SELECTION GUIDE

ELECTROSTATIC
LIQUID FINISHING SOLUTIONS

Sames

*The **finishing** experts*

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In order to permit you to increase your productivity and your competitiveness, Sames Technologies is dedicated to excellence every day in terms of reliability and innovation. We constantly improve our performances and the quality of your processes to satisfy your requirements. Resulting in the development of reliable technologies, guaranteeing a quick return on investment (ROI).

You will discover in this catalogue solutions responding to your needs in order to reach the application result you are looking for. We also help you in determining choices of equipment, which permits your installation to respond to VOC directives. We are always ready to answer your questions and to assist you in defining your painting process.

Good reading.

Table of contents

Products

A strong identity at your disposal

For several decades, Sames Technologies has acquired a vast knowledge and has built up a unique know-how in lots of different fields of activity.
Numerous installations in the fields of car manufacturing, tier 1&2 and in many other fields, are equipped with our electrostatic solutions.

This know-how is for you the guarantee that we are experience people, able to understand your needs and to speak the same language.
It is also the guarantee for you to work with technicians who are able to lead you towards the best technical alternative and to offer you a reliable solution regarding your application.

You surely can rely on our know-how to enable you to reach your efficiency goals in a durable manner. Sames will put itself on the line to find with you solutions to improve your competitiveness and to make your investments cost-effective.

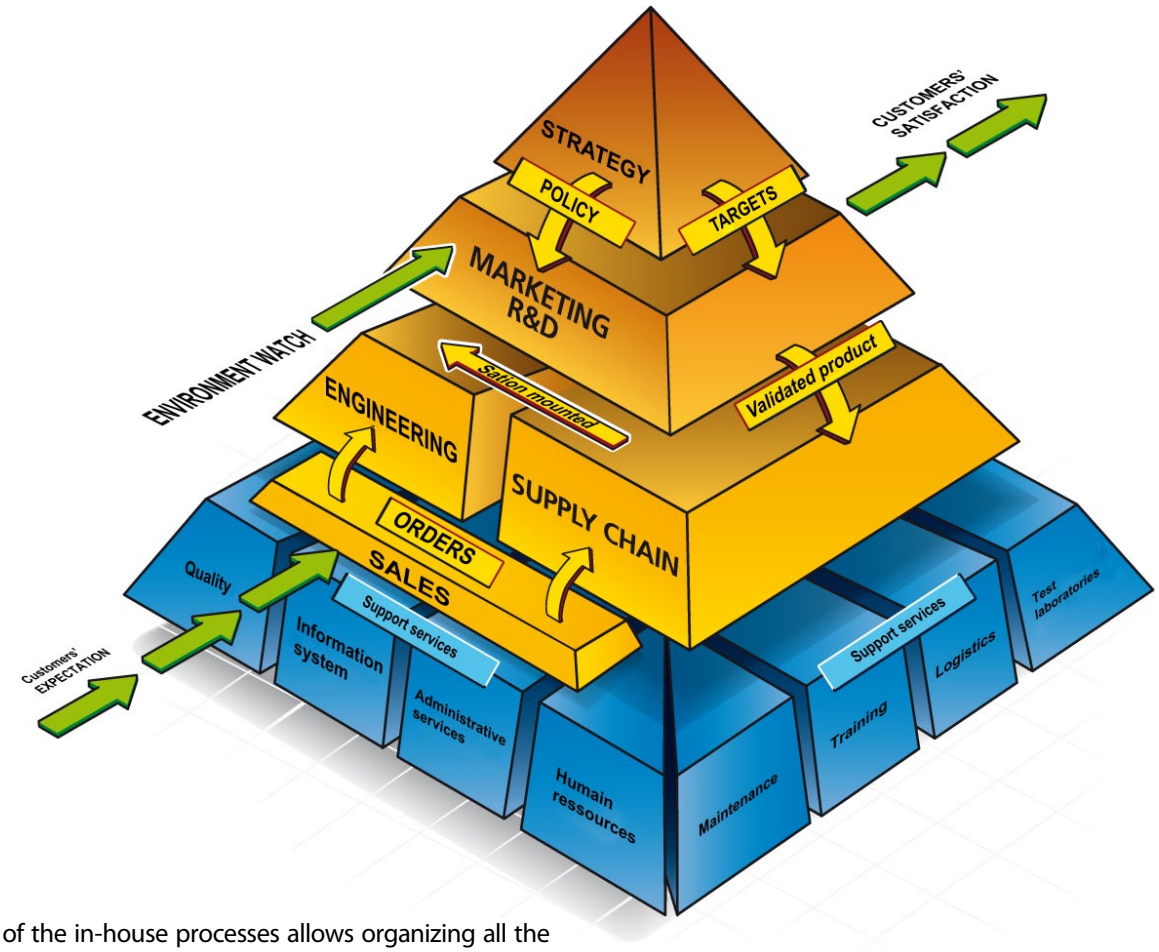
We work in cooperation with our customers on different markets all over the world and contribute to the improvement of their competitiveness. This approach mainly comes in the following points:

> Increase the productivity = to increase the rates of production by cutting down on products and reducing maintenance operations
> Requirements for a high quality application
> Control of the V.O.C. emissions
> Change from solvent to water based painting process
> Adaptability to the ever growing number of colors = fast color change with minimal paint losses
> 2-K Process
> High solid contents
> Unlimited number of colors

> 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 equipment is subjected to the following European directives:
- 94/9/CE Explosive atmospheres
- 2006/42/CE Machines
- 2006/95/CE Low voltage
- 2004/108/CE Electromagnetic compatibility
- 97/23/CE Pressurised equipment
- 2002/95/CE ROHS Limitation of dangerous substances
- 2002/96/CE WEEE Electronic and electrical equipment waste
- 1907/2006/CE REACH Registration, evaluation and authorisation of chemical substances



A pyramid of the in-house processes 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.

Sames strength is acquired through experience gained in the field of paint application process worldwide. We create partnerships with our customers, to rationalize the costs of finishing:

Assembly and validation platform prior shipment in MEYLAN – FRANCE

> Improvement of the transfer efficiency of the paint equipment

> Minimization of paint losses

> Optimization of paint processes

> Guarantee of a high reliability rate

> Liquid paint solutions

Water-borne paint supply, isolated of the ground potential, dedicated to electrostatic application with internal electrostatic charge.

Whichever your process may be, there is always a well-established 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 found to meet your needs; our range allowing equipping any type of installation.

> Customer service

Sames Technologies offers a complete range of services, adapted to all your needs:

advice, repair, maintenance or intervention by a qualified technician. Whichever your request may be, Sames Customer Service department, a team of 20 persons, is at your disposal to respond to your needs as soon as possible.

>>ASSISTANCE AND TECHNICAL SUPPORT

+33(0)4 76 41 60 01

In order to gain the most from your installation, (paint or powder), advice and expertise of specialists is essential. , Sames customer support will carry out a diagnostic survey of your installation, and will provide you with complete technical assistance for the improvement or the upgrade of your paint line

Services and technical assistance contracts:
> Technical assistance on site
> Preventive maintenance
> Retrofit
> Audit and optimization of the Process

>> REPAIR

+33(0)4 76 41 61 39

Regular maintenance by trained technicians or a retrofit of your equipment, is the best way to guaranty the correct running of your plant. To this end, 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 an upgrade

>> SPARE PARTS

+33(0)4 76 41 60 60

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

>> TRAINING

+33(0)4 76 41 61 60

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

We design training courses that are tailored to your requirements, allowing you to learn the requisite knowledge to use during the maintenance of your equipment, these are organized throughout the year.
A catalogue can be obtained upon request. You will then be 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 organized within your premises or in our training centre located in our headquarters in Meylan, France.

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, elastomeres…
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 penetrated 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

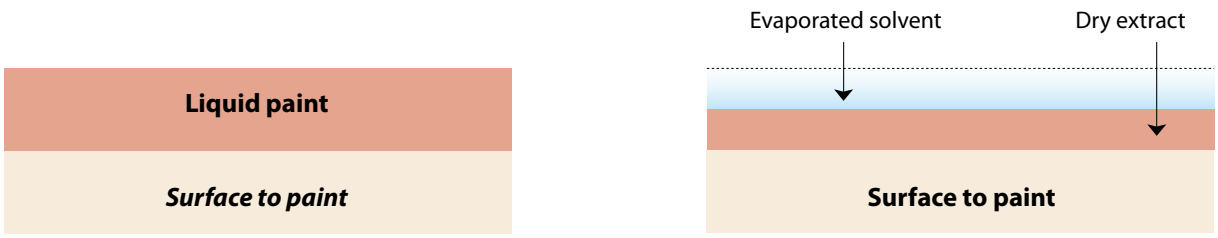

40s CA4

Paint

> Paints

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).

Paint

> Paint consistency

• 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.

viscosity in seconds CF#4	Temperatures (°C)																			
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	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

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.

Paint

> 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 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 M Ω.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 circs, 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.

Paint

> Paint resistivity

• 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 MΩ.cm will generate a low electrostatic efficiency, particularly if the HV is also low (20/30KV).
On the contrary, low resistivity paint (< 10 MΩ.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.

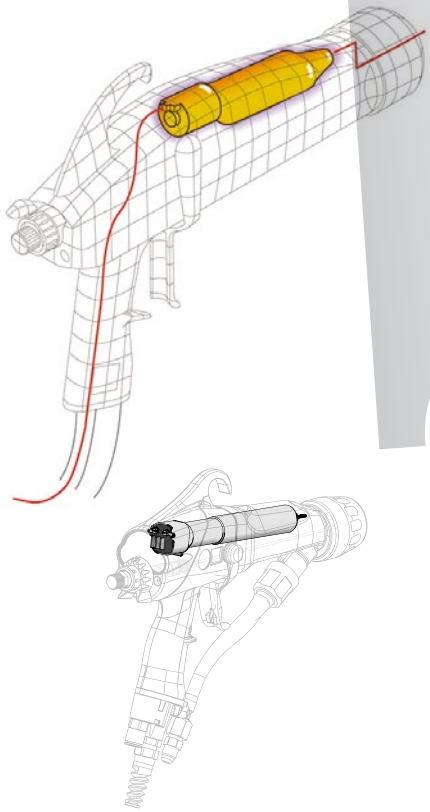
Paint

> Main solvents:

Properties of products	Boiling temperature (°C)	Flash point (°C) (CF) (1)	Explosive limit in vol.%		Toxicity limit of concentration in the air (2)	
			Lower	Upper	P.P.M. (3)	mg/m³
Amyle acetate	149	25	1.1	7.5	100	525
Butyle acetate	124-126	23	1.7	15	150	710
Dry butyle acetate	112	31 (CO)	1.7	-	200	950
Ethyle acetate	77,1	- 4,4	2.2	11.5	400	1400
Ethylglycol acetate	156,4	52	1.7	5.8	100	540
Isopropyle acetate	93	4.4	1.8	8	250	950
Methyle acetate	57-58	- 13	3.1	16	200	610
Acetone	56,2	- 18	2.5	12.8	1000	2400
Amylic alchohol	137.8	33	1.2	10	-	-
Butylic alchohol	117.5	29	1.4	11.2	100	300
Dry butylic alchohol	99.5	24	1.7	9.8	150	450
Ethylic alchohol	78.5	13	3.3	19	1000	1900
Isopropylic alchohol	82.4	12	2	11.8	400	980
Methylic alchohol	65	12	6	36.5	200	260
Benzene	80.1	- 11	1.4	8	25	80
Butylglycol	171743	60	1.1	10.6	50	240
Cyclohexane	81	- 20	1.3	8.3	300	1050
Cyclohexanol	161	68	1.8	-	50	200
Cyclohexanone	156	44 to 64	1.3	9.4	50	200
Diacetone alcool	168	54-55	1.8	6.9	50	240
Dioxane 1-4	101	12.2	2	22	100	360
Terebenthine essence	154-170	35	0.8	-	100	560
Special essences	30-210	4	1	6.5	-	-
Ethylglycol	135	40	2.6	15.7	100	370
Methylethylcetone	79.6	- 6	1.8	11.5	200	590
Methylisobutylcarbinol	130	41	1	5.5	25	100
Methylisobutylcetone	116	16	1.4	7.5	100	410
Methylglycol	125768	46	2.5	14	25	80
Naphta solvent (4)	125-160	23 to 32	0.9	6	100	400
Styrene	146	31	1.1	6.1	100	420
Tetrahydrofuranne	64-66	- 17	2.3	11.8	200	590
Toluene	110.6	4.4	1.3	7	100	375
Trichlorethylene	87	non-flammable	-	-	100	535
White spirit	135-205	30 to 65	1.1	6.5	200	1150
o-Xylene	144	30	1	6	100	435

