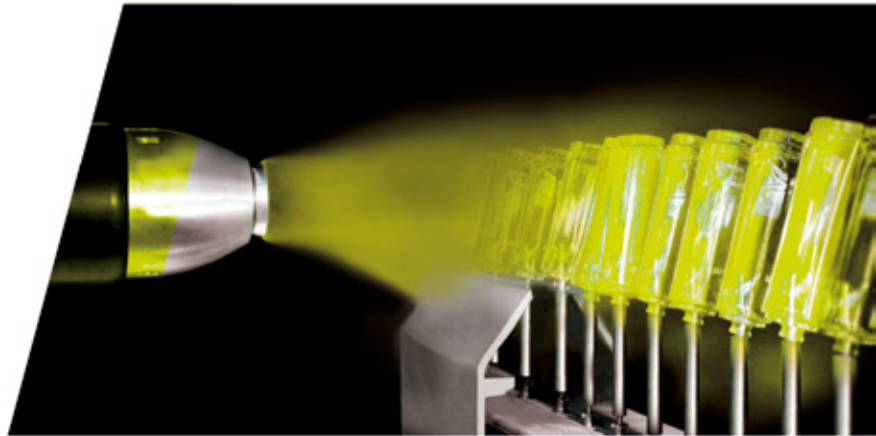




Electrostatic Liquid Finishing



Catalog

Expertise for high finishing quality & efficiency

Apply your Skills

www.sames-kremlin.com



Editor's note



In order to help you increase your competitiveness, SAMES Technologies daily dedicates itself to excellence in terms of innovation and reliability.

We constantly improve our performances as well as quality to satisfy your needs.

We also help you define the equipment allowing your installation to comply with V.O.C. directives. We enable you to benefit from reliable technologies while ensuring you a swift return on investments.

You will find in this catalogue the equipment that will enable you to reach the paint application results you are aiming at.

Providing you with the best, whatever your requirements, is our mission.

All SAMES team is at your disposal to answer your questions.

Enjoy your reading.

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One-component material



Two-components material



Solvent based paint



Water based paint



Lubricant



Electrical charge by direct contact (internal charge)



Electrical charge by external electrodes (EXT)

A strong identity at your disposal

In over 65 years of experiences, SAMES Technologies has built up a unique know-how in many different fields of activity. Numerous installations such as car manufacturing, tier 1&2 and many other industrials markets are equipped with our electrostatic solutions.

This know-how is for you the guarantee that we are experienced team members, able to understand your needs and to speak the same language.

It is also the guarantee for you to work with experts that are able to lead you towards the best technical alternative and to offer you a reliable solution.

You surely can rely on SAMES to enable you to reach your efficiency goals in a sustainable manner.

Improving your competitiveness and making your investments cost-effective is our commitment.

“ Our strength: a real and strong collaboration with our worldwide customers, to answer various and complex needs.



Painting test center SAMES

This approach mainly comes in the following points:

➤ Premium Quality

➤ Competitivity

High Transfer Efficiency,
High Flow & speed,
Productivity increase,
Reliability,
TCO⁽¹⁾ reduced

➤ Any Process

1K/2K material
Solvent & Water based material
Medium & High solid contents
3wet process
Exterior & Interior robotic
Stop & go or Conveyor

(1): total cost of ownership

Improve your business

Leader in finishing solutions to protect and embellish materials, SAMES is your key partner to enhance your productivity, combined with an excellent finish quality.



THE MOST ADVANCED

TECHNOLOGIES

R & D = 48 people
(20% of the workforce)

Over 60 active patents

Electrostatic expertise
Finishing Science
Powder coating inventor

INNOVATIVE

TURN-KEY OFFER

Key technical areas controlled

- Finishing,
- Robotics,
- Mechanical,
- Automation,
- Fluid,
- Electrical, Electronics...

Engineering =
200 people worldwide

ENGAGED

BEYOND YOUR NEEDS

Analyze and anticipate your needs

A global network of experts, close to you

Support you

- Culture of industrial and technical cooperation
- Services during the life of your installation

Our commitments

Customer satisfaction through clear processes

Customer service

SAMES TECHNOLOGIES HAS WORKED OUT A COMPLETE OFFER OF SERVICES, ADAPTED TO ALL YOUR NEEDS:

Advice, repair, servicing, adjustment or intervention by a qualified technician. What ever your request may be, SAMES Customer Service department, a team of 20 persons, is at your disposal to answer your needs within the shortest time.

> ASSISTANCE AND TECHNICAL SUPPORT



+33 (0)4 76 41 60 01

tech-emergency-line@sames.com

In order to make the most from your installation, paint or powder, advice and expertise of specialists are essential. Made of practical, experienced members, SAMES customer support team will carry out a diagnostic of your installation and will provide you with a worthy technical assistance for the improvement or retrofit of your paint line.

Services and technical assistance contracts:

- ▶ Technical assistance on site
- ▶ Preventive maintenance
- ▶ Retrofit
- ▶ Audit and optimization of the process



> REPAIR

A regular, and carried out professionally, maintenance or a retrofit of your equipment, is the best way to guaranty the correct running of your equipment. To this end, do not hesitate and contact one of our technicians:

- ▶ to have technical advice or technical assistance by phone
- ▶ to have one of your product repaired or controlled
- ▶ to carry out a retrofit

> SPARE PARTS



Original spare parts guaranty the correct running of your equipment. We are there to deal with all your orders of spare parts throughout the world. Thus, our aim is to rapidly supply you and at the best price, with the wished part in order to guaranty an optimum and prolonged running of your paint or powder application equipment.

> TRAINING



SAMES Technologies is registered as a training centre by the French Ministry of Employment.

Training sessions that allow you learning the requisite knowledge to the use and the maintenance of your equipment are organised throughout the year. A catalogue can be obtained upon request. You will be then able to choose among the proposed selection of training courses, the type of training that meets your needs or production aims. These training sessions can be organised within your premises or in our training centre located in our headquarters in Meylan - FRANCE.



Quality insurance

In conformity with the ISO9001 standard - issue 2008, the requisite procedures and registrations are mastered. The seriousness with which SAMES' quality policy is dealt ensures you an optimum quality at each stage of the production and of the assembly of the components.

Our products are in the scope of the following European directives:

- 94/9/CE Explosive Atmospheres
- 2006/42/CE Machinery
- 2006/95/CE Low Voltage
- 2004/108/CE Electromagnetic Compatibility
- 97/23/CE Pressure Equipment
- 2011/65/UE RoHS

Restriction of Hazardous Substances in electrical and electronic equipment

- 2012/16/UE WEEE

Waste Electrical and Electronic Equipment

- 1907/2006/CE REACH

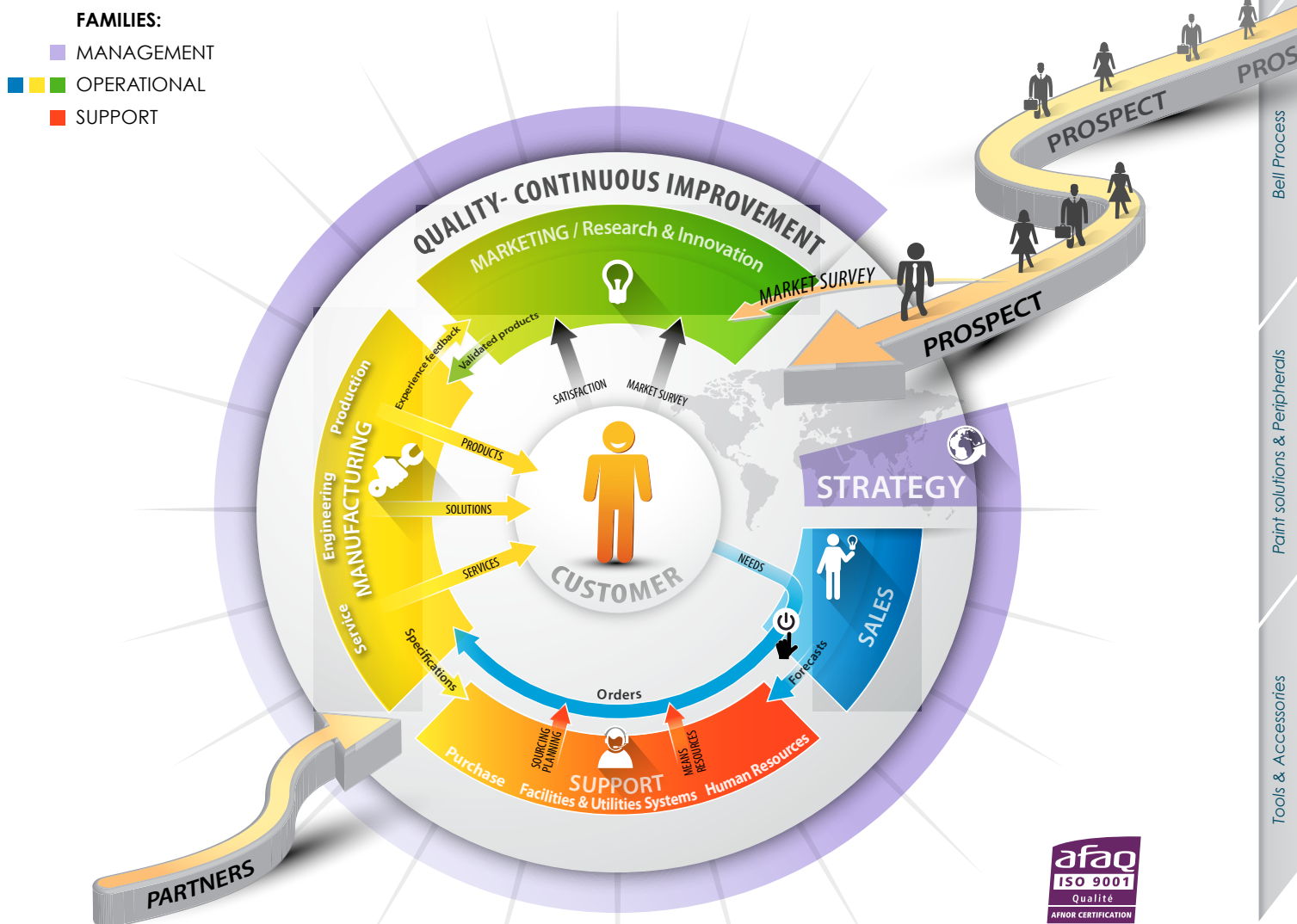
Registration, Evaluation, Authorization and Restriction of Chemicals

Some european directives will be revised during 2016, contact us.

A process mapping allows organizing all the stages while being very attentive to the various environments (customers, competition...), to the audits (inner and outer) and to the indicators linked to the defined aims.

" OUR ATOMIZERS ARE CERTIFIED ATEX FOR ZONE 1, THE HIGHEST SAFETY REGULATION THAT YOU COULD ENCOUNTER "

PROCESSES MAPPING



Certified Managing System

16 SUBSIDIARIES

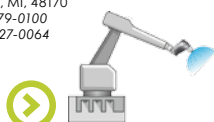
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Subsidiary



Paint Application Center



Liquid paint solutions

Whichever your process may be, there is always a well proven painting solution to carry out your application:

- ▶ Solvent based paint
- ▶ Water based paint
- ▶ 2-component paint
- ▶ Metallic paint

In close collaboration with our technical teams, a solution will be worked out to meet your needs; our range allowing equipping any type of installation.

Research & Innovation

SAMES' main activity is to increase the productivity of its customers by designing and manufacturing innovative electrostatic systems. Launching new products on to the market is the core of our organization.

Our know-how, our large investment in Research & Development as well as our reliability-proven equipment allow us proposing our customers integrated robotic solutions.

SAMES integrates its own technology for decades all around the world. Your efficiency is leading our solutions:

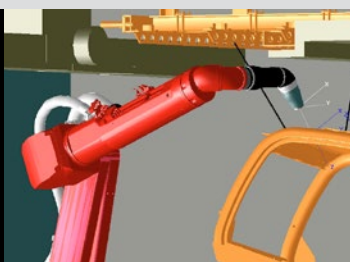
- **Improvement of the transfer efficiency**
- **Minimization of paint losses**
- **Optimization of paint processes**
- **Sustainable paint process**
- **Solve color matching issues**
- **Install complete painting solutions wherever your needs are**
- **Increase production capacity**
- **Improve finishing quality**



**LIQUID PAINT
SOLUTIONS**



**RESEARCH &
INNOVATION**



**ENGINEERING
PARTNERSHIP**



CUSTOMER SERVICE

Engineering partnership

Thanks to high-tech equipment and a dedicated program, our specialists model your project in 3 dimensions and virtually conduct the realisation of robotic paths. The validation of the process on the screen presents you with obvious advantages: test of the most efficient paths as well as precious time savings for the technicians for the adjustment and the final assembly on the production site.

SAMES masters the design and the running of its automatic functions with **EASY2PAINT** suite software.

- ▶ 25 years of experience
- ▶ High flexibility and adaptability for the control of the parameters
- ▶ Accuracy of the adjustments

EASY2PAINT is a concept that gathers the most advanced and proven techniques in terms of supervision, communication and decentralized intelligence, and simulation of application. It is a user-friendly tool that enables the operator to visualize the functions of the process as well as the interfaces with the environment.

ROBCAD tool is an expert system for paint application;

it allows the simulation of:

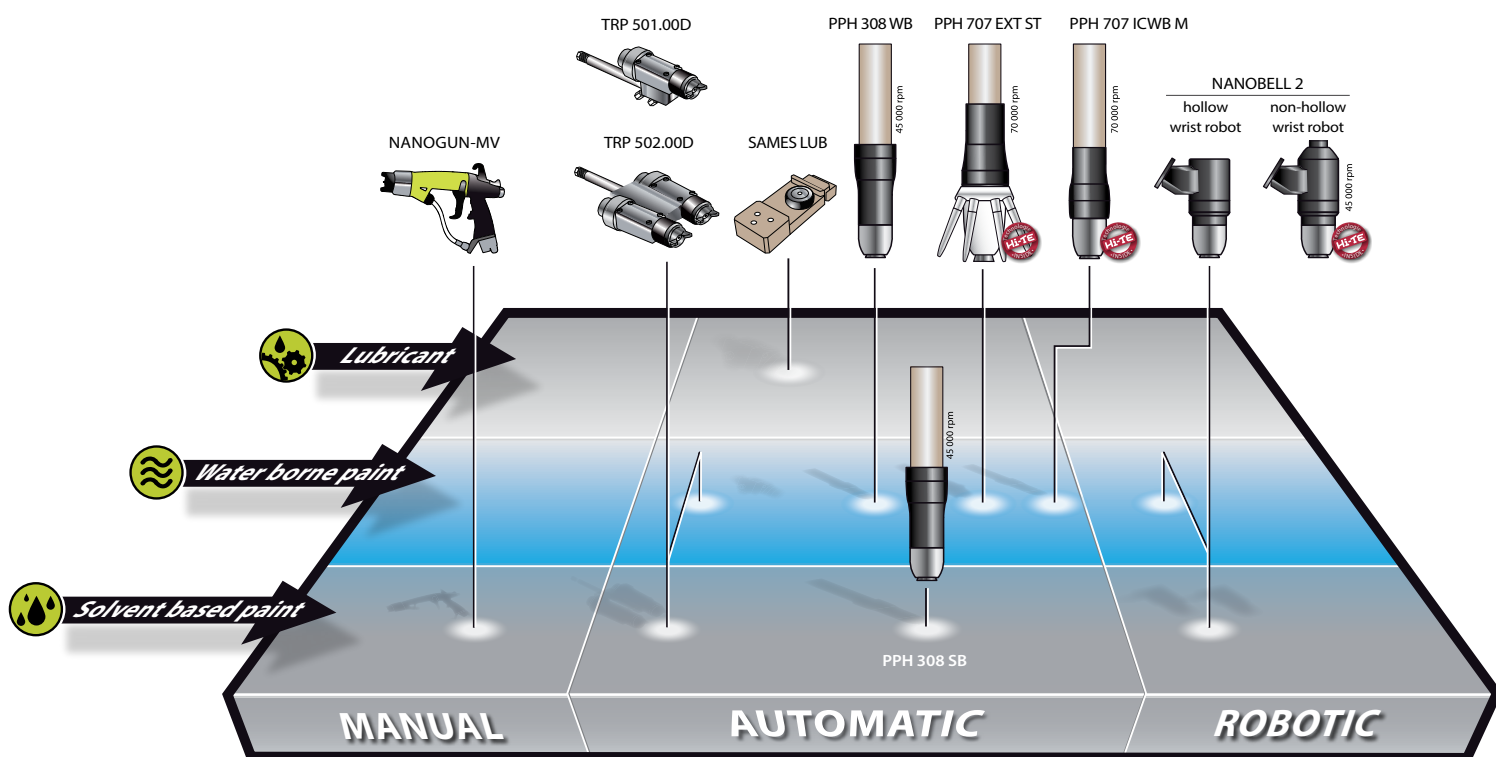
- ▶ paths,
- ▶ accessibility,
- ▶ execution of the cycle times,
- ▶ thickness simulation of forecast,
- ▶ spraying tables.

Range of the liquid sprayers

PRESENTATION OF OUR RANGE

THE SAME'S LIQUID ELECTROSTATIC LINE COMPRISES FIVE TYPES OF PRODUCTS:

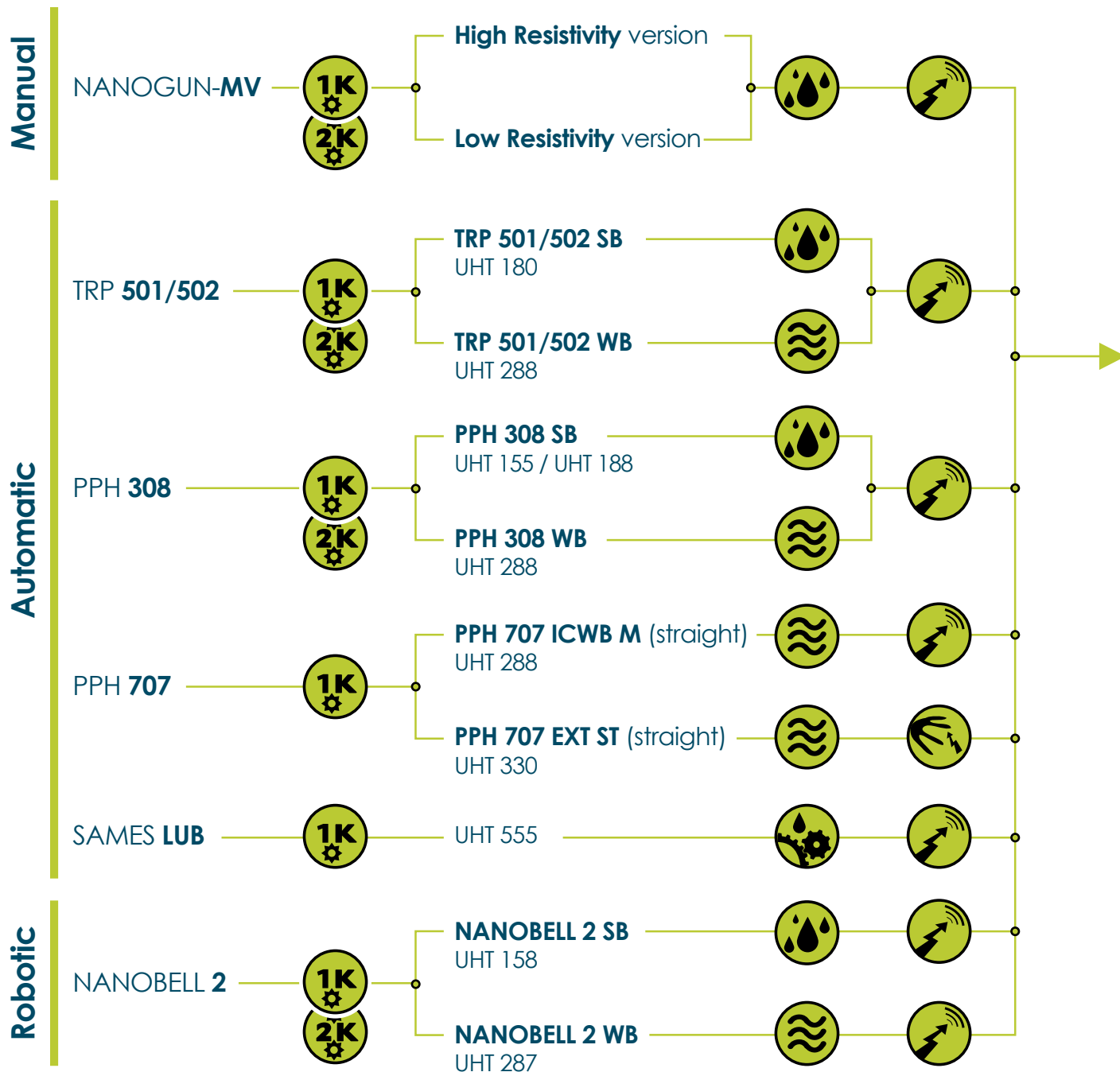
- > **Nanogun**, dedicated to the manual electrostatic application of paint with high transfer efficiency and good ergonomics.
- > **TRP**, the automatic gun atomizer for electrostatic application with high flow rate.
- > **SAMES LUB** solution, dedicated to the electrostatic application of lubricants.
- > **«RANGE 3»**, including PPH 308 and Nanobell, the all-around bell turbine automatic and robotic sprayers for general industry applications.
- > **«RANGE 7»**, including PPH 707 external and internal charge with high speed turbine for enhanced finishing quality.



THE RANGE 3 & 7 ARE WELL RECOGNIZED FOR THEIR:

- Finishing quality
- High Performance
- Flexibility

Range of the liquid sprayers



One-component paint



Two-components paint



Solvent based paint



Water based paint



Lubricant



Electrical charge by direct contact (internal charge)



Electrical charge by external electrodes (EXT)

MANUAL SPRAY GUN

NANO GUN-MV

Manual electrostatic low pressure gun



- > Lightweight electrostatic gun
- > Outstanding finish quality
- > High voltage & current for more paint savings

NANO GUN-MV is a manual air spray gun, for the spraying of solvent materials. Paint may be supplied to it via pump, pressure tank or circulating.

When spraying, the charged paint drops follow the lines of the electric field to the part. Electrostatics result in paint savings and wrap around, reduced overspray and pollution. Adding compressed air to it, allows penetration into cavities.

0.5 to 500 MΩ.cm

488 g

60 kV
80 μA

up to
1000cm²/min



Fan spray

Super VORTEX
Round Spray

FIELD OF APPLICATION

- Aerospace
- Metallic furniture
- Cycles & Motorcycles
- Wood industry
- Aluminium profiles
- Agricultural & construction equipment
- Automotive
OEM, Tier One and Tier Two



NANOGUN-MV

CUSTOMERS' BENEFITS

Intuitive controls

- ▶ High voltage On/Off
- ▶ Pattern width
- ▶ Paint flow rate

**Option**

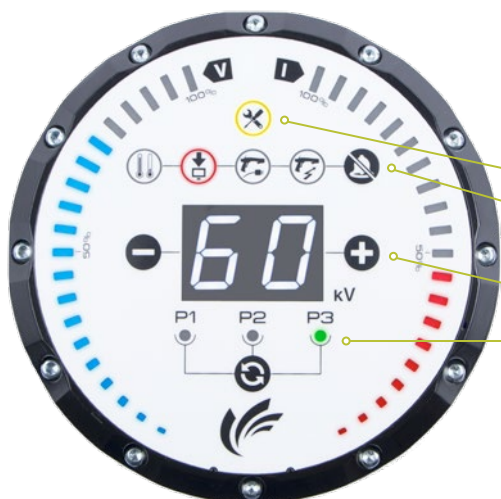
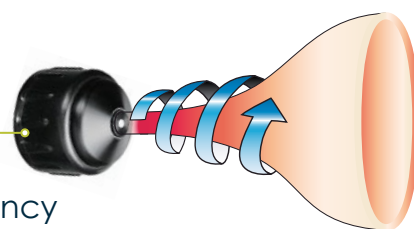
- ▶ A coil fluid hose to facilitate safe application of metallic paints

**Enhanced ergonomics**

- ▶ Lightweight
- ▶ Perfectly balanced
- ▶ Grip & barrel design based on firearms manufacturers' studies
- ▶ Flexible hoses
- ▶ High Resistivity version

**Aircap innovation**

- ▶ Super Vortex technology for finest atomization
- ▶ Good homogeneity between edge and center of pattern
- ▶ New round spray design: less overspray for 10% higher efficiency
- ▶ New fan spray aircap: 19% higher efficiency

**GNM6080 Control Module**

- ▶ Easy to maintain:
 - Scheduled alert
 - Diagnostic alert
- ▶ Easy to use:
 - kV setup value
 - 3 presets
 - Readable up to 5 meters

Technical Data

GUN		NANOGUN-MV
Gun weight without hoses or cables		488 g
Gun length		230 mm
Hose lengths available		7.5 m, 15 m and 25 m (option)
Type of spray		Super Vortex round spray dia.(mm) 8, 12 and 6 (option) Fan spray
Spray width, 25 cm away		Fan spray : 37 cm Round spray Ø6 : 19 cm, Ø8 : 20 cm, Ø12 : 21 cm
Wetted parts		Titanium, Tungsten, Chemraz®, PA12, PEBD, PEEK
Pneumatic supply		NANOGUN-MV
Max air supply pressure		7 bar (101psi)
Product supply		NANOGUN-MV
Paint flow rate		from 100 to 1000 ⁽¹⁾ cc/min.
Max paint supply pressure		7 bar (101psi)
Recommended product viscosity		14 to 50 seconds AFNOR #4 Cup
Fluid max temperature		45 (°C)
<i>(1): depending on viscosity</i>		
High Voltage		GNM6080
Voltage maxi.		60 kV
Current maxi.		80 µA

ATEX marking:

NANOGUN MV

CE 0080 Ex II 2 G
0.24 mJ
INERIS14ATEX014

CI I, GP D, Spray Mtl
Refer to manual 7105

GNM6080:

CE 0080 Ex II (2) G
[0.24 mJ]
INERIS14ATEX014



TWO VERSIONS DEPENDING ON YOUR NEEDS:



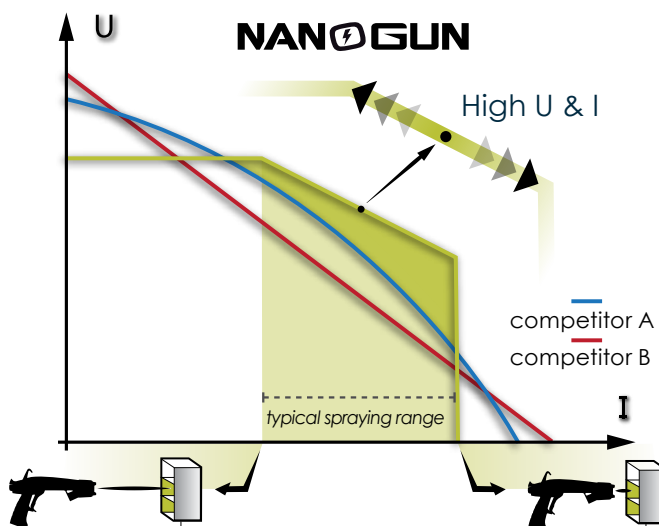
GUN VERSION:	Compatible with	Paint resistivity
HR / QD (High Resistivity/Quick Disconnect)	solvent based paint	10 to 500 MΩ.cm
LR (Low Resistivity)	solvent based paint	0.5 to 200 MΩ.cm

NANOGUN-MV STANDS FOR HIGH VOLTAGE & CURRENT:

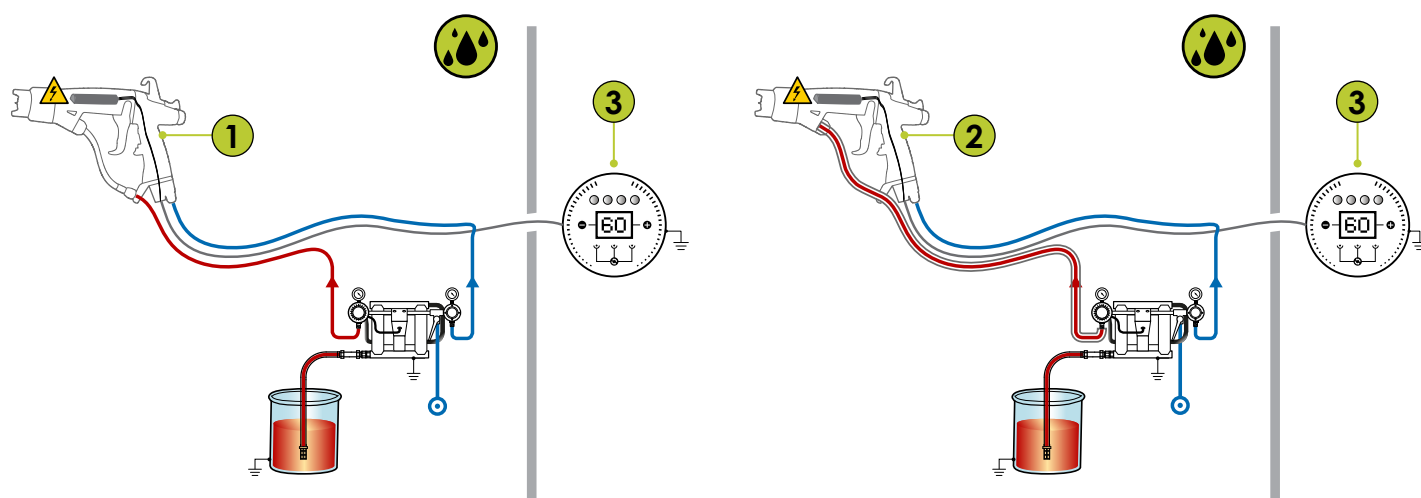
Taking full advantage of our 65 years of expertise with electrostatic technology, SAMES has developed the only electrostatic gun to spray with BOTH high current and high voltage, guaranteeing:

- Optimal paint charge
- Efficient paint transportation to the part

This combination delivers up to 20% higher transfer efficiency compared to previous gun designs.



