SGI Pastry

User manual



L'Art de la Pulvérisation

Air dryers





Air dryers

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General information

1.1. Functional Description

The refrigeration cycle air dryers have been designed to remove condensate from compressed air through cooling; they are compact and energy-efficient. The operating principle of the dryers described in this manual is illustrated by the air and refrigeration circuit diagrams (sections 2.2 and 2.3).

The air supplied to various applications is virtually free of moisture, while the condensate collected in the separator is discharged to the outside through dedicated drain devices. Before leaving the dryer, the treated air is preheated in counterflow relative to the incoming air. This helps reduce the size of the unit and prevents the formation of condensation on the external surface of the line tubing.



The dryer is already equipped with all necessary control, safety, and regulation devices and therefore does not require any auxiliary components.

Overloading the equipment—within the maximum operating limits—may reduce dryer performance (higher dew point) but does not compromise safety.



The electrical circuit (Appendix E) has a minimum protection rating of IP 42; the user is responsible for providing line protection and grounding in accordance with the electrical standards in force in their country.

1.2. Safe use of the dryer

Symbols applied to the dryer and indicated in the manual.

Do not touch electrical hazard
Prohibition of maintenance to unqualified personnel
Environmental requirements
Recyclable materials

From a safety standpoint, this equipment has been designed and manufactured in compliance with current European directives. Therefore, all installation, operation, and maintenance activities must be carried out in accordance with the instructions in this manual.



All operations related to installation, maintenance, and inspection that require access to the dryer must be performed by qualified personnel.



The manufacturer shall not be held liable for any use of the dryer that is different from or not in compliance with the instructions provided in this manual.





Technical description

2.1. Operation

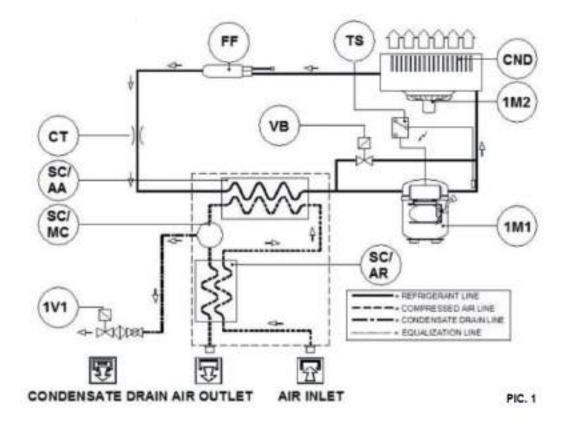
The dryer described in this manual essentially consists of two separate circuits: one for compressed air, divided into two heat exchangers, and the other, a refrigeration circuit.

The hot and humid air first passes through an air-to-air heat exchanger before entering the evaporator (air/ refrigerant heat exchanger), where it is cooled through contact with the refrigeration circuit, causing the moisture to condense. The condensed moisture is then separated and expelled via a separator.

The cold air then passes back through the air-to-air exchanger, where it is partially reheated by the incoming air, which begins to cool down in this pre-refrigeration stage.

The refrigeration circuit used in this process is primarily composed of a refrigeration compressor, a condenser, and an evaporator, also referred to as the air/refrigerant heat exchanger.

2.2. Refrigeration Circuit 2.2.1. Diagram





2.2.2. Refrigeration compressor (1M1)

The refrigeration compressor acts as the system's motor. It compresses the refrigerant gas coming from the evaporator (low-pressure zone) to the condensation pressure level (high-pressure zone). All compressors are manufactured by leading companies and are designed for applications requiring high compression ratios and significant temperature variations. Their hermetically sealed construction ensures perfect gas containment, providing high energy efficiency and a long service life.

Mechanically, the compression unit is supported by dampers that significantly reduce noise emissions and vibration transmission. The electric motor is cooled by the suction refrigerant gas, which passes through the motor windings before reaching the compression cylinders. An internal thermal protection device safeguards the compressor from excessive temperatures and overcurrents. This protection resets automatically once normal temperature conditions are restored.

2.2.3. Condenser (CND)

The condenser is where the gas from the compressor is cooled and condensed into liquid form. Mechanically, it consists of a circuit of copper pipes (for gas transport) embedded in a pack of aluminum fins. Cooling occurs thanks to an axial fan that forces ambient air through the finned pack, using pressure generated inside the dryer.