(1): CF = closed dish; CO = open dish
(2): these values were established by American hygenists corresponding to 7-8 h/day and a 40 h/week
(3): p.p.m. = parts per million, by volume
(4): derived from coal (Extract from n°103 INRS brochure)

Electrostatic spraying



High voltage is generated by a cascade emitting a low-voltage signal and intermediate frequency. This module supplies a stage voltage step which produces a high voltage.
The cascade, also known as «High Voltage Unit» is sometimes built-into the sprayer.
This applies to:
:: Manual sprayer **MIV6600 and SPRAYMIUM**
:: Automatic sprayer **PPH 308 CI** in paint solvent based high resistivity's version (≥ 6 MΩ.cm) & low resistivity's version (> 0.5 MΩ.cm)
and **NANOBELL** in paint solvent based resistivity's version ≥ 0.5 MΩ.cm

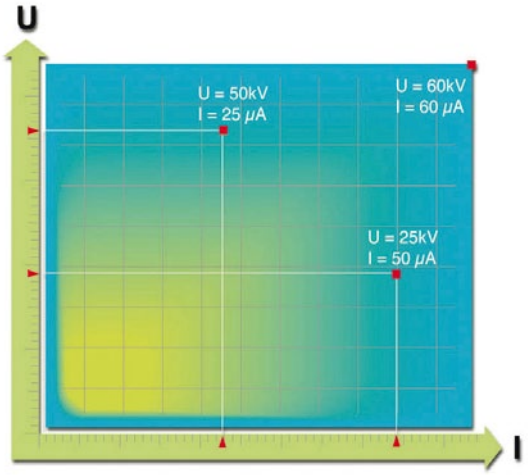
It also may be external to the gun, and connected to it via a high voltage cable, like most of the automatic line of applicators (generaly for an application of water-based paint nonflammable or hardly flammable): **PPH 405**, **TRP 500**, **PRT**, **PPH 707 EXT-ST** (external charge), **PPH308 CI** and **NANOBELL**.

SPRAYBOX

GNM 200

The cascade used with the manual range of guns is the SPRAYBOX, and is built along IP54 protection and sealing specs. When installed in control panels, the power supply is called GNM 200, and is built along IP 20 protection and sealing specs. It is the version that's used with automatic applicators.

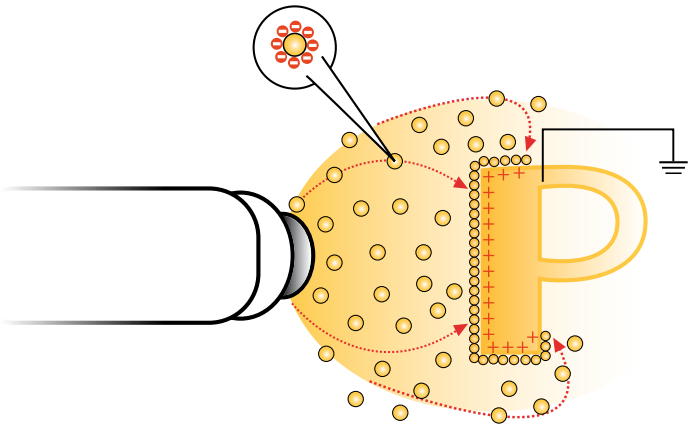
The GNM recognizes the type and model of gun (UHT) when it is connected to it. The operating set up of the recognized cascade is then implemented by the GNM200.
During operation, the electrostatic charge is kept to its best level, regardless of the shape of the parts, paint characteristics, and target distance. This is made possible through the rectangular voltage/ current curve of the GNM. (see right).
Voltage and current are operator-adjustable. The GNM power supplies also include features such as: over-current disjunction, DI/DT, and more, in order to optimize safety of the systems.



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: discs and bells

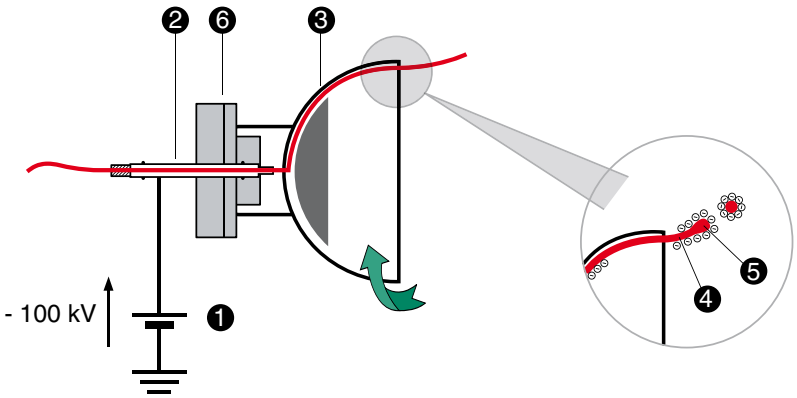
> Conduction charge is only efficient for paints of low resistivities (< 500 MΩ.cm).

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

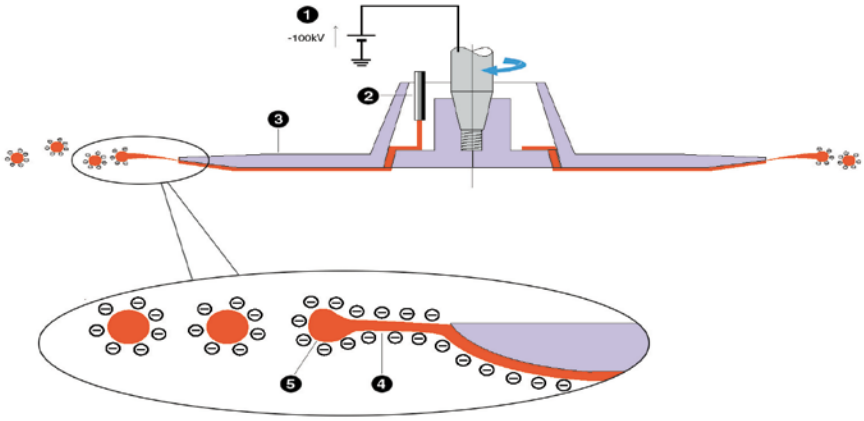


1: High voltage generator
2: injector
3: bell cup
4: paint
5: droplet
6: turbine

Electrostatic spaying

> Conduction (contact) charge: discs and bells

High speed disc: Rpm from 5,000 to 21,000 tr/min in charge.

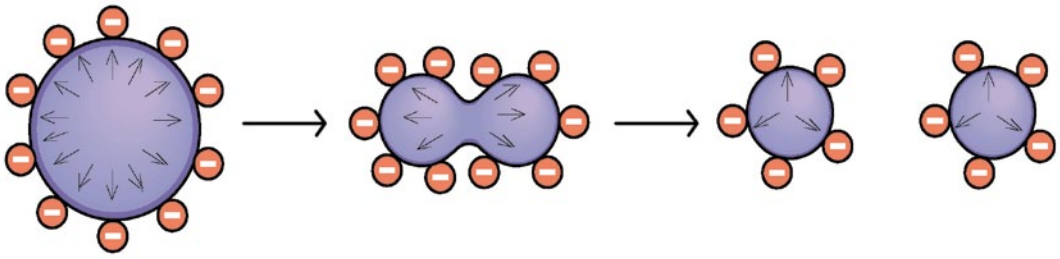


1: HV generator
2: injector
3: disc
4: paint
5: droplet

During spraying, particles repel each other, and tend to make the pattern more homogeneous and smooth. Looking at a particle, when the electrostatic pressure caused by the repelling of charges of a same sign « **-** » is bigger than the cohesive forces of the fluid surface tension, the drop breaks down into smaller droplets of the same size:

The reduction in size of the drop, results in a finer atomization, a better quality of the film, in terms of thickness and coverage.
Then the cloud of paint is attracted by the grounded part. Only cavities, subjected to faraday cage effect, do not get the same amount of covering. On the contrary, edges do concentrate the lines of the electric field (known as the edge effect). To improve on the covering of the parts, they can revolve on their axis, in front of the applicator.

Spraying with an electrostatic handgun allows for reduced motion, less fatigue, higher production rates, and material consumption reduced by 30% compared to conventional airspray. The resistivity of the paint must be adapted to the type and model of gun.



Electrostatic spaying

> Benefits of electrostatics spraying

The technology favors paint savings, reduces overspray (pollution), and allows covering more easily the rear side of parts (wrap).

Spraying with E/S consequently:

:: Improves on conventional air atomization

:: Increases transfer efficiency:
> saves on paint
> reduces VOC's emissions
> reduces booth cleaning
> reduces booth residues

:: provides excellent finish quality:
> provides uniform film built
> provides coverage and even thickness

:: provides superior wrap:
> induces less spray time
> requires less applicators

The total sum of these advantages eventually reduces the operating costs of painting, and increases the productivity of the paint shop.

> Internal (direct) charge vs external charge

Paint is brought to HV potential:
• either prior to spraying it, by contact with HV inside the paint circuit or the injector = **internal charge**
• or after its being sprayed, it is charged outside of the atomizer = **external charge**

Why two ways to the same result ?

Internal charge is the traditional way. We apply the voltage to the paint just before it is about to exit the applicator. The resistivity of the paint being high enough, the physics of the process make it easier for the electric charges to float to ground through the paint pattern and the grounded part, than through the paint itself in the paint tube.

On the contrary, when the resistivity of the paint is low, like water-based products, the electric charges will go to ground through the conductive paint.

To overcome this, one has 2 solutions:
:: Isolate the whole paint circuit from ground
:: Charge the paint after it has come out of the applicator in a mist form, and is no longer in contact with the supply line and the ground.

Each technique has its pros and cons. The choice is in fact only offered when spraying very conductive paints (water-based). In other cases, direct charge is used.

To remain factual, we can retain the following points:

Internal charge
Advantages
:: Paint savings,= because of better transfer efficiency
:: Finish is very = because the charge is very stable
:: Less applicator maintenance = because of the absence of charging electrodes
:: Better penetration in cavities = because of the smaller size of the applicator

External charge
Advantages
:: Lesser investment, as paint lines do not have to be isolated, and the charging gear is mounted directly on the applicator
:: No electrical headache (no energy building up in the paint lines)
:: Easy to install: there is not a lot of hardware needed to carry a direct charge system over to an external charge system

Electrostatic spaying

> Parts electrical conductivity

Generally speaking, metallic components do not cause a problem for electrostatic spraying. However, some conditions need to be met when spraying non metallic parts.
Wood needs to retain a minimum natural humidity (10 %) When spraying dry wood, a quick sponge bath to wet the surface is considered like sufficient. Some wood essences cannot be sprayed with electrostatic, as they are not humid enough (bamboo for instance is only 5 %).