Build your Gun



Mark	NANOGUN SET (Handgun + hoses + Control module + tools)			
	with Fan spray	with Super Vortex Round Spray ø6 mm	with Super Vortex Round Spray ø8 mm	with Super Vortex Round Spray ø12 mm
1 HR / QD VERSION				
Paint hose = 7.5 m	910017223-07	contact us	910017224-07	910017741-07
Paint hose = 15 m	910017223-15	contact us	910017224-15	910017741-15
2 LR VERSION				
Paint hose = 7.5 m	910017221-07	contact us	910017222-07	910017742-07
Paint hose = 15 m	910017221-15	contact us	910017222-15	910017742-15
HR / QD = High Resistivity & Quick Disconnect LR = Low Resistivity				
3 Mark 3	CONTROL MODULE			
GNM6080 EU	910017193			

OPTION NOZZLES AND AIRCAPS

Fan spray nozzle

Description	type	Reference
Fan spray	nozzle	1406402
	air cap	900009014



= air cap fan spray

Round spray nozzle - Super VORTEX

Injector (ø mm)	type	Reference
6	nozzle	910018322
	air cap	900011365
8	nozzle	910003847
	air cap	900010503
12	nozzle	910003920
	air cap	900010504



= air cap round spray

AUTOMATIC SPRAY GUN

TRP 501/502

Automatic pneumo-electrostatic sprayer



- > High paint savings
- > Increased productivity
- > Simplified maintenance
- > Easy to use

TRP sprayer allows the application of solvent or water-soluble liquid paints in automotive and general industry. It ensures a perfect finishing combined with significant paint savings. The additional benefit of the TRP is to apply very high flow rates (up to 1200 cm³/min in some configurations).

TRP is usually used with a reciprocating machine or in a fixed station. Using a multi-axis robot is also possible.

For over 20 years, TRP is the reference in the world of finishing in the fields of industry and automotive, often copied never equaled.

FIELD OF APPLICATION

- Metallic furniture
- Cycles & Motorcycles
- Wood industry
- Aluminium profiles
- Agricultural & construction equipment
- Automotive OEM, Tier One and Tier Two



0,5 to 500 MΩ.cm
(solvent paint)

800 g - 1200 g

100 kV
200 μA (UHT180)
500 μA (UHT288)

up to
800cm²/min



TRP 501/502

CUSTOMERS' BENEFITS

High Performance

► The transfer efficiency is high; it is doubled compared to a conventional gun application (30% to 60% depending on the shape of the part, the paint being used and the working adjustments).

Easy-to-use:

► The adjustments of all the gun parameters (product flow, paint spray, product opening control) are remotely controlled, manually or by a PLC.

Easy to Maintain

► The high transfer efficiency reduces emissions of VOCs (volatile organic compounds) which facilitates the compliance of the installation with environmental legislation and reduces dirt from the spray booth due to the application. Moreover, a purge valve is integrated to the spray, which allows priming, rinsing and draining of the equipment, with a minimum projection of paint into the cabin, maintenance is reduced.

RANGE

The spray head **TRP 500** is the basic component of sprayer models, **TRP 501** and **502**. It can be equipped to produce a round spray or fan spray. An air control system allows the start or stopping of spraying, thus releasing the air spray and allowing the closing of the fluid needle.

The combination of a supply block and a spray head is called **TRP 501.00D**.

The combination of a supply block and two spray heads is called **TRP 502.00D**.

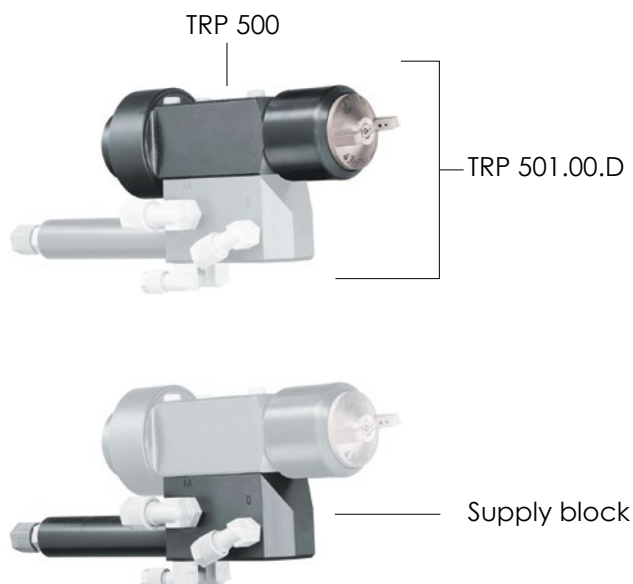
► **TRP 501.00D** sprayer is equipped with a gun on which can be assembled either a fan or round (Vortex effect) spray nozzle:

➤ The fan spray is equipped with a metal injector to guaranty a steadfast spraying quality in the long run (few wear). The injector diameter is of 1.5 mm and comes in several versions.

➤ The round spray comes in four calibres:
- calibre ø8 mm = standard
- calibre ø6 and 12 mm = as an option

► **TRP 502.00D** sprayer is equipped with two fan spray guns. The converging patterns are directed at the part as one pattern, and are supplied and piloted simultaneously. TRP 502 versions provide twice the paint flow offered by TRP 501 versions.

► The gun is assembled onto a support allowing two tilting angles.



Technical Data

Dimensions	TRP 501.00D	TRP 502.00D	GNM 200
Length (mm) L1	302	319	95
Width (mm) L2	44	180	140
Height (mm) L3	120	120	205
Weight (Without hoses) (g)	800	1200	2200
IP			20

Pneumatic supply	TRP 501 / 502	GNM 200
Air pressure maxi. (bar)	6 (90 psi)	
Fluid pressure maxi. (bar)	6 (90 psi)	
Normal pilot pressure (PT - PD)	5 (75 psi)	
Response time opening fluid (ms)	25 (indicative)	
Response time cutting fluid (ms)	30 (indicative)	
Electrical supply		110 V / 220 V 50 Hz / 60 Hz
Voltage maxi. (kV)		100
Current maxi. (μA)		200 (UHT 180) 500 (UHT 288)

Spraying	Round spray	Fan spray	Fan spray (TRP 502)
Impact width (mm) (for information only)	100 to 400	100 to 500	660
Total air wide (Nm3/h)	7 - 27	7 / 40	14 / 80
Paint flow (cc/min)	from 100 to 500	from 100 to 800	from 200 to 1200
Viscosity seconds (AFNOR Cup n°4)	from 14 to 68	from 14 to 68	from 14 to 68
Solvent paint, resistivity maxi. (MΩ.cm)		500	
Solvent paint, resistivity mini. (MΩ.cm)		0.5	
Recommended application distance (mm)	from 100 to 400	from 150 to 450	

ATEX marking:

**TRP 501.00D &
TRP 502.00D:**

CE 0080 II 2 G

EEx > 350mJ
ISseP06ATEX032X

**UHT 180 EEx e &
UHT 288 EEx e:**

CE II 2 GD

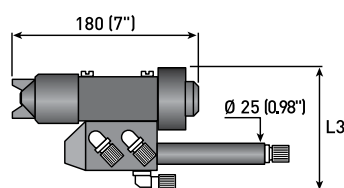
EEx e II
ISseP01ATEX002U

GNM200⁽¹⁾:

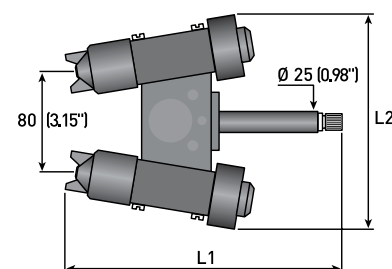
CE II (2) G

[EEx > 350 mJ]
ISseP05ATEX032X
ISseP06ATEX032X
ISseP07ATEX001X

(1): This control module allows piloting the UHT. It is a combined material that is part of the configuration of the certified equipment and that contributes to its good working. It has to be installed into a non explosive area.



TRP 501-00D



TRP 502-00D

Air / Product interfaces

AA: center air (JP) or direct air (JR)

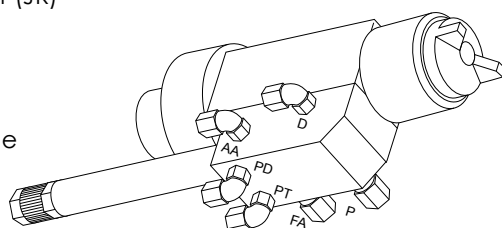
FA: fan air (JP)

P: paint supply

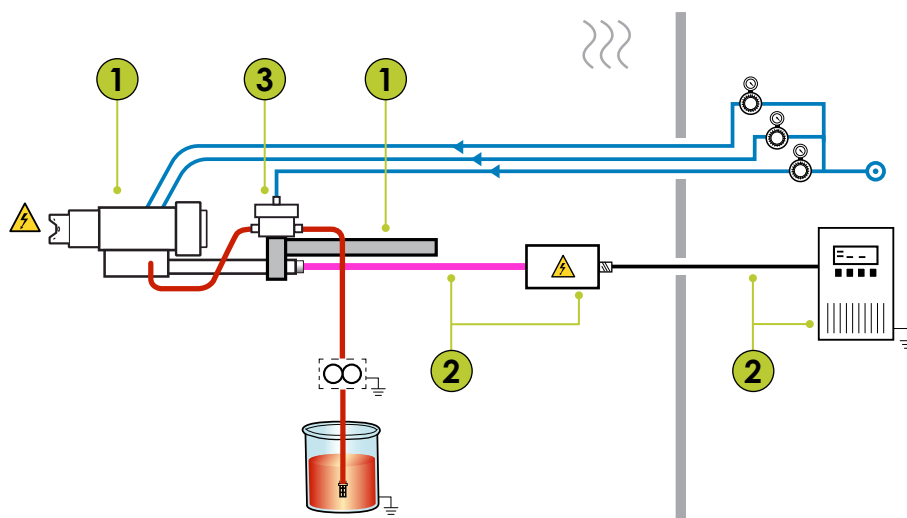
D: purge

PD: purge valve control

PT: opening / closing of needle



Build your Gun

USE FOR SOLVENT-BASED PAINT

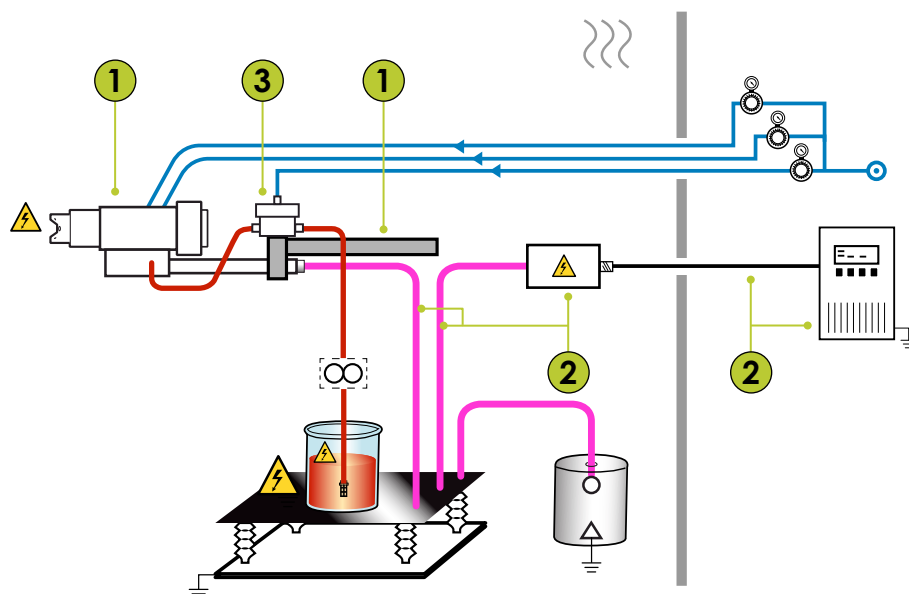
1 Mark 1		REFERENCE AUTOMATIC SET TRP 501.00.D		
TRP set		with Fan spray	with Super Vortex Round Spray ø8 mm	with Super Vortex Round Spray ø12 mm
Sprayer		910014590	910014589	910014588
TRP support		910003599	910003598	910003603
fixing nut (Ø27/50mm)		437293	437293	437293
		732018	732018	732018
2 Mark 2				
Cable high voltage 100kV (9 m), High voltage connection TRP (2nd for 2 TRP), UTH 180 EEXe (kit UHT 188 EEXe for 2nd output), Male plug 7cts, Tighten cable PG11(7/12), Cable low voltage (UHT-Terminal box: 4.8m), Cable low voltage (GNM200-Terminal box: 17m), Fem plug 19cts, GNM200A 220V + sector connection (2.5m), Colorless Rilsan hose Dia.10/12 (9m)				
Description				
High voltage kit solvent based paint	for 1 TRP 501	910014592	910014592	910014592
	for 2 TRP 501	910014593	910014593	910014593
3 Mark 3				
Description				
Paint regulator (2nd for 2 TRP)		750016	750016	750016

• Not included (contact SAMES):

- air supply hoses
- pumping system

- color change block (refer to page 72)
- air regulator (contact SAMES)

Build your Gun



USE FOR WATERBORNE PAINT



1

Mark 1

TRP set
Sprayer
TRP support
fixing nut (Ø27/50mm)

REFERENCE AUTOMATIC SET
TRP 501.00.D

with Fan spray	with Super Vortex Round Spray ø8 mm	with Super Vortex Round Spray ø12 mm
910014590	910014589	910014588
910003599	910003598	910003603
437293	437293	437293
732018	732018	732018

2

Mark 2

Cable high voltage 100kV (20m for 1 TRP & 30m for 2 TRP),
High voltage connection TRP (2nd for 2 TRP),
UTH 288 EExe,
Male plug 7cts, Tighten cable PG11(7/12),
Cable low voltage (UHT-Terminal box: 4.8m),
Cable low voltage (GNM200-Terminal box: 17m),
Fem plug 19cts,
GNM200A 220V + sector connection (2.5m),
Colorless Rilsan hose Dia.10/12 (9m)
Eye fitting M8 type HAN 20/02 (10 unit.)

Description

High voltage kit	for 1 TRP 501
waterborne paint	for 2 TRP 501

910014594

910014595

910014594

910014595

910014594

910014595

3

Mark 3

Description

Paint regulator (2nd for 2 TRP)

750016

750016

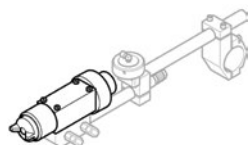
750016

- Not included (contact SAMES):
 - air supply hoses
 - pumping system
 - color change block (refer to page 72)

- air regulator
- Insulating table, Short-circuiting, Safety lock, High voltage discharge

SPRAYING HEAD

TRP 500 alone

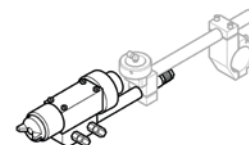


Description	Type of nozzle	Reference
TRP 500 JP	JP	752 949
TRP 500 JR	JR Ø8mm	752 991
TRP 500 JR	JR Ø12mm	752 992

JP: fan spray, JR: round spray

SPRAYER

TRP 500 built on manifold



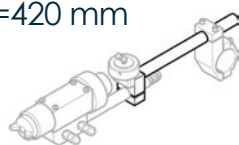
Description	Type of nozzle	Reference
TRP 501.00D	JP	910003599
TRP 501.00D	JR Ø8mm	910003598
TRP 501.00D	JR Ø12mm	910003603

JP: fan spray, JR: round spray

COMPONENTS

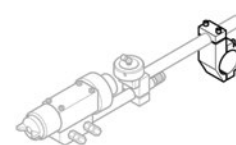
Isolated support Ø27mm, lg=420 mm

Description	Reference
Support TRP	437293



Fixing nut Ø27/50 mm

Description	Reference
nut	732018



OPTION NOZZLES AND AIRCAPS

Fan spray nozzle



Description	Injector (ø mm)	Reference
Nozzle JP single circuit	1.1	730 355
injector INOX	1.2	755 287
	1.5	439 058
Nozzle JP single circuit	1.2	428 375 ⁽¹⁾
Complete nozzle INOX	1.5	429 064 ⁽¹⁾
Nozzle JP double circuit	1.5	752 055

(1): The fan spray nozzle is all stainless steel material – cast in one piece.

Aircap - Fan spray



Description	Material	ø (mm)	Reference
aircap JP - standard	Plastic		436 939
aircap JP - wide pattern	Plastic		422 513
aircap JP - standard	Brass		Contact us
aircap JP - wide pattern	Brass		Contact us
aircap JP - stainless nozzle	Brass	1.2	428 376
	Brass	1.5	429 063

Round spray nozzle (VORTEX)



Description	Injector (ø mm)	Reference
Nozzle without injector		752 983
Injector JR	6	455 234#
	8	455 235#
	12	455 236#

#: set of 5

Aircap - Round spray



Description	Material	ø (mm)	Reference
aircap JR	Plastic	6	430 804
		8	430 540
		12	430 179

ACCESSORIES: MEASURE «TEST AIRCAPS»

The air caps permit to measure the pressure (bar) of the air plenum (fan air and centre air) at the level of the gun head. This measure is very important to define the shape of the pattern (spray symmetry, width...).



Description	Material	Reference
JP Cap (same as JP cap 436 939)	Brass	437 257 ⁽²⁾

(2): standard pattern

Nuts



Description	Reference
Nut for nozzle JP	745 066
Nut for nozzle JR	749 982

AUTOMATIC SPRAY GUN

SAMES LUB

A modular design for electrostatic precise spraying of lubricants



- > High transfer efficiency
- > Accurate low flow (< 1 cc)
- > Minimal space required
- > Easy integration

APPLICATION

Fin and tube machining & press tools

Lubrication is Necessary:

- Tool protection: to control temperature to avoid wear
- Secure non-clogging of strip on tool
- Provide a good quality to the strip folded

FIELD OF APPLICATION

AUTOMOTIVE/TRUCK

Fins are used for radiators, heater cores and AC condensers

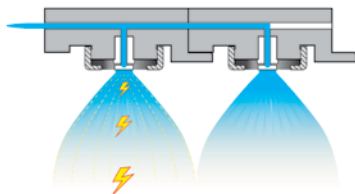
H V A C

Fins are used for building heat exchangers

HEAVY INDUSTRY

Lubrication is used on press work

CUSTOMERS' BENEFITS



**MAXIMUM
EFFICIENCY**



**ENERGY
SAVINGS**



**ENVIRONMENTALLY
FRIENDLY**

Reduction in overspray: Transfer efficiency > 98%

Environmentally friendly: No more VOC rejection

Post-treatment of LUBRICANT is no more required: Heat degreasing can be removed

Energy costs savings: No more post-treatment = gas, electricity, water, ... consumptions reduced

Maintenance reduced: No more system cleaning

Safety in workshop improved: No risk of slipping for operators

SAMES LUB

MODULAR DESIGNED SPRAYER

If strip width is above 100mm, **SAMES LUB** sprayers can be connected to lubricate on larger width, **on a common rail**. Our design allows to connect up to **5 ATOMIZERS** in one block with one **single control** for High Voltage, air flow, oil flow. This modular design allows SAMES Lub to lubricate coils of **any width** with a very regular oil flow.

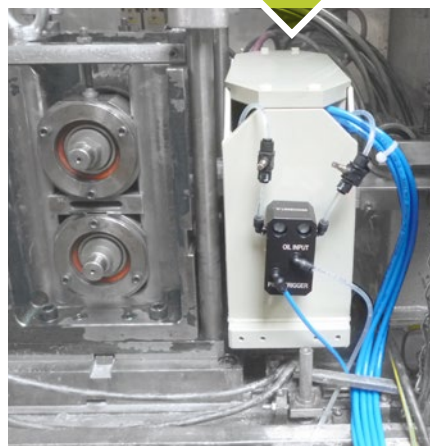
SAMES LUB INTEGRATED SOLUTION:

1 INSULATED BOOTH

2 EASY INTEGRATION

3 ACCURATE FLOW CONTROL

4 EASY TO USE



TECHNICAL DATA

Designation:	nominal
High voltage Maxi. (kV)	60
Flow rate (cc/min.)	2 to 220
Normal pressure of supply (bar)	0.2 to 4
Viscosity (sec. cup AFNOR #4)	10 to 30
Resistivity	between 6 MΩ.cm and 800 MΩ.cm
Trigger valve pilot (bar)	1 to 6
Atomization air pressure (bar)	0.2 to 6
Additional air pressure (bar)	0.2 to 6

ATEX marking: **SAMES LUB**

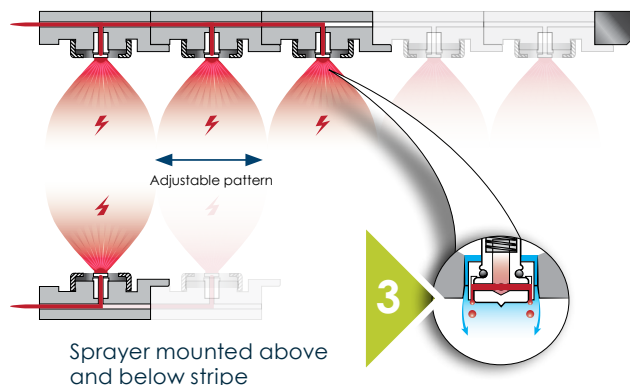
CE II 3 G X T 60°C
W = 1.4 J

CONTROL OF LUBRICANT SPRAY

Due to low flow of lubricant being sprayed (down to 1 cc/min), a flowmeter controls the spray presence.

In case of lubricant missing, flowmeter will alarm operator and is coupled to the main machine.

Lubricant flow regulation control in closed loop is available upon request



AUTOMATIC ATOMIZER WITH ROTARY BELL

PPH 308

Rotary bell atomizer for solvent based and waterborne paint



- > High transfer efficiency (up to 80%*)
- > Superb gloss and regularity of film build
- > Easy and fast maintenance

* under certain conditions

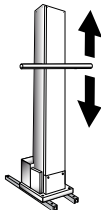
The sprayer PPH 308 allows the application of liquid solvent-based or water-based paint in general industry. Known as the best rotary bell sprayer, PPH 308 benefits from technologies developed for Automotive markets.

It is usually used with a reciprocating machine or in fixed station.

FIELD OF APPLICATION

- Aerospace
- Metallic furniture
- Cycles & Motorcycles
- Wood industry
- Aluminium profiles
- Agricultural & construction equipment

EXAMPLES OF INSTALLATIONS

Type	Characteristics	Markets
 Fixed base	• Small-sized parts on flat or vertical line • Line speed from 1 to 6 m/mn	• Wood: Bed frames • Metal: rims, wheels, heating resistance • Glass: perfume bottles, spirits • Plastic: lipsticks
 Reciprocator 1 axis	• Line speed from 1 to 6 m/mn • Object on satellites with simple geometry	• Wood: picture frames, rod curtain • Metal: shock absorbers, metallic bottles, aluminium profiles



0.5 to 500 MΩ.cm
(solvent paint)
≈ KΩ.cm
(waterborne paint)

Kg 2.5 kg



85 kV/100 μA
(UHT155)
100 kV /
200 μA (UHT188)
500 μA (UHT288)

up to
600 cm²/min

Magnetic
Bellcup

up to
45 000 rpm

PPH 308

CUSTOMERS' BENEFITS

High Transfer Efficiency

- ▶ 85 kV, 100 μ A integrated High Voltage cascade
- ▶ VORTEX air shroud technology for higher performance

INCREASED PRODUCTIVITY

- ▶ Flow rate up to 600cc/min
- ▶ Technology inspired from automotive industry
- ▶ Contact free magnetic air bearing turbine for less wear

Easy Maintenance

- ▶ Magnetic bellcup fastening system
- ▶ Optimised design for assembly/disassembly

Excellent Finishing

- ▶ High speed turbine up to 45000 rpm
- ▶ Large selection of shaping air shrouds and bell cups to spray all materials
- ▶ Good penetration effect even with difficult parts



RANGE

Depending on the type of application (solvent based or water-based) the version of the sprayer PPH308 differs across the wire elements connected to high voltage circuits' product and rinsing:

PPH 308 SB
For an application of **SOLVENT-BASED PAINT** with a **resistivity $\geq 6 \text{ M}\Omega\cdot\text{CM}$** :

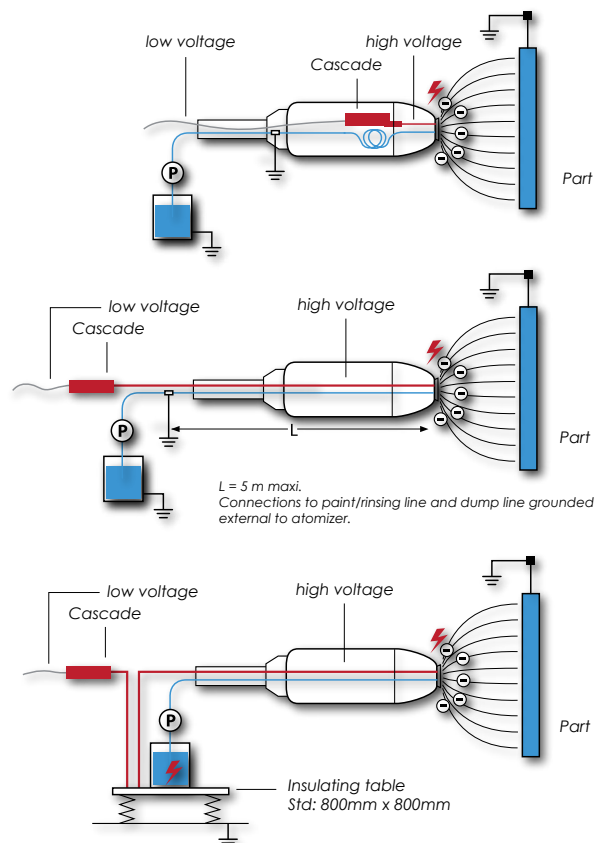
- The product distribution system is connected to potential of the ground.
- High voltage unit (UHT155) integrated into the sprayer.
- Coil hose back on paint circuit and purge return.