It is essential that the ambient temperature does not exceed the rated value. It is also very important to **KEEP THE UNIT FREE FROM DUST AND OTHER DEBRIS.**

2.2.4. Filter dryer (FF)

Traces of moisture, residues that may accumulate inside the cooling system, or dense compounds formed after prolonged dryer use can reduce compressor lubrication and clog the capillary tube. The function of the filter dryer, placed upstream of the capillary tube, is to trap impurities and prevent them from circulating within the system.

2.2.5. Capillary tube (CT)

The capillary tube is a narrow copper tube located between the receiver and the evaporator, which restricts the flow of refrigerant. This restriction causes a pressure drop that is proportional to the target temperature in the evaporator: the lower the pressure at the capillary tube outlet, the lower the temperature in the evaporator.

The capillary tube's length and diameter are precisely dimensioned to match the expected evaporator performance; no maintenance or calibration is required.



2.2.6. Aluminium heat exchanger (SC)

The air/air heat exchanger, the air/refrigerant heat exchanger, and the condensate separator (demister type) are integrated into a single module. The counterflow of compressed air in the air/air heat exchanger ensures maximum heat transfer. The large cross-section of the exchanger channels reduces air velocity and decreases the energy required for flow. The generous dimensions of the air/refrigerant heat exchanger, combined with the counterflow of the refrigerant gas, ensure complete evaporation of the refrigerant (preventing liquid return to the compressor).

The high-efficiency condensate separator is positioned between the heat exchangers. It requires no maintenance, and the coalescing effect guarantees a high level of moisture separation.

2.2.7. Safety thermostat (TS)

This system also acts as a protective measure for the compressor. When the dryer is operating with the correct amount of refrigerant, the discharge temperature remains stable. If not, the discharge temperature rises above the standard threshold, and the safety thermostat shuts off power to the compressor. Discharge temperature also increases if the condenser is dirty or the fan fails.

2.3. Air circuit

The function of the dryer is to dehumidify compressed air. Any use of the machine outside the conditions described in Appendix A must be approved by the manufacturer.



Installation -

3.1. Acceptance and transport

Upon delivery, the customer must inspect the dryer entirely and ensure that all items listed in the shipping documents are present.



Any claim regarding missing or damaged items must be submitted directly to our headquarters or the nearest distributor within eight (8) days of receiving the goods.

The dryer must always be kept in an upright position, as indicated by the symbols on the packaging. Use handling equipment that is properly rated for the weight of the machine. Do not remove the packaging until the dryer has been placed in its final installation location.

The original packaging should be retained at least for the entire duration of the product's warranty. Be sure to dispose of packaging materials in accordance with local regulations.

Do not remove any panels, either during transport or while positioning the dryer.

In case of non-use, the dryer must be stored in its packaging and in a dust-free location protected from high temperatures (max. 50°C, with relative humidity not exceeding 90%). If storage exceeds 12 months, please contact the manufacturer.

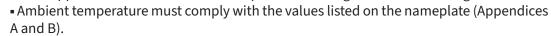


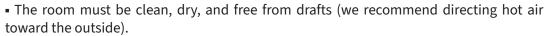
3.2. Installation location

The following conditions must be met to ensure a suitable installation environment:



- Protect the machine from weather elements and direct sunlight.
- The support base must be level and capable of bearing the machine's weight.







• Ensure sufficient space around the dryer for proper cooling and for easy access during maintenance and inspections.

The intake air must be free from flammable fumes or vapors to avoid the risk of explosion or fire.

3.3. Installation layout



Before installation, ensure that:

- No part of the equipment is under pressure.
- No part of the equipment is electrically energized.
- The connecting pipes to the dryer are clean.



Only after verifying these conditions should installation proceed.

Connect the dryer to the compressed air line as shown in the installation diagrams. Once completed:

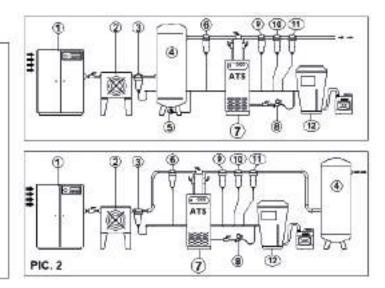


- Position the dryer so that all control instruments are clearly visible, ensuring optimal operation.
- \blacksquare Install a 3 μm dust filter, which is essential for the proper functioning of the dryer's internal components.



• Install a bypass system to isolate the dryer from the equipment and facilitate any future maintenance operations.

