to operate.

It is essential that the sifter control panel be installed more than 1m from the sifter.

3. Setting the equipment

3.1. Recycled powder transport



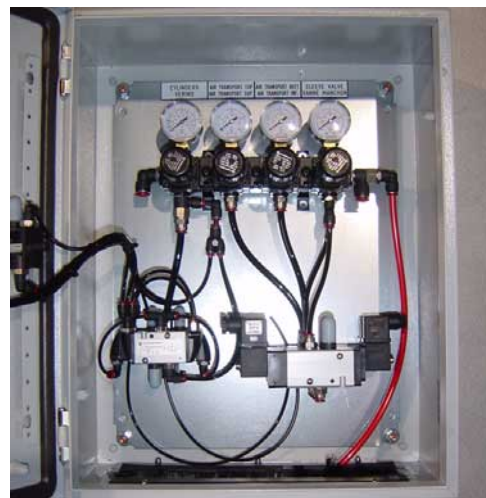
WARNING : This is set by a SAMES technician.

The recycling device is controlled using the PLC.

This device is regulated by adjusting the duration and the pressure of the injections of powder transport air.

The pressures are regulated on the front panel. The values of the pressures for the various air supplies are given below. The duration of each injection is set from the PLC. The transport air pressures must enable powder to be recycled without excessive smoke in the powder station.

Setting pressures on the front panel, diagram of the control panel:

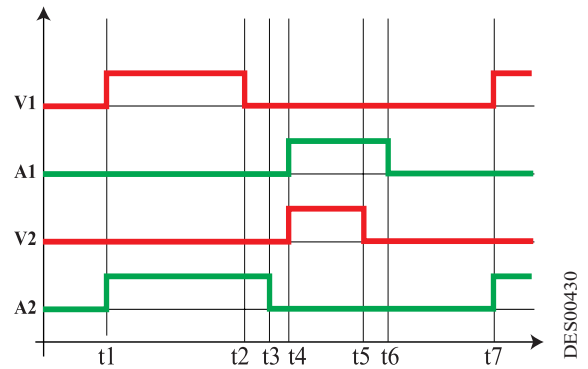


The values of the transport air pressures to be set inside the control cabinet are as follows:

Sleeve valves	1.8 bar (27 psi)
Upper transport air	1.2 bar (18 psi)
Lower transport air	1 to 3 bar (15 to 45 psi).
Sifter locking cylinders	4 bar (60 psi)

Setting the injection cycle: the recycled powder transport is entirely controlled by the installation PLC.
 Transport cycle diagram:
 The times of the transport sequences are programmed on the PLC:

t1 to t2	Intake of powder into the buffer area
t1 to t3	Powder carried to the powder station
t3 to t4	Wait
t4 to t5	Powder intake to the recycling hose
t4 to t6	Transport from V1 to V2
t6 to t7	Wait for next cycle



4. Cleaning the sifter

The operation of the recycling system is controlled from the PLC.

It is essential to clean the sifter on each change of color and before a production shutdown of more than 2 hours.

Sifter cleaning procedure



WARNING : Air suction must be operating while the sifter is being cleaned.

- 1 Lower the sifter from the cyclone by operating the locking cylinders using the handle on the control panel.
- 2 Pivot the sifter to access the perforated plate.
- 3 Clean the perforated plate using the control cabinet air blower.
- 4 Unscrew and remove the perforated plate
- 5 Clean both sides of the perforated plate using the blower (blowing must be carried out under the cyclone. To do this, position the perforated plate against one of the two sifter end stops and on the sifter ring).
- 6 Clean the screen under the cyclone using the air blower.
- 7 Reposition the sifter **without the screen or perforated plate**:
 - Place it against the stop on the cyclone frame.
 - Raise it by working the locking cylinders.
- 8 Start the self-cleaning of the recycling hose.
- 9 Open the sifter and clean the hopper of the sifter under the cyclone
- 10 Reassemble the screen and perforated plate, then reposition the sifter (see 7)
- 11 The recycling system is then ready to operate.