PPH 308 SB
For an application of **SOLVENT-BASED PAINT** with a **resistivity $> 0.5 \text{ M}\Omega\cdot\text{CM}$** :

- The product distribution system is connected to potential to the ground.
- High voltage unit (UHT188) remote sprayer
- No Coil hose

PPH 308 WB
For an application of **WATER-BASED PAINT** nonflammable or hardly flammable:

- The product distribution system is isolated of the potential from the ground (ex: table or other insulating).
- The application is made by internal charge (best yield).
- High voltage unit (UHT288) remote sprayer.
- The number of colors is limited.



Technical Data

Weight	PPH 308
Spare atomizer, without cable and hose	2.5 kg

Pneumatic supply	PPH 308
Operating air pressure maxi. (bar)	6 (90 psi)
Normal pilot air (bar)	8.5 to 10 (127,5 to 150 psi)
Magnetic bearing air pressure (bar)	6 (90 psi)
Amount of air bearing backup (bar)	25 liters - 6 bars (90 psi)
Total air consumption (Nm ³ /h)	20 to 45

Fluid supply	PPH 308
Fluid pressure maxi. (bar)	10 (150 psi)
Paint flow (cc/min)	30 to 600 ⁽¹⁾
Viscosity range (seconds) Coupe FORD n°4	15 to 45
Product supply hose (mm)	ø4x6
Supply hose control fluid (mm)	ø2.7/4
Power drain hose (mm)	ø4x6
Power drain hose control (mm)	ø2.7/4
Power steering flush injector (mm)	ø2.7/4
Power steering flush bell (mm)	ø2.7/4

(1): depending on viscosity

Performances	Turbine		
Rotation speed	5000 to 45 000 rpm (upon diameter of bell cup used)		
High Voltage	UHT 155 EEx em	UHT 188 EEx e	UHT 288 EEx e
Voltage maxi.	85 kV	100 kV	100 kV
Current maxi.	100 µA	200 µA	500 µA

ATEX marking:

PPH 308solvent-based product
with $R \geq 6 \text{ M}\Omega\cdot\text{cm}$:

CE 0080 II 2 G

EEx > 350mJ
ISseP05ATEX032X

UHT 155 EEx em:

II 2 G

EEx em II
ISseP01ATEX012U**PPH 308**solvent-based product
with $R > 0.5 \text{ M}\Omega\cdot\text{cm}$ &
water-based paint:

CE 0080 II 2 G

EEx > 350mJ
ISseP06ATEX032XUHT 188 EEx e &
UHT 288 EEx e:

II 2 GD

EEx e II
ISseP01ATEX002U**GNM200⁽²⁾:**

CE II (2) G

[EEx > 350 mJ]
ISseP05ATEX032X
ISseP06ATEX032X
ISseP07ATEX001X

(2): This control module allows piloting the UHT. It is a combined material that is part of the configuration of the certified equipment and that contributes to its good working. It has to be installed into a non explosive area.

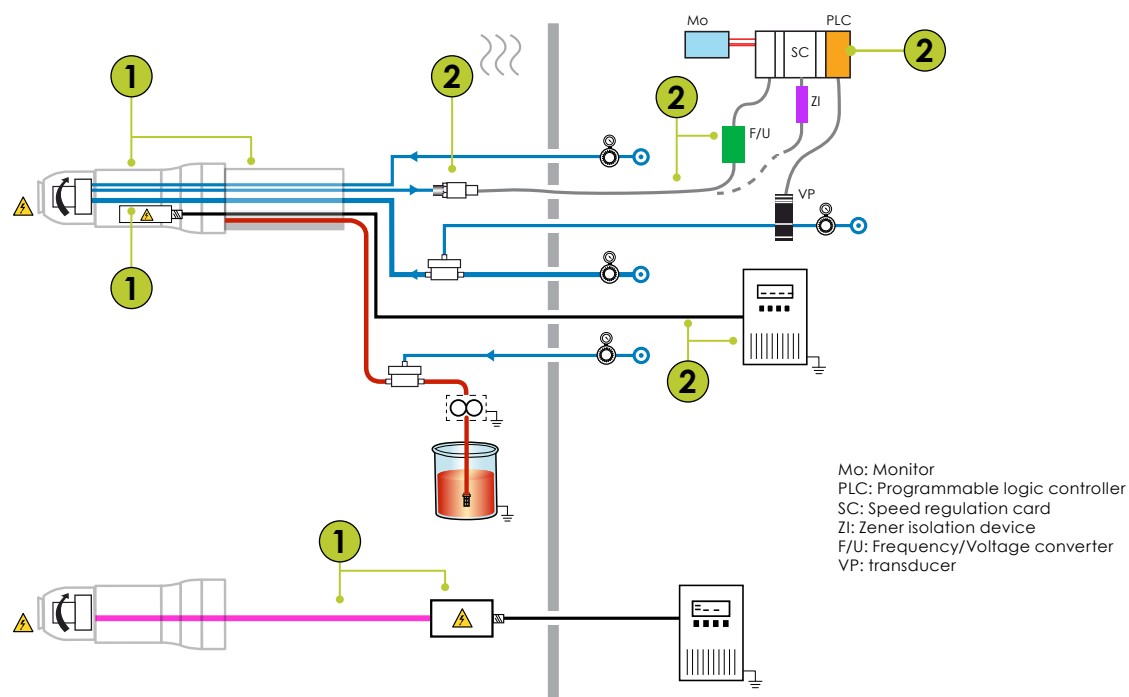
THREE VERSIONS DEPENDING ON YOUR NEEDS:



VERSION	Compatible with	Product Resistivity
PPH 308 SB High voltage unit (UHT 155 EEx em) integrated into the sprayer	solvent based paint	$\geq 6 \text{ M}\Omega\cdot\text{cm}$
PPH 308 SB Remote high voltage unit (UHT 188 EEx e) from sprayer	solvent based paint	$> 0.5 \text{ M}\Omega\cdot\text{cm}$
PPH 308 WB Remote high voltage unit (UHT 288 EEx e) from sprayer	water-based paint ⁽³⁾ nonflammable or hardly flammable	$\approx \text{K}\Omega\cdot\text{cm}$

(3): the product distribution system must be isolated from the ground potential.

Build your Atomizer

USE FOR SOLVENT-BASED PAINT

1

Mark 1

PPH 308 SB set	
UHT 155 EEx em or UHT 188 EEx e	
Reciprocator support	
fixing nut	

2

Mark 2

Cable low voltage (8m),
GNM200A + sector connection (2.5m),
Speed regulation (SC + ZI) or F/U converter

Description	
Electrical kit without speed regulator	220 V
	110 V
Electrical kit with speed regulator	220 V
	110 V
Electrical kit with F/U converter	220 V
	110 V

REFERENCE ATOMIZER
PPH 308 SB

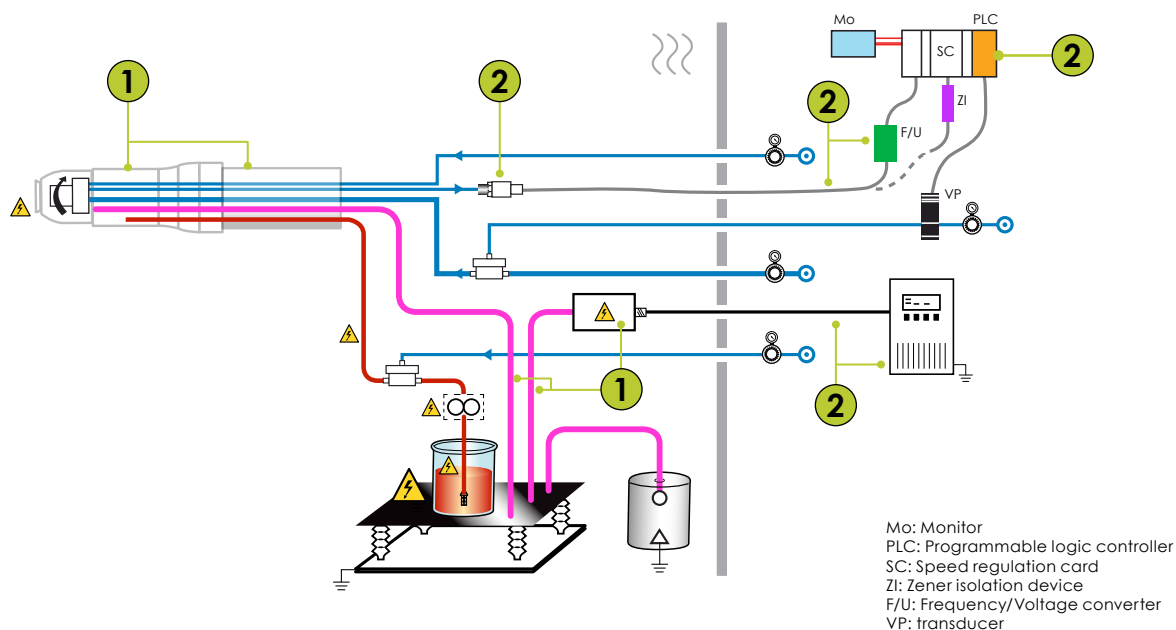
solvent-based paint with a resistivity $\geq 6 \text{ M}\Omega\cdot\text{cm}$	solvent-based paint with a resistivity $> 0.5 \text{ M}\Omega\cdot\text{cm}$
910001669	910003721
1520282	910001759
1203616	1203616
1204441	1204441

910002212	910002212
910002588	910002588
910002329	910002329
910002589	910002589
910003346	910003346
910015373	910015373

- Not included:
- bell cup and air shroud (refer to page 46)
- air supply hoses (contact SAMES)

- pumping system (contact SAMES)
- color change block (refer to page 72)
- air regulator/pilot (contact SAMES)

Build your Atomizer



USE FOR WATER-BASED PAINT

1

Mark 1

PPH 308 WB set	
	UHT 288 EEx e
	Reciprocator support
	fixing nut

REFERENCE ATOMIZER
PPH 308 WBwater-based paint
with $\alpha \approx K\Omega.cm$

910003722
910002864
1203616
1204441

2

Mark 2

Cable low voltage (8m),
GNM200A + sector connection (2.5m),
Speed regulation (SC + ZI) or F/U converter

Description	
Electrical kit without speed regulator	220 V
	110 V
Electrical kit with speed regulator	220 V
	110 V
Electrical kit with F/U converter	220 V
	110 V

910002212
910002588
910002329
910002589
910003346
910015373

- Not included:
- bell cup & air shroud (refer to page 46)
- air supply hoses (contact SAMES)
- pumping system (contact SAMES)

- color change block (refer to page 72)
- air regulator (contact SAMES)
- Insulating table, Short-circuiting, Safety lock, High voltage discharge

Build your Atomizer

DISCHARGE SYSTEM OF SUPPLY WATER-BASED PAINT

The water-based paint is connected to the potential of the high voltage through an isolated table during electrostatic application.



PPH 308 WB



Short-circuiter

it allows the potential of the ground from all supply water-based paint installed on table isolated safely.



Insulating table



Safety lock

5



Mark	Description	Reference
2	Short circuiter	910008804
3	Insulating table 800mm x 800mm	1519263
	Insulating table 1600mm x 800mm	1519265
4	Safety lock 2x3 left side position	110001586
	Safety lock 2x3 right side position	110001587
5	High voltage discharge rod assembly	750207
6	Connecting cable between 2 and 3	910015658

AUTOMATIC ATOMIZER WITH ROTARY BELL

PPH 707 ICWB-M

Rotary bell atomizer for waterbased paint
with internal charge



- > High productivity
- > A-grade finishing quality
- > Easy to maintain



Atomizer PPH 707 ICWB M is a high performance atomizer with rotating bell cup, dedicated for applying non-flammable or not easily flammable water-based paints, using internal charge.

Originally developed for automotive OEM and Tier 1 markets, PPH 707 ICWB M offers unrivalled results in terms of productivity, thanks to its high flow rate and transfer efficiency even with fast reciprocator speeds (up to 1000 mm/s).

FIELD OF APPLICATION

- Automotive OEMs, Tier One & Tier Two
- Wheels



PPH 707 ICWB-M

CUSTOMERS' BENEFITS

High Performance

- ▶ High rotating speed
- ▶ Strong flow rate with high reciprocator speed
- ▶ High transfer rate
- ▶ Specific body design preventing dust & droplet
- ▶ High voltage unit
- ▶ Hi-TE dual shaping air

Flexibility

- ▶ Full Bell/Bell process: Primer, Basecoat 1, Basecoat 2, Primer
- ▶ Compatible with whole SAMES bellcup range
- ▶ Wide or narrow pattern

High Reliability

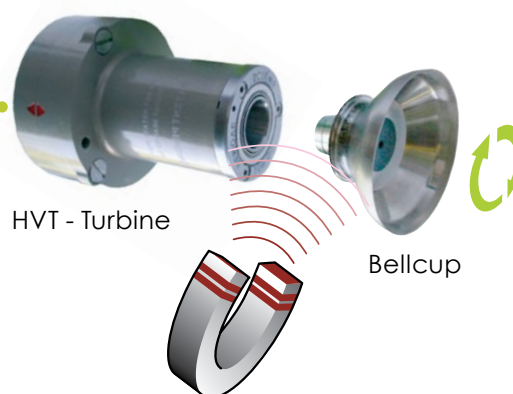
- ▶ Long life HVU (High Voltage Unit)
- ▶ 2.5 million cycles life of valves
- ▶ 7 years/30 000h. warranty* turbine

* Whichever is the sooner



Easy to Maintain

- ▶ Magnetic bellcup fastening system
- ▶ Quick disconnect
- ▶ Easy access to valves, fittings
- ▶ No calibration tool required



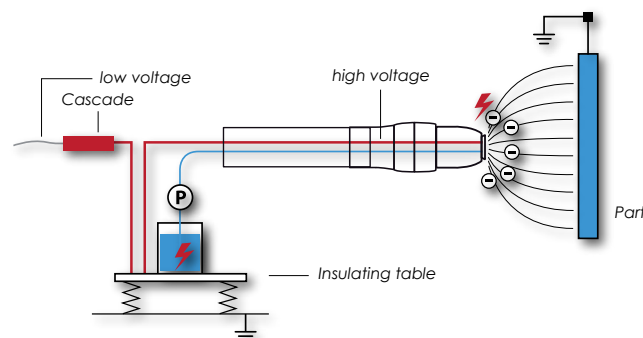
RANGE



PPH 707 ICWB-M

For an application of **WATER-BASED PAINT** nonflammable or hardly flammable:

- The product distribution system is isolated of the potential from the ground (ex: table or other insulating).
- The application is made by internal charge (best yield).
- High voltage unit (UHT288) remote sprayer.
- The number of colors is limited.



Technical Data

Weight	PPH 707 ICWB M
Without cables and hoses	8.5 kg

Pneumatic supply	PPH 707 ICWB M
Shaping air pressure maxi. (bar)	6 maxi (90 psi)
Nanovalue pilot air (bar)	8 to 10 (120 to 150 psi)
Microvalve pilot air (bar)	6 to 10 (90 to 150 psi)
Magnetic bearing air pressure (bar)	5,5 mini - 7maxi
Amount of air bearing backup (bar)	25 liters under 6 bar (90 psi)

Fluid supply	PPH 707 ICWB M
Fluid pressure normal (bar)	6 to 8 (90 to 120 psi)
Fluid pressure maxi. (bar)	10 (150 psi)
Paint flow (cc/min)	up to 1000 maxi ⁽¹⁾
Viscosity range (s.) Coupe FORD n°4	20 to 40

(1): depending on viscosity

Air consumption	
Pilot (NI/min.)	10
Bearing air (NI/min.)	125
Shaping air (NI/min.)	200 to 850
Turbine (NI/min.) depending on use pressure/flow	135 to 685

Performances	Turbine
Rotation speed	15 000 to 70 000 rpm (during application)
High Voltage	UHT 288 EEX e
Voltage maxi.	100 kV
Current maxi.	500 µA

ATEX marking:

PPH 707 ICWB M: UHT 288 EEx e:

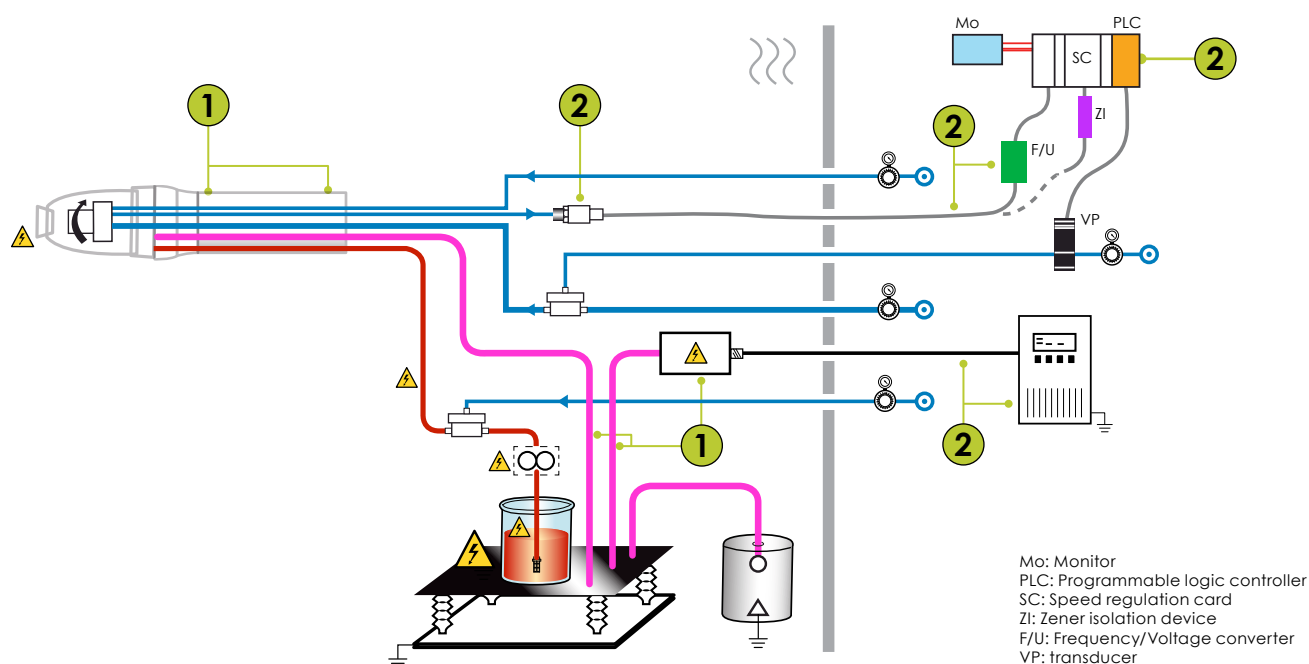
CE 0080 II 2 G II 2 GD
EEx > 350mJ EEx e II
ISseP06ATEX032X ISseP01ATEX002U

GNM200⁽²⁾:

CE 0080 II (2) G
[EEx > 350 mJ]
ISseP05ATEX032X
ISseP06ATEX032X
ISseP07ATEX001X

(2): This control module allows piloting the UHT. It is a combined material that is part of the configuration of the certified equipment and that contributes to its good working. It has to be installed into a non explosive area.

Build your Atomizer



USE FOR WATER-BASED PAINT



1	Mark 1	REFERENCE ATOMIZER PPH 707 ICWB-M
	PPH 707 ICWB-M set	910009002
2	Mark 2	
	Cable low voltage (8m), GNM200A + sector connection (2.5m), Speed regulation (SC + ZI) or F/U converter	
	Description	
	Electrical kit without speed regulator	220 V
		110 V
	Electrical kit with speed regulator	220 V
		110 V
	Electrical kit with F/U converter	220 V
		110 V
3	Mark 3	
	Description	
	High voltage unit UHT 288 EEx e	910002864

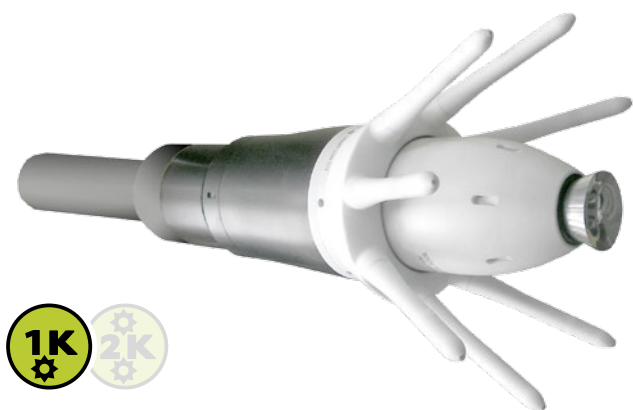
- Not included:
- bell cup and air shroud (refer to page 46)
- air supply hoses (contact SAMES)

- pumping system (contact SAMES)
- color change block (refer to page 72)
- air regulator/pilot (contact SAMES)

AUTOMATIC ATOMIZER WITH ROTARY BELL

PPH 707 EXT-ST

Rotary bell atomizer for waterbased paint
with external electrodes



- > High productivity
- > Easy to integrate
- > High finishing quality

PPH 707 EXT-ST is dedicated for applying non-flammable or not easily flammable water-based paints. Equipped with SAMES Hi-TE spraying technology patented by SAMES, PPH 707 EXT-ST is THE benchmark for external charge spraying.

The electrostatic charge made by ionization (or indirect charge) is called « external charge »: The particles get electrically charged by passing close to electrodes external to the sprayer. Equipped with SAMES Hi-TE spraying technology, the performances in terms of productivity, transfer efficiency and quality of finish position SAMES as THE reference of the external charge applicators.

The paint feeding system remains ground wired:

- No necessary modification of the existing paint circuit.
- From an existing solvent installation switched to waterborne, only the PPH 707 EXT-ST would be installed in order to spray the new materials = limited costs.

FIELD OF APPLICATION

• Automotive
OEM, Tier One & Tier Two

• Metallic furniture

• Wood industry

• Drums & gas containers

• Cycles & Motorcycles

• Aluminium extrusions

• Agricultural & construction equipment



PPH 707 EXT-ST

CUSTOMERS' BENEFITS

Optimized productivity

- ▶ High transfer rate
- ▶ Spraying at high flow rates at very high-speed (robot movement up to 1 m/s)
- ▶ Large pattern size (between 325 and 475 mm)
- ▶ Fast colour change
- ▶ Variable pattern during spraying for seamless transitions between small and large surfaces

High Reliability

- ▶ Long life HVU (High Voltage Unit)
- ▶ 7 years/30 000h. warranty* turbine
- ▶ 2.5 million cycles life of valves

* Whichever is the sooner

Easy to Maintain

- ▶ Equipped with the new spraying system Dual Pin technology, it's reduces extremely contamination.
- ▶ Easy access to valves, fittings
- ▶ Magnetic bellcup fastening system
- ▶ Quick disconnect
- ▶ Specific body design preventing & dust or droplet

Easy integration

- ▶ Implementation on existing installations without modification of paint supply system
- ▶ No short circuiter nor insulating table needed
- ▶ Illimited number of colors



RANGE

Due to the conductivity of the paint particles, the application of water-based product with the sprayer PPH 707 EXT-ST differs across the electric charge of the paint by ionization or indirectly (**external**):

- ▶ Particles charge in the vicinity from external electrodes.

PPH 707 EXT-ST

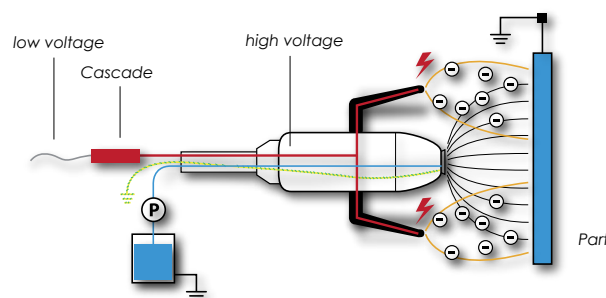


For application of water-based product non-flammable or hardly flammable:

- The product distribution system is at ground potential.
- The application is done by external charge.
- High Voltage Unit (UHT330) Remote Sprayer.
- The number of colors is limited

- ▶ The scanning speed with **PPH 707 EXT-ST** can reach up to **900 mm/sec.**

- ▶ **PPH 707 EXT-ST** is equipped with a single version of bell **EX65 HI-TE EXT** technology and shaping air assembly.



Technical Data

Weight	PPH 707 EXT-ST
Without cables and hoses	6.6 kg

Pneumatic supply	PPH 707 EXT-ST
Shaping air pressure maxi. (bar)	6 maxi (90 psi)
Nanovalue pilot air (bar)	8 to 10 (120 to 150 psi)
Microvalve pilot air (bar)	6 to 10 (90 to 150 psi)
Magnetic bearing air pressure (bar)	5,5 mini - 7maxi
Amount of air bearing backup (bar)	25 liters under 6 bar (90 psi)

Fluid supply	PPH 707 EXT-ST
Fluid pressure normal (bar)	6 to 8 (90 to 120 psi)
Fluid pressure maxi. (bar)	10 (150 psi)
Paint flow (cc/min)	up to 1000 maxi ⁽¹⁾
Viscosity range (s.) Coupe FORD n°4	20 to 40

(1): depending on viscosity

Air consumption	
Pilot (NI/min.)	10
Bearing air (NI/min.)	125
Shaping air 1 (NI/min.)	100 to 600
Shaping air 2 (NI/min.)	100 to 600
Turbine (NI/min.) depending on use pressure/flow	135 to 685

Performances	Turbine
Rotation speed	15 000 to 70 000 rpm (during application)
High Voltage	UHT 330 EEX e
Voltage maxi.	85 kV
Current maxi.	500 µA

ATEX marking :

PPH 707 EXT-ST: UHT 330 EEX e:

CE 0080 II 2 G

EEx > 350mJ
ISseP06ATEX032X

II 2 GD

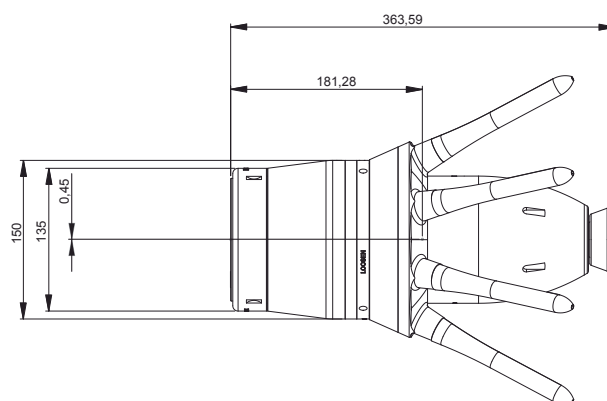
EEx e II
ISseP01ATEX002U

GNM200⁽²⁾:

CE 0080 II (2) G

[EEx > 350 mJ]
ISseP05ATEX032X
ISseP06ATEX032X
ISseP07ATEX001X

(2): This control module allows piloting the UHT. It is a combined material that is part of the configuration of the certified equipment and that contributes to its good working. It has to be installed into a non explosive area.



Hi-TE TECHNOLOGY:

► The external shroud is composed of couples of combined air holes. This external shroud allows several aimed applications; the pattern can fastly vary from a narrow and penetrating spray to a wide and wrapping spray for an optimal transfer efficiency.