Plastics are even trickier. Their conductivity is extremely low: 10^{12} to 10^{17} MΩ.cm and they need to be made conductive. For the odd job, one may spray them with conductive solvent. For mass production, it's best to have the plastics mixed up with some conductive material, when possible, at time of fabrication. Another solution is to spray them with a light coat of a conductive primer.

Sometimes, when the part is thin enough and needs be finished on one side only, it is placed on a metal holder of the same shape, which also permits to ground it. Some systems may combine above solutions.

> Hooks and racks conductivity

For the parts to attract the paint drops, they and whatever they are hanging from must be properly grounded. An uninterrupted connection must be established from the part throughout the rack, the hook, the rotator to the conveyor, which is grounded by construction.

Such a connection must be checked upon periodically, as with time, the racks etc. may be covered with paint residues isolating them from the ground, damageable to the good operation of the system, and creating a potential fire hazard.

Recommendation following type of parts to be coated

Application process	Centrifugal electrostatic		Pneumatic electrostatic			High pressure electrostatic
Application area ↓	PPH 308 Nanobell PPH707 EXT-ST	PPH 405	TRP 500	Vortemail VEC	MIV 6600	SPRAYMIUM
Automotive manufacturers, Tier-one, Tier-two suppliers						
Household appliance, electrical apparatus						
Metallic furniture						
Cycles, Motors						
Works machines, Agricultural machines, Large surfaces, Railway equipment, Aircrafts						
Cylindrical parts						
Small parts						
Profiled sections						
Wood, Chairs, Furniture						
Coil coating Dry lub						

Sames

The whole range

Manual guns

MIV6600
Electrostatic sprayer high, low pressure

SPRAYMIUM®
Electrostatic sprayer high and medium pressure

IsoBUBBLE™ II
Specific set for water-based paint

Automatic sprayers

TRP
Automatic pneumatic-electrostatic sprayer

PPH 308
Automatic electrostatic sprayer with rotating bell

NANOBELL®
Sprayer with rotating bell, dedicated to little charge robots: compact and light

VORTEMAIL
Automatic electrostatic sprayer of email with cut product head

PPH 405
Automatic electrostatic sprayer with rotating disc

REVERSE FLUSH
Solution for optimization of rinsing of paint lines

PPH 707 EXT-ST
Electrostatic sprayer with external charge for water-based paint

Peripherals

AP 1000
Measuring paint resistivities

HVP 125
Measuring high voltage unit

MODUCLEAN
Color-change block

REV 600
Control module

SLR
«Plug-and-spray» control solution for bell & gun type sprayers

Gear pumps

Peristaltic pumps

RFV 2000
Electronically-controlled reciprocator RFV 2000

- Solvent-based paint
- Water-based paint flammable or flame-retardant
- Bi-components paint
- Electrical charge by direct contact (internal charge)
- Electrical charge with external electrodes




MIV 6600 Manual gun

Illustration

Description

MIV 6600 is a manual air spray gun, for the spraying of solvent and water based materials. Paint may be supplied to it via pump, pressure tank or circulating.

ATEX marking:

For MIV6600.1 and MIV6600.H1:

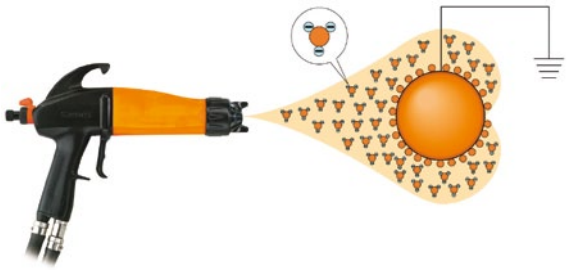
CE 0080 Ex II 2 G
ISSeP00ATEX018
EEx 0,24 mJ

GNM100(1) :

CE EN 50050
ISSeP03ATEX047
ISSeP04ATEX074
ISSeP00ATEX005
ISSeP00ATEX018

Marking for GNM 100(1)
(1) : this control module is the only one allowing the manual liquid paint set MIV to be ATEX certified.
Installation outside from the explosive area.

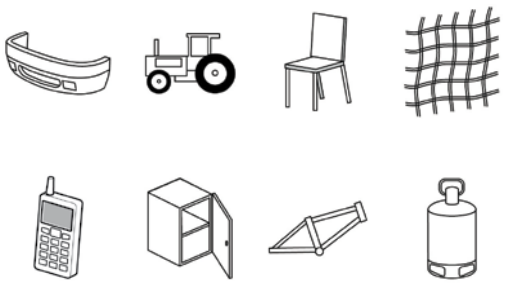
When spraying, the charged paint drops follow the lines of the electric field to the part. Electrostatics result in paint savings and wrap around, reduced overspray and pollution.
Adding compressed air to it, allows penetration into cavities.



Where used

MIV 6600 may be used just about everywhere in the industry:

:: Job coating
:: Wood (furniture) industry
:: Aluminum profiles
:: Metal furniture
:: Automotive, airspace, public works and agricultural implements



MIV 6600 Manual gun

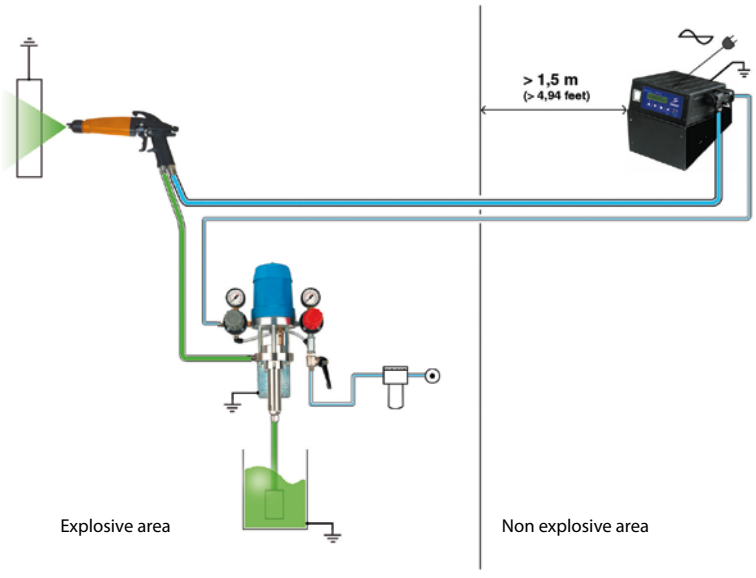
> Customer benefits:

:: Finish quality: even film, superior atomization, overall quality.
:: Paint savings: from 30 to 50 %
Reduced VOC's and booth maintenance.
:: Time savings: while spraying, one may adjust the pattern shape and size simply by turning the back knob. The 6600 condenses simplicity, efficiency, and speed.

:: Easy maintenance: the booth does not require as many cleanings, the gun is user friendly. With its smooth rounded surfaces.
:: The top of the safety list: ATEX approved in conjunction with the GNM.
:: Ergonomic: MIV is easy to handle, sits comfortably in hand, as its lightweight offers the best balance available today.

The MIV 6600 package

The package is made of the handgun, 2 supply hoses (air + Low Voltage, Fluid), the power supply GNM 100, a wall-mount bracket, and a kit of specific tools.



MIV 6600 comes with an integral HV [1] cascade monitored from the GNM 100 power supply. The compact generator provides separate control for voltage (kV) and (µA).

Gun and Generator are indissociable , and make for most of the spray package.

[1] HV = High Voltage

Supply fluids to MIV via a pump (6 b - 90 psi max) or a pressure pot.
The GNM provides a low-volt signal to the gun, and re-routes air from the air drop. An air flow switch is hooked up to the side of the GNM, and actuates HV when the trigger is pressed, and the compressed air flows.
An air flow switch is hooked up to the side of the GNM, and actuates HV when the trigger is pressed, and the compressed air flows.

The fluid hose pertains to the type(s) of fluids it contains. Each version of handgun may be outfitted with a paint hose designed to cope with a particular range of resistivity. GNM 100 supplies all versions of handguns made by Sames. Recognition of the handgun by the GNM is carried out automatically as soon as the gun is connected to the power supply, and the U & I set up of the cascade is entered automatically.

MIV 6600 Manual gun

> Concentrated technology for a high quality finishing

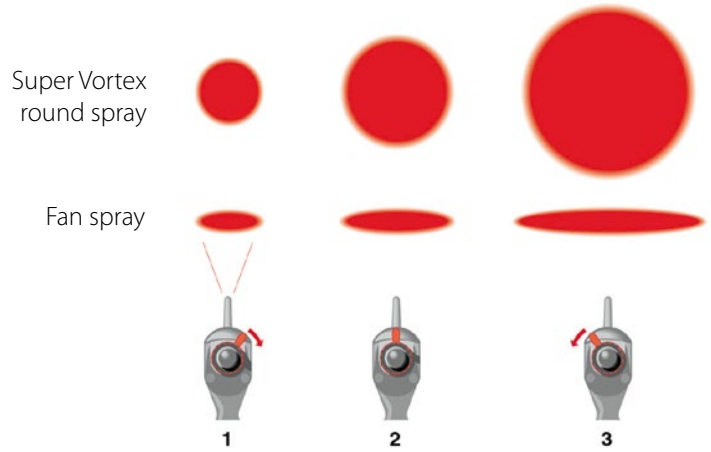
Operation

There are 2 basic versions, fan and round spray.
Adjustment of the pattern is a simple question of turning a knob at the back of the gun.
This fast action makes operating the gun easy, and generates time savings, as any part may be sprayed with one gun only, by the same operator.

Super Vortex round spray

Fan spray

Super Vortex round spray: The narrow pattern (1) is to force paint into hollow parts and cavities, the wider pattern (3) is to spray as fast as possible with the best wrap possible.
Fan spray: Often used for large surfaces. Pattern is adjustable from very narrow and circular (1), to very wide and flat (3).
Super Vortex round spray: Provides generally a finer spray and reduced overspray. The diffuser better atomises the paint: vortex is larger and softer.



MIV 6600 Manual gun

MIV 6600 technical characteristics

Dimensions	*MIV 6600 (handgun)*	*GNM 100 (power supply)*
Length (mm)	Fan spray: 300 Round spray: 290	220
Width (mm)		175
Height (mm)		84
Weight (w/o hoses) (kg)	620	3000
IP		64

Supplies	*MIV 6600 (handgun)*	*GNM 100 (power supply)*
Max air pressure	6 bar (90 psi)	
Max fluid pressure	6 bar (90 psi)	
Electrical		110 V / 220 V 50 Hz / 60 Hz
Air / Low Voltage hose (m)		9
Fluid extension (m)		4 and 9 (for MIV .H1 version)

High Voltage		*GNM 100 (power supply)*
Voltage (kV)		adjustable from 0 to 60
Current (µA)		adjustable from 0 to 60

Atomization	*Round spray*	*Fan spray*
Pattern width (mm) (tentatively)	320 to 430 (per caliber)	450
Fluid flow (cc/min)	70 to 750	100 to 750
viscosity (s) (AF #4 cup)	14 to 40	14 to 40

Safety Instructions

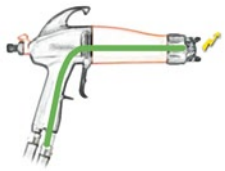
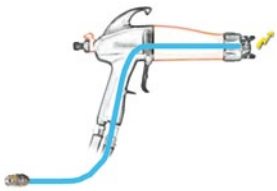
When using MIV 6600.1 and .H1, it is mandatory to ground the paint supply system : Pressure pot, or pump (1 or 2-K).

When using MIV 6600 W, it is mandatory to connect the provided discharge resistor between the paint supply system and the ground. The paint supply system is to be installed in a grounded isolation cage. An isolation distance of at least 500 mm must be kept at all times between all components inside it and the ground.
In no case should the operator be able to get in contact with the paint supply system during operations. The paint supply system must automatically be grounded when the door to the cage is opened.