5. Maintenance

5.1. Preventive maintenance

At each change of color, the perforated plate, screen and hopper must be suitably cleaned using the control panel air blower.

5.1.1. Cleaning the screen

The screen only needs to be cleaned when it is obstructed with hardened powder. Before starting the cleaning operation, comply with the safety rules ([see § 1.2 page 4](#)).

Equipment necessary:

- Clean non-fluffy cloths
- Cleaning product of type MEK or MIBK
- Rubber gloves
- Protective goggles
- Ventilated enclosure

Weekly cleaning procedure

- Clean the screen in the same way as for a change of color using the air blower provided.
- Place the screen in a ventilated enclosure provided for the use of volatile inflammable products.
- Use a cloth copiously soaked in cleaning product to remove the accumulations of melted powder on the screen above the recovery vat. Rub until all melted powder is removed.



WARNING : The cleaning product must not come in contact with the seals of the screen (risk of damaging the seals and the glue holding them in place).

- Afterwards rub a clean, dry cloth over the whole of the upper and lower surface.
- Blow air over the screen.
- Leave to dry for as long as it takes for the solvent to disappear.

5.1.2. Cleaning the cyclone

This cleaning operation must be carried out when a thick layer of hardened powder appears at the bottom of the cyclone. Before starting the cleaning operation, comply with the safety rules ([see § 1.2 page 4](#)).

Equipment necessary:

- Clean non-fluffy cloths
- Rubber gloves
- Protective goggles
- Glass micro beads

Cleaning procedure for the inside cone of the cyclone

- Clean the entire installation fully.
- Stop recycling, remove the screen and perforated plate.
- Remove the upper sleeve valve and install the "hopper closing plate" instead.
- Fill the sifter with 10kg of glass micro-beads.
- Install the "dummy screen" in place of the screen and perforated plate.
- Close the sifter.
- Operate the ventilation for about 2 hours 30 minutes.
- After cleaning, remove the micro-beads and re-install the sifter.