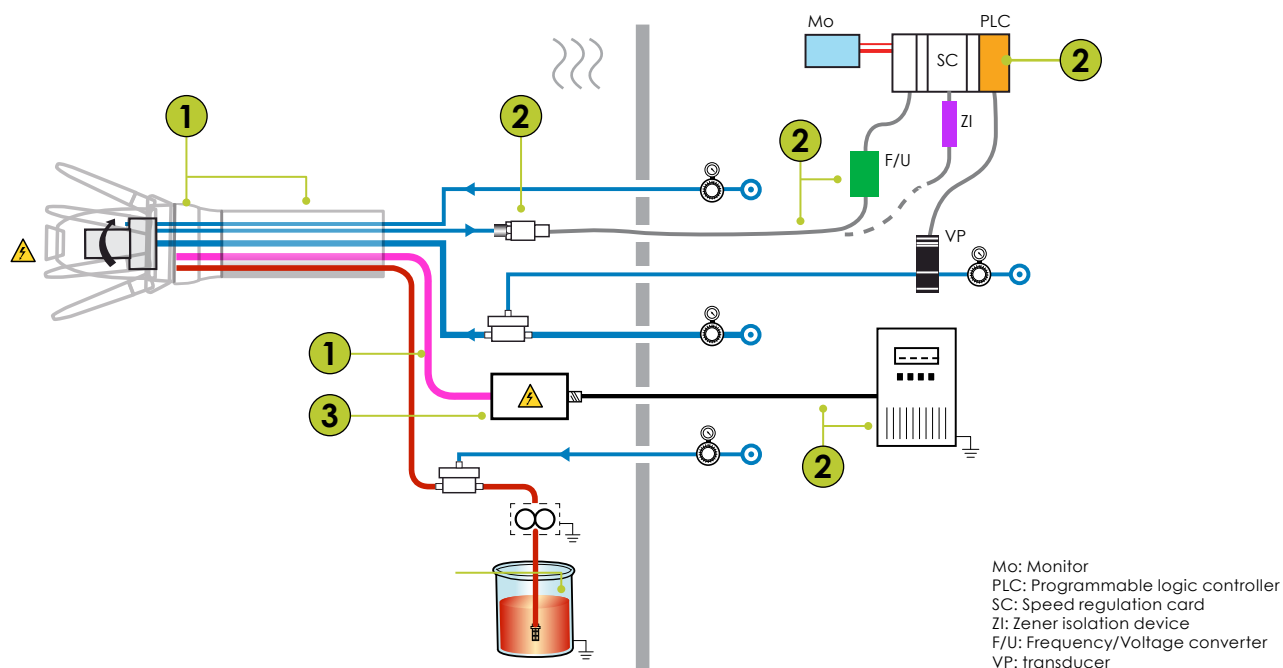
Main benefits:

- More paint savings
- Better finishing quality and color match
- Easy operation thanks to single air adjustment

► Dual pin:
low contamination innovation



Build your Atomizer



USE FOR WATER-BASED PAINT



1	Mark 1
PPH 707 EXT-ST set (with arm support and nut)	

REFERENCE ATOMIZER PPH 707 EXT-ST
910014446

2	Mark 2
Cable low voltage (8m), GNM200A + sector connection (2.5m), Speed regulation (SC + ZI) or F/U converter	

Description	
Electrical kit without speed regulator	220 V
	110 V
Electrical kit with speed regulator	220 V
	110 V
Electrical kit with F/U converter	220 V
	110 V

Contact us
Contact us
910006062
Contact us
910014614
910016209

3	Mark 3
Description	
High voltage unit UHT 330 EEx e	

910007139

- Not included:
- bell cup and air shroud (refer to page 46)
- air supply hoses (contact SAMES)

- pumping system (contact SAMES)
- color change block (refer to page 72)
- air regulator/pilot (contact SAMES)

ROBOTIC ATOMIZER WITH ROTARY BELL

NANO BELL 2

Rotary atomizer bell for Robotic application

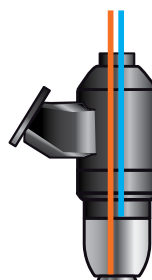
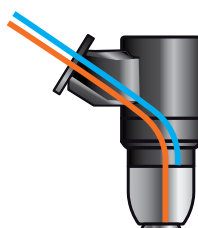


- > Easy integration and maintenance
- > High transfer efficiency
- > High finishing quality

The **NANO BELL2** robotic sprayer is compact, lightweight (5 kg) and sturdy, meeting the expectations of manufacturers of small and average plastic parts, of the wood industry and of manufacturers of metal parts.

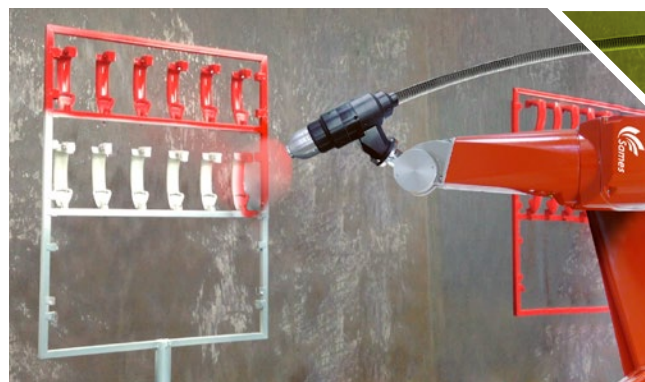
With **NANO BELL2** they all have access to an applicator which can significantly increase their paint savings, while improving the quality of their production. It can spray, depend on configuration solvent-based or water-based paints, mono or multi-components paints.

BOTH VERSIONS AVAILABLE IN

hollow
wrist robot:non-hollow
wrist robot:

FIELD OF APPLICATION

- Aerospace
- Metallic furniture
- Cycles & Motorcycles
- Drums & Gas containers
- Wood industry
- Aluminium profiles
- Agricultural & construction equipment



Application with non-hollow wrist robot version

0.5 to 500 MΩ.cm
(solvent paint)
≈ KΩ.cm
(waterborne paint)

Kg 5 kg



70 kV/100 μA
(UHT 158)
70 kV/500 μA
(UHT 287)

up to
750cm²/min

Dual
Shaping air

Magnetic
Bellcup

up to
45 000 rpm

NANO BELL 2

CUSTOMERS' BENEFITS

High Transfer Efficiency

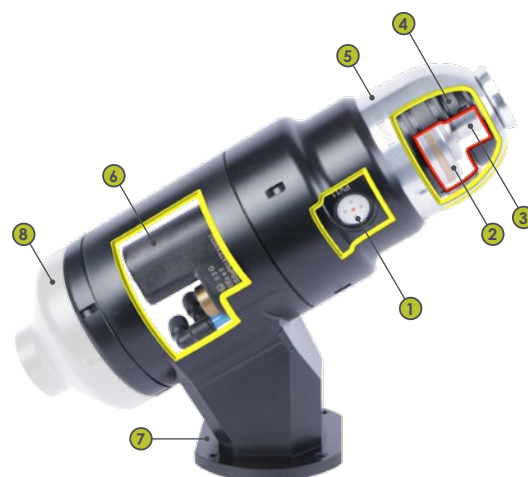
- Significant paint savings (from 20 to 50% more savings than conventional gun)
- Variation of pattern thanks to Hi-TE Technology for more spray control

Easy integration & maintenance

- Light weight sprayer for small size robots
- Allows mounting on both hollow and non-hollow wrist
- Easy to dismantle
- Easy access to valve, fittings
- Light life magnetic turbine

High finishing quality

- This atomization of paint droplets
- Sharp control of applied thickness



- (1) Microvalve
- (2) Magnetic turbine
- (3) Bell cup EC50 Hi-TE
- (4) Internal shaping air shroud
- (5) External shaping air shroud

- (6) High Voltage Unit (UHT 158 EEx e)
- (7) Arm support with output of hoses and cables in hollow wrist robot version
- (8) Output of hoses and cables in non-hollow wrist robot version

Easy Maintenance

- Magnetic bellcup fastening system
- Optimised design for assembly/disassembly



RANGE

Depending on the type of application (solvent-based or water-based), the spray version NANO BELL2 differs through the wiring of the elements connected to the high voltage and circuits produced and rinsing:

NANO BELL 2 SB

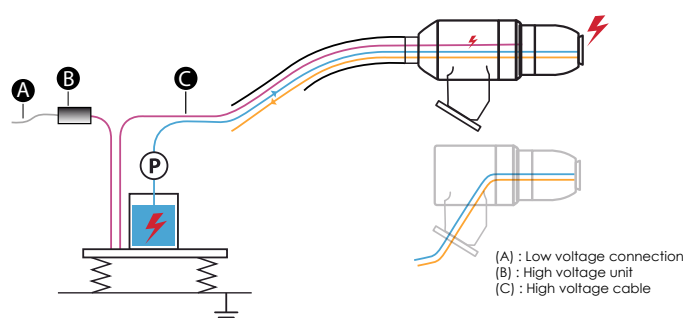
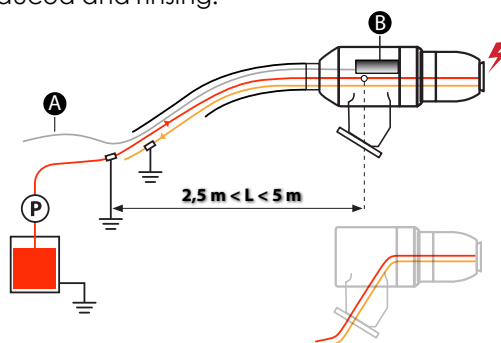
For an application of **solvent-based paint** with a resistivity $\geq 6 \text{ M}\Omega\cdot\text{cm}$:

- The product distribution system is connected to ground potential.
- High Voltage Unit **(B)** UHT158 [70kV/100 μ A] is integrated to the sprayer.
- Two versions are available:
 - hollow wrist robot
 - non-hollow wrist robot

NANO BELL 2 WB

For an application of **water-based paint** nonflammable and flammable:

- The product distribution system is isolated from the ground potential, example: isolated table.
- The application is made by internal charge (best yield).
- High Voltage Unit **(B)** UHT287 [70kV/500 μ A] is remote from the sprayer.
- The number of colors is limited.
- Two versions are available:
 - hollow wrist robot
 - non-hollow wrist robot



- (A) : Low voltage connection
- (B) : High voltage unit
- (C) : High voltage cable

Technical Data

Weight	NANOELL 2
Both versions NANOELL 2, without hoses (kg)	5 kg

Fluid supply	NANOELL 2
Fluid pressure maxi. (bar)	10 (150 psi)
Paint flow (cc/min) according type of paint	30 to 750 ⁽¹⁾
Viscosity range - FORD n°4 (seconds)	20 to 50

(1): depending on viscosity

Pneumatic power	NANOELL 2
Operating air pressure (bar)	6 (90 psi) to 10 (150 psi)
Magnetic bearing air pressure (bar)	6 (90 psi) to 10 (150 psi) 85 NI/min.
Air shroud pressure (bar)	6 (90 psi) constant
Micro air pressure (bar)	1.9 to 3 bar constant
Operating consumption (NI/min.)	10
Bearing air consumption (NI/min.)	125
Air shroud consumption (NI/min.)	0 to 600 (depending skirt)
Turbine air consumption (NI/min.)	190 to 700

Performances	Turbine	
Rotation speed	5000 to 45 000 rpm (upon diameter of bell cup used)	
High Voltage	UHT 158 EEX e	UHT 287 EEX e
Voltage maxi.	70 kV	70kV
Current maxi.	100 µA	500 µA

ATEX marking:

NANOELL 2
solvent-based product
with R ≥ 6 MΩ.cm:

CE 0080 II 2 G
EEx > 350mJ
ISseP05ATEX032X

UHT 158 EEX e:
70kV/100µA

II 2 G
EEx e II
ISseP01ATEX002U

NANOELL 2
water-based paint
with R = kΩ.cm

Homologation in progress

GNM200⁽²⁾:

CE II (2) G
[EEx > 350 mJ]
ISseP05ATEX032X
ISseP06ATEX032X
ISseP07ATEX001X

(2): This control module allows piloting the UHT. It is a combined material that is part of the configuration of the certified equipment and that contributes to its good working. It has to be installed into a non explosive area.

SEVERAL VERSIONS DEPENDING ON YOUR NEEDS:



VERSION	Compatible with	Product Resistivity
NANOELL 2 SB High voltage unit (UHT 158) integrated into the atomizer	solvent based product	≥ 6 MΩ.cm
NANOELL 2 WB Remote high voltage unit (UHT 287) from atomizer	water-based paint (3)nonflammable or hardly flammable	< 6 MΩ.cm contact SAMES
		≈ 0 MΩ.cm

(3): the product distribution system must be isolated from the ground potential.

RECOMMENDATIONS

High voltage (kV)	Solvent paint Resistivity
30 kV	0.5 to 1 MΩ.cm
50 kV	1 to 6 MΩ.cm
70 kV	> of 6 MΩ.cm



HI-TE TECHNOLOGY



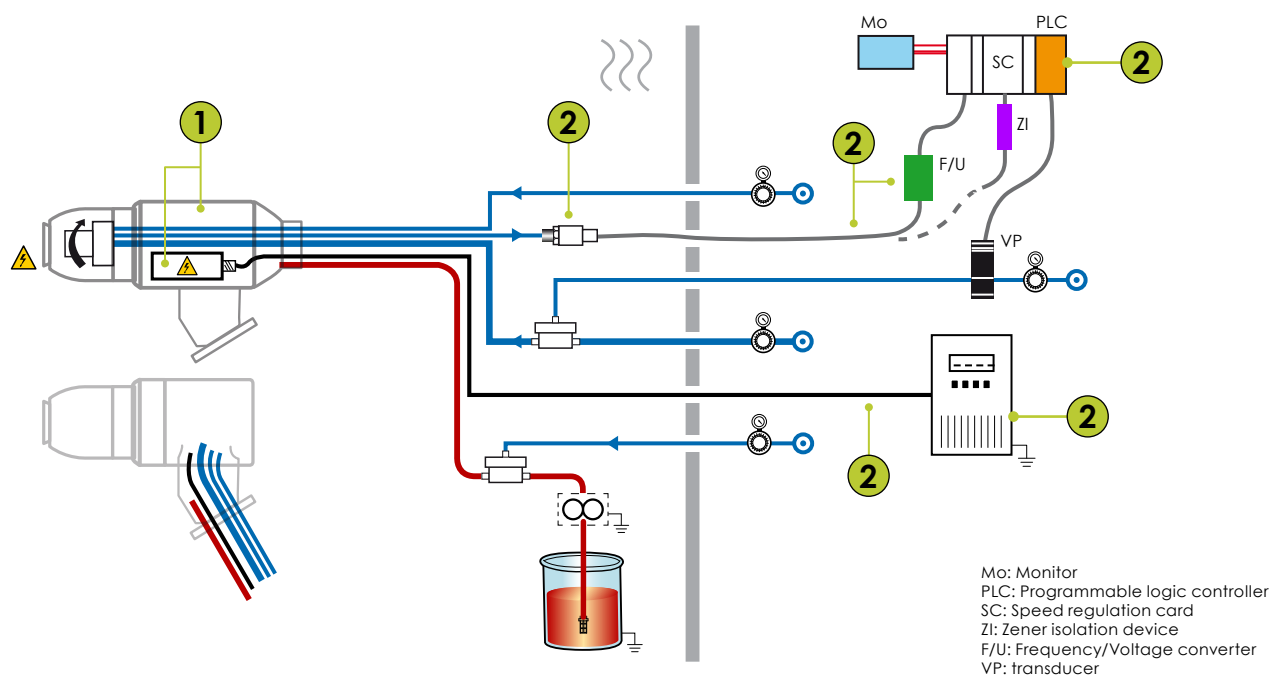
The external shroud is composed of couples of combined air holes. This external shroud allows several aimed applications; the pattern can fastly vary from a narrow and penetrating spray to a wide and wrapping spray for an optimal transfer efficiency.

MAIN BENEFITS:

- More paint savings
- Better finishing quality and color match
- Easy operation thanks to single air adjustment



Build your Atomizer

USE FOR SOLVENT-BASED PAINT **1** Mark 1

NANOELL 2 SB (hollow wrist robot)

NANOELL 2 SB (non-hollow wrist robot)

REFERENCE ATOMIZER
NANOELL 2 SBsolvent-based paint with
a resistivity $\geq 6 \text{ M}\Omega\cdot\text{cm}$

910016011

solvent-based paint with
a resistivity $> 0.5 \text{ M}\Omega\cdot\text{cm}$

Contact us

2 Mark 2Cable low voltage (8m),
GNM200A + sector connection (2.5m),
Speed regulation (SC + ZI) or F/U converter

Description	
Electrical kit without speed regulator	220 V
	110 V
Electrical kit with speed regulator	220 V
	110 V
Electrical kit with F/U converter	220 V
	110 V

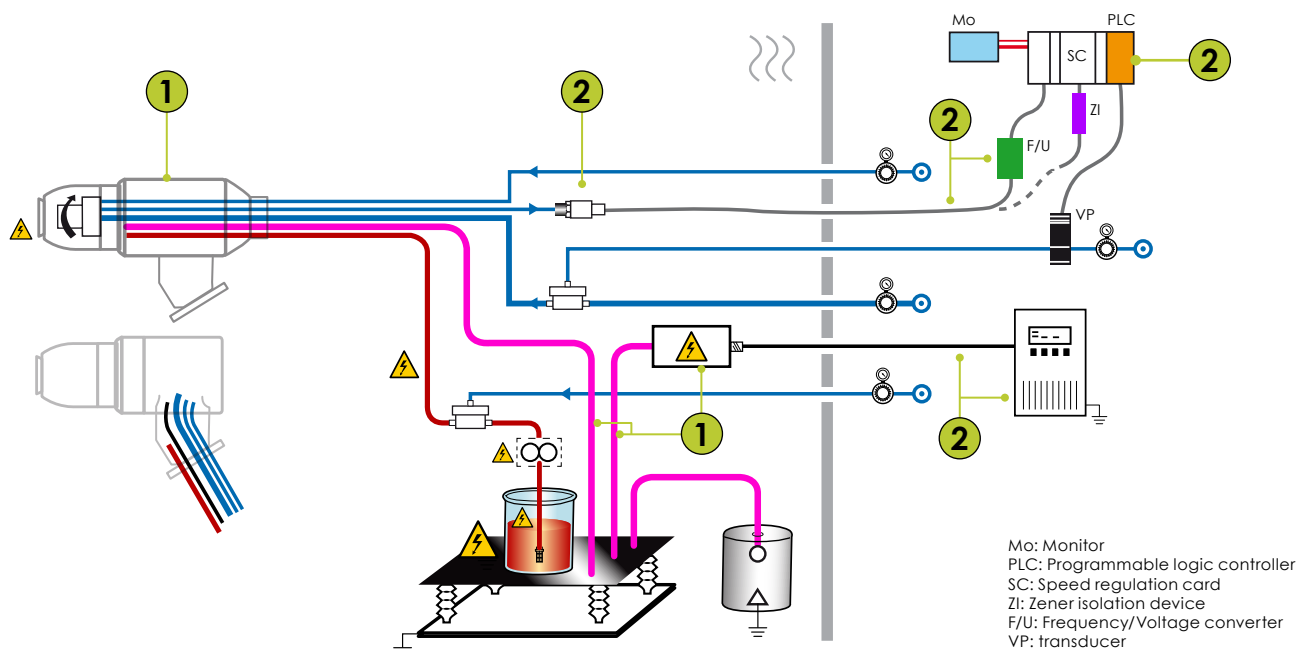
910002212
910002588
910002329
910002589
910003346
910015373

910002212
910002588
910002329
910002589
910003346
910015373

- Not included:
- bell cup and air shroud (refer to page 46)
- air supply hoses (contact SAMES)

- pumping system (contact SAMES)
- color change block (refer to page 72)
- air regulator/pilot (contact SAMES)

Build your Atomizer

USE FOR WATER-BASED PAINT

1

Mark 1

REFERENCE ATOMIZER
NANO BELL 2 WBwater-based paint
with $\alpha \approx \text{k}\Omega \cdot \text{cm}$

NANO BELL 2 WB (hollow wrist robot)

910016903

NANO BELL 2 WB (non-hollow wrist robot)

910016902

2

Mark 2

Cable low voltage (8m),
GNM200A + sector connection (2.5m),
Speed regulation (SC + ZI) or F/U converter

Description	
Electrical kit without speed regulator	220 V
	110 V
Electrical kit with speed regulator	220 V
	110 V
Electrical kit with F/U converter	220 V
	110 V



910002212
910002588
910002329
910002589
910003346
910015373

- Not included:
- bell cup & air shroud (refer to page 46)
- air supply hoses (contact SAMES)
- pumping system (contact SAMES)

- color change block (refer to page 72)
- air regulator (contact SAMES)
- Insulating table, Short-circuiting, Safety lock, High voltage discharge

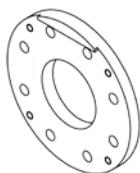
Build your Atomizer

COMPONENTS

Adaptation for assembly on robots

Robot model	Reference
EPX 2050/2900	910018263
P250	910019313
RX160	910018262
TX250	910018264
IRB4400	910018261

for others robots, contact SAMES



BE MORE FLEXIBLE

NANOELL 2 with **GUN head** (option)

Switch easily from bell to gun process for more penetration.

This feature available as an option of Nanobell sprayer replaces all bell components (turbine, shroud, and bell cup) by fan shaped electro pneumatic sprayer, without disassembling the body.



Description	Reference
GUN head	910019815

DISCHARGE SYSTEM OF SUPPLY WATER-BASED PAINT

The water-based paint is connected to the potential of the high voltage through an isolated table during electrostatic application.



NANOELL 2 WB



Insulating table



Short-circuiter

it allows the potential of the ground from all supply water-based paint installed on table isolated safely.



Safety lock

Mark	Description	Reference
3	Short circuiter	910008804
4	Insulating table 800mm x 800mm	1519263
	Insulating table 1600mm x 800mm	1519265
5	Safety lock 2x3 left side position	110001586
	Safety lock 2x3 right side position	110001587
6	High voltage discharge rod assembly	750207
7	Connecting cable between 2 and 3	910015658

Range of bells & Air shrouds

For 35 years, SAMES is focusing the design of bell cup and air shrouds on Finishing performances: improving atomization, pattern control and transfer efficiency. Being the latest part in contact with paint, the Bell cup is the key of your finishing performances.

The interior shape of these cups have been carefully validated for each paint layer, and Sames equipments are used with every paint supplier in the world. Our Paint lab are available to validate your complete paint process with our latest equipments.

RANGE

The use of air shrouds and bell cup depend on the sprayer you choose.

- > For the **RANGE #3**, a **TPAM** turbine is used (**45 krpm** max)
The choice of the bell is linked to the sprayer:

PPH 308

EC35
EC50
EC65

NANOBELL 2

EC35 Hi-TE
EC50 Hi-TE
EX65 Hi-TE



The use of air shrouds and bell cup depend on the sprayer you choose.

- > For the **RANGE #7**, a **HVT** turbine is used (**70 krpm** max)
The choice of the bell is linked to the sprayer:

PPH 707 ICWB-M

EC35 Hi-TE nw
EC50 Hi-TE nw
EX65 Hi-TE
EX80 Hi-TE

PPH 707 EXT-ST

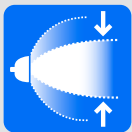
EX65 Hi-TE EXT



Uniform & stable pattern for the whole variation range of paint spraying



Highest transfer efficiency reduction by more than 30% of product losses



Variable patterns during spraying process, while guarantying the sturdiness of the pattern range with swift transitions



Working more quickly up to 1m/sec



The insurance of the best finishing quality, color-match index IV, the highest



FIELD OF APPLICATION

Four different diameters are available: ø35, 50, 65 and 80 mm enabling to reach the target application result. Sprayer bells are easily swapped thanks to a simple tool.
«EC» range distinguishes itself by a tulip-shape bell;

the «EX» shape, for Exponential, is now also available with 80mm cup. Each bell is thus combined to an air shroud with Vortex effect only with the **HI -TE technology**.

EC35 is perfect to apply on smaller parts with recesses.

EC50 is the multipurpose bell diameter to obtain good results with all kinds of paints.

EX65 provides better atomization for enhanced color-match.

EX80 combined with PPH 707 ICWB-M is the preferred tool for larger parts with the highest flow rates.

EC 35 Hi-TE

EC 50 Hi-TE

EX 65 Hi-TE

EX 80 Hi-TE

Hi-TE: Vortex air + Straight air
NW: Narrow Wide
PSW: Primer Super Wide

BSW: Basecoat Super Wide
CSW: Clearcoat Super Wide
EXT: for External electric charge

Range of bells & air shrouds

CUSTOMERS' BENEFITS

Performances:

- ▶ Technology of mixing straight and vortex airs
- ▶ Two technologies of air-shroud:
 - NW** for flexible pattern from 100 to 300mm;
 - SW** for super wide pattern 400-500mm
- ▶ Less shaping air consumption compared to competition
- ▶ All paints: High solid solvent or waterborne paint, 1K or 2K
- ▶ All applications: Primer, Base, Clear
- ▶ Metallic base dust coat

Simplified maintenance:

- ▶ The smooth surface of the bell is easily cleaned; an automatic cleaning system for several bells at a time is also available to maintain a perfect application result.
- ▶ Unique design of magnetic bell cup
- ▶ Quick assembly and disassembly of all SAMES bells and air shrouds.

The high voltage:

- ▶ A high level of productivity
- ▶ Homogenous spraying
- ▶ Regular paint spray
- ▶ Wrap around effect (the skirting-round effect allows a paint deposit behind the part)

Application:

Hi-TE NW

Narrow pattern

On the edges and the small surfaces = Less paint outside the target

very swift transition

Hi-TE ... SW

Wide pattern

On wide surfaces = Reduction of spraying times

Super Wide pattern

On wide surfaces = Reduction of spraying times

Widened front profile of the bell, optimized for a better atomization.



EX65 Hi-TE

Narrow front face, reducing pollution while spraying.

A shroud composed of pairs of combined airs on a similar diameter.