MIV 6600 Manual gun

> Gun line

A complete line of handguns for all kinds of jobs:
The MIV 6600 comes in 3 versions

Paint	Solvent base	Solvent base	Water base
Resistivity (MΩ.cm)	High: 10 to 500	Medium: 1 to 500	Few: kΩ.cm
Version	MIV 6600 .1	MIV 6600 .H1	MIV 6600 W
			
Paint hose (m) Electrically isolated Integral with the gun	-	5	9
Fluid line extension (m) (Non insulated) 	-	4 9	-
Air + BT (m) 	9	9	9
B.T. : Low voltage			

Manual equipment

MIV 6600 Manual gun

> Use for solvent based paint

Equipment high & low pressure 8 bar max.

Description of the product	Designation	Hose length	Reference
Paint high resistivity "MIV6600 .1": ≥ to 10 MΩ.cm • MIV 6600 .1 equipped with his nozzle • Control module GNM100 • Fixing kit GNM • Super Vortex Round Spray: SV08 JR ø8 mm • Fan spray: JP • Hoses, Specific tooling	E. MIV6600 .1 SV08	9 m	910 011 146
	E. MIV6600 .1 JP	9 m	1 515 111
Paint low resistivity "MIV6600 .H1": ≥ to 1 MΩ.cm • MIV 6600 .H1 equipped with his nozzle • Control module GNM100 • Fixing kit GNM • Super Vortex Round Spray: SV08 JR ø8 mm • Fan spray: JP • Hoses, Specific tooling	E. MIV6600 .H1 SV08	9 m	1 522 371
	E. MIV6600 .H1 JP	9 m	1 516 896

> Use for water-based paint

Equipment low pressure 8 bar max.

Description of the product	Designation	Hose length	Reference
Water-based Paint "MIV6600 W": Few kΩ.cm • MIV 6600 W equipped with his nozzle • Control module GNM100 • Discharge resistor, Ground wire • Fixing kit GNM • Super Vortex Round Spray: SV08 JR ø8 mm • Fan spray: JP • Hoses, Specific tooling	E. MIV6600 W SV08	9 m	910 011 147
	E. MIV6600 W JP	9 m	1 516 762

MIV 6600 Manual gun

> Use for solvent based paint

Spray gun only

Description of the product	Designation	Hose length	Reference
Paint high resistivity "MIV6600 .1": ≥ to 10 MΩ.cm • MIV 6600 .1 equipped with his nozzle • Super Vortex Round Spray: SV08 JR ø8 mm • Fan spray: JP	MIV6600 .1 SV08	9 m	910 011 144
	MIV6600 .1 JP	9 m	1 516 771
Paint low resistivity "MIV6600 .H1": ≥ to 1 MΩ.cm • MIV 6600 .H1 equipped with his nozzle • Super Vortex Round Spray: SV08 JR ø8 mm • Fan spray: JP	MIV6600 .H1 SV08	9 m	1 522 373
	MIV6600 .H1 JP	9 m	1 516 765

> Use for water-based paint

Spray gun only

Description of the product	Designation	Hose length	Reference
Water-based Paint "MIV6600 W": Few kΩ.cm • MIV 6600 W equipped with his nozzle • Super Vortex Round Spray: SV08 JR ø8 mm • Fan spray: JP	E. MIV6600 W SV08	9 m	910 011 145
	E. MIV6600 W JP	9 m	1 516 776

Control module

Description of the product	Reference
GNM100	858 075
Wall-mount bracket	822 542

Options

Description of the product	Reference
High Voltage Resistor	1 506 262
Nozzle conversion kits SV08 to SV12	910 011 152

Notes

SPRAYMIUM® Manual gun

Illustration

SPRAYMIUM
THE BEST ELECTROSTATIC GUN

Description

SPRAYMIUM® is a manual pneumatic-electrostatic spray gun used for the application of liquid paint based on solvent or water in the general and automotive industry. It may be supplied by a low or high pressure distribution as a piston pump (mono or bi-component), a circulating or a pressure tank.

The gun is connected via a low voltage connection to the control module SPRAYBOX®.

ATEX marking:

SPRAYMIUM HR & LR :

CE 0080 Ex II 2 G

Ex 0.24 mJ
ISSeP08ATEX020

FM APPROVED
For Electro.Fin.Appl.
CL. I, GP.D, D spray Matl.
When configured
according to #800001509

c US

SPRAYBOX(1) :

CE 0080 Ex II (2) G

[Ex 0.24 mJ]
ISSeP08ATEX020

FM APPROVED

c US

(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.

Advantages

The main three advantages of SPRAYMIUM are:

Paint savings :

• The electrostatic technology favors paint savings, reduces overspray (pollution), and permits to cover more easily the other side of parts (wrap).

• The electrostatic wraparound is very important, it:
- Saves on paint
- Reduces spray time
- Reduces the number of sprayers or operators.

• The transfer efficiency is very important. It:
- Saves on paint
- Reduces VOC's emissions
- Reduces booth cleaning
- Reduces booth residues
- Reduces maintenance needs

Spray quality

• The **AIRMIX®** spray pattern uses compressed air to adjust the spray fan from wide to narrow, from the spray tip. This technology uses a medium pressure pump (fluid pressure < to 120 bar maxi.) very strong, inexpensive.

• The "High pressure" spray pattern uses a very little air spray. The pump delivers a fluid pressure > to 120 bar. This technology produces very little mist and permits the application of high viscosity fluid with high flows and to work with a high speed application.

• The "Low pressure" spray pattern improves the penetration on parts and optimizes the wrap round effect thanks to the round jet nozzle ***SUPER VORTEX***. The paint is sprayed by an air vortex.

Easy maintenance:

• SPRAYMIUM makes cleaning easy thanks to its smooth surfaces and rounded shapes.

• The service life is longer due to it being constructed from solvent resistant materials.

• The air hose / low voltage may be disconnected rapidly under the handle.

• The complete disassembly of the gun is fast with standards tools and a multi-function key. For easy maintenance.

SPRAYMIUM Manual gun

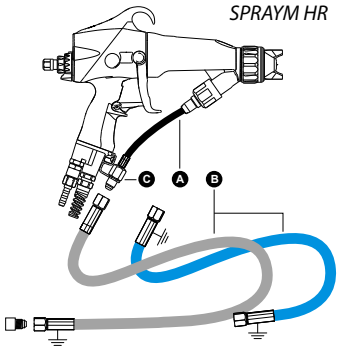
> SPRAYMIUM offers a complete range of guns:

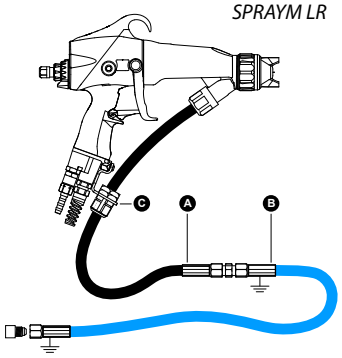
Range

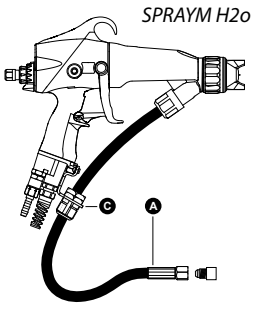
SPRAYMIUM can be equipped with different heads (flat spray or round spray) and
• Low pressure: 8 bar = **LP**,
• Medium pressure: 120 bar = **HP**,
• High pressure: 200 bar = **HP**

The gun comes in three versions:
• Solvent-based paint with high resistivity > a 5 MΩ.cm
= **SPRAYM HR**
• Solvent-based paint with low resistivity > a 0.5 MΩ.cm
= **SPRAYM LR**
• Water-based paint non-flammable or flammable
= **SPRAYM H2o**

Illustration of versions







Ⓐ : product hose
Ⓑ : extension product
Ⓒ : hose support

Possible versions of hoses:

	HR				LR		H2o	
	LP		HP		LP	HP	LP	HP
Length	**A**	**B**	**A**	**B**	**A + B**	**A + B**	**A**	
0.2 m	✓		✓					
10 m		✓		✓	✓	✓	✓	✓
15 m		✓			✓		✓	
20 m		✓		✓	✓	✓	✓	✓
30 m				✓		✓		✓

Type of head:

	Type of spray	Type of nozzle	Fluid pressure	Solvent > 5 MΩ.cm	Solvent > 0.5 MΩ.cm	Water kΩ.cm
SSV08	Super Vortex	SSV08	8 bar = LP	HR	LR	H2o
SSV12		SSV12				
SP	Fan	P15				
SX120	Airmix	X14 (09:139)	120 bar = HP			
SX200		X14 (09:139)	200 bar = HP			

SPRAYMIUM Manual gun

> Concentrated technology for a high quality finishing

Use

SPRAYMIUM® is a lightweight gun, with integrated controls on the rear of its handle, from where the operator can, with one hand, choose among 3 pre-programmed electrical characteristics and control the flow of paint through an adjusting knob.

The LEDs allow the user to see the program in use. These pre-programmed settings can be modified by the operator in order to better adapt to the types of parts to be painted.

SPRAYMIUM® combines innovation and experience of both SAMES & KREMLIN brands: The range gives access to Low Pressure and high pressure spraying technologies and to the Vortex and AIRMIX® qualities which are guarantees of high quality for industrial finishing.

A pressure sensor integrated in the gun permits a real-time air flow measurement, what helps to make a very precise setting and to ensure a perfect daily repeatability. This innovation is patented and exclusive for SPRAYMIUM®.

SPRAYMIUIM technical characteristics

	SSV08	SSV12	SP	SX120	SX200
Type of sprayer	Super Vortex	Super Vortex	Fan	Fan spray Airmix	Fan spray Airmix
Standard head	SSV08	SSV12	SP	X14	X14
Paint pressure maxi.	8 bar			120 bar	200 bar
Air pressure inlet	6 bar ± 1 bar				
Temperature	0°C - 40°C				
Paint flow maxi. (viscosity 25s. cup AFNOR 4) cm^3/min	650	750	750	550	700
Wide impact	35 cm	40 cm	18 - 47	29 cm	29 cm
Air flow	7.5 - 17	9 -23	12 - 25	8	8
Paint viscosity recommended	14 s. at 40 s.			≤ 40 s.	
Weight	880 g.				
Outlet voltage	85 kV maxi. (+0kV; 15kV) Adjustable on SPRAYMIUM or SPRAYBOX				
Outlet current	100 µA maxi.				
Air connection on handle	F 1/4 NPS				
Air connection available	Quick-disconnect flexible air hose ø 8mm				
Paint connection type	M 1/2 JIC				

For SPRAYMIUM H2O version, please refer to the chapter dedicated to Isolated unit IsoBUBBLE for water-based paint

To know the reference of a gun alone and a gun with its nozzle (without cables and hoses),. Don't take into account the two latest number after the hyphen.
ex : The reference 910004885 = SPRAYM LP-HR-SSV08

SPRAYMIUM Manual gun

> Use for solvent based paint

Equipment low pressure 8 bar max. "LP"