Air Compressor 2 After cooler 3 Condensate separator 4 Receiver 5 Automatic Drain 6 Dust Filter 3µ 7 Dryer 8 Solenoid drain valve 9 Coalescing Filter 1µ 10 Coalescing Filter 0.01µ 11 Activated carbon filter 0.003 mg/m³ Water/Oil Separator 12





3.4. Connection to the network

DANGER – Presence of High Voltage. PROPER HANDLING PROCEDURES MUST BE USED TO AVOID ELECTRIC SHOCK.



Connection to the power supply must be performed by qualified personnel. All protection systems must comply with the electrical regulations in force in your country.

Before connecting the unit to the electrical supply, check that the available voltage and frequency match the nameplate data. A voltage tolerance of $\pm 5\%$ is allowed.

The dryers are already equipped with a power cable.

The main power socket must be fitted with a residual-current circuit breaker with overload protection (RCBO), and a qualified technician must check that the power cable cross-section is adequate and complies with local regulations. The cable must be sized according to the dryer's electrical consumption (see nameplate values).

Do not connect the dryer until you are certain that the network voltage and frequency are stable and match the data on the nameplate.

The user is responsible for providing line protection and grounding in accordance with the national electrical standards of the country of use.

3.5. Condensate drainage



The condensate is discharged at the same pressure as the incoming air.

Never direct the condensate drain stream at any person.





The condensate collected in the dryer contains oil particles released by the compressor. We recommend installing an oil/water separator to collect condensate from compressors, dryers, tanks, filters, etc.

The dryer can be equipped with either a timed drain controlled by an electronic board or a capacitive drain (see Appendix G).



Start-up

4.1. Before starting





Before starting the unit, ensure that all functional parameters match the nameplate data. The dryer is tested and pre-set before shipping, meaning no additional adjustments are needed for operation. However, during the first hours of use, its proper functioning should be monitored.

4.2. Start-up

Upon delivery, the customer must inspect the dryer entirely and ensure that all items listed in the shipping documents are present.











- 3. The display will show the current temperature.4. The unit will start after a one-minute safety delay.
- 5. Wait 5 to 10 minutes for the machine to reach standard operating parameters.
- 6. Slowly open the air outlet valve, then gradually open the air inlet valve.
- 7. Allow air to flow slowly into the dryer.
- 8. Check that all connecting pipes are properly tightened and secured.

Before disconnecting the dryer from electrical power supply, press START/STOP key for at least 3 seconds. After that wait 10 minutes before switching the dryer on again, in order to allow freon pressure re-balance.

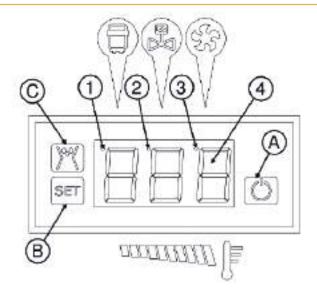


Fonctionnement

5.1. Control panel

The machines in this series are equipped with an electronic system that allows reset operations to be carried out from a digital control panel located on the front of the dryer.

The control panel, as shown in the diagram, consists of three buttons:(START / STOP (A), SET (B), DRAIN TEST (C)) and three indicator lights identified by icons.







Vo.	LED	ICON	STATUS	DESCRIPTION
1	LED COMP		ON	Compressor energized
2	LED VALVE		ON	Condensate drain energized
3	LED FAN		ON	Fan energized
931	10 000 000 000		OFF	UNIT SWITCH OFF
4	DISPLAY		3	DEWPOINT TEMPERTURE
A	START / STOP key			Activates and deactivates the process
В	SET key	SET		Parameter setting entry (depend on the current display)
c	DRAIN TEST key	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		Manual drain test

5.2. Standard operation

START / STOP key: Pushed for 3 seconds, it activates or deactivates the process. When the process is deactivated, the display not shows. During the dryer operation, the COMP LED (1) is on.

5.3. Programming

The device controls the compressor, fan and condensate drain solenoid of the dryer, and allows the calibration of the operating parameters. In case of particular requirements concerning the operation management the user can change the setting of the programmed parameters. The parameters (Pr1-8), which can be set up, are show on table.