EC50 Hi-TE

Choose your bell

RANGE #3 BELL CUP SYSTEM

Atomizer equipped with **INTERNAL CHARGE**

Description	Bell Material	Reference
EC 35	1 - system	
	2 - Shaping air	910001297
	3 - Bell cup	Aluminium 910000877
		Titanium 910008677
EC 50	system	910014441
	Shaping air	910001298
	Bell cup	Aluminium 910000876
EC 65	system	
	Shaping air	Vortex air shroud 910001196
		Straight air shroud 910001695
	Bell cup	Aluminium 1527176
		Titanium 1527175
		Aluminium for application wood 910009283
EC 35 Hi-TE	system	910008515
	Shaping air	910008975
	Bell cup	Aluminium 910000877
EC 50 Hi-TE	system	910008514
	Shaping air	910007433
	Bell cup	Aluminium 910000876
EX 65 Hi-TE	system	910008513
	Shaping air	910008211
	Bell cup	Aluminium 910008179



Choose your bell

RANGE #7 BELL CUP SYSTEM

Atomizer equipped with **INTERNAL CHARGE**

Description	Bell Material	Reference
EC 35 Hi-TE NW	1 - system	910020612
	2 - Shaping air	910020606
	3 - Bell cup Aluminium	910000636
	1 - system	910020613
	2 - Shaping air	910020606
	3 - Bell cup Titanium	910011188
EC 50 Hi-TE NW	1 - system	910020610
	2 - Shaping air	910020605
	3 - Bell cup Aluminium	910003159
	1 - system	910020611
	2 - Shaping air	910020605
	3 - Bell cup Titanium	910008756
EC 50 Hi-TE PSW	system	910015776
	Shaping air	910015761
	Bell cup Aluminium	910003159
	system	910015777
	Shaping air	910015761
	Bell cup Titanium	910008756
EC 50 Hi-TE CSW	system	910015780
	Shaping air	910015763
	Bell cup Aluminium	910003159
	system	910015783
	Shaping air	910015763
	Bell cup Titanium	910008756
EX 65 Hi-TE	system	910008511
	Shaping air	910008535
	Bell cup Aluminium	910004615
	system	910010196
	Shaping air	910008535
	Bell cup Titanium	910009383
EX 80 Hi-TE BSW	system	910014659
	Shaping air	910013214
	Bell cup Titanium	910012705



2 - Shaping air assembly
3 - Bell cup

1 - Bell cup system

Hi-TE: Vortex air + Straight air
NW: Narrow Wide
PSW: Primer Super Wide
BSW: Basecoat Super Wide
CSW: Clearcoat Super Wide
EXT: for External electric charge

Atomizer equipped with **EXTERNAL CHARGE**

Description	Bell Material	Reference
EX 65 Hi-TE EXT	system BELL SERRATED	910014654
	Shaping air	910013133
	Bell cup Aluminium	910004615
	system BELL NOT SERRATED	910014655
	Shaping air	910013133
	Bell cup Aluminium	910008549



Choose your bell

CHARACTERISTICS

RANGE #3

EC 35

EC 50

EX65 -> for finer atomization

EC 65 -> for larger impact

Paint flow	20 to 450 cc/min	30 to 500 cc/min	35 to 600 cc/min
Impact diameter	75 to 350 mm	100 to 450 mm	150 to 550 mm
Primer solvent		✓	✓
Primer water		✓	✓
Solvent based	✓	✓	✓
Water based	✓	✓	✓
Metallic base	✓	✓	✓
Varnish	✓	✓	✓
Bi-components		✓	✓
High solids		✓	✓

The values of parameters given below are indicative

RANGE #7

EC 35 **Hi-TE** nw

EC 50 **Hi-TE** nw

EC 50 **Hi-TE** PSW

EC 50 **Hi-TE** CSW

EX65 **Hi-TE**

EX80 **Hi-TE** BSW

Paint flow	100 to 600 cc/min	200 to 750 cc/min	100 to 350 cc/min	150 to 850 cc/min
Impact diameter	100 to 300 mm	300 to 500 mm	300 to 350 mm	300 to 500 mm
recommended for	Optimized for coating narrow surfaces and difficult recesses	- CSW (Clear coat Super Wide) for the clear coat application - PSW (Primer Super Wide) version is recommended for the primer application - Optimized for high paint flow at high tip speed	- Optimized for the BELL/BELL process - High performance on color-match - Very useful for metal base application	BSW (Base coat Super Wide) version is recommended for the Base coat application
Primer solvent	✓	✓		
Primer water	✓	✓		
Solvent based	✓	✓	✓	✓
Water based	✓	✓	✓	✓
Metallic base	✓	✓	✓	✓
Varnish	✓	✓		
Bi-components	✓	✓	✓	✓
High solids		✓		

The values of parameters given below are indicative



BELL CUP MANUFACTURED WITH THE
HIGHEST PRECISION TECHNIQUES USED FOR
AERONAUTIC AND AEROSPACE INDUSTRIES



Microphone

The microphone sensor is designed for the reading and regulating of the turbine rotation speeds of all the SAMES sprayers.

The principle of rotation speed reading is acoustic-based. An air arrives at the level of the bell; it is guided by a groove and directed at each turbine revolution to create a pressure variation that flows up to the sensor. This signal is then converted into electrical variations in order to adjust the bell rotation speed.

POSSIBLE UNIT CONFIGURATIONS

There are two possible uses to regulate the bell rotation speed.

- Either thanks to a speed regulation card (diagram 1) allowing then acting on the transducer to drive the turbine rotation air;
- Or by converting the sensor frequency into voltage towards a PLC (diagram 2). The minimal air hose length (Out) to the sensor is of 4.5 m with a requisite air pressure comprised between 1.9 and 3 bar. For an extension of this hose, increase the sensor inlet pressure by 0.4 bar per 30 cm. The maximal recommended length is of 8 m.

M: microphone sensor

B: air super-charger

VP: transducer

In: air inlet inside the sprayer

Out: air outlet towards the micro sensor

AR: turbine rotation air

AL: supply card

SC: speed regulation card

MO: monitor

CFU: frequency/voltage converter

PLC: programmable logic controller

MA: combined equipment, installation in non-explosive area

BZ: Zener isolation device

diagram 1

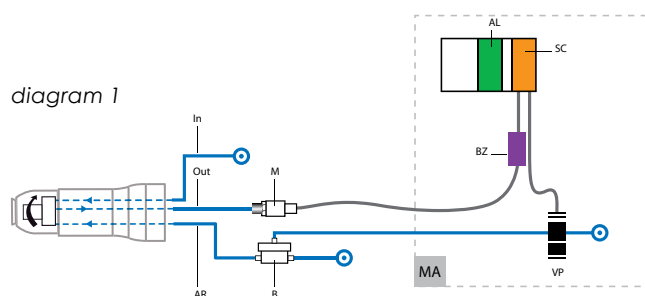
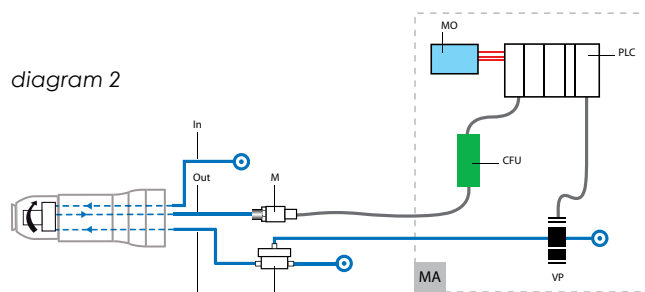


diagram 2



CUSTOMERS' BENEFITS

Longer service life

- Pneumatic hose through the robot arm and not through a cable (torsion, numerous movements ...)

Simple and reliable

- The connecting components are not sensitive to the dirt (paint)
- Pneumatic signal not influenced by electrostatic phenomena or CEM (electromagnetic compatibility)
- 100% compatible use with high voltage (breakdown, creeping ...)

Optical fibre

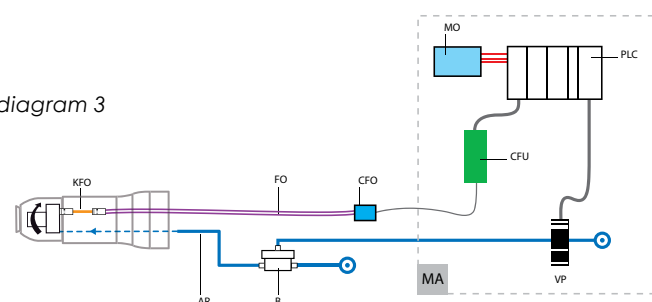
The turbine rotation speed reading system can also be carried out by optical fibre. This solution is possible with the **RANGE 7** of SAMES sprayers.

The reading of the turbine rotation speed is made thanks to a **fibre optics** principle. An «optical fibre Kit» unit (refer to *diagram 3, KFO*) includes the sprayer elbow.

One of both fibres emits a continuous luminous signal that reflects itself on the turbine shaft in a discontinuous signal of which frequency gives the rotation speed (2 luminous pulses/turbine revolution). This discontinuous signal is transmitted by the second fibre towards the optoelectronic converter (refer to *diagram 3, CFO*), thanks to an optical fibre kit of 8-m long (refer to *diagram 3, FO*). The electrical-pulse signal at converter outlet is recovered and analysed by the converter system Frequency/Voltage (**CFU**).

At a 65000 rpm rotation speed, the frequency will be at 2.16 kHz.

diagram 3



KFO: Optical fibre kit
FO: Fibre kit (8-m long)
CFO: Optical fibre sensor (converter)
B: air super-charger
VP: transducer
AR: turbine rotation air

MO: monitor
CFU: frequency/voltage converter
PLC: programmable logic controller
MA: combined equipment, installation in non-explosive area

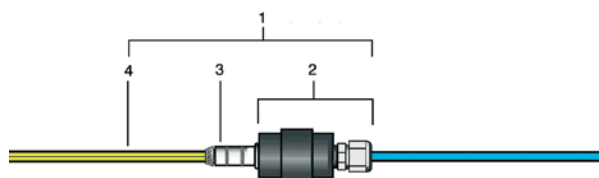
MICROPHONE SENSOR

Description	Mark	Type	Reference
sensor kit with plug & cable	1	Europe	851510

Description	Mark	Type	Reference
Assembled microphone sensor	2	Europe	851488 ^(A)
		US	459881 ^(B)

3-contact plug	3	EU/US	E4PTFS195
Electrical cable (2 x 0.5mm ²)	4	EU/US	Contact us

(A): air connection for an ext. Ø6 hose (ref: F6R PUK 316) - 1/8" BSP
(B): air connection for a Ø1/4 hose (ref: F6R PUQ 210) - 1/8 NPT



ATEX marking:

Microphone

CE II (2)/2 GD
EEx SYST (Ia IIB T4 - T135°C)
INERIS05ATEX007X

F/T converter

CE 0080 II (2) GD [Ex ia] IIC
[Ex iaD]
INERIS 04ATEX0086

OPTICAL FIBRE

Description	Mark	Type	Reference
Optical fibre kit in the elbow	5	PPH 707-SB elbow	910005173
8-m fibre kit	6		910005172
Optical fibre sensor	7		110000846AT



SPEED REGULATOR

Description	Mark	Use	Reference
Freq/voltage converter	CFU	HVT	1525628
Transducer	VP		R3VVPR230
DP50 3/8 Air booster	B		220000331
Speed regulation card	SC	HVT (BSC100)	220000010

PAM: turbine (45K rpm)

HVT: turbine (70k rpm)

SLR Rack

Control solution for bell & gun type sprayers

SLR rack range is dedicated to control an automatic paint installation. Each SAMES sprayer (rotary atomizer or pneumo-electrostatic gun) is driven by its dedicated module «S-BOX Bell or S-BOX Gun» that is integrated to SLR with the following way :

- ▶ in a «SLR cube» (to drive one single sprayer)
- ▶ in a «SLR tall cabinet» (to drive up to 2 bell sprayers or 4 pneumo electrostatic guns).

Thanks to the SLR range, installation and control of paint systems is made easier.



SLR Cube

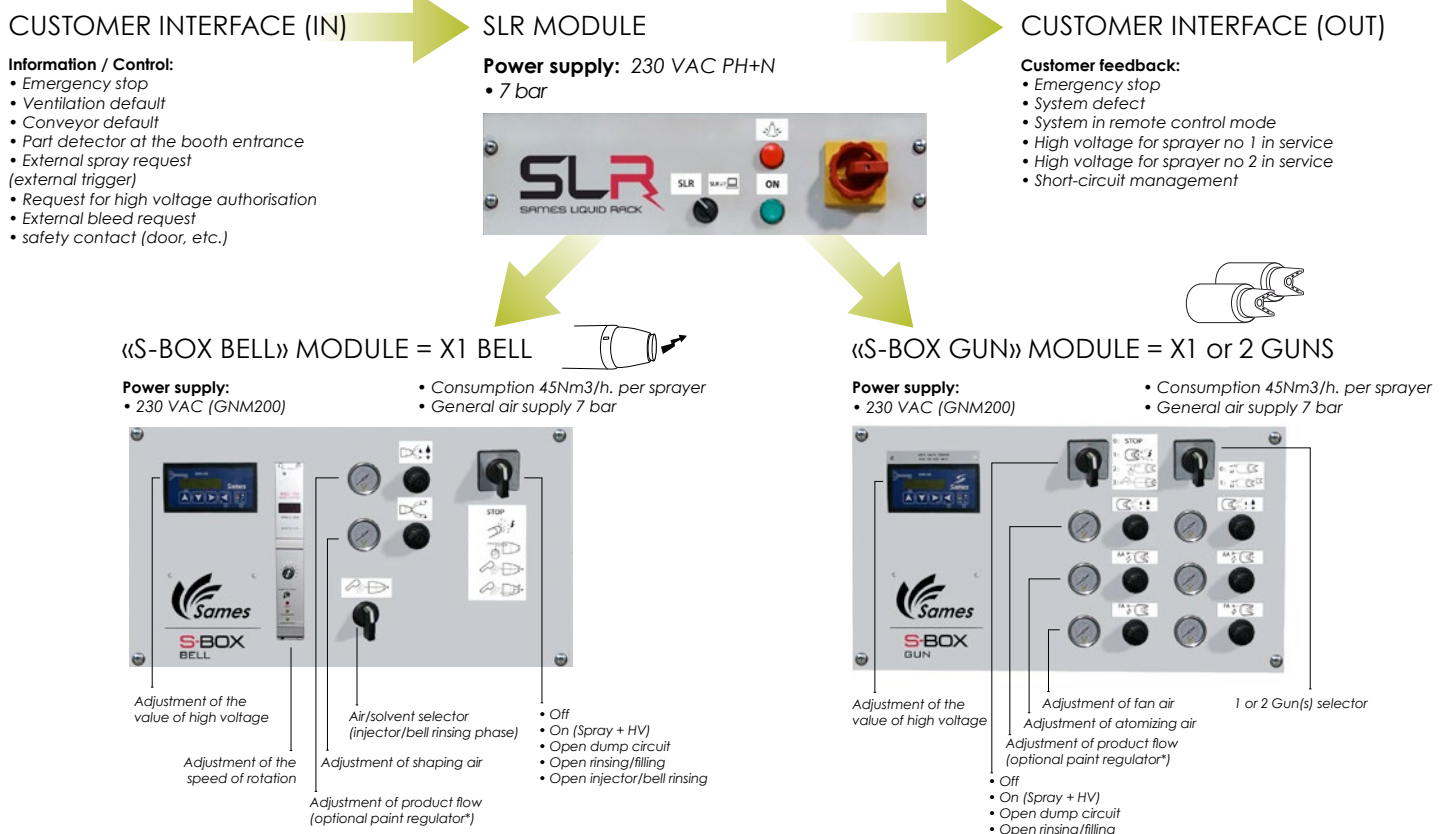


SLR Tall cabinet

FUNCTIONS

The SLR module is designed to feed and control the two S-Box modules (Bell/Gun) as far as possible. This module provides access to two control modes for S-Box modules:

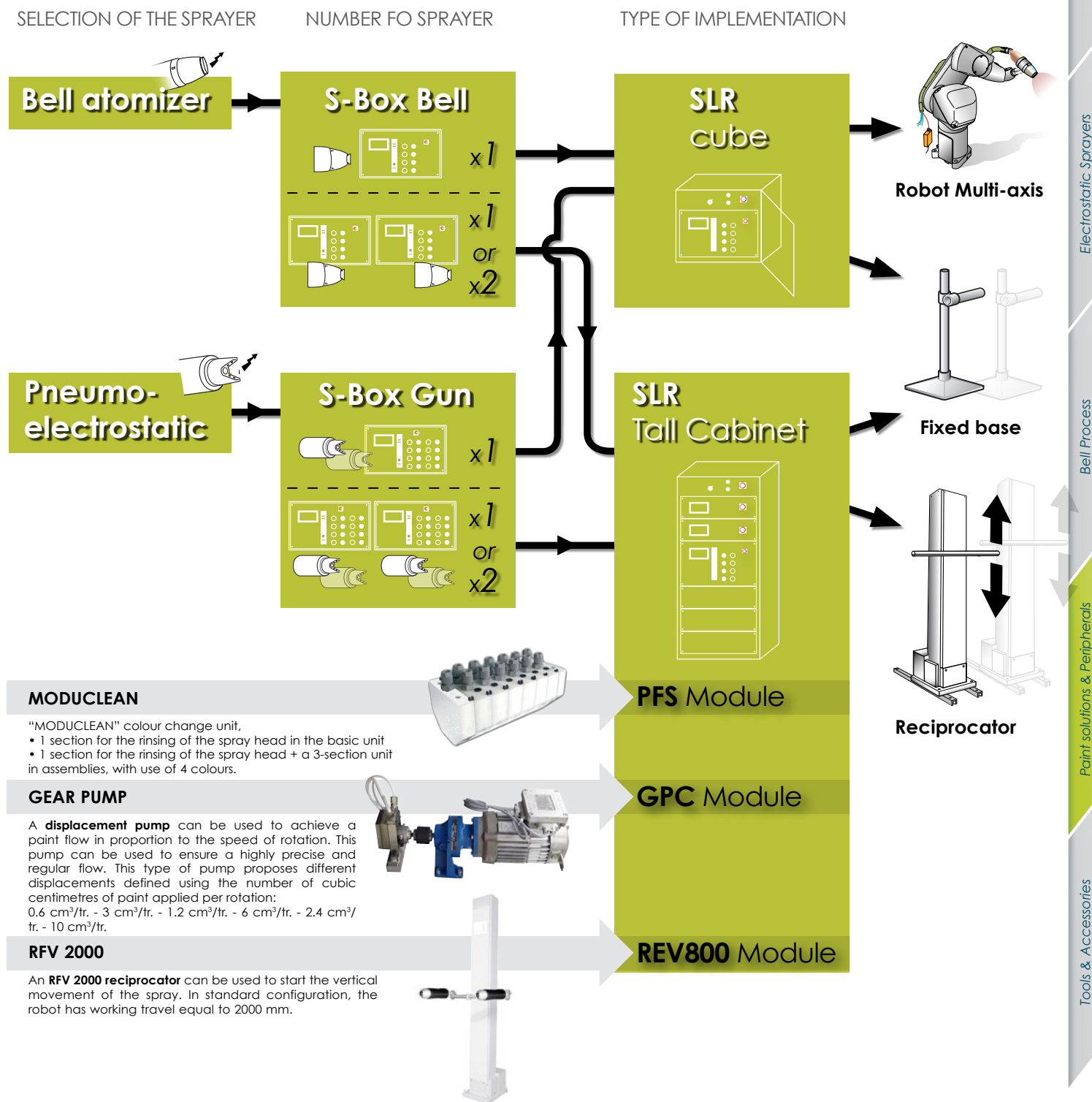
- ▶ Local mode (manual adjustment of spray commands on the front panel of the module)
- ▶ Remote mode (external control trigger + remote high voltage for robotic applications for example)



SLR Rack

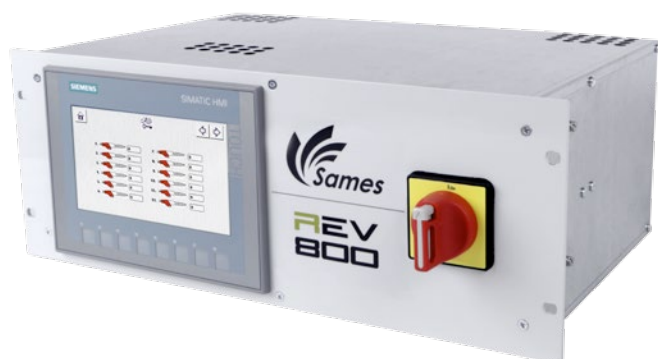
POSSIBLE CONFIGURATIONS

To create your list of references, contact SAMES



REV 800

Electrostatic paint management



The REV 800 module is intended to drive an automatic powder electrostatic paint installation.

- > Reciprocator motion type
- > Light curtains parts detection
- > Independent spray triggers
- > Conveyor pulse control

TECHNICAL DATA

Supply	REV800
Inlet voltage (V)	230 single
Inlet frequency (Hz)	47 - 63
Inlet current (A)	16
Supply of API (V)	24
Dimensions	
Weight (kg)	13,8
Height (U)	4
Width (inches)	19
Protection degree	
Rack version	IP54 (front panel) IP20 (rear panel)
Control screen	
Screen	7 inches LCD TNT
Display	resistive analog touch-sensitive screen, controlled by a finger, non-pointed object or glove.
Conditions of use	
Ambient temperature (°C)	< 40
Ambient humidity	< 85 % without condensation
Installation	in non ATEX Area

It can operate:

- ▶ the "up & down" axis of one or two reciprocator(s) SAMES RFV 2000 type,
- ▶ spray guns activation and the input/output interfacing with the installation.

The REV800 also manages the parts parameters required by the application via an integrated PLC:

- ▶ sweeping movement with parameters set for one to three zones: reversing points and speed change points,
- ▶ zone speeds adjustable from 0 to 60 m/min. stop/start running up to six spray guns per robot,
- ▶ management of ten memorized programmes (production runs for parts for painting).

The REV800 module is interfaced with the installation to:

- ▶ detect the parts,
- ▶ detect external faults,
- ▶ detect that the booth is operating correctly: conveyor belt and ventilation,
- ▶ manage faults: signaling system and external output authorizing start up (example : conveyor belt),
- ▶ manage timeouts for the application between parts, between two robots and three spray gun configurations.



CUSTOMERS' BENEFITS

REV800 module allows the operator to run his installation extremely simply

- ▶ **Very user-friendly:** learning the process is quick and intuitive - graphic icon display.
- ▶ **System reliability:** the system is managed by a programmable logic controller (PLC).
- ▶ **Easy to use:** the intuitive interface simplifies the selection of each menu to the maximum.
- ▶ **Time saving:** easy calibration of the high and low points and the robot axis. The parameter table choice can be made on line during production, without stopping the conveyor belt.
- ▶ **Ergonomics:** wide, easy to read and operate color touch-screen.

REV 800

FUNCTIONS

The REV800 integrates the basic functions of an application process:

- 2 "up & down" type reciprocators - 1 axis
- 3 sweeping zones per reciprocator
- controls up to 6 sprayers per reciprocator
- 20 parts production runs per reciprocator

The 19 inch standard dimensions of the REV800 module allows easy integration into a SAMES modular cabinet and connection to the various SAMES spray gun control modules.

With the following functionalities, the REV800 module interfaces easily with an industrial application:

- parts detection (handles spraying and timed delays)
- external faults (recip stops, spraying stops)
- booth ventilation
- conveyor pulse
- conveyor stop
- E-stop
- external faults (warning, signals, other...)
- conveyor start authorization

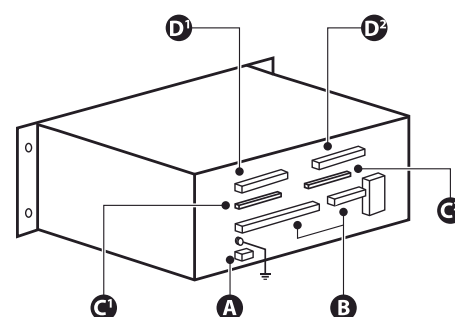
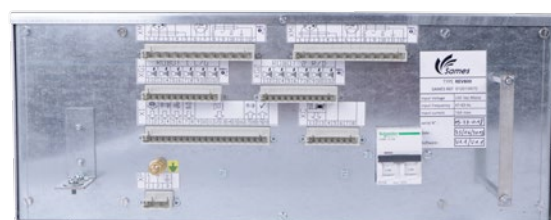
CONTROL MODULE REV800

Description	Reference
REV800 RACK VERSION	910019970
SCREEN PROTECTION SHEET	110002029
CONNECTING CABLES REV800 TO RFV2000	910003807



CONNEXIONS

Description	Mark	Function	mm2	Reference
Electrical supply	A		3G2.5	E4PCAL580
Inputs	B	Emergency stop	2x1	E2LAAB100
		Conveyor belt running	2x1	E2LAAB100
		Fan operating	2x1	E2LAAB100
		External faults	2x1	E2LAAB100
		Parts detection	3G0.75	E2LDAC075
Outputs	B	Conveyor belt autorisation	2x1	E2LAAB100
		Function OK	2x1	E2LAAB100
Spray gun control ⁽¹⁾	C1 & C2		2x1	E2LAAB100
Motor control	D1 & D2	Motor, lg = 30m	4G1.5	1411222
		Temperature sensor	2x1	1411223
		Potentiometer ⁽²⁾	4G0.75	1409971



(1): cable by the metre necessary for one spray gun, the C1 & C2 connection can each run 6 triggers

(2): the potentiometer must be connected via a Zener barrier protection device which is a certified (POT31) electric system. The Zener barrier is installed at the rear of the control module REV 800 on a rail provided for this purpose.

Part number of the cable connecting the Zener barrier to the REV 800: **1411224**

Part number of the cable of the potentiometer: **1409971**

Part number of the Zener barrier : **E6GPSR077AT**

RFV 2000

Vertical and Horizontal movement system



RANGE

The RFV reciprocator 2000 is intended to equip automatic installations for painting or powder coating. There are two types of reciprocators that comply with ATEX:

- For **liquid paint** applications, mechanism usually located in zone 1 or 2, which determines a category for which the equipment is approved, category = 2. It can lead to a combination of paint sprayers such as:
- 2 or 4 paint sprayers PPH 308
 - 1 or 2 paint sprayers PPH 707 EXT-ST / ICWB
 - 4, 6 or 8 spray paint TRP 501

- For **powder coating** applications, mechanism is in zone 22 to note that the regulation nevertheless considered that the equipment is approved, category = 2 instead of 3. It can lead to a combination of powder projectors such as:
- 4, 6, 8 or 10 projectors powder Auto Mach-Jet
 - 2 or 4 INOBELL powder turbines

The RFV 2000 reciprocator is controlled by:

- a control module REV 800 or MCR
- PLC for a more complex automatic installation

CUSTOMERS' BENEFITS

- Extremely simple construction and operation (very long service life).
- Stroke and speed adjustable remotely over a very wide range.
- Optimum safety: the reciprocator is CE approved.
- Reduced maintenance: limited to cleaning the chains and transmission devices.
- No special prepared area (the robot can be positioned or displaced manually without effort).

TECHNICAL DATA

Description	RFV 2000 for application of liquid paint	RFV 2000 for application of powder paint
Effective stroke – landmark A	1000 to 3000 depending on the version	
Sweeping speed (m/minute) to 50 Hz	adjustable up to 60	adjustable up to 25
Floor surface	0.55 x 0.70 m	
Power motor (w)	750	375
Robot weight (kg)	approx 230	
Single phase supply	220 V / 50-60 Hz	
Eyebolts	ø 28 mm	

ATEX marking:

RFV2000 (liquid paint)

CE II 2 G c II B T4

Technical file: RFV

RFV2000 (powder paint)

CE II 3 D c T125°C

Technical file: RFV



RFV 2000

Mechanism of the robot «RFV 2000»

Description	Mark	Effective stroke (cm)	Reference
RFV 2000	1	200	910006928-200
liquid paint		80 < xx0 < 340	910006928-xxx
RFV 2000	1	200	910006929-200
powder paint		80 < xx0 < 340	910006929-xxx

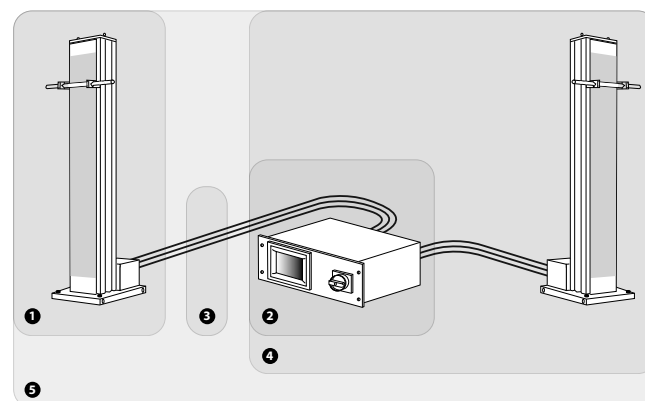
XX0 = effective stroke in cm, ex: 280 cm

It is best to choose a standard mechanical robot (200 cm stroke), even if the stroke is greater than the height of the pieces to be painted, it can adapt to space constraints. Otherwise, the choice will be made either because of environmental stress. (ex : a cabin height of less than 3.4 m) or for heights to be painted over 2m.