Description of the product	Designation	Hose length	Reference
Paint high resistivity "HR": **> to 5 MΩ.cm** • Gun LP-HR equipped with his nozzle • Control module SPRAYBOX • Fixing kit SPRAYBOX • Hose HR/LP, ø int. 6.3 mm, 10-15-20 m (color hose grey, F1/2 JIC) • Adapter M1/2 JIC en F3/8 NPS • Air connection and low voltage, 10-15-20 m • Specific tooling	E. SPRAYM LP-HR-SSV08	10 m	910004885-10
		15 m	910004885-15
		20 m	910004885-20
	E. SPRAYM LP-HR-SSV12	10 m	910004883-10
		15 m	910004883-15
		20 m	910004883-20
	E. SPRAYM LP-HR-JP-SP	10 m	910004884-10
		15 m	910004884-15
		20 m	910004884-20
Paint low resistivity "LR": **> to 0.5 MΩ.cm** • Gun LP-HR equipped with his nozzle • Control module SPRAYBOX • Fixing kit SPRAYBOX • Hose LR/LP (F1/2 JIC) : 10 m (ø int. 4.8 mm) isolated hose color black 10 m + 5 m (ø int. 6.3mm, color blue, 10 m + 10 m (ø int. 6.3mm, color blue • Adapter M1/2 JIC en F3/8 NPS • Air connection and low voltage, 10-15-20 m • Specific tooling	E. SPRAYM LP-LR-SSV08	10 m	910005778-10
		15 m	910005778-15
		20 m	910005778-20
	E. SPRAYM LP-LR-SSV12	10 m	910005776-10
		15 m	910005776-15
		20 m	910005776-20
	E. SPRAYM LP-LR-JP-SP	10 m	910005777-10
		15 m	910005777-15
		20 m	910005777-20

Spray Gun only low pressure 8 bar max. "LP"

Description of the product	Designation	Reference
Paint high resistivity "HR": **> to 5 MΩ.cm**	SPRAYMIUM SSV08 LP-HR	910004885
	SPRAYMIUM SSV12 LP-HR	910004883
	SPRAYMIUM SP15 LP-HR	910004884
Paint high resistivity "LR": **> to 0.5 MΩ.cm**	SPRAYMIUM SSV08 LP-LR	910005778
	SPRAYMIUM SSV12 LP-LR	910005776
	SPRAYMIUM SP15 LP-LR	910005777

SPRAYMIUM Manual gun

> Use for solvent-based paint

Equipment medium pressure 120 bar max. "HP"

Description of the product	Designation	Hose length	Reference
Paint high resistivity "HR": **> to 5 MΩ.cm** • Gun HP-HR type flat jet AIRMIX equipped with a head x14 and nozzle 09:139 • Control module SPRAYBOX • Fixing kit SPRAYBOX • Hose HR/HP, ø int. 4.8 mm, 10-20-30 m (color blue, F1/2 JIC) • Air connection and low voltage, 10-20-30 m • Specific tooling	E. SPRAYM HP-HR-SX120	10 m	910007016-10
		20 m	910007016-20
		30 m	910007016-30
Paint low resistivity "HR": **> to 0.5 MΩ.cm** • Gun HP-HR type flat jet AIRMIX equipped with a head x14 and nozzle 09:139 • Control module SPRAYBOX • Fixing kit SPRAYBOX • Hose LR/HP (F1/2 JIC) : 10 m (ø int. 4.8 mm) isolated hose color black 10 m + 10 m (ø int. 6.3mm, color blue), 10 m + 20 m (ø int. 6.3mm, color blue) • Air connection and low voltage, 10-20-30 m • Specific tooling	E. SPRAYM HP-LR-SX120	10 m	910007017-10
		20 m	910007017-20
		30 m	910007017-30

Spray Gun only medium pressure 120 bar max. "HP"

Description of the product	Designation	Reference
Paint high resistivity "HR": **> to 5 MΩ.cm**	SPRAYMIUM HP-HR-SX120	910007016
Paint high resistivity "LR": **> to 0.5 MΩ.cm**	SPRAYMIUM HP-LR-SX120	910007017

SPRAYMIUM Manual gun

> Use for solvent-based paint

Equipment high pressure 200 bar max. "HP"

Description of the product	Designation	Hose length	Reference
Paint high resistivity "HR": **> to 5 MΩ.cm** • Gun HP-HR type flat jet AIRMIX equipped with a head x14 and nozzle 09:139 • Control module SPRAYBOX • Fixing kit SPRAYBOX • Hose HR/HP, ø int. 4.8 mm, 10-20-30 m (color blue, F1/2 JIC) • Air connection and low voltage, 10-20-30 m • Specific tooling	E. SPRAYM HP-HR-SX200	10 m	910004888-10
		20 m	910004888-20
		30 m	910004888-30
Paint low resistivity "HR": **> to 0.5 MΩ.cm** • Gun HP-HR type flat jet AIRMIX equipped with a head x14 and nozzle 09:139 • Control module SPRAYBOX • Fixing kit SPRAYBOX • Hose LR/HP (F1/2 JIC) : 10 m (ø int. 4.8 mm) isolated hose color black 10 m + 10 m (ø int. 6.3mm, color blue), 10 m + 20 m (ø int. 6.3mm, color blue) • Air connection and low voltage, 10-15-20-30 m • Specific tooling	E. SPRAYM HP-LR-SX200	10 m	910005781-10
		20 m	910005781-20
		30 m	910005781-30

Spray Gun only high pressure 200 bar max. "HP"

Description of the product	Designation	Reference
Paint high resistivity "HR": **> to 5 MΩ.cm**	SPRAYMIUM HP-HR-SX200	910004888
Paint high resistivity "LR": **> to 0.5 MΩ.cm**	SPRAYMIUM HP-LR-SX200	910005781

SPRAYMIUM Manual gun

> Use for water-based paint

Equipment low pressure 8 bar max. "LP"

Description of the product	Designation	Hose length	Reference
• Gun LP equipped with nozzle • Hose LR, ø int. 4.8 mm, 10-15-20 m isolated hose color black • Hose LR, ø int. 4.8 mm, 10-15-20 m isolated hose color black • Air connection, 10-15-20 m • Specific tooling	E. SPRAYM H2o SSV08	10 m 15 m 20 m	Contact us
	E. SPRAYM H2o SSV12	10 m 15 m 20 m	
	E. SPRAYM H2o SP	10 m 15 m 20 m	

Equipment medium pressure 120 bar max. «HP»

• Gun H2o type flat jet AIRMIX equipped with head and nozzle 09:139 • Hose LR, ø int. 4.8 mm, 10-20 m isolated hose color black • Air connection, 10-15-20 m • Specific tooling	E. SPRAYM H2o SX120	10 m 20 m	Contact us

Equipment high pressure 200 bar max. «HP»

• Gun H2o type flat jet AIRMIX equipped with head and nozzle 09:139 • Hose LR, ø int. 4.8 mm, 10-15-20 m isolated hose color black • Air connection, 10-15-20 m • Specific tooling	E. SPRAYM H2o SX200	10 m 20 m	Contact us

SPRAYMIUM Manual gun

Accessories

Filters product online

Description of the product	Resistivity	Version SPRAYMIUM	Reference
Filter M-F 1/2JIC equipped with a sieve filter n°6 (160 µm)	High «HR» Assembly recommended with handle of the gun	Low pressure «LP» High pressure «HP»	155010100 155010100
Filter M-M 1/2JIC equipped with a sieve filter n°6 (168 µm)	Low «LR» assembly between 2 hoses	Low pressure «LP» High pressure «HP»	155010000 155010000
Filter out of pump F 3/8 NPT - M 1/2 JIC equipped with a sieve filter n°6 (168 µm)	Low «LR» assembly recommended in out of pump instead of fitting F3/8NPT - M1/2JIC	Low pressure «LP» High pressure «HP»	155580300 155580300
Sieve filter n°6 (168 µm)			129609908
Sieve filter n°12 (280 µm)			129609909
Sieve filter n°6 for out filter pump			000161106

Triggers Kit to use 4 fingers

Description of the product	Version SPRAYMIUM	Resistivity	Reference
4 fingers trigger	Low pressure «LP»	High «HR»	910006140
		Low «LR»	Contact us
	High pressure «HP»	High «HR»	910005973
		High «HR» for SX120	910007093
		Low «LR»	Contact us
		Low «LR» for SX120	Contact us

Swivel

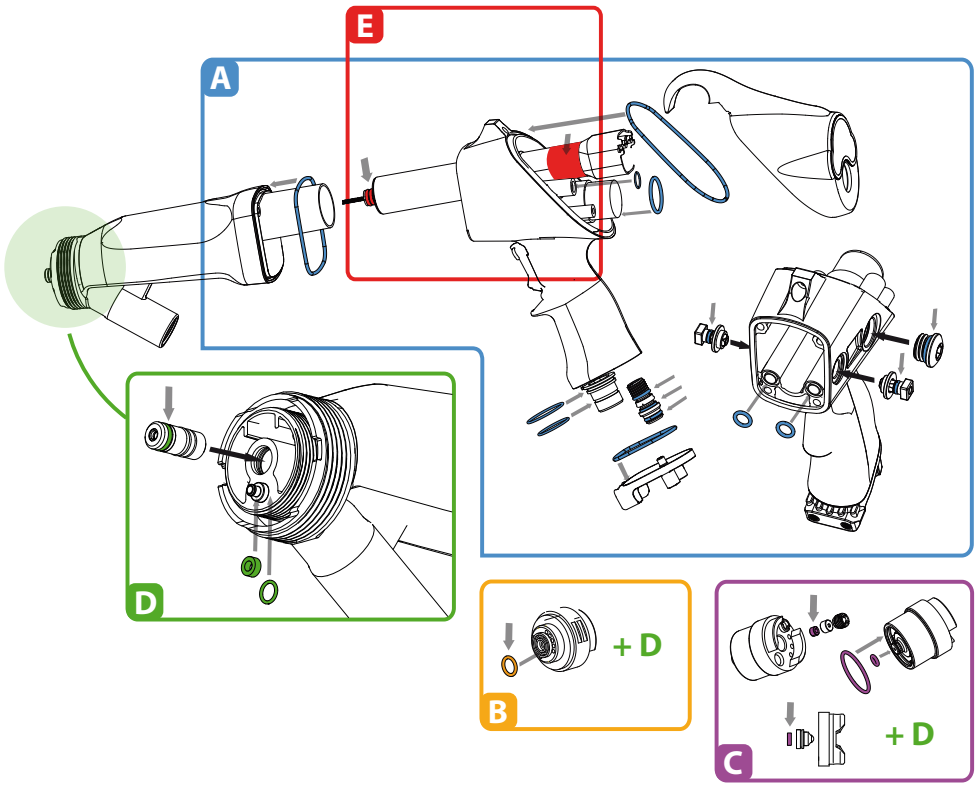
Swivel for paint hose	High pressure «HP»	High «HR»	129670405

SPRAYMIUM Manual gun

Seals kit

Compatible with all SPRAYMIUM versions

Description of product	Landmark	Reference
Seals kit for gun handle	A	910006459
Seals kit for low pressure head «LP»	B + D	910006460
Seals kit for high pressure head «HP»	C + D	910006476
Seals kit for high voltage cascade	E	910006477



Supply system

Pressure tank

Description of product	Reference
Tank (8 liter capacity) without agitator	F4RSTV120
Tank (8 liter capacity) with pneumatic agitator	F4RSTV121

Pumps and accessories

Description of product	Reference
Diaphragm pump, comes with a wall bracket and regulator product. Type 1/1 - 18 l./min.	Y1PPPM412
diaphragm pump, delivered on foot and paint regulator (ref.: 151758000). Type 1/1 - 18 l. / min.	270000053
Type pump 20 / 1 on trolley	Y1PCDL408
Type pump 40 / 1 on trolley	Y1PCDL410

SPRAYMIUM Manual gun

Option aircap and nozzles

Aircaps
low pressure
"LP" version

Description of the product	Reference
SPE, aircap impact flat jet close	737550
SP, aircap fan spray (STANDARD)	737549
SPL, aircap large wide spray	737552

Aircaps
high pressure
"HP" version

Description of the product	Reference
Aircap X14 (AIRMIX)	132500410

X14 airmix aircap

06-079	134506079
06-099	134506099
06-119	134506119
06-139	134506139
09-079	134509079
09-099	134509099
09-119	134509119
09-139 (STANDARD)	134509139
12-119	134512119
12-139	134512139
14-099	134514099
14-179	134514179

Control module SPRAYBOX

Technical characteristics SPRAYBOX	
Electrical power	90/270 V - 50/60 Hz
Supply current maxi.	1 A
Power max.	32 V.A.
Protection	IP 54
Dimension (mm)	320 x 260 x 60
Installation	Out of ATEX zone
Low voltage connection on side of gun	Securise by screw, never to disconnect in zone explosive atmosphere

Description of the product	Reference
Module SPRAYBOX	110000352
Fixing kit	910005759

Isolated paint system IsoBUBBLE™ II

Illustration

Description of the product

Isolated paint system ISOBUBBLE™ II is a supply station electrically isolated : it is specifically designed for fitting the SPRAYMIUM H2O gun version in water-based paint or other aqueous product (non-flammable). Thus, it allows the use of high voltage with a water-based paint (conductive) while protecting the operator from electrical shock.