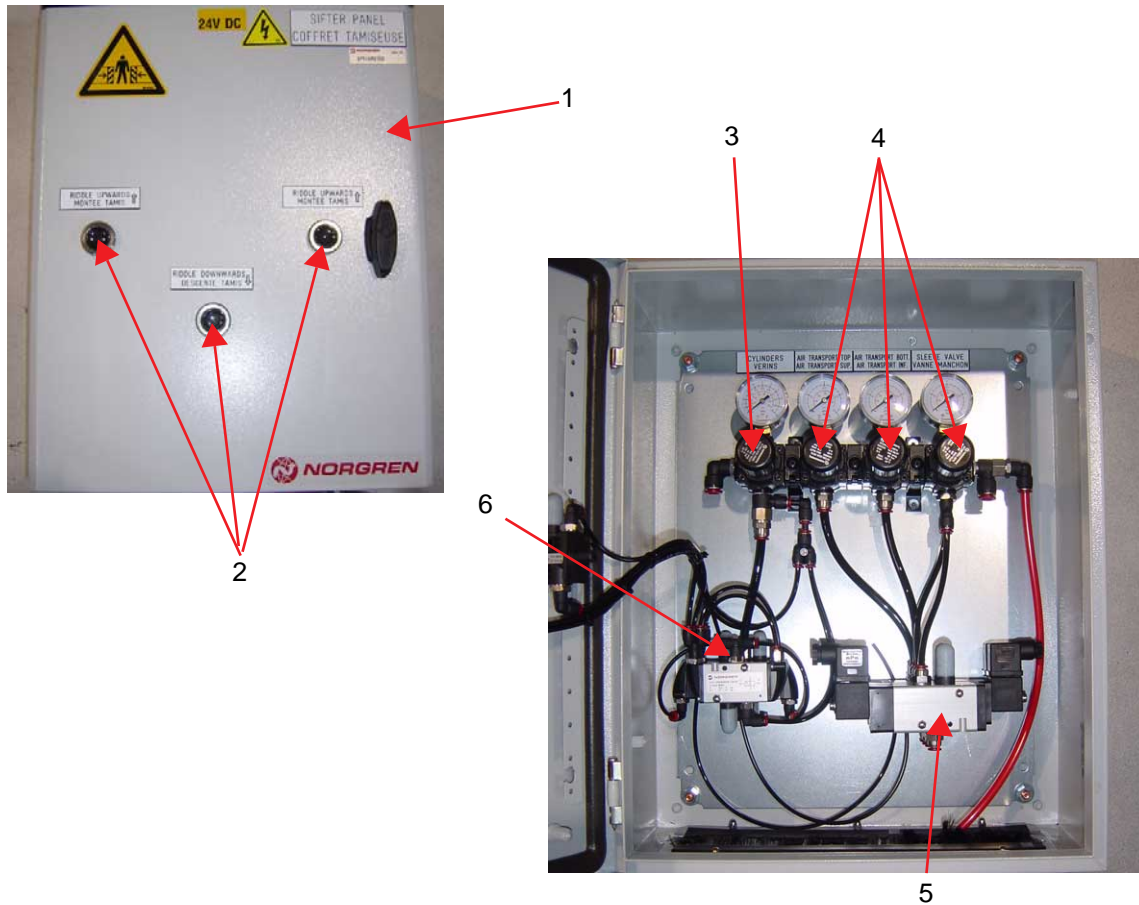
5.2. Corrective maintenance

Type of breakdown	Likely cause	Remedy
No recycling	Defect displayed on the screen if the installation PLC	Find the cause of the defect, then reset.
	Screen obstructed	Clean the screen using compressed air. Replace it if necessary (see § 5.1.1 page 14).
	Recycled powder transport hose blocked.	Clean the powder transport hose using compressed air. Ensure it is not bent and is correctly connected under the sifter. Replace it if necessary.
	Sleeve valve malfunction.	Check for the presence of opening air for the defective sleeve valve. Replace the sleeve if necessary (see RT Nr 6057). Also check the quick bleed valves and replace if necessary.
		Replace the valve sleeves (see RT Nr 6057).
	Inversion of upper and lower hoses	Check the sleeve-valve connections and transport air.
Defective non-return valve on the transport air inlets.	Replace or clean the non-return valves of the transport air supply system with an air blower.	
Air leakage under the cyclone	Defective seal.	Replace the seal under the cyclone.
Difficulty in pivoting the hopper	Lack of grease on the hopper rotation shaft	Grease the hopper rotation shaft.

6. Spare Parts

NB: The information and characteristics provided in this manual are not contractual and **SAMES** reserves the right to modify this equipment without notice.