Mechanism of the robot «RFV 2000»
+ Control module REV 800

Description	Mark	Pilot of	RFV version	Effective stroke (cm)	Reference
REV 811	4	x1 RFV one axis	liquid paint	200	910002370
			powder paint	200	910002373
REV 821	5	x2 RFV one axis	liquid paint	200	910002371
			powder paint	200	910002374

The assembly includes the electrical control cables (approx. 30m) and the REV 800 (delivered as a rack version)



- ① = Zone 1 or 2 (RFV for liquid paint)
Zone 22 (RFV for powder paint)
- ② = REV 800/MCR, out of ATEX area 0 ½ and 22 area with sealed version box
- ③ = Electrical connections for 1 x RFV2000,
Ref. = 910003807 =
motor cable: 1 411 222 (4G1.5mm2) +
cable temperature sensor: 1 411 223 (2x1mm2) +
potentiometer cable: 1 409 971 (4G0.75mm2)
- ④ = REV 811 (RFV 2000 + REV 800)
- ⑤ = REV 821 (2 x RFV 2000 + REV 800)

COMPONENTS

Guide rail kit

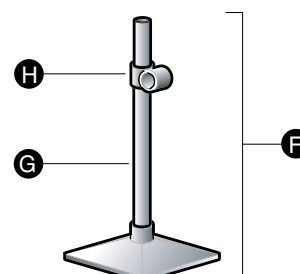
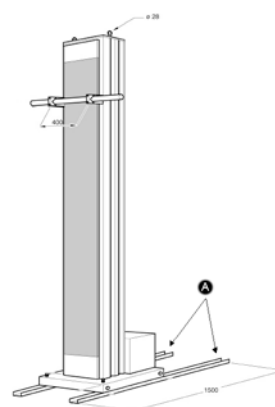
Description	Mark	Lenght (mm)	Reference
2 guiding rails & fixing pins	A	1500	1525228

Components for fixed spray

Description	Mark	Lenght (mm)	Reference
Rod (base + tube)	F	1500	459127
Tube only	G	1200	744097
		1500	1410592
Fixing nut	H	Ø50/30 mm	749805
		Ø50/50 mm	429104
		Ø50/60 mm	1204441

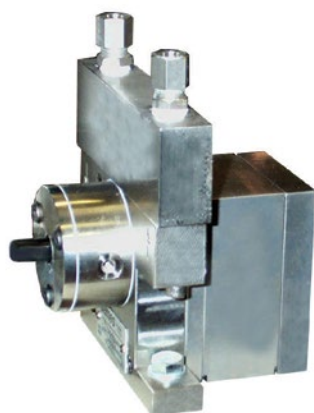
Optional tray

Description	Lenght (mm)	Reference
Cable tray kit	Hose < 2000	1514325
(2 kits per reciprocator)	Hose > 2000	1525208



Gear pump

Flow management



The gear pump enables liquid, solvent-based and water-soluble paints for general industrial applications to be sprayed using all the SAMES automatic spray guns (PPH 308, TRP 500, NANOELL2, etc...).

RANGE

This type of pump has 6 displacements defined by the number of cubic centimeters of paint delivered per revolution:

- 0.6 cm³ /R
- 1.2 cm³ /R
- 2.4 cm³ /R
- 3 cm³ /R
- 6 cm³ /R
- 10 cm³ /R

These different displacements cover a flow rate range of 0.5 to 80 L/hour. They are chosen according to the required flow rate and the rotation speed range. It is preferable for the operating speed to be less than 120 rpm.

Three types of coating are available for each pump:

- **STEEL:** for solvent-based product use,
- **STAINLESS STEEL:** for water-based product use,
- **ADLC:** intense coating which increases surface hardness and has a better coefficient of friction. This type of pump cleans to 100% by injecting a powerful flow of rinsing product, the pump cleans itself very quickly therefore. The use of water-based products necessitates the use of suitable positive displacement pumps.

TECHNICAL DATA

Pressure	Valve drive	Supply	Use
Maxi. operating air pressure . (bar)	6 (90 psi)		
Mini. operating air pressure (bar)	3 (45 psi)		
Pilot air supply (mm)	ø2.7x4		
Mini. inlet material pressure (bar)		0.5 (7.5 psi) to facilitate priming	
Maxi. inlet material pressure (bar)		2 (30 psi)	
Maxi. outlet material pressure (bar)			10 (150 psi)
Maxi. rotation speed (rpm)			220

Connections	Inlet	Outlet
Pump connection bar (BSP)	1/4	1/4

ATEX marking:

CE II 2 G c T4

Technical file: Gear pump



Example of an insulated system

Choose the pump

TYPE OF PUMP SELECTION



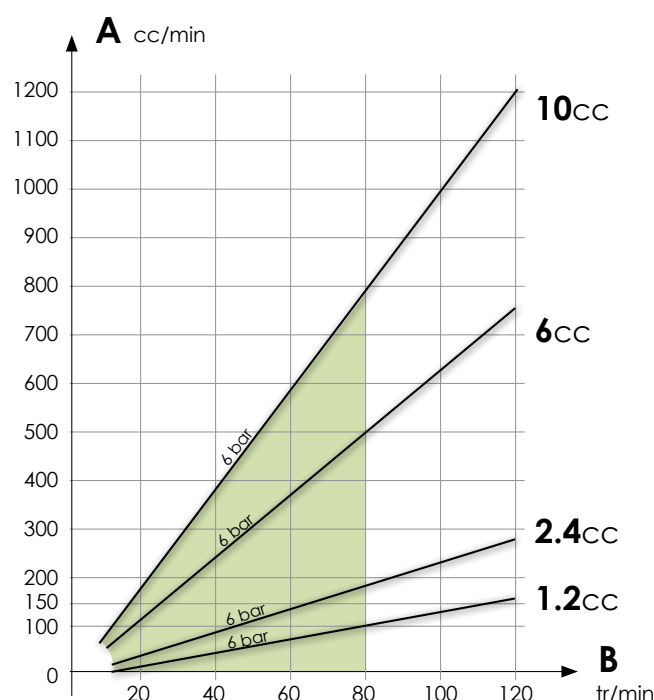
A: Material flow in cc/min

B: Pump rotation speed in rpm

The curve indicates the flow of the pump with a back-pressure from 0 to 6 and from 6 to 10 bar.

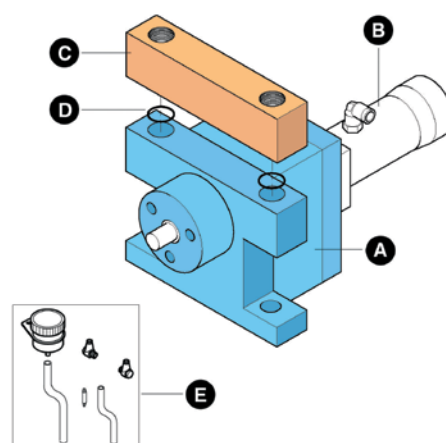
One must not select a pump of which flow would be too close to the minimum or maximum speed, but close to 80 rpm.

■ = recommended working zone



Gear pumps

Description	Mark	Capacity (cm ³ /rev)	Reference
Pump STEEL (1)	A	0.3	Y1PCDL025AT
		0.6	Y1PCDL026AT
		1.2	Y1PCDL028AT
		2.4	Y1PCDL030AT
		3	Y1PCDL036AT
		6	Y1PCDL037AT
Pump INOX (1)	A	0.6	Y1PCDL101AT
		1.2	Y1PCDL053AT
		3	Y1PCDL045AT
		6	Y1PCDL055AT
Pump INOX RINSABLE (2)	A	1.2	758704
		2.4	756515
		10	756560
Pump ADLC (2 & 3)	A	1.2	1410767
		2.4	1410670
		6	1410031
		10	1410030
Shunt valve kit	B	1.2 / 2.4 / 6 / 10	910007369
Connexion base	C	1.2 / 2.4 / 6 / 10	730269
O-ring (x2)	D	1.2 / 2.4 / 6 / 10	J3TTCN011#
Adaptation kit MESAMOL (4)	E	1.2 / 2.4 / 6 / 10	854279
Oil MESAMOL		1 liter container	H1HMIN037



(1): Seal kit for Pump Steel and Inox, **REF: 752203**

(2): Seal kit for Pump Inox rinsable & ADLC, **REF: Y1AJDP054**

(3): ADLC = coating with high surface hardness (more durable)

(4): The pumps can be equipped with a sealing system to prevent the passage of air in the fluid circuit (if used with a hardener).

Fast Clean Gear pump

Flow management



The gear pump is used for the supply of liquid paints, either solvent or water based, for all SAMES automatic sprayers.

- > Accurate dosing
- > Compact design
- > Fast clean technology

RANGE

This type of pump comes in 3 capacities defined by the number of cm³ per revolution:

- 3 cm³ / rev
- 6 cm³ / rev
- 10 cm³ / rev

These different capacities allow covering a flow bracket from 0.5 to 80 L/hour.

The choice is made with respect to the target flow and the rotation speed bracket. It is recommended to run at less than 80 rpm.

The gear pump ensures a paint **flow** that is proportional to its rotation speed. Its use ensures a **regular** and **accurate** flow. The pump has to be supplied with a material at 0.5 bar pressure. In the case of a distribution system, the material pressure regulator is to be connected before the pump, whereas a flow meter is always connected after the pump. Upstream pressure facilitates priming but also ensures the flow corresponding to the capacity and speed of the pump.

TECHNICAL DATA

FCG pump

CAPACITY		3 cc	6 cc	10 cc
Dimensions (mm)	Length	124.5	136	150
	Height	85	85	85
	Width	60	60	60
Weight (kg)		1.91	2.1	2.88
Max. pressure		15 bar		
Rotation speed (RPM)		10 to 80		
Accuracy in normal conditions ⁽¹⁾		± 2 %		
Pilot air supply (mm)		Ø2.7 x 4		

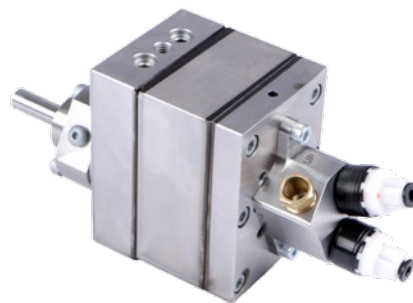
(1): 30-80 rpm, rinsing viscosity 25 sec. DIN4, ΔP ± 2 bar

ATEX marking:

F.C.G. 3cc or F.C.G. 6cc or F.C.G. 10cc,

CE II 2 G c T4

Technical file: Gear pump



Choose the pump

CUSTOMERS' BENEFITS

Long life pump

- Low wearing parts
- Stainless steel ADLC
- Cleaning helps to lubricate rotating parts

Compatibility

- Can replace Easy Rinsing Pump:
 - same interface with motor
 - same interface with regulators
- UPvalve for shunt block

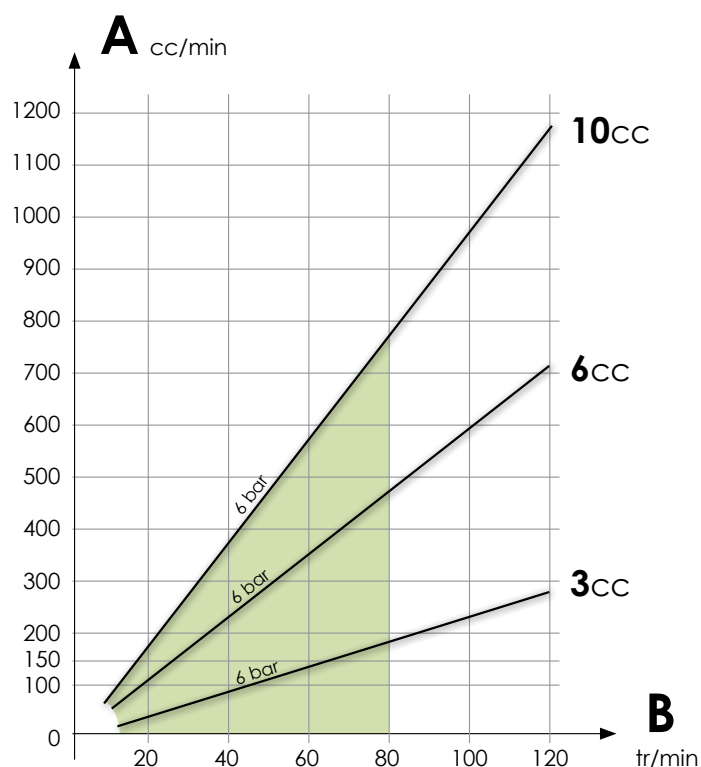
Efficient cleaning process

- Fast clean of every rotating parts
- Shunt block rinse gears (teeth and axles)

Robust design

- Long know-how gearpump design
- Rotation locked to the motor by a pin, ceramic surface reinforced

TYPE OF PUMP SELECTION



A: Material flow in cc/min

B: Pump rotation speed in rpm

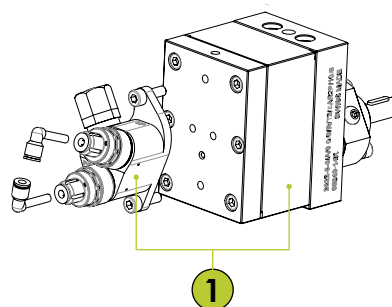
The curve indicates the flow of the pump with a back-pressure from 0 to 6 and from 6 to 10 bar.

One must not select a pump of which flow would be too close to the minimum or maximum speed, but close to 80 rpm.

■ = recommended working zone

Fast Clean Gear Pump

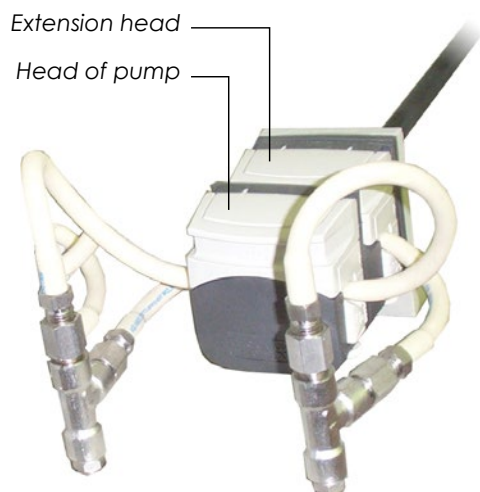
Description	Mark	Capacity (cm ³ /rev)	Reference
Pump with Shunt Block	1	3	910020406
		6	910020407
		10	910020408



Description	Reference
Fitting 4/6 - G 1/4"	910007346
Fitting 5/8 - G 1/4"	910007347

Peristaltic pump

Flow management



The peristaltic pump allows abrasive products (without chemical aggressivity), principally liquid vitreous enamel, to be carried to the VORTEMAIL VEC spray gun.

The peristaltic pump ensures a product flow rate proportional to its rotation speed.

The principle of the peristaltic pump system is three turning rollers which flatten the flexible hose. The assembly comprises two pumps in parallel (pump head and extension head) which feed a single spray gun. The product pulsation on leaving the nozzle is thus reduced and the range of flow rates can be increased if necessary. There is no need to feed the pump with a pressurized or other circulating product.

TECHNICAL DATA

Dimension	Head of pump	Extension head
Width (mm)	85	85
Height (mm)	82	82
Depth (mm)	53	58

Pressure	Use
Outlet fluid pressure maxi. (bar)	10 (150 psi)
Rotation speed maxi. (tr/min.)	220
Pump	100% water rinse

Suitable safety sleeve at pump outlet, serving as fuse in the event of overpressure

Flow	Hose (mm)	Flow (cm ³ /min.)	Speed (tr/min.)
Flow range corresponding (fluid hose length = 10 m)	ø 6.4	720	
	ø 8	1000	
Speed range corresponding (density = 1.75, setup = 1.050gr/m ² , 2 sides)	ø 6.4	180	30
	ø 6.4	360	60
	ø 6.4	550	90
	ø 6.4	720	125

Connexions	Inlet pump (mm)	Outlet pump (mm)
Fluid hose connexions	ø 9	ø 9

Choose the pump

RANGE

Thanks to the quick flexible hose change, 2 different displacements can be obtained with the same two pumps. This hose is sandwiched at each end of the casing (pump) where it is flattened according to the internal diameter:

Ø int. 6.4 mm $\approx$ 3.1 cm³ /R

Ø int. 8 mm $\approx$ 4.6 cm³ /R

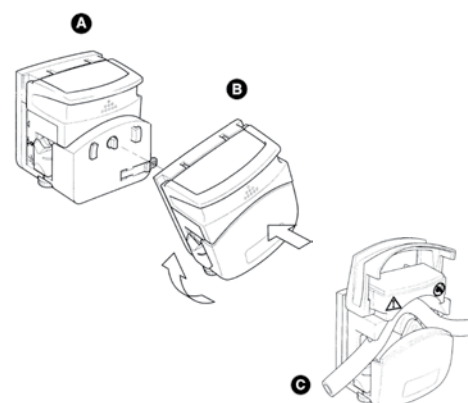
They are chosen according to the required flow rate and the rotation speed range. It is preferable for the motor operating speed to be less than 120 rpm.

PERISTALTIC PUMP ALONE AND FLEXIBLE HOSES

Description	Mark	Ø int. (mm)	Reference
Extension head 313XB2	A		Y1PCDL445
Head of pump 313D2	B		Y1PCDL444

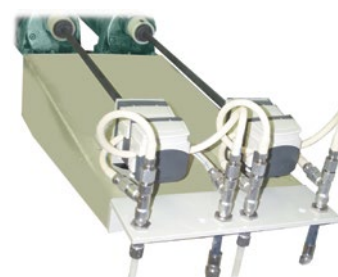
*It is possible to assemble several extension headers in parallel with a single drive motor.
Ex: configuration "3 x A x B + 1" can power two sprays but with identical speeds on a shaft.*

Description	Mark	Ø int. (mm)	Reference
Flexible hose	C	6.4	Y1PACC447
		8	Y1PACC448



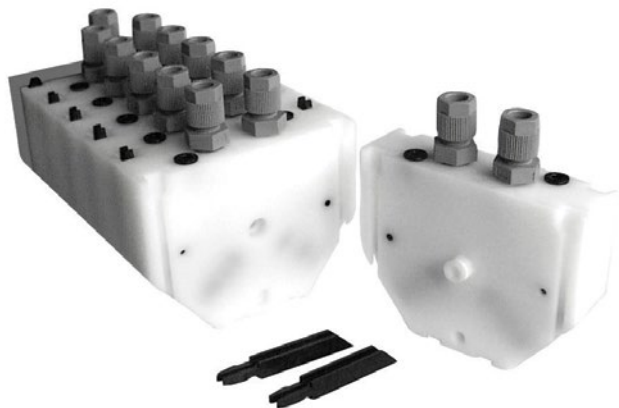
FITTED SUPPLY UNIT (WITHOUT VARIABLE SPEED DRIVE(S))

Description	Mark	Ø int. (mm)	Reference
CTH 301	720	6.4	1524174
	1000	8	1524175
CTH 302	720	6.4	1524177
	1000	8	1524178



Moduclean & Moduflow

Color management



MODUCLEAN and MODUFLOW are color-changer blocks, their compact and modular design allows adding several components (slices).

Each slice allows using two materials (paint or rinsing material) thanks to micro-valves.

The color-changer block is used similarly with all the automatic spraying equipment: PPH 308, TRP 500, NANOELL2, etc...

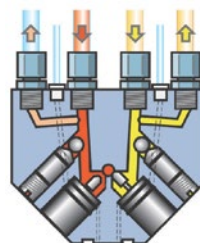
RANGE

There are two models of slices: the choice depends on the type of material: a constant circulation of the material avoids stagnation within the hosing; it is thus recommended using a slice equipped with material return.

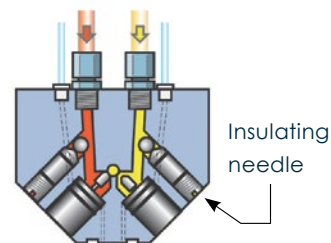
> Moduclean model

The Moduclean slice includes an insulating needle that allows cutting the material input upstream of the micro-valve. This latter can be then replaced without cleaning the paint circuit and without stopping the possible material circulation (in its version «with return circuit»).

The micro-valve that comprises the slice allows using any type of materials, either solvent or water based.



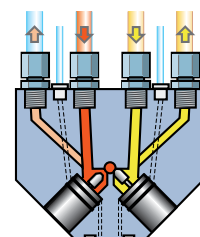
Slice with material return



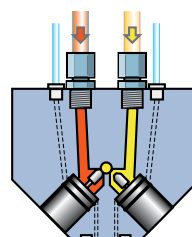
Slice without material return

> Moduflow model

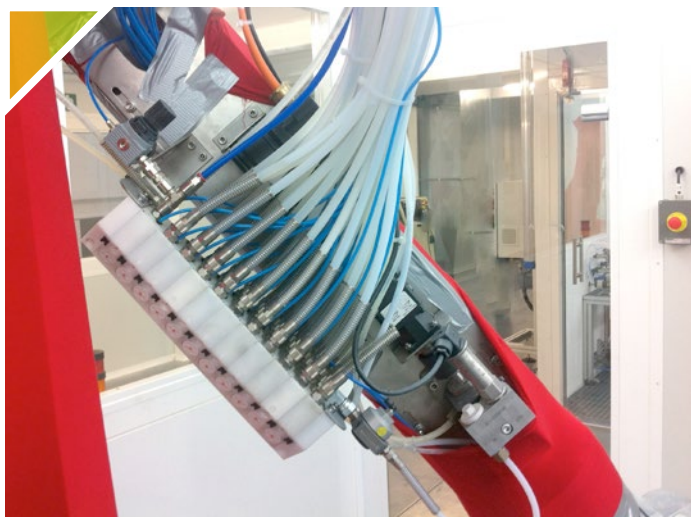
The Moduflow slice does not include any insulating needle.



Slice with material return



Slice without material return



Moduclean & Moduflow

CUSTOMERS' BENEFITS

Modular

► The slices are easily added up or removed thanks to snap-on bar (no tool required). Each slice ensures a perfect tightness of the material passage.

Simplified maintenance

► The micro-valve can quickly be changed without removing the MODUCLEAN block and without stopping the material circulation: no production stop.

Material saving

► The reduced length of the MODUCLEAN or MODUFLOW blocks allow optimized color-change time, minimized rinsing material consumption and paint losses.

TECHNICAL DATA

Dimension	Slice	End parts (inlet/outlet)
Length (mm)	28	20
Width (mm)	104	104
Height (mm)	80	80
Weight with fittings (g)	250	

Supplies	Slice / End parts (inlet/outlet)
Maxi. material pressure (bar)	10 (150 psi)
Maxi. back pressure (bar)	40 (600 psi)
Maxi. pilot pressure (bar)	8 (120 psi)
Pilot air	filtered, dehydrated, de-oiled
Response time (material trigger)	50 ms with 0.5m pilot hose ø 2.7x4 mm
Response time (material trigger)	300 ms with 15m pilot hose ø 2.7x4 mm
Viscosity, Ford cup #4 (seconds)	40

Example of use for 4 colors (diagram 1), the block includes:

2 slices (color from 1 to 4)

1 slice for rinsing (A = air / S = Solvent or Water)

1 inlet slice

1 outlet slice

The Moduclean block becomes modular in case of the addition of other colors.

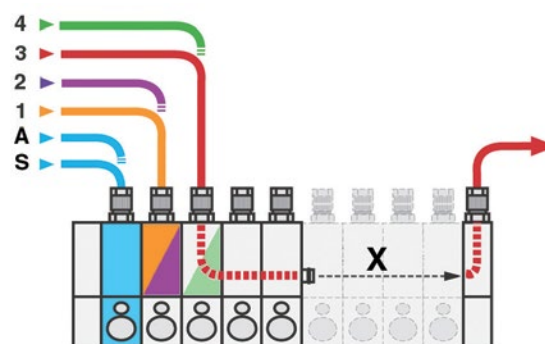


diagram 1

Moduclean & Moduflow

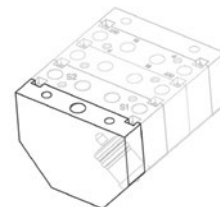
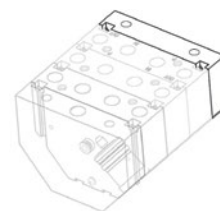
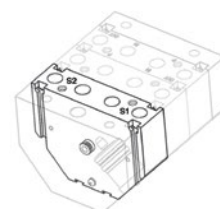
COLOR-CHANGER BLOCK

Description	Version	Type	Reference
MODUCLEAN slice	Europe	with return	1 514 627
		without return	1 514 628
MODUFLOW slice	Europe	with return	910013608
		without return	910013607
	US	with return	910005854
		without return	1 525 568

Description	Version	Reference
Inlet slice	Moduclean - Moduflow EU/US	1 519 870

Description	Version	Reference
Outlet slice - 1 outlet	Moduclean EU - Moduflow US	1 519 871
	Moduflow EU	1 523 588

The MODUCLEAN block unit is fixed at both ends by 4 screws



OPTIONAL BASE PLATE FOR FLOWMETER AND BALL REGULATOR CONNECTION

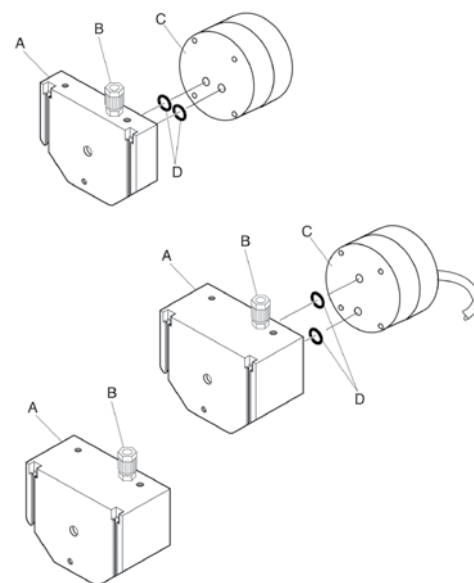
Description	Type	Version	Reference
Outlet base plate for flowmeter	Horizontal flowmeter connection	Moduclean	856 040
		Moduflow US	856 035

Description	Type	Version	Reference
Outlet base plate for flowmeter with integrated ball regulator	Vertical flowmeter connection	Moduclean	910 000 309

Description	Type	Version	Reference
Outlet base plate	Reversed regulator position	Moduclean	910 001 891
With integrated ball regulator		Moduclean	910 001 604

Caption

- A Adapter base plate, it is assembled instead of an outlet slice (1 519 871)
- B Material outlet, the material fitting is not included in the outlet base plate
- C Flowmeter, not included in base plate reference
- D O-rings included in the outlet base plate reference



Moduclean & Moduflow

FITTINGS

The material fittings are not provided with the MODUCLEAN / MODUFLOW slices as they can change from one system to another to match used fluid flow.

In the case of a slice with material return, the fittings are of same diameter.

MODUCLEAN - MODUFLOW

Description	Hose ø (mm)	stretch version (mm)	Reference
Rack 1/4 BSP Fitting	2.7 x 4	-	910007344
	3 x 6	-	910007345
	4 x 6	-	910007346
	5 x 8	-	910007347
	6 x 8	-	910007348
	7 x 10	-	910007349
	8 x 10	-	910007350
	9 x 12	-	910007351
	6 x 8	50	910008944
		90	910008948
	8 x 10	50	910008945
		70	910008949
		90	910008950
	9 x 12	50	910008946
		70	910008951

Fittings are sold by the piece

4 fittings for one return slice

2 fittings for one no-return slice

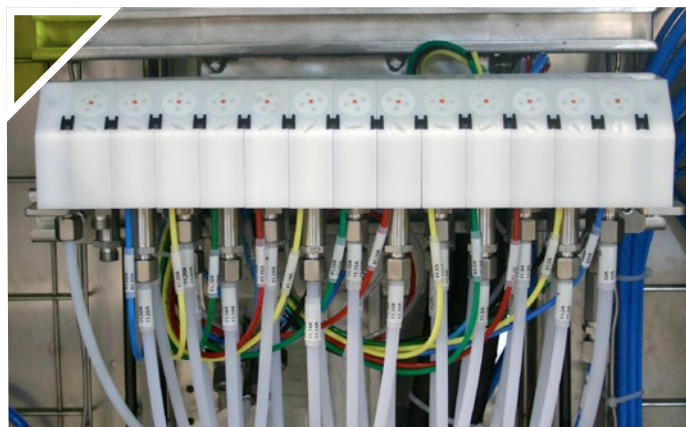
torque nut brass stainless steel fitting: 14nm

Description	Reference
check valve 1/4 BSP	910017145-V2

torque nut brass stainless steel fitting: 14nm



Please, contact SAMES for metallic fittings assembly instructions in accordance with ATEX regulation.