How to set up

10

- To enter the configuration mode, press and hold the SET (B) button for at least 3 seconds.
- The first parameter, Pr1, will appear.
- Use the DRAIN (C) button to increase or decrease the value.
- To confirm and move to the next parameter, press the SET (B) button.
- To save and return to the normal display, press and hold the SET (B) button for 3 seconds.
- If no action is taken for 30 seconds, the system will automatically exit configuration mode.



Parameter	Description	Unit	Range	Default	Note		
Pr1	Drain time	sec	7-10	1	Adjust depending on condition		
Pr2	Drain cycle time	sec	0-600	120	0 to use with no loss drain		
Pr3	Auto reset time	min	1-19	5			
Pr4	Sensor type		0-3	0	1		
Pr5	Fan set point	,C	25-52	42/46*	Manufactury (see and)		
Pr6	Fan hysteresis	.C	7-10	1/2**	Manufactory use only		
Pr7	Fan offset	'C	-5/+5	0			
Pr8	Dew point offset	.C	-5/+5	0			

The fan setpoint is 42°C for models DGO24-216, and 46°C for models TRAIE330-440. The fan hysteresis is 1°C for models DGO42-240, and 2°C for models DGO330-440.

5.4. Alarms

Message	Description	Conditions	Actions
ES	Energy saving	Dewpoint lower than -1 'C over 6 minutes	Wait 5 minutes for auto restart working function
AdP	High dewpoint alarm	Dewpoint higher than 17 °C Over 6 minutes	Switch off the unit to reset if alarm persists contact service
P1	Dewpoint probe alarm	All problem with dewpoint probe	Change probe / dryer will not stop to work
P2	Fan probe alarm	All problem with fan probe	Change probe / dryer will not stop to work fan motor keep running

5.5. Alarm history

The device can show the alarm history, indicating how many alarm events occurred during the last operation.

To access the alarm history display:

- 1. Press and hold SET (B) and DRAIN TEST (C) simultaneously for 2 seconds.
- 2. You will see "E", showing the number of energy-saving events.
 - Press SET (B) for 1 second to reset this value.
 - Press DRAIN (C) for 1 second to go to the next alarm history entry.
- 3. You will then see "S", indicating the number of sensor time-related issues.
 - Press SET (B) for 1 second to reset this value.
 - Press DRAIN (C) for 1 second to go to the next alarm history entry.
- 4. You will then see "d", indicating the number of high dew point alarms that occurred.
 - To return to the normal display, press and hold SET (B) and DRAIN TEST (C) for 2 seconds.





Maintenance, troubleshooting, spare parts and disposal

The dryer is a refrigeration unit and, as such, all maintenance operations must comply with the safety regulations in force in the country of installation.

6.1. Inspection and maintenance

Before carrying out any maintenance, ensure that:

- 1. No part of the system is under pressure.
- 2. No part of the system is electrically energized.

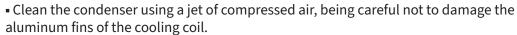
WEEKLY or EVERY 40 OPERATING HOURS

- Check the temperature on the control panel display.
- Visually inspect the regular discharge of condensate.

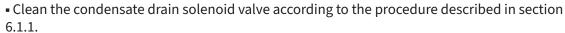




MONTHLY or EVERY 200 OPERATING HOURS











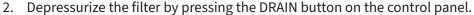
YEARLY or EVERY 2000 OPERATING HOURS

- Check the condition of the condensate drain hose and replace it if necessary.
- Check the tightness and proper fastening of all connecting pipes.
- After these operations, ensure the unit is functioning properly.

6.1.1. Cleaning the drain solenoid valve









Unscrew the filter cap to access the metal cartridge, then clean it with a jet of compressed air.



Reassemble the unit and reopen the inlet and outlet valves.







6.2. Troubleshooting



Repairs and any inspection or maintenance tasks must only be performed by qualified personnel. For refrigeration circuit maintenance, contact a certified refrigeration technician.