The paint is supplied with a large range of pumps from the brand KREMLIN-REXSON : PMP 150, 02.75, 20.15, 20.25/20.50, 40.25/40.50, 17A/34A.

ISOBUBBLE™ II is part of a complete set ready to paint, Installation is very easy, and frees the customer of any additional protection for the operator.

Advantages

• **High transfer efficiency**: The paint is put directly to the high voltage to obtain a maximum charge of droplets and to ensure high transfer efficiency in the application.
• The SPRAYMIUM H2o gun does not include high voltage cascade, it is lighter = user comfort.
• **Ergonomics**:
- The paint system is compact and mobile
- Broad access to the paint tank
- Setting up of pumps is easy, and user friendly
- Robustness of the equipment
• **High protection** of the operator regards to electrical shocks.
• The power of the system is quick and easy.
• High capacity of the fluid tank : 60 Litre capacity.

Technical characteristics ISOBUBBLE II

Insulating material	Polyethylene
Total high	1453 mm
External diameter	721 mm (haut) / 700 mm (bas)
Weight (kg)	30
Inlet air pressure maxi.	6 bar (90 psi)
Electrical supply AQUABOX	90/270 V - 50/60 Hz
Outlet voltage (cascade HT)	50 kV
Outlet current (cascade HT)	100 µA

Range

The whole set is composed of an isolated paint system IsoBUBBLE II and a «**SPRAYMIUM H2o**» version for water-based paint non-flammable or flammable.

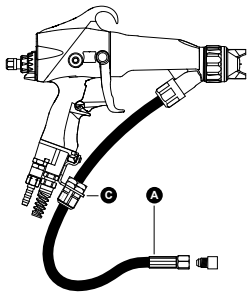
SPRAYMIUM H2o is connected via a low voltage connection to the specific control module **AQUABOX**.

SPRAYMIUM H2o operate at:

• Medium pressure: 120 bar = **HP**,
• High pressure: 200 bar = **HP**

Possible versions of tubes :

	H2o
	HP
Length	**A**
10 m	✓
15 m	✓
20 m	✓



Ⓐ : fluid hose
Ⓑ : extension fluid
Ⓒ : hose support

Isolated unit IsoBUBBLE™ II

> Use for water-based paint

Description of the product	Designation	Length hose	Reference

Medium pressure equipment 120 bar max. "HP"

• Paint system ISOBUBBLE II • Gun H2o, type flat jet AIRMIX (120 bar) • Hose LR, ø int. 4.8 mm, 10-20-30 m • Air connection, 10-20-30 m • Specific tooling • Control module AQUABOX • Fixing kit AQUABOX • Cable, 5 m - Lug ø 6 mm	E. SPRAYM H2o SX120 equipped with X14 air cap and 09:139 nozzle	10 m 20 m 30 m	Contact us

High pressure equipment 200 bar max. "HP"

• Isolated paint system ISOBUBBLE II • Gun H2o, type flat jet AIRMIX (200 bar) equipped with X14 air cap and 09:139 nozzle • Hose LR, ø int. 4.8 mm, 10-20-30 m • Air connection, 10-20-30 m • Specific tooling • Control module AQUABOX • Fixing kit AQUABOX • Cable, 5 m - Lug ø 6 mm	E. SPRAYM H2o SX200 equipped with X14 air cap and 09:139 nozzle	10 m 20 m 30 m	Contact us

TRP Automatic spray

Illustration

ATEX marking:

TRP 501.00D & TRP 502.00D:

CE 0080 Ex II 2 G

EEx > 350 mJ
ISSeP06ATEX032X

UHT 180 EEx e & UHT 288 EEx e:

Ex II 2 GD

EEx e II
ISSeP01ATEX002U

GNM200[1]:

CE 0080 Ex 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.

Description

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

The 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.

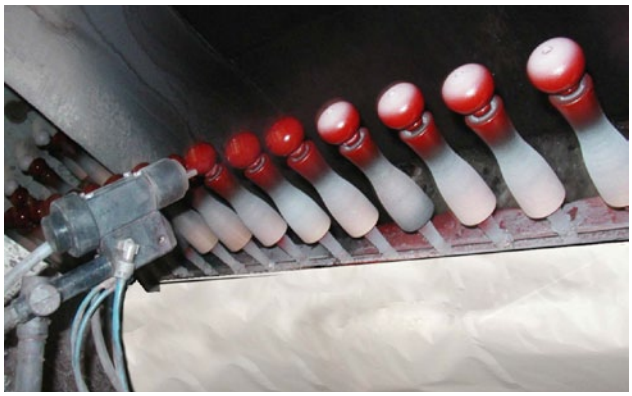
Advantages

Simple and reliable conception:
The transfer efficiency of the TRP is high, compared to conventional air spray applications, (30 to 60% depending on the shape of the part, the paint used and the settings of operation). The electrostatic application saves a large quantity of paint used over a production period.

When the first coat of paint is applied, the electrostatic wrap round effect attracts the paint to the rear side of the part, a light application is thus sufficient to fully paint the surfaces of the part.

Simplified maintenance:
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.

Easy to use:
Parameter adjustments (paint flow, atomization, spray pattern) are set manually, remotely or automatically with a PLC.



TRP Automatic spray

> TRP offers a very complete range of spray:

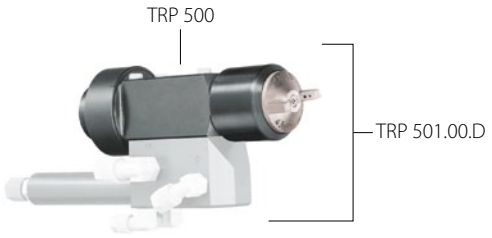
Range

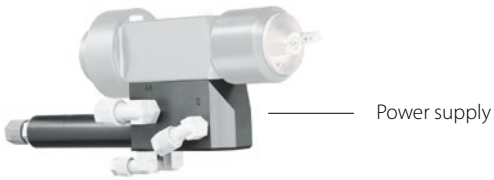
The spray head **TRP 500** is the basic component of sprayer models, **TRP 501** and **502**. It can be equipped to produce a round jet or flat jet. An air control system allows the start or stopping of spraying, thus releasing the air spray and allowing the closing of the fluid needle.
The combination of a power supply and a spray **head** is called TRP 501.00D
The combination of a power supply and **two** spray **head têtes** is called TRP 502.00D.

The **power supply** allows the mounting of the spray head (TRP 500). It includes a fluid inlet, an outlet drain fluid, a high voltage outlet and four air inlets (needle steering, draining pilot and two air spray):

• The air inlets are:
> Steering needle, landmark PT
> Steering drain (rinse / priming), landmark PD
> Air center (flat fan) or air directional (round fan) and landmark AA
> Air horn (flat fan) or air vortex (round fan), landmark FA
• Fluid inlets:
> Paint inlet, landmark P
> Outlet drain painting, landmarker D

Illustration of versions





The sprayer **501.00.D TRP** is equipped with a gun and a nozzle flat jet or round jet (vortex effect):
• the flat spray is built with a metal nozzle to ensure a consistent spray quality over time (low wear). The diameter of the injector is 1.5 mm and exits in several versions.
• The round spray is available in four sizes:
- Ø8 caliber and 12 mm standard
- Ø6 caliber and 20 mm = optional

The sprayer **502.00.D TRP** is equipped with two flat jet nozzles. The two heads, whose jets converge on the object to be painted into a single jet, are supplied and controlled simultaneously. The maximum flow rate of atomized fluid is increased compared to a TRP 501.

TRP Automatic spray

Specifications

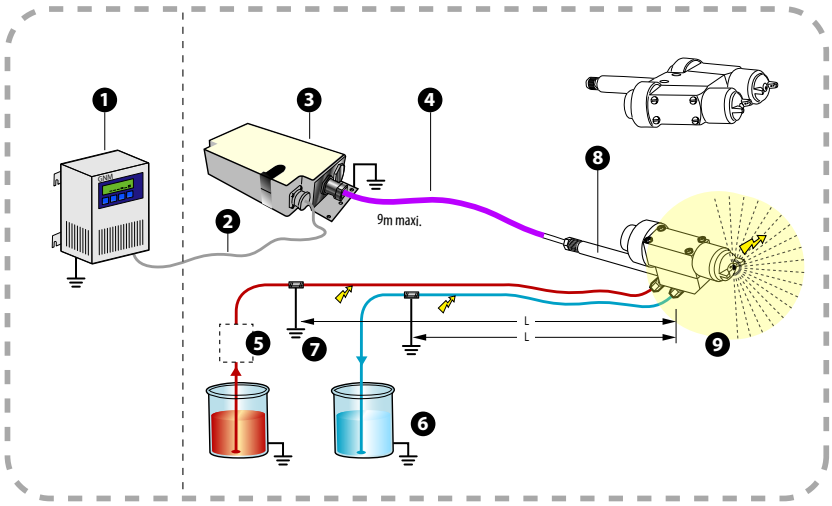
Dimensions	TRP 501.00D	TRP 502.00D	GNM 200
Length (mm)	300	300	95
Width (mm)	44	180	140
Height (mm)	90	90	205
Weight (Without hoses) (g)	800	1200	2200
IP			20
Power	**TRP 501 / 502**		
Air pressure maxi.	6 bar (90 psi)		
Fluid pressure maxi.	6 bar (90 psi)		
Normal pilot pressure (PT - PD)	5 bar (75 psi)		
Response time opening fluid (ms)	25 (Indicative)		
Response time cutting fluid (ms)	30 (Indicative)		
Fittings	**Europe**		
Pilot air (PT-PD)	1/8"NPT - ø 4x6 mm		
Air spray (AA-FA)	1/4"NPT - ø 8x10 mm		
Fluid (D-P)	1/8"NPT - ø 6x8 mm		
Electrical supply			110 V / 220 V 50 Hz / 60 Hz
High voltage			
Voltage maxi. (kV)			100 kV
Current maxi. (µA)			200 µA (UHT 180) 500 µA (UHT 288)
Spraying	**Round spray**	**Fan spray**	**Fan spray (TRP502)**
Impact wide (mm) (Indicative)	100 to 400	100 to 500	660
Total air flow (in Nm3/h)	7 - 27	7 - 40	14 - 80
Paint flow (in 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	from 100 mm to 400 mm	from 150 mm to 450 mm	