6.1. Control cabinet

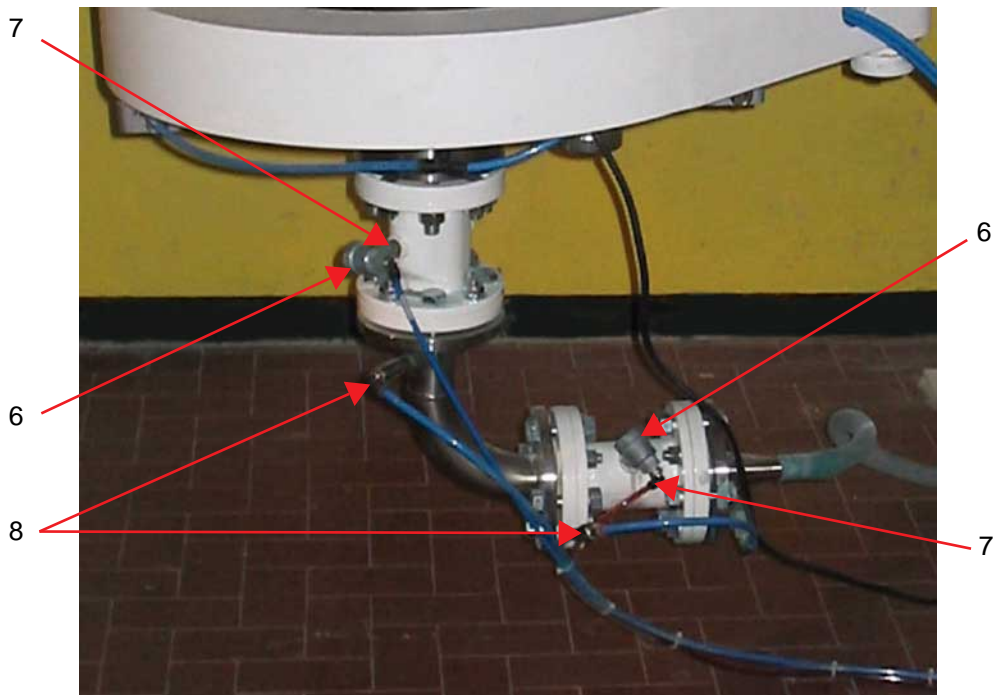
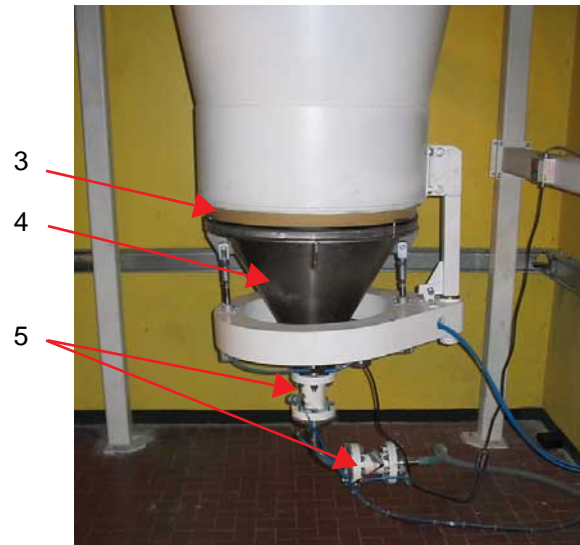


Item	Part number	Description	Qty	Unit of sale	First Priority	Wear
1	900002084	Sifter control cabinet	1	1	-	-
2	220000087	Distributor 3/2 G 1/8	3	1		X
3	220000085	10 bar pressure regulator	1	1	-	-
4	220000086	4 bar pressure regulator	3	1	-	-
5	220000088	Distributor 3/2 G 1/4	4	1		X
6	220000141	Distributor 5/3 CF G1/8	1	1	-	X

Labels in cabinet

2	BPSV1, BPSV2, BPRV
3	RGCT
4	RGT1, RGT2, RGM1
5	YVT1, YVT2, YVM1, YVM2
6	PV1, PV2

6.2. Recycling assembly



Item	Part number	Description	Qty	Unit of sale	First Priority	Wear
1	900001570	Perforated plate	1	1		X
2	900001859	400 µm screen	1	1		X
3	900001569	Hopper seal	1	1	-	X
4	180000040AT	Vibrator	1	1	-	-
5	F1VPDM116	Sleeve valve	2	1	X	X
	F1VACC126	Sleeve for sleeve valve	-	1	X	X
-	900001501	Flat seal	4	1	-	-
-	X2BVHA438	H M16 x 60 galvanized steel screw	16	1	-	-
-	X3CDSP789	Lock washer, Dia 16	16	1	-	-
-	X2BEHU016	H M16 galvanized steel nut	16	1	-	-
6	F1CNRE009	Quick exhaust valve	2	1	X	X
7	F6RLHC214	Male-male nipple	2	1	-	-
8	R2RPRE006	Non-return valve	2	1	-	-

Required for cleaning the cyclone and the hopper

Item	Part number	Description	Qty	Unit of sale	First Priority	Wear
-	240000487	Bag of glass micro beads	-	25 kg	-	-
-	900002243	Hooper closing plate	-	1	-	-
-	900002242	Dummy screen	-	1	-	-