FAULT	REMEDY				
	Check for power supply.				
Control panel screen does not light up	Check electrical wiring.				
tigiit up	Check electronic board; replace if problem persists.				
	Check electrical wiring and electronic board.				
	Internal thermal protection has been triggered; wait 1 hour and check again. If the issue persists, stop the unit and contact a refrigeration technician.				
Compressor does not start	Check electrical parts of the compressor.				
	Replace if the compressor is short-circuited.				
	Check the protection fuse (if present) and replace.				
Fan does not run	Check the electrical wiring.				
	Check the wiring and electronic board; replace if needed.				
	Replace fan if it is short-circuited.				
	Check electrical wiring.				
	Prefilter is dirty; clean it.				
No condensate discharge (no	Drain solenoid coil is burnt; replace.				
air or water)	Drain solenoid valve is clogged or stuck; clean or replace it.				
	Check electronic board; replace if necessary.				
	If the screen temperature is lower than normal, contact a refrigeration technician.				
	Drain solenoid valve is blocked; clean or replace it.				
Continuous air discharge from the condensate drain	Check the condensate drain timing parameters.				
the condensate drain	Check the electronic board and replace if necessary.				
	Dryer is off; turn it on.				
	Bypass system (if present) is open; close it.				
Water in downstream piping	No condensate discharge; refer to relevant section.				
	Temperature on display is higher than nominal; see troubleshooting section.				
	Check correct air inlet/outlet connections.				
	Compressor does not start; refer to related section.				
	Fan not running; refer to related section.				
	Inlet air flow rate and/or temperature exceed nameplate values; return to nominal conditions.				
Temperature on screen is	Ambient temperature exceeds rated conditions; restore proper environment.				
higher than nominal	Condenser is dirty; clean it.				
	No condensate discharge; refer to relevant section.				
	Evaporator temperature probe is misaligned or faulty; check it.				
	Refrigerant leak; stop the unit and contact a refrigeration technician.				
	Check wiring.				



FAULT	REMEDY
	Check correct inlet/outlet air connections.
	If temperature on screen is too low, contact a refrigeration technician.
	Evaporator probe is misaligned or faulty; verify.
Compressed air does not pass	Check for clogged pipes and clear if needed.
through the dryer	Check bypass system (if installed) is correctly configured.
	Check electronic board; replace if necessary.

Important:

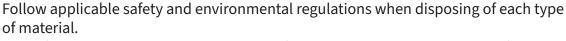
The temperature probe is extremely delicate. Do not unplug or remove it from its housing. For any issue, contact the service center as soon as possible.

6.3. End of life

When decommissioning the dryer, it must be dismantled into groups of homogeneous materials.









The refrigerant contains small quantities of lubricating oil released by the refrigeration compressor.

Do not release it into the environment.

Drain it from the unit using proper equipment before sending the machine to a certified recycling center for proper treatment and disposal.





A. Technical specifications

Dryers Air flow rate	10	42	60	120
Air flow rate	l/min	700	1000	2000
	scfm	24,5	35	70
Air connections	BSP-F		G 3/4"	
Refrigerant			R134a	
Fan motor working pressure	barg	Running 11 / Stop 8		
Weight	kg	23	24	
Air inlet temperature	°C	35° (Max 70°)		
Ambient temperature	°C	25° (Min 5- Max 50°)		
Working pressure	barg	7 (Max 16)		
Pressure dew point	°C	3° (Max 10°)		

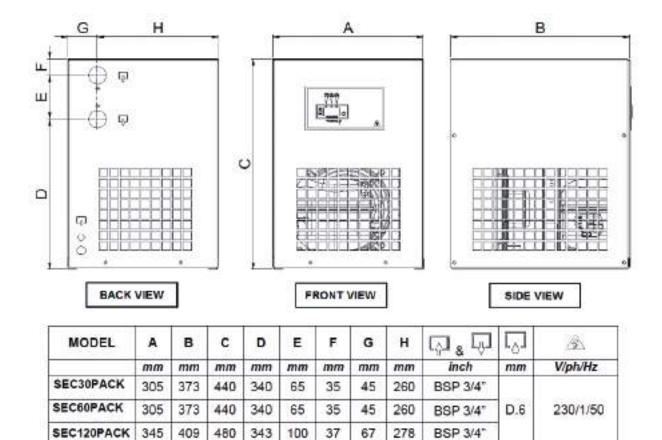
Power supply	V/Ph/Hz		230/1/50	
Nominal consumption	kW	0.18	0.22	0.32
Nominal current	Α	1.14	1.30	1.45
Full load current	Α	1.31	1.44	1.58
Locked rotor current	A	4	4	6