TRP Automatic spray

> Installation

Solvent based paint application

Illustration



Designation

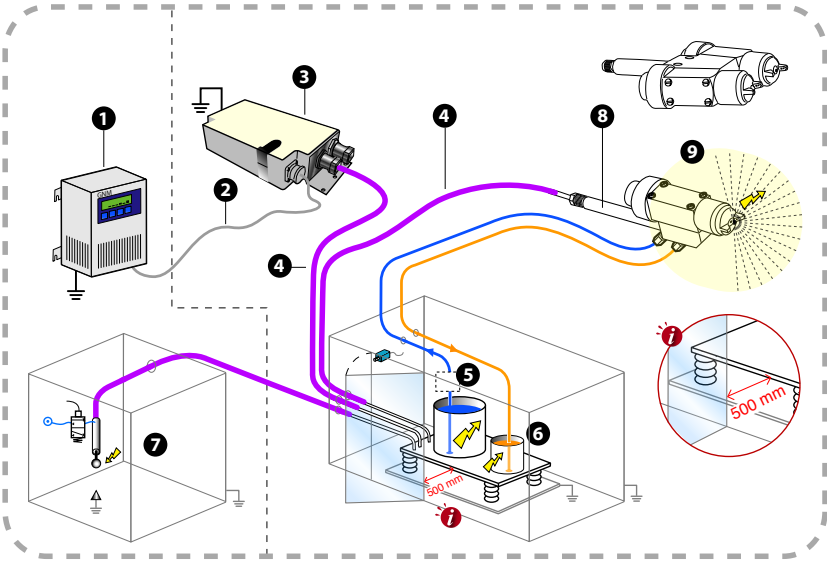
	Paint resistivity > à 0.5 MΩ.cm
1	Control module GNM200
2	Low voltage connection
3	High voltage unit UHT180 EEx e
4	High voltage cable (9 meters max. or 2 x 4.25 meters max.)
5	Paint and supplies related to the flushing potential of the ground
6	Circuit purge grounded
7	Connections on circuits connected to ground
8	Configuring supply block TRP with damping resistor
9	Safety distance between the elements at the high voltage and the ground

All conductive parts must be connected to the ground potential.
L = distance of installation distance between the 1 installation and ground (7) :

- *L = 2.5 m if paint resistivity > 1 MΩ.cm*
- *L = 5 m if 0.5 ≤ paint resistivity <1 MΩ.cm*

Water-based paint application

Illustration



Designation

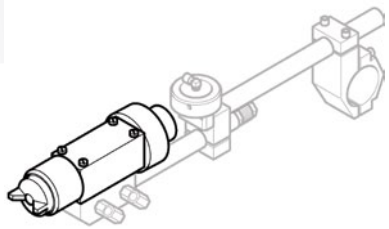
	Inflammable or flammable paint
1	Control module GNM200
2	Low voltage connection
3	High voltage unit UHT288 EEx e
4	High voltage cable
5	Paint and supplies related to the flushing potential of the ground
6	Circuit purge grounded
7	Discharge system out of ATEX zone
8	Configuring supply block TRP with damping resistor
9	Safety distance between the elements at the high voltage and the ground

All conductive parts must be connected to the ground potential.

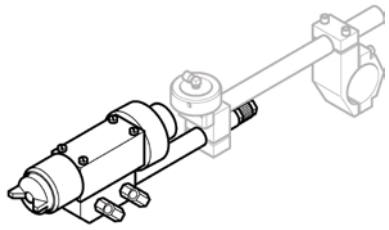
TRP Automatic spray

> Air spray TRP500/501.00D/502.00D

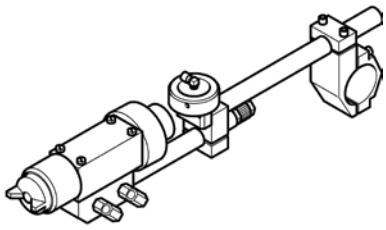
Spray head TRP 500 alone

Illustration	Designation	Type of nozzle	Reference
	TRP 500 JP	Fan spray	752949
	TRP 500 JR 8	Round spray – injector ø8 mm	752991
	TRP 500 JR 12	Round spray – injector ø12 mm	752992

Air spray TRP 500 built on manifold

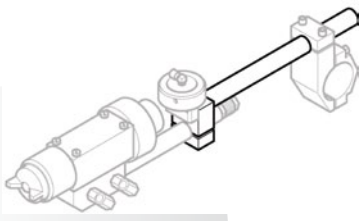
Illustration	Designation	Type of nozzle	Reference
	TRP 501.00D JP	Fan spray	910003599
	TRP 501.00D JR 8	Round spray – injector ø8 mm	910003595
	TRP 501.00D JR 12	Round spray – injector ø12 mm	910003603
	TRP 502.00.D	Fan spray	910003600

Automatic set

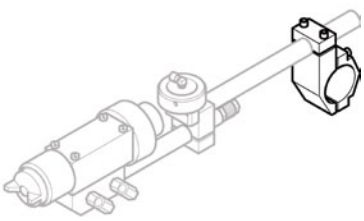
Illustration	Designation	Type of nozzle	Reference
	TRP 501.00D JP + Regulator	Fan spray	910004231
	TRP 501.00D JR 8 + Regulator	Round spray - injector ø8 mm	910004226
	TRP 501.00D JR 12 + Regulator	Round spray – injector ø12 mm	910004227

Components

Isolated support ø27 mm lg= 420 mm

Illustration	Reference
	437293

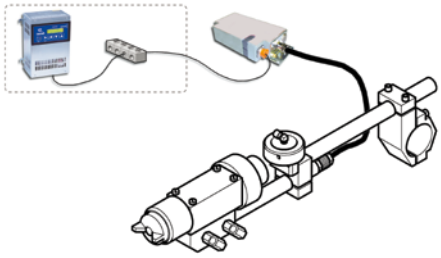
Fixing nut ø27/50 mm

Illustration	Reference
	732018

TRP Automatic spray

> Automatic set of paint

Use for solvent-based paint

Illustration	Sprayer	Quantity	Type of nozzle	Reference
	TRP 501	1	Fan spray	910005918
			Round spray, inject. ø8 mm	910005916
			Round spray, inject. ø12 mm	910005917
	TRP 501	2	Fan spray	910005921
			Round spray, inject. ø8 mm	910005919
			Round spray, inject. ø12 mm	910005920
	TRP 502	1	Fan spray	910005922

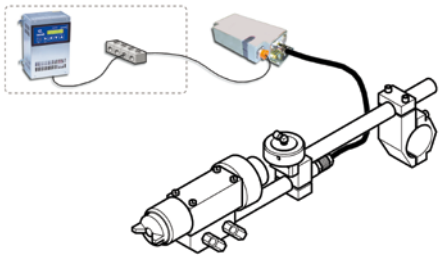
Composition for one sprayer:

1	TRP501 / 502.00.D	1	CABLE HT 100 kV (9 m)
1	GNM200A 220V with microprocessor	1	FEM plug 19CTS
1	UHT180 EEx e	1	Tighten cable PG11(7/12)
1	Paint regulator – europe version 750016	1	High voltage Connection TRP ATEX
1	TRP support	1	Colorless rilsan hose D:10 /12 INCOLORE (8.5 m)
1	Fixing nut D: 50/27	1	Sector connection 10A 250V (2.5 m)

Composition for two sprayers/

2	TRP501.00.D	1	FEM plug 19CTS
1	GNM200A 220V with microprocessor	1	Tighten cable PG11(7/12)
1	UHT180 EEx e	2	High voltage Connection TRP ATEX
2	Paint regulator – europe version 750016	1	Colorless rilsan hose D:10 /12 INCOLORE (8 m)
2	TRP support	1	Sector connection 10A 250V (2.5 m)
2	Fixing nut D: 50/27	1	Kit for UHT188EEXe 2nd output
1	CABLE HT 100 kV (8.5 m)		

Use for water-based paint

Illustration	Sprayer	Quantity	Type of nozzle	Reference
	TRP 501	2	Fan spray	910003985
	TRP 501	2	Round spray, inject. ø8 mm	910003983
	TRP 501	2	Round spray, inject. ø12 mm	910003984

Composition for two sprayers/

2	TRP501.00.D	1	FEM plug 19CTS
1	GNM200A 220V with microprocessor	1	Tighten cable PG11(7/12)
1	UHT288 EEx e	2	High voltage Connection TRP ATEX
2	Paint regulator – europe version 750016	1	Colorless rilsan hose D:10 /12 INCOLORE (8 m)
2	TRP support	1	Sector connection 10A 250V (2.5 m)
2	Fixing nut D:50/27	1	Kit for UHT188EEXe 2nd output
1	CABLE HT 100 kV (8.5 m)		

TRP Automatic spray

Options nozzles and Aircaps

Fan spray nozzle with injector

Illustration	Designation	Injector (ø mm)	Reference
 *Injector*	Nozzle JP single circuit	1.1	730355
	Injector INOX	1.2	755287
		1.5 (standard)	439058
	Nozzle JP single circuit	1.2	428375
	Complete nozzle all INOX	1.5	429064
	Nozzle JP double circuit	1.1	752056
		1.5	752055

Aircap – Fan spray

Illustration	Designation	Material	Reference
	Aircap JP – Standard	Plastic	436939
	Aircap JP – Wide impact	Plastic	422513
	Aircap JP – Standard	Brass	733957
	Aircap JP – Wide impact	Brass	Contact us
	Aircap JP	For injector 1.2 mm	428376
	For stainless nozzle	For injector 1.5 mm	429063

Round spray nozzle

Illustration	Designation	Injector ø (mm)	Reference
	Nozzle JR without injector		752983
	Injector JR	6	455234
		8	455235
		12	455236
		20	455237

Aircap – Round spray

Illustration	Designation	for nozzle ø (mm)	Reference
	Aircap JR	6	430804
		8	430540
		12	430179
		20	430719

Nuts

Illustration	Designation	Reference
	Nut for nozzle JP	745066
	Nut for nozzle JR	749982

TRP Automatic spray

Paint regulator

• The Fluid pressure regulator installed on the paint circuit:
> it can be placed anywhere in case of a fixed spray.
> It must always be positioned as close to the sprayer in case of a spray scan.
• The regulator allows absorption of pressure variations of the paint generated by the supply system (pulse effect), variations in paint pressure due to the variations of column height paint (animation of the spray that rises and decreases).

• For an air pressure control (pipe ø2.7 x 4 mm) of the regulator, the paint flow will also depend on the pressure drop downstream of the regulator: pipe diameter, size of the restrictor in the head TRP500, the size of the injector nozzle and the viscosity of the fluid.

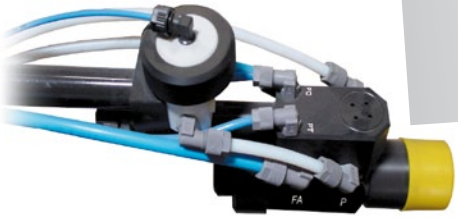
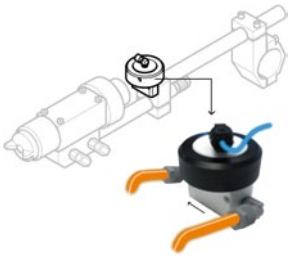
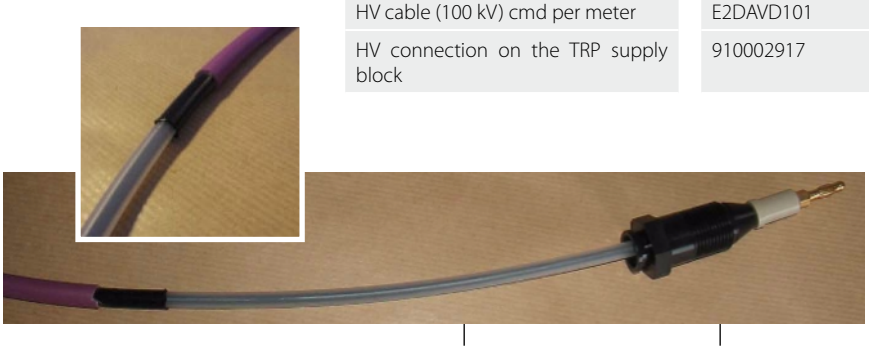


Illustration	Designation	Paint pressure	Reference
	Regulator (standard)	6 bar	750016
	Regulator with low flow	6 bar	758180
	Reinforced regulator	20 bar	759817

High voltage cable

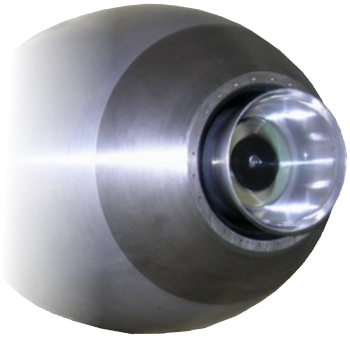
The high voltage cable connects the unit high voltage to the sprayer.
The high voltage unit is generally placed closer to the spray, in respecting the rules of facilities, preparation and lengths of high voltage cable (9 m max. and whatever the number of sprays).