Moduclean & Moduflow

RINSING BLOCK

Description	Type	Reference
Equipped rinsing block	without EUROPE	return 857 723

This reference includes: 1 514 628 + 1 519 870 + 1 519 871, refer to § Color-changer block

MODUCLEAN COLOR-CHANGER BLOCK

The MODUCLEAN slices are of **without-material-return type**

Description	number of colors	Reference
Block without return	2	910001348
	4	910001349
	6	910001350
	more than 6	contact us

The material fittings are not included in the color-changer blocks.

The MODUCLEAN slices are of **material-return type**

Description	number of colors	Reference
Block with return	2	910001366
	4	910001367
	6	910001368
	more than 6	contact us

The material fittings are not included in the color-changer blocks.



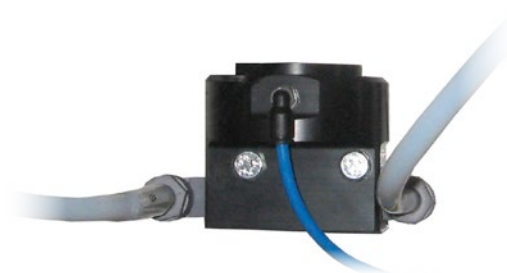
Regulator

The ball paint regulator comes in two versions:

> Ball regulator directly integrated within a special MODUCLEAN base plate.



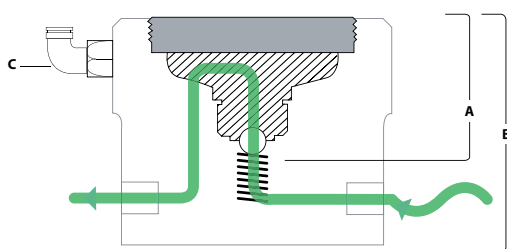
> Stand-alone ball regulator that is independently installed onto the paint circuit as closely as possible to the sprayer (recommended).



DESCRIPTION

The regulator allows **absorbing** the **variations** of paint pressure generated by the supply system (pulsation effect) and **adjusting** the target **flow** with accuracy.

For a given pilot air pressure of the regulator, the paint flow will also depend on the pressure drop downstream of the regulator (on sprayer side): hose diameter, size of the restrictor, sprayer injector and product viscosity.



INSULATED STANDALONE REGULATOR

Description	Mark	Version	Reference
Integrated ball regulator	A	Europe	1 514 104
		US	1 514 104
Complete insulated ball regulator ⁽¹⁾	B	Europe	1 526 677
Elbow union ⁽²⁾ (pilot air)	C	Europe	F6R LCS 304
		US	F6R PDQ 206

(1): Paint circuit connection type EU = 1/8 GAZ and US = 1/8 NPSM

(2): Only for insulated regulator (included with insulated regulator reference)

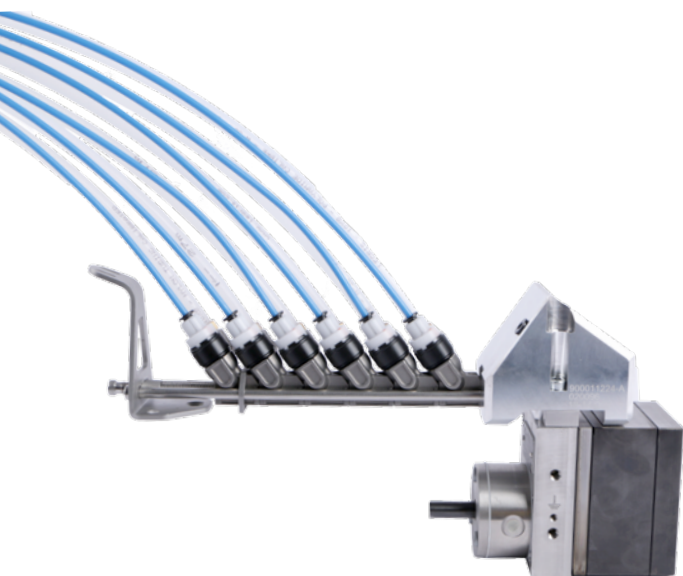
PAINT REGULATOR KIT

Paint	Hose	Atomizer	Reference
Solvent	Ø6 mm	TRP	Consult Sames
		PPH308	910015320
		NANOELL 2	Consult Sames
	Ø8 mm	TRP	910018411
		PPH308	910009591
		NANOELL 2	Consult Sames
Water-based	Ø10 mm	TRP	910018412
		PPH308	910009592
		NANOELL 2	Consult Sames

PAINT FLOW CONTROL

UPside CCV

Color change block



- > Lightweight design
- > Easy maintenance
- > Flexible assembly

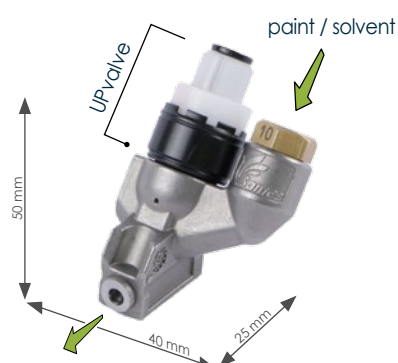
UPside CCV is the universal robotic color change block. The compact and modular design gives several solutions to integrate on robot arms.

Innovations are in every parts: stainless steel modules, **new UPvalve**, compact fittings, oriented hoses for easy integration, integrated regulator.



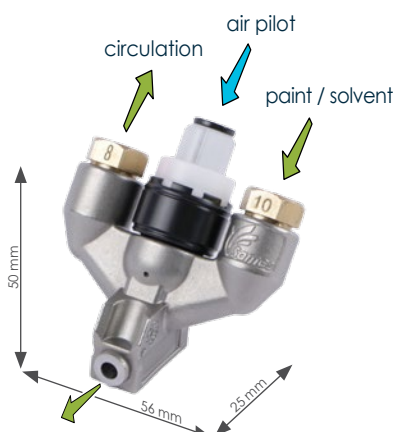
2 MODULES:

UPside CCV without return



Based on microvalve technology, UPvalve has its air pilot fitting included on its TOP.

UPside CCV with return



This module is more compact than market CCV.

FIELD OF APPLICATION

- Car body interiors
- Door cut-ins
- Rocker panels
- Penetration in hollow body (dead areas...)
- Any type of openings (ventilation louvers on bumpers...)
- Metallic base coat: 2nd base coat with Bell/Gun process
- Bumper

MATERIAL HANDLED

Every type of paint, primer, basecoat, clearcoat, 1K or 2K material, solventborne or waterborne

TECHNICAL DATA

Weight	
Upside CCV with return equipped with 1 valve & 2 ø8/10 fittings	101 g
Upside CCV without return equipped with 1 valve & 1 ø 8/10 fitting	78 g
Air pressure	
Valve pilot	6 bar (90 psi) - 10 bar (150 psi)
Paint	
Orifice diameter	ø 4 mm
Operating pressure	0 bar (0 psi) to 20 bar (3000 psi)
Viscosity solvented paints	20 to 50 seconds - FORD cup#4
Viscosity waterborne paints	200 mPa.s at 250s ⁻¹
Body material	Stainless Steel

Applicable Tubing

ØI.D x ØO.D.
3 x 6
4 x 6
5 x 8
6 x 8
7 x 10
8 x 10

For fractional dimension of hose, contact us

ATEX marking:

UP SIDE CCV:

CE II 2 G c T4

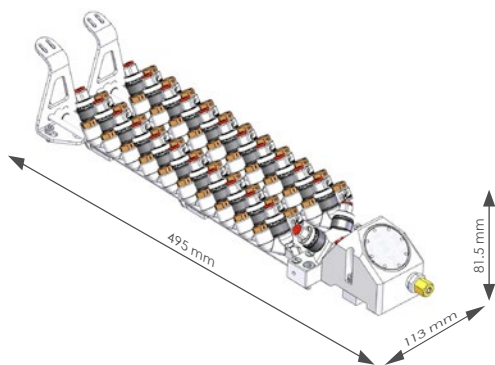
UPside CCV

Robotic design

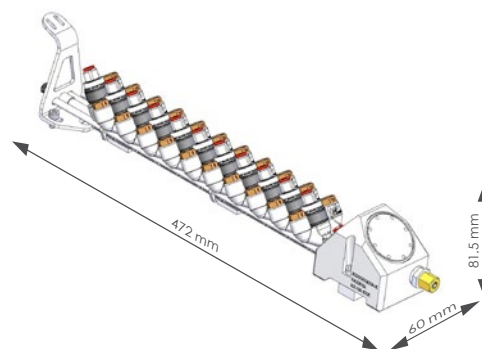
- Lightweight design:
78g per color including fitting (52% lighter)
- Compact size: 30% less volume
- Oriented fittings:
reduces space requirement
- Robust design:
metal-in-metal fittings and valve seats

Switch [24 COLORS]

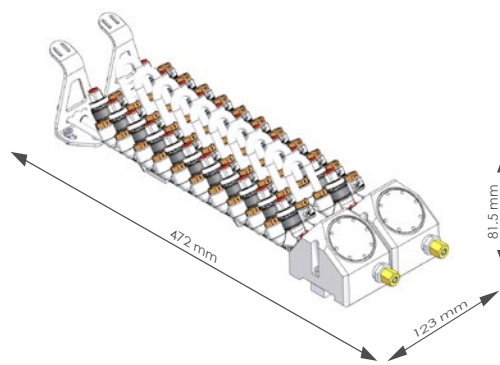
For low paint loss and compactness choose «SWITCH» module minimizing paint volume. Recommended if more than 12 colors.

**In line [12 COLORS]**

One line, each module equals one color

**Double circuit [12 COLORS]**

During painting with 1st circuit, the 2nd one prepares the next color for a very fast color change combined with PPH707 double circuit.

**COMPARISON**

	In Line	Switch	Double circuit
Compactness	+	+++	++
Lightweight	+++	++	++
Color change	+	++	+++

BUILD YOUR COLOR CHANGE BLOCK

To build your color change block, refer to the configurator file available at your SAMES contact.

Easy to use

- Plug & use modules, including fittings
- Direct access:
all fittings and valves located on one side
- Easy to clean CCV + Regulator + Pump:
low solvent consumption
- Dedicated tool kit

Flexibility

- One color = One module
- Adapts to every robot arm
- Included recirculation feature
- Remote or integrated regulator
- Backward or forward rinsing direction

Reverse Flush

Solution for optimization of the paint line rinsing system

Reverse Flush is a block that **allows dumping and rinsing** the material supply system without going through the sprayer.

Reverse Flush comes in 2 versions, remote and built-in; it can be installed within all the paint unit configurations: It will depend on the distance between the pump and the sprayer.

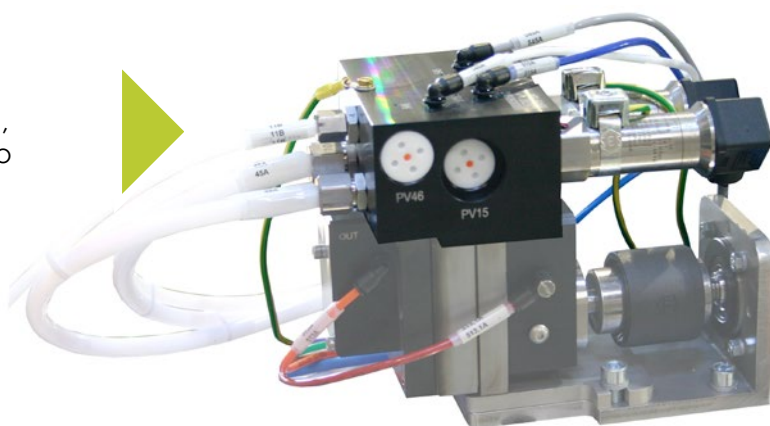
REMOTE REVERSE FLUSH BLOCK

When the pump is to be placed far away from the sprayer (distance $>$ to 1.5 m) as in the case of the « Slim Arm » on which no pump can be assembled, then the so-called "remote" reverse flush block is used and is ideally placed at a distance comprised between 1 to 1.5 m from the sprayer.

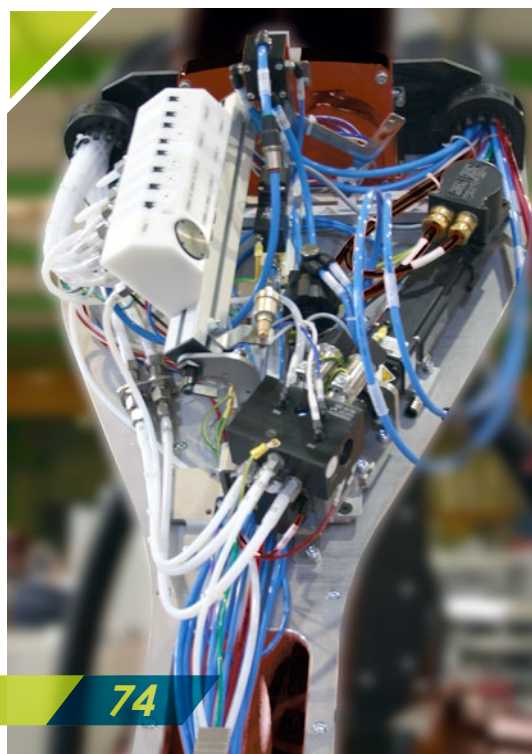


BUILT-IN REVERSE FLUSH BLOCK

When the pump is placed close to the sprayer (distance $<$ to 1.5 m) as in the case of the "Process Arm", then the reverse flush block is directly assembled onto the pump. The reverse flush block called "built-in" is used. This configuration is optimal with a simplified installation.



Process arm



- DECREASE OF RINSING TIME AND COLOR CHANGING TIME
- RINSING MATERIAL SAVING
- PAINT SAVING
- PRODUCTIVITY INCREASE
- UPDATING OF EXISTING INSTALLATION
- REDUCED BULK OF THE EQUIPMENT
- REINFORCED SAFETY

Reverse Flush

CUSTOMERS' BENEFITS

 High Performance

- ▶ The dump hose always remains clean and dry, thus high voltage return is not possible = reinforced safety
- ▶ The pump is kept apart from the material circuit, thus rinsing is easier and is carried out in masked time:
More over, pump and sprayer rinsing can be carried out independently = Cycle time decrease and solvent saving.
- ▶ The block is close to the sprayer thus allowing a smaller product hose diameter (Dia.: 4 mm instead of 5mm) = Paint saving.
- ▶ The pump priming with circuit 2 during the end of the spraying of circuit 1 becomes possible = Cycle time decrease and color change time decreased.
- ▶ When the paint circuit is equipped with long lengths of hosing, the block can be placed any where on the paint circuit to cut the circuit, thus allowing dissociating the rinsing of both parts = Optimization of rinsing times.

EXAMPLES OF INSTALLATIONS THAT HAVE BEEN ASSEMBLED:

The Reverse Flush block can be installed with any type of sprayer in internal charge version (solvent based paints) or external charge (water based paints), single or dual circuit, equipped with:

- a trigger valve and
- a dump valve

Ex: PPH 707-SB, PPH 707-MS-GUN, ...

1 Single circuit sprayer: pump placed at 1.5 m from sprayer => **Built-in Reverse Flush** block: The reverse flush allows decreasing the cycle time from 18 to 15 sec; i.e.: **16% saving on color change time.**

2 Single circuit sprayer: pump placed at 5 m from sprayer => **Remote Reverse Flush** block: The reverse flush allows decreasing the cycle time from 29 to 21 sec; i.e.: **27% saving on color change time.**

3 Double circuit sprayer: pump placed at 1.5 m from sprayer => **Built-in Reverse Flush** block: The reverse flush allows decreasing the cycle time from 14.5 to 5 sec; i.e. **62 % saving on color change time !**

4 Double circuit sprayer: pump placed at 5 m from sprayer => **Remote Reverse Flush** block: The reverse flush allows decreasing the cycle time from 26 to 7 sec; i.e.: **80 % saving on color change time !**

Note: These values depend on the characteristics of the installation (hose diameters, type of material...)

CHARACTERISTICS

Working pressure	Pressure
Rinsing material (bar)	5.5 (82,5psi) - 6 (90psi)
Rinsing air (bar)	5.5 (82,5psi) - 6 (90psi)
Material supply (bar)	5.5 (82,5psi) - 6 (90psi)

REFERENCES

Description	Version	Reference
Reverse Flush Block	Remote	910 007 340 ⁽¹⁾
	Built-in	910 007 773 ⁽²⁾

(1): The four fittings are included into the remote reverse flush block

(2): The four fittings are not included into the block reference:

Please, consult SAMES

CE  II 2 G c T6

Type: REVERSE FLUSH

Technical file: BLOC PV

HVP 500

Measuring device
High voltage probe



- EASY TO READ DISPLAY: 4 1/2" digit display
- PORTABLE: Protected by a foam lined aluminum case
- FACTORY CALIBRATED: HVP500 is calibrated to NIST standards



HVP500 is a precision high voltage probe designed to measure DC voltages up to 100 KV.

HVP500 consists of a removable probe containing high voltage resistors and a 4 1/2" digit display.

The probe resistors are very high resistance to minimize loading of the high voltage being measured. The removable probe screws into the hand held base and comes with 2 removable tips, including a ball and a cone. This portable hand held unit comes in a foam lined aluminum case that is lockable.



Description	Reference
HVP 500	220000326

TECHNICAL DATA

Description	Reference
Voltage	0 to ± 100 KV
Accuracy	$\pm 0.1\%$
Resistance	10 G ohm $\pm 5\%$
Stability	100 ppm/ $^{\circ}\text{C}$
Weight	1 lbs. 11 oz.

It has to be used only in NON EXplosive ATmospheres.

AP 1000

Measuring device
Resistivohmeter



This device is equipped with:

➤ A metallic box, an open cover, a control plate on which are displayed:

> A reading of the measure on 3 separate scales.

> The red, black or blue colour buttons allow choosing the measure scale adapted and corresponding to a resistivity bracket of the measured paint.

➤ A measuring probe, connected to the box thanks to a cable, able to resist to the usual solvents. When the device is not used, the probe is placed into a housing of the box.

USE

The AP 1000 resistivohmeter is specially designed to quickly measure with accuracy the resistivity of the paints and clears applied by electrostatics.

This process works with any paints provided that their thinner incorporated before use gives these paints certain qualities making their spraying easier. The resistivity factor is of major importance. This device is of precious help to the paint optimization laboratories, to sub-suppliers control departments or to users of paints applied by electrostatics.

Description	Reference
AP 1000	910 005 790

Resistivity measure contained between
0.5 MΩ.cm and 1000 MΩ.cm

Beware: The operator must take a paint sample and carry out the measures in a non NON EXPlosive ATmospheres.

Operators accessories

1 Coverall anti-static

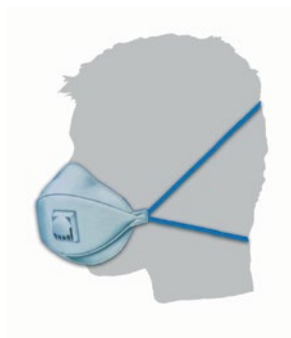
Size "S" to "XXL". Grey.
Extremely sturdy, recommended for liquid paint.
Contamination limited, reduced risk of electrostatic charge accumulation.



2 Hat, grey (one size)



4 Dust mask



Meets European standard EN-149-2001, class FFP2. Provides protection only from wearer from mechanically and thermally produced particulates.

May be used to protect against concentrations up to 10 times the Average Exposure Value (AEV), Belgium upper limit (VLB).

5 Anti-solvent mask



Complies with European standard EN 405:2001. Protection against most vapours/gases and particles such as:

- Inorganic vapours and acid gas, up to 1000 ppm or 10 x VME/VLB, taking the lowest of the 2.
- Particles up to 50 x VME/VLB

3 Coverboots (one size)

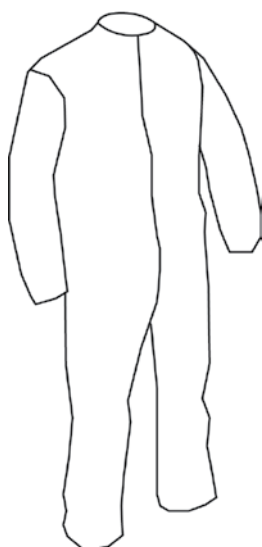
Operators accessories

6 **Gloves - Nitrile rubber (one size)**

Provide protection against numerous chemicals such as alcohols, aromatic and chlorinated solvents (within the provisions of the chemical resistance chart).
Meet the dispositions of European directive 89/686/CEE.

**7** **Light protection coverall (one size)**

Woven paper overall very sturdy. The use of overalls is recommended to protect against micro-particles, splashing and spray dust, depending on the degree of toxicity of the products and working conditions .
Complies with European standards EN 13982/1 and EN 13034.
Certified types 5 and 6.



N°	Reference
1	(S) W5GMAS059
	(M) W5GMAS060
	(L) W5GMAS061
	(XL) W5GMAS062
	(XXL) W5GMAS063
2	W5GMAS070
3	W5GMAS071 # (x10 qt)
4	W5GMAS018 (x10 qt)
5	W5GMAS035
6	W5GGAM039
7	W5GMAS024

N°1: Anti-static work-suit, size S, M, L, XL, XXL

Paint

Decoration and protection of metals are always linked.

For that purpose, all kinds of surface treatments exist (chrome or nickel plating, aluminum coating, etc.), and other coatings. In this particular area, paints fill in a large percentage.

Paints are universally utilized, and can be applied to just about everything: wood, metal, stone, leather, plastics, elastomers...

Paints are not a finished product, and the quality of the application will be depending on all the steps of its implementation, generally known as "the painting system".

The steps are :

- ▶ surface preparation (pre-treatment)
- ▶ spraying of the materials (varnishes, tints, paints...),
- ▶ curing

Whatever kind of parts is being sprayed.

For your information, we will review here the basics of each of those steps.

SURFACES PREPARATION (PRE-TREATMENT)

There is a whole range of treatments, mechanical or chemical that any surface must be subjected to, prior to the application of the first layer of paint, tint or varnish.

An appropriate surface treatment is the essential premise for a good protection and the final visual aspect of the finished part. Surface treatment is often the most extensive, and the most expensive area of a painting system.

Material	Physical preparation	Chemical
Steel:	Sanding, Blasting	Brushing acid
Aluminum:	Brushing	Vapor blast
Wood:	Sanding	
Plastic:	Flame	Plasma torch

Once treated, the surfaces must be:

- ▶ Free of powdered or non adherent residues,
- ▶ Free of oil, grease, humidity

To get a very good anti-corrosion protection, mostly on metals, one sprays:

- ▶ either a primer, or a filler
- ▶ or an anti-corrosion paint

A primer is a liquid material at approximately 16 s, CA4 (or Ford #4 cup), which is sprayed as a thin film, designed to penetrate the unevenness of the metal's surface.

The phosphoric acid in the primer, attacks the metal surface, resulting in an isolating and inert phosphate.

Primers are appreciated for their very good adhesion to metals.

They MUST be coated with paint, which will eventually shield them.

An anti-corrosion paint is applied in thicker films than primers.

As they contain corrosion inhibitors, they protect metals chemically and mechanically.

They save time, as one applies in one pass the corrosion inhibitor and the mechanical protection. These materials are often used for infrastructures and metallic carpentry, as they offer the choice of being left as is, or of being covered with a film of colored finish.



16s CA4

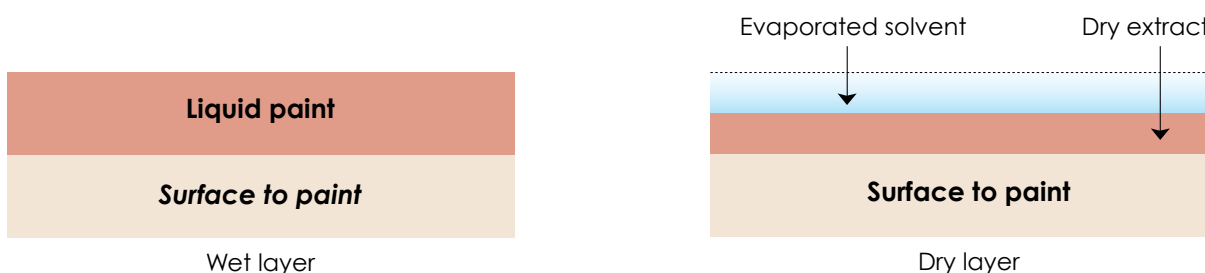


40s CA4

Paint

As we all noticed from finished parts, paint is a hard coating. However, we spray a liquid. This change of nature is caused for the most part by elements present in the material, whose function is described below.

The composing elements of paints:



All paints are generally made of several components diluted in solvent (which may be water), which will eventually go back to solid after they dry out on the painted surface:

- ▶ binding materials
- ▶ pigments
- ▶ additives

The binding materials are generally more or less transparent, like a resin. When diluted alone in solvent, it becomes a varnish:

Binding material + solvent = varnish

The paint is often given the name of the type of binding material it is made from; for example, cellulosic paints use cellulose as a binding material. To make the film opaque one adds very fine powders high in color called pigments.

Binding material + solvent + pigment = paint

At last, to give the film particular characteristics (mechanical resistance, for example) quite a few charges and additives are added to the above mixture.

Solvents dissolve the other components of the paint:

- ▶ Light solvents: evaporate quite quickly, so much so that the paint drops may dry before they reach the part, and not overlap correctly. They are never used alone, but combined with others.
- ▶ Heavy solvents: evaporate rather slowly, allowing the paint to spread well as it hits the surface of the part. They provide the smooth and slick aspect of the film. They are usually added in measured quantities to the light solvents, as they extend the drying time.
- ▶ There are medium solvents: they evaporate in a few seconds, allowing the droplets to mix on the surface, and drying quickly enough.

In the manufacture of its paint, the paint manufacturer first considers the list of solvents which will be able to dissolve the binding materials he wants to use, and then picks up the ones whose volatility matches the type of drying method requested (air, oven). Just before the use, the operator may add a thinner to his paint, to give it the fluidity (viscosity) required for his spraying operation.

Paint

PAINT CONSISTENCY

Viscosity

This physical dimension characterizes the capability of a fluid to flow under pressure.

All materials are more or less viscous (including solid metals). To make it easier to understand: water is almost not viscous, oil is much more, and mayo even more. To characterize this, physicians use a unit called the Poise: in fact as it is rather a large measurement, they routinely use one hundredth of the Poise, called Centipoise.

To precisely measure the viscosity of a fluid takes a lot of time and heavy expensive equipment. In our industry, we always use consistency cups. They are little pre-sized funnels, with a calibrated hole. One fills up the cup of liquid paint and measures the time needed to empty it, which is why we speak of a paint at 20s, or 40s, or 70s.

To mix it up a little further, there are various consistency cups, of different sizes and with different calibrated holes. The most used ones in Europe are the AFNOR #4 (CA4) and the Ford #4 (CF4), which both have a 4mm calibrated hole. The chart below shows correspondence between various cups, and the matching viscosity in centipoises.