B. Legend

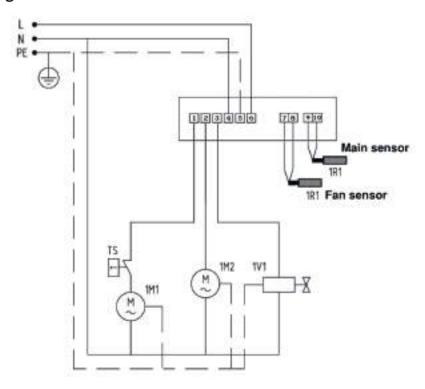
1A1	Electronical controller				
151	Main switch				
1M1	Refrigera	nt compressor			
1M2	Fan moto				
1R1	NTC prob	e L=0.8m			
1R2	NTC prob	e L=2.5m			
CND	Condenser				
FF	Filter dryer				
SC	Aluminum heat-exchanger				
	SC / AA	Aluminum exchanger air - air			
	SC / AR	Aluminum exchanger air - refrigerant			
0.00	SC / MC	Mixing chamber			
VB	By-pass v	alve			
TS	Thermal switch				
1B1	Coil drain	valve			
RBF	Filter	AT USD			
1V1	Solenoid	Solenoid valve			
CT	Capillary	tube			

C. Dryer dimensions

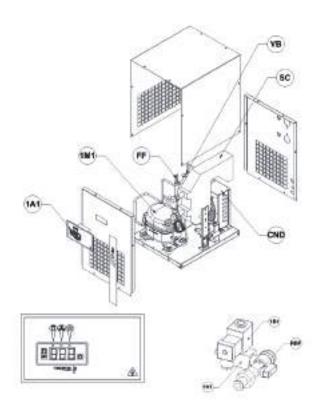




D. Electrical diagrams



D. Exploded view - Recommended spare parts





The suggested spare parts list will enable you to promptly intervene in case of abnormal operation, so avoiding to wait for the spares delivery. In case of failure of other parts, for example inside the refrigerating circuit, the replacement must mandatory be worked out by a refrigerating systems specialist or in our factory.

	DESCRIPTION OF THE SPARE PARTS	CODE	42	60	120
1A1	Electronic controller	0EB,00004	10	10	10
151	Main switch	250.0016.00.00-WH	11,000		-
270		332.TSWO.21.00			
1R1	NTC probe L=0.8m	0EP.00006	20	20	20
1R2	NTC probe L=2.5m	0EP.00007	344		
VB	By pass valve	142.2950.00.00	1	1	1
1000		142,4536,00.00			
181	Coil C8728 220-240V 50/60	240.T100.01.00	1+		1+
171	Solenoid CS728 Conn 1/2*	0RV.00000	10	-	10
RBF	Strainer CS728 Conn1/2",6	0RV.S0000	1	1	1
	Leonaros	210.0130.00.00	1	1	
	Fan motor	210.0131.00.00			1
		210.0132.00.00			
	Electric Company of Control of	213.0061.00.00	1	1	
1M2	Fan blade	213,0062.00.00	11		1
11012		213.0063.00.00	1000	31.	0.00
	Fan grid	213.0065.00.00	1	1	
		213.0066.00.00			1
		OEF.C0003			
	Fan motor unit	210.D350.02.B0			
	Dehydration filter	630,0049,00,00	- 1	1	1
FF		630,0050,00.00	10 0		
		630,0075,00.00	10000		
		921.0020.D0.00-00	1		
		921.0035.D0.00		10	
		921.0108.00.00			1
	200200000	921.0150.D0.00-BOI	100		- 1
CND	Condenser	921,0195,00,00			
	Refrigerant compressor	921.0013.01.00	0.0		
		921.0365.00.00	17-11		
		921.0480.D0.00			
		201.0102.00.00	1		
		201.0100.00.00		1	
		201.0101.00.00		11	1
1M1		201.0110.00.00-CH			-
		201.T135.VH.SM	_		
		201.T102.00.00			
		201.T103.00.00			
		920.5088.00.00	1	1	
		920.5105.00.00	-	-	1
		920.5089.00.00			1
SC	Aluminum heat exchanger	920,5161,00,00	19. 9		
	The state of the s	920.5090.00.00	TY Y		
		920.1326.00.00			
		920.1327.00.00	13.0		
TH	Safety Thermostat	0ET.00000	1	1	1

NOTE - To order the suggested spare parts or any other part, it's necessary to quote the data reported on the identification plate.





"We are at your disposal to advise you on the most suitable equipment for your daily use.

Optimal results are achieved through a combination of high-quality equipment, a

sufficiently powerful air supply, and your expertise!"



SGI - SPRAY GUN IMPORT

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-sGifastry-



Témoignage

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