AFNOR 4 (CA4)	ISO 4	mPas.s	Centipoises	Ford 4 (CF4)	DIN 4 (D°)	LCH (Fr)	ZAHN (n°2)
12	-	20	20	10	11	6	18
14	17	25	25	12	12	7	19
16	23	30	30	14	14	-	20
20	34	40	40	18	16	8	22
25	51	50	50	22	20	9	24
29	60	60	60	25	23	10	27
32	68	70	70	28	25	-	30
34	74	80	80	30	26	11	34
37	82	90	90	33	28	12	37
40	93	100	100	35	30	13	41
45	-	120	120	40	34	14	49
50	-	140	140	44	38	15	58
56	-	160	160	50	42	16	66
61	-	180	180	54	45	17	74
66	-	200	200	58	49	18	82
70	-	220	220	62	52	19	-

Nota: 1 poise = 100 centipoises and 1 mPas.s = 1 centipoise (If the density of the paint is equal as 1 and if it is a fluid Newtonien, that is to say no thixotrope).

Temperature and viscosity

The table below shows the changes in viscosity of a glycerophthalic paint as the temperature varies.

Viscosity of paint changes with variations in temperatures (a paint of 40s CF4 at 10°C will have a viscosity of 20s at 30°C), this often explain the concerns of application depending on the geography of a country.

	Temperatures (°C)																			
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
V I S C O S I T Y i n s e c o n d s C F # 4	27	26	24	23	22	21	21	20	19	18	18	17	17	16	15	15	14	14	14	14
	33	31	29	27	26	25	23	22	21	20	19	18	18	17	16	16	15	15	14	14
	39	36	34	32	30	28	26	24	23	22	21	20	19	18	17	17	16	15	15	14
	46	42	39	36	34	31	29	27	26	24	23	22	21	19	18	17	17	16	15	15
	54	49	45	41	38	35	32	30	28	26	24	23	21	20	19	18	17	17	16	15
	56	51	47	43	40	36	33	31	29	27	25	23	21	20	20	19	18	17	16	16
	61	55	50	46	42	38	35	32	30	28	26	24	22	21	20	19	18	17	16	16
	69	63	56	52	46	42	39	35	32	30	28	25	24	23	21	20	19	18	17	16
	77	69	62	55	50	46	41	38	35	32	29	27	25	24	22	21	19	18	17	16
	84	74	67	61	54	50	44	40	36	34	30	28	26	25	23	22	20	18	17	16
	95	84	75	66	60	54	48	44	40	36	33	30	28	26	24	22	20	19	18	17
	104	92	81	73	65	58	52	46	42	38	35	31	29	27	24	23	21	20	19	18
	112	100	88	76	69	62	54	49	44	40	36	32	30	27	25	23	21	20	19	18
	122	108	90	85	75	66	59	53	47	42	38	35	31	28	26	24	22	21	19	18
	132	120	102	90	80	70	63	55	50	44	40	36	33	30	27	25	23	22	20	18
	142	124	108	95	84	74	65	58	52	46	41	37	34	31	27	25	23	22	20	18
	152	132	119	101	90	80	69	61	54	48	43	38	35	31	28	26	24	23	21	18
	164	140	123	106	94	83	73	64	56	50	45	40	36	32	29	27	24	23	21	18

Paint

Temperature and viscosity

Example: At 20°C, a paint with a required 22s viscosity, may reach:

- at 12°C, 28s
- at 32°C, 17s

Significant differences in flow and quality will occur during the day:

	Temperatures (°C)	Viscosity - CF#4 (seconds)	Flows (cm ³ /mm)
Morning, cool shop	15	23	460
Mid day, warm shop	20	20	520
Oven on	25	17	560

In this instance, the paint warmed up by 10°C (50 F), changing the viscosity from its original 23s to 17s, and raising the flow at the gun by 22 %, resulting in sags and runs.

Even worse, a paint prepared at 20s in a warm atmosphere (20C), may reach 28s the next morning, before the temperature rises: the sprayed film will be coarser, and will take longer to dry.

Advice:

Keep temperatures as close to 20C (70 F) as possible: that's the temperature of choice given by the paint manufacturer for most applications. If the paints are stocked in a non conditioned room, take to the spray booth the cans that are going to be used the next day at least 12 hours ahead of time. To ensure a constant quality of paint all year long, it is well advised to install a paint-heater on-line, delivering a constant, say 25°C (77 F), to the applicator, regardless of the outside or ambient temperature, and you will eliminate the viscosity variations due to temperature. Warning ! With multi-components materials, the pot-life is dramatically reduced when their temperature is raised. The paint manufacturer must be advising you on such an installation.

Drying paint

All paints breakdown into 2 types of compound:

- The dry content
- The VOC'S, or water for water soluble paints.

To cure a paint, means evaporating the volatile compounds first, and then hardening the solid ones.

One distinguishes drying from hardening.

Drying describes the formation of a dry film by only removing the volatile compounds. This happens in 2 stages: during spraying and in the film itself.

Accounting for such variables as temperature, droplets size, type of applicator, target distance, viscosity, the paint will reach the target in various stages of wetness (or dryness).

Which means that most of the solvent evaporated before the drop reached the target. The drying of the wet film is sped up when the part is circulated in a well ventilated, dry and dust-free room.

Paint

Paint resistivity

Resistivity describes the capability of a material to oppose the passage of electricity.

In a paint line, the lower the resistivity of a paint ($< 10 \text{ M } \Omega \cdot \text{cm}$), the higher the amp-draw from the HV generator (UHT), and vice versa.

How does resistivity affect a paint system ?

It will have 2 influences:

► On the electrical consumption of the paint and solvent circuits (and then the configuration of the system).
This is a concern of those direct charge systems, with grounded paint circuits, and their amp-draw readings between the HV (injector, bell-cup) and the first grounded part (fitting, flow-meter, pressure pot, Q/D).

► On the charge of the paint droplet (and the application properly speaking):
The lower the resistivity, the better the charge.
The higher the charge, the better the electrostatic field, the higher the transfer efficiency.
However, the drawbacks of electrostatics are going to be also higher; overloaded edges, light coverage inside cavities.

Also, the lower the resistivity, the higher the backspray and applicator soiling: aircaps, and bell body.

What is the best resistivity window ?

We measure it with a meter called the 'AP 1000 resistivohmeter'.

All values indicated by Sames are taken with this particular piece of equipment. Sames insists that the meter only gives an indication, not a precise measurement. Though no rule may be firmly established, (the level of charge brings forth the notion of time), Sames feels that paint with a resistivity just under $500 \text{ M } \Omega \cdot \text{cm}$ will generate a low electrostatic efficiency, particularly if the HV is also low (20/30KV).

On the contrary, low resistivity paint ($< 10 \text{ M } \Omega \cdot \text{cm}$) will generate a fast soiling of the equipment, overloads and thin areas, albeit providing generally high transfer efficiency.

Too low resistivity material in the paint line, will result in too much amp-draw for the available current provided by and depending on the UHT.

The risk is, not to be able to spray correctly, with recurrent over-current faults.

When on the edge with some materials, it is mandatory to test them to validate a system design.



Warning: When measuring resistivity from a metal based paint, the reading is that of the resin and solvent. For electrostatic spraying, the type and quality of the coating of the metal flakes (aluminum), is all important for the non-shorting of the paint line to ground.

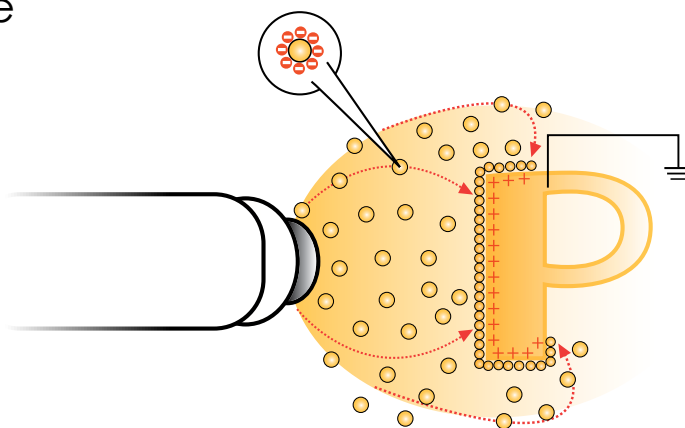
Up to a set up value, the paint line may consume microamps in relation to the material.

Should that value be reached, the power supply (GNM) faults into disjunction, or by current limitation, resulting in a very low high voltage, or no high voltage at all.

Electrostatic spraying

Atomization by electric charge

> When spraying, the droplets atomized by the nozzle of the gun are electrically charged by the current provided by the UHT, and conveyed into the electrostatic field; 85kv for a handgun, and 70 to 100 kV for an automatic atomizer. In the electrostatic field established between the gun and the grounded part travel the paint particles, which are deposited uniformly on all faces of the part, providing the highest transfer efficiency.



Schema: wraparound effect

Conduction (contact) charge: bells

> Conduction charge is only efficient for paints of low resistivities ($< 500 \text{ M}\Omega\cdot\text{cm}$).

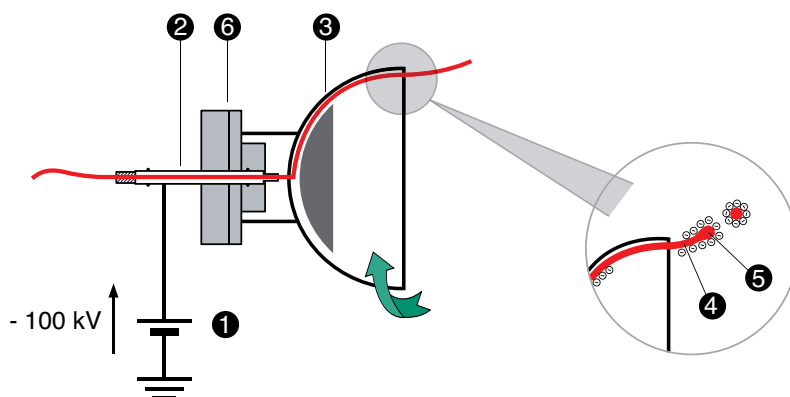
The bell-cup or disc are under high voltage (-100 kV), and are the actual electrodes of the applicator.

The stream of paint out of the injector, hits the disc or cup, and gets its electric charge from it. The surface of the paint becomes equipotential, that is the charges are spread equally well on the surface of the film of paint.

Paint threads are formed by the electric field, and by the superficial tension of the fluid, and break into droplets, at the first instability. Electric charges remain on the surface of the drop.



High speed bell, RPM 5,000 to 45,000 RPM, loaded



1: High voltage generator
2: injector
3: bell cup

4: paint
5: droplet
6: turbine

Determination of application settings

TRP sprayer

Setting of the air round spray is easier than fan spray.

1/ Assistance in setting air round spray:

The round jet nozzle is used when one wishes to obtain a maximum electrostatic recovery on medium or small parts (tubes, grids, rings, etc...).

The two air streams are dependent because they converge at the air cap and allow for some adjustment of atomization alone or in combination:

- ▶ Returns only direct air = small paint particle atomization with a maximum penetration
- ▶ Swirling air alone = gives large paint particle atomization with maximum enveloping paint application
- ▶ Combination of airs = can get all the diameters of impact between the intermediate diameter max. (Directional air alone) and the diameter min. (Swirling air only)

Search results		Direct air alone	Swirling air only	Direct air + swirling air
Impact size	Wraparound effect	AA	FA	AA + FA
Small	Small	✓		
Medium	Medium			✓
Large	Strong		✓	

2/ Assistance in setting air fan spray:

2-1/ The fan spray is used when one wishes to obtain a high quality appearance (brightness, tense) on medium or large parts and flat parts as well as cavity for maximum penetration.

The two air streams are dependent because they converge at the air cap and allow for precise atomization and versatility with this combination:

- ▶ Air center = gives thinness of spraying and pushes the mist at the nozzle
- ▶ Air horn = adjusts the length of fan pattern

2-2/ A successful application, with, good coverage and thickness uniformity which requires best settings of pneumatic-electrostatic sprayer.

For this, it is important to define the application process, and in particular:

- ▶ Paint flow (this is expressed in cm³ / min or more known cc / min)
- ▶ Fan pattern length
- ▶ Scanning speed of the robot

Determination of application settings

2-3/ Usually the fixed parameters are:

- Chain speed is given respect to the process line (timing) = **Vc**
- Height scan is equal to the height of the parts to paint, to which we add about 150 mm top and bottom (reversal points of the robot outside the area to be painted) = **H**
- The thick file that is fixed by the client's requirements and / or supplier = **Ed**

Warning: It is imperative to respect the spraying distance allowed based on the voltage. These distances are shown in the equipment manuals.

2-4/ The setup of the gun can then be divided into three stages:

- 2-4-1/** Calculation of paint flow theory
- 2-4-2/** Shape and length of impact
- 2-4-2/** Calculating the speed of scanning

2-4-1/ Calculation of theoretical flow of paint from a gun:

$$D = \frac{(100 \times H \times Vc \times Ed)}{(R \times ES)}$$

H: height of scanning robot in cm (fixed parameter)

Vc: chain speed in m / min (fixed parameter)

Ed: thickness to deposit in microns (fixed parameter)

R: atomizer performance in% (1)

Es: dry product to be applied (provided by the manufacturer of paint)

(1): The return of a TRP 500 in an optimal configuration is 55%, that of a TRP 700 ESLP in same conditions is 65%.

2-4-2/ Shape and length of fan pattern:

By equipping the TRP500 with a pressure indicating air cap (See § «Accessories» - page 78), it is possible to adjust the air spray (AA and AF).

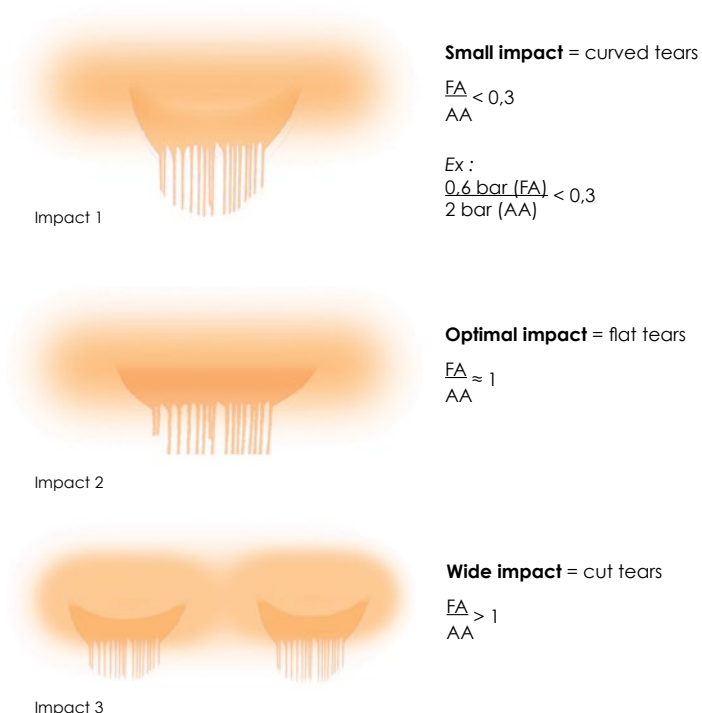
After setting these pressures, the fan pattern can be sprayed on to a sheet of aluminum foil with TRP500 equipped with its standard insulating cap. This is done by spraying a short term (1 to 3 sec.) and fixed at an equivalent distance to the distance of the work on line.

The paint fan pattern thus produced will provide paint drips to visualize the shape of the jet.

Measuring the pattern is assessed as follows (see impact 1-2-3):

- The appearance of impact (a form of streaks)
- The length of pattern
- The fine spray
- Uniformity of fan pattern (symmetry of impact)

A fan pattern well adjusted to cover your painted component will ensure the best wrap effect.



Determination of application settings

2-4-3/ Calculating the scan rate (Vb) to obtain an optimal recovery and a perfect thickness uniformity:

Scanning speed of the robot $V_b = V_c \times (2 \times \frac{H}{L_i})$

Vc: chain speed in m / min (fixed parameter)

H: height scanning robot in cm (fixed parameter)

Li: impact length in cm

Thus, each point on the surface to be painted is covered twice : the impact of length "**Li**" is equal to the scanning pitch of the robot (**P**). See Figure 4.

Depending on system configuration, it is possible to cover the same area (area of the room) four times, six times or n times (n being an even number).

Ex: a length smaller impact ($L_i / 2 = V_b \times 2$) gives a faster scan and therefore more passes before the work part.

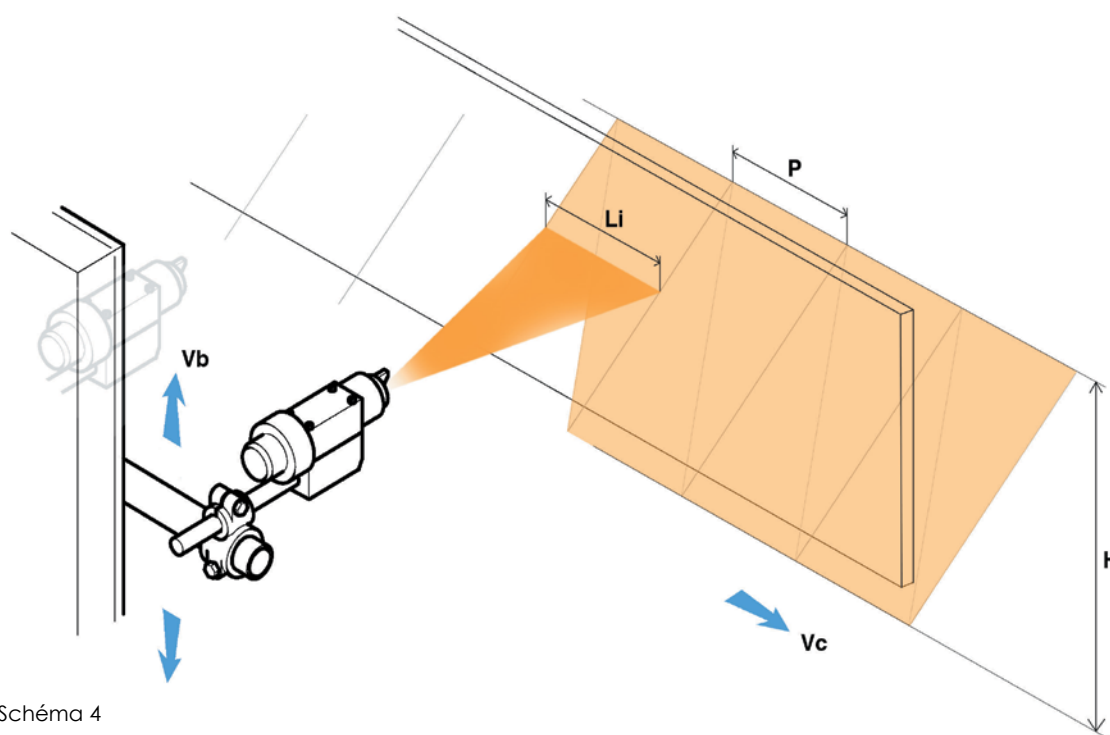


Schéma 4

We can easily set one TRP 500 sprayer to, good coverage and perfect consistency of thickness.

NB: if the scanning speed of the machine is a fixed parameter, then it is possible with the previous formula, to find the length of the ideal theoretical jet (it only remains to adjust the air for the spray calculated length).

Determination of application settings

PPH sprayer

This paragraph describes the setting up of a rotating bell painting application. The following advice is not exhaustive: it is often necessary to perform laboratory tests to determine the precise parameters corresponding to the process line.

To define application settings, you must first

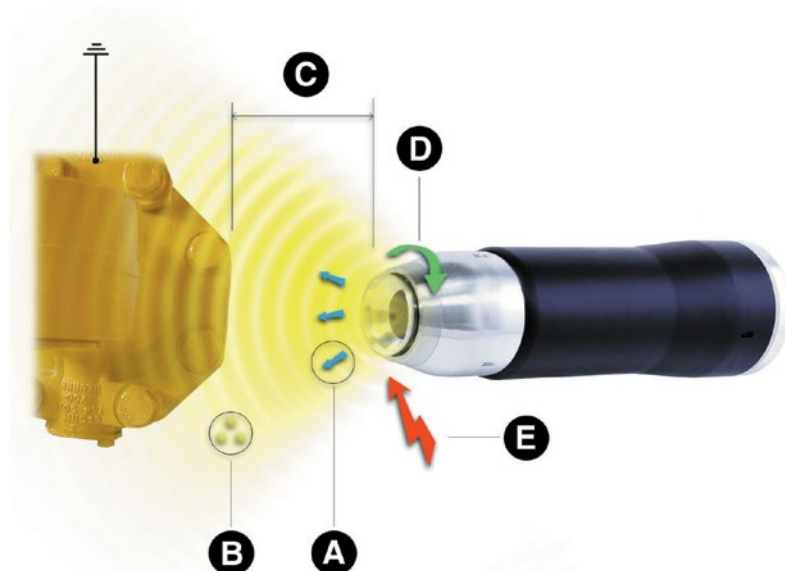
- ▶ Define areas to be painted automatically.
- ▶ Identify the need (or not) pre-keys or manual retouching
- ▶ Define the layers of paint to be deposited and the minimum and maximum tolerances
- ▶ Know the speed of the conveyor
- ▶ Obtain at least the 4 following characteristics:
(If the product painting technique)

- > Solids
- > Viscosity
- > Limit bites
- > Sag Limit

(Check periodically the viscosity of the product because it can cause changes on the outcome of application)

Obtain the vertical velocity of air in the spray booth. This value usually ranges between 0.3 and 0.5 m/s.

The main parameters to adjust the application are:



A) Spraying air (air cup)

B) Paint flow

C) Application distance

D) Rotating speed of the bell

E) The value of high voltage

THE MAIN PARAMETERS TO ADJUST THE APPLICATION ARE:

1/ The air spray (air skirt)

The air skirt adjusts the size of the fan pattern. The higher the value of the air skirt, results in a narrow and penetrating fan pattern, conversely, a very low air skirt gives a broad fan pattern.

- The desired fan pattern will depend on the surface to be painted, it must allow a homogeneous collection of it and minimize overspray in the booth. Too much air and dirt skirt = fog ⁽¹⁾

- Too little air skirt = hollow center of fan pattern⁽¹⁾
- - For the purposes of flat piece = lower air skirt
- For the application of complex component (entry) = increase air skirt

(1): Phenomenon sensitive to high volume of paint

2/ The paint flow

The paint flow is the parameter that yields the thickness dry film.

Where no test would have been done in the laboratory, and you do not have precise data: you can then use the formula. Theoretical following as a starting point.

Flow paint sprayer

$$D = \frac{(100 \times H \times Vc \times Ed)}{(R \times ES)}$$

The flow will depend on several factors:

H: height scanning robot in cm (fixed parameter, this corresponds to the height of the part to which is added about half the width of impact. These are the high points and low points of the conversion part)

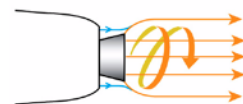
Vc: line speed in m / min (fixed parameter)

Ed: thickness to deposit, in microns (fixed parameter, microns)

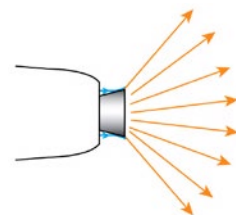
R: thickness to deposit, in microns (fixed parameter, microns) %⁽²⁾

Es: dry product to be applied (provided by the paint manufacturer)

(2): The return of a PPH 308 in an optimal configuration is 90%.



The outer cup incorporates Vortex air outlet holes inclined to the passage of air. This cup is recommended in most configurations thanks to the versatility of the settings. It encourages the transfer efficiency and the electrostatic wraparound effect.



The outer cup incorporates Straight air outlet holes for the passage of air. This cup is recommended when looking for a better penetration into the work part, particularly with a large flow (> 500 cc / min).

Determination of application settings

PPH sprayer

3/ Distance of spraying

The spraying distance is an important parameter that affects the evaporation of solvents in the process of spraying and therefore the tension of the film.

Quick evaporation tends to reduce this tension. Product formulation, including the balance of light and heavy solvents must be adjusted to achieve an optimum.

Heavy solvents help keep a paint film wet longer, but it may increase the risk of running.

Too much light solvent can cause a dry powdery application.

It is therefore possible to adjust the spray distance to influence the evaporation of solvents. However it is advisable to adjust the dilution of products for application in rotating bell.

Distance is often recommended application of the order of 250 mm.

The minimum acceptable distance is 150 mm to 70kV and a maximum of 350 mm:

- ▶ Below 150 mm, it will meet with problems of paint impact, and recovery of defects.

Caution is vital to respect the spray distance allowed based on the voltage.

These distances are shown in the equipment manuals.

- ▶ Above 350 mm, we begin to experience problems in dirt (over spray) and decreased deposition efficiency.

4/ Rotation speed of the bell (Range #3)

The speed of rotation will help determine the size of paint particles.

The higher the speed, the particles are fine and vice versa.

The speed required is very dependent on the product formulation.

The speed used as the starting value =

30 to 35 000 tr/min for solvents

35 to 40 000 tr/min for water-based materials

These values correspond to average flows (300 cc / min). For small flow rates or lower viscosities, it will decrease the speed and sometimes it will fall to values below 30 000 tr/min.

The key aspects due to:

- Turning too fast
 - ▶ Spraying too dry
 - ▶ Matt finish, decrease the brightness
 - ▶ Low deposition efficiency
- A rotation too slow
 - ▶ Less good homogeneity in particle size
 - ▶ Worse controlling the fan pattern of the skirt
 - ▶ Appearance orange peel
 - ▶ Worst tense
 - ▶ Tears

Determination of application settings

PPH sprayer

5/ Value of the high voltage

The high voltage increases the transfer efficiency. Indeed, the charged paint particles are attracted by the part connected to ground.

The value of the high voltage will depend on the resistivity of the material being applied.

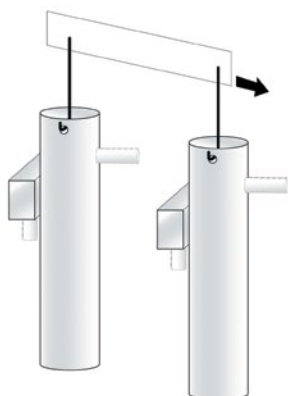
The higher the resistivity, the lower the value of the high voltage.

Typical values are:

- for products containing solvents (resistivity of 1 to 500 M Ω .cm):
 - ▶ Internal charge = 80 kV
 - ▶ To the metallic base, a circuit «Coil» is built into the sprayer PPH 308 and allows the use of high voltage to 80 kV.
- For water-based materials (resistivity of the order of several k Ω .cm):
 - ▶ Internal charge = 60 kV
 - ▶ External charge = 70 kV
- requirement for penetration into the part = decrease of the high voltage
- an application for a single part (flat) = increase in high voltage
- to reduce the paint flow = increase of the high voltage

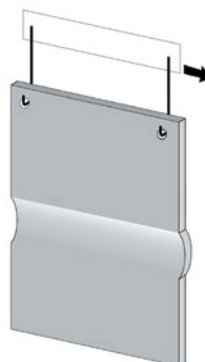
Example 1:

- Spray:
 - Flow = 200 cc / min
 - HV = 50 kV
 - Air cup = 300 L / min
 - Type of bell = $\varnothing$ 65 mm or 70
 - Distance = 200 mm application
 - Speed = 25 000 rpm
- Data:
 - Solvent-based product
 - Product solids = 30%
 - Desired thickness = 50 microns
 - Conveyor speed = 3 m/min.



Example 2:

- Spray:
 - Flow = 120 cc / min
 - HV = 90 kV
 - Air cup = 150 L / min
 - Type of bell = $\varnothing$ 60 mm or 65
 - Distance = 250 mm application
 - Speed = 35 000 rpm
- Data:
 - Solvent-based product
 - Product solids = 30%
 - Desired thickness = 50 microns
 - Conveyor speed = 3 m/min.





A large rectangular area filled with a fine grid pattern, intended for handwritten notes or calculations.

HIGHLIGHT YOUR DIFFERENCE



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