Illustration	Designation	Reference
	HV cable (100 kV) cmd per meter	E2DAVD101
	HV connection on the TRP supply block	910002917

Connexion HV - TRP *Connexion HV - TRP*

PPH 308 rotary atomizer

Illustration



Description

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 has developed technologies for the application in the automotive field.

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

ATEX marking:

PPH 308
Solvent-based product with R ≥ 6 MΩ.cm:
CE 0080 Ex II 2 G
EEx > 350 mJ
ISSeP05ATEX032X

UHT 155 EEx em:
Ex II 2 G
EEx em II
ISSeP01ATEX012U

PPH 308
Solvent-based product with R> 0.5 MΩ.cm & water-based paint:
CE 0080 Ex II 2 G
EEx > 350 mJ
ISSeP06ATEX032X

UHT 188 EEx e & UHT 288 EEx e:
Ex II 2 GD
EEx e II
ISSeP01ATEX002U

GNM200[1]:
CE 0080 Ex 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.

The advantages are numerous and permit:

• A high saving of paint (high transfer efficiency which can reach a yield above 80%).

• A quick roi of the equipment.

• A high level of productivity (paint flow up to 600cc/min).

• The bell application has evolved, the bell was used to paint flat parts:
- The air cup technology with VORTEX effect provides as good results as a pneumatic-electrostatic sprayer, the transfer efficiency is more important.

• A very good penetrating effect on difficult parts.

• A maximum recovery of parts to be paint (the electrostatic wrap round effect permits a transfer of paint behind the part).

• An adjustable spray paint pattern.

• An consistent and high quality of spray.

• A optimal use of bi-component product.

• The conception of PPH 308 was optimized in order to reduce the maintenance operations and to facilitate the disassembly of various components.

• The conception of the magnetic air bearing turbine (TPAM) allows rotation without mechanical friction, the bell is turning on an "air cushion", which prevents the wear of moving parts:
- low maintenance costs
- long life

PPH 308 rotary atomizer

> Spray solutions "PPH 308 internal charge version"

Range

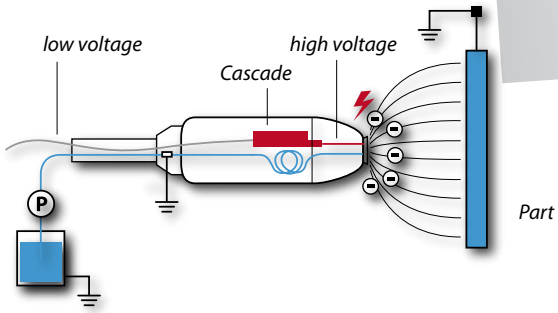
Depending on the type of application (solvent based or water-based) the version of the sprayer PPH308 differs across the wire elements connected to high voltage circuits' product and rinsing:

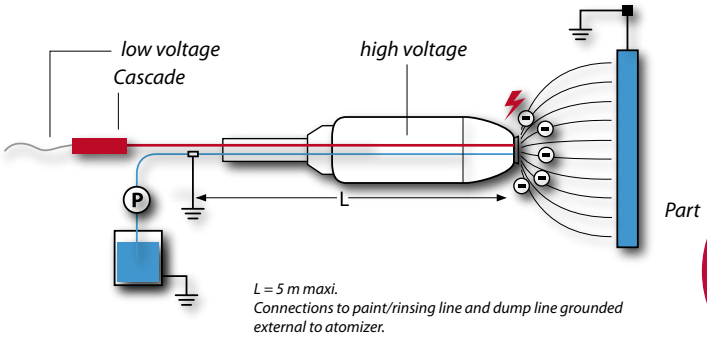
• For an application of **solvent-based product** with a **resistivity ≥ 6 MΩ.cm** :
- The product distribution system is connected to potential of the ground.
- High voltage unit (UHT155) integrated into the sprayer.
- Coil hose back on paint circuit and purge return.

• For an application of **solvent-based product** with a **resistivity > 0.5 MΩ.cm** :
- The product distribution system is connected to potential to the ground.
- High voltage unit (UHT188) remote sprayer
- No Coil hose

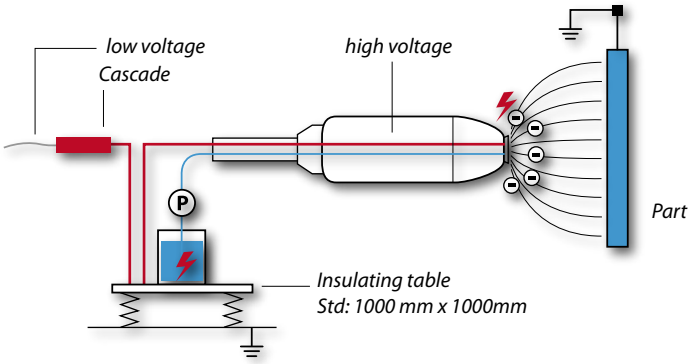
• For an application of **water-based paint nonflammable or hardly flammable**:
- The product distribution system is isolated of the potential from the ground (ex : table or other insulating).
- The application is made by internal charge (best yield).
- High voltage unit (UHT288) remote sprayer.
- The number of colors is limited.

Illustration of versions





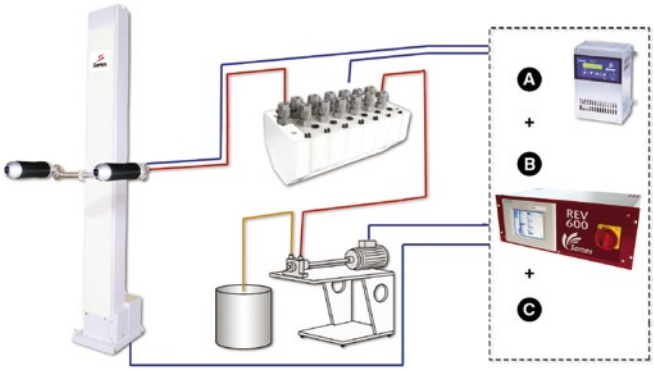
L = 5 m maxi.
Connections to paint/rinsing line and dump line grounded external to atomizer.



PPH 308 rotary atomizer

> Possible configuration

Example of installation (INSA plastics laboratory – France)



A = GNM200 control module
(for high voltage control)
B = REV 600 Recip controller, API or PLC
(recip and atomization control)
C = Motor speed regulation or frequency/voltage module, with API,
(paint supply system control)

Technical characteristics

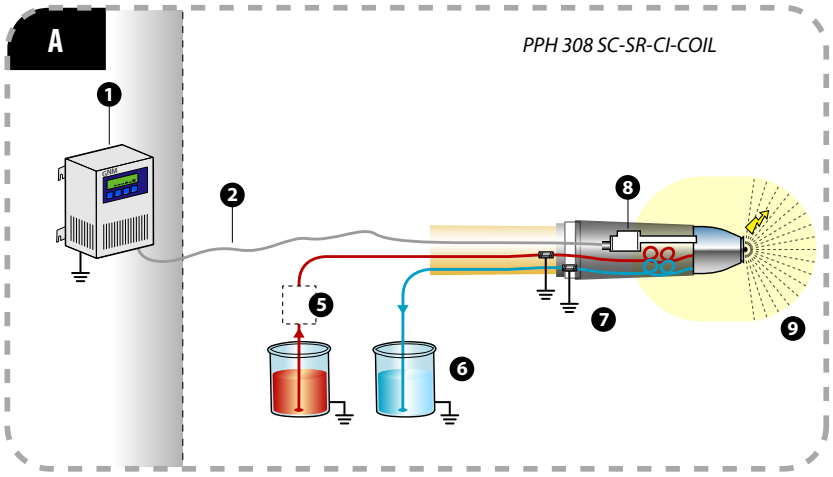
Weight	PPH308 (internal charge)
Without hoses and cables	2.5 kg
Pneumatic power	
Operating air pressure maxi. (bar)	6 (90 psi)
Normal pilot air (bar)	8.5 to 10 (127.5 to 150 psi)
Magnetic bearing air pressure (bar)	4 mini / 7 maxi
Amount of air bearing backup (bar)	25 liters under 6 bar (90 psi)
Total air consumption (Nl/min.)	20 to 45
Rotation speed (Rpm (loaded))	5 000 to 45 000 (during application)
Air supply micro (mm)	ø4x6
Microphone air (out) (mm)	ø4x6
Air supply turbine rotation (mm)	ø7x10
Air supply turbine braking (mm)	ø6x8
Magnetic bearing air supply (mm)	ø4x6
Supply air spray (mm)	ø6x8
Fluid supply	
Fluid pressure maxi.(bar)	10 (150 psi)
Paint flow (cc/min)	30 to 600
Viscosity range (seconds) Ford Cup 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

PPH 308 rotary atomizer

> Installation rules

Application of solvent-based paint

Illustration



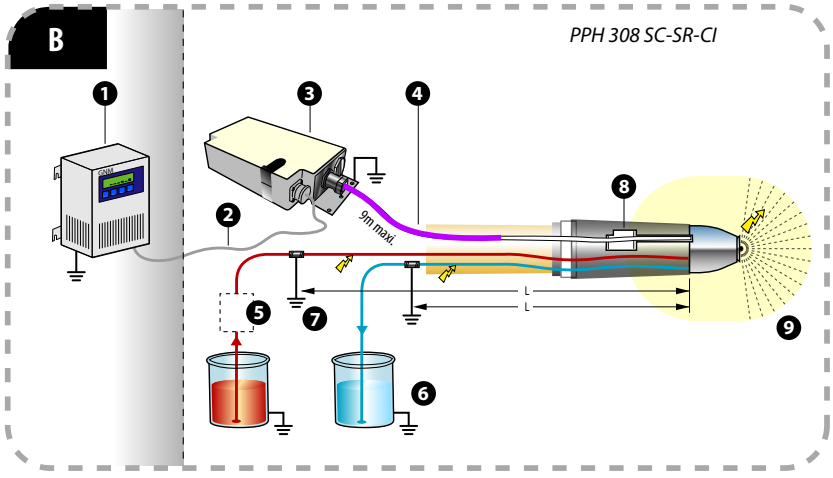
All conductive parts must be connected to the potential of the ground (Ex: moduclean, Gear Pump…)

Designation

A	**Paint resistivity ≥ to 6 MΩ.cm**
1	Control module GNM200 (Out of ATEX zone)
2	Low voltage connection
3	
4	
5	Paint and supplies related to the flushing potential of the ground
6	circuit purge grounded
7	Connections on circuits connected to ground
8	High voltage unit UHT155 EEx em
9	Safety distance between the elements at the high voltage and the ground

Application of solvent-based paint with low resistivity

Illustration



All conductive parts must be connected to the potential of the ground.
L = distance between element at high voltage and ground (5m max).

Designation

B	**Paint resistivity > to 0.5 MΩ.cm**
1	Control module GNM200 (Out of ATEX zone)
2	Low voltage connection
3	High voltage unit UHT188 EEx e
4	High voltage cable (9 m. maxi.)
5	Paint and supplies related to the flushing potential of the ground
6	Circuit purge grounded
7	Connections on circuits connected to ground
8	Configuring supply block TRP with damping resistor
9	Safety distance between the elements at the high voltage and the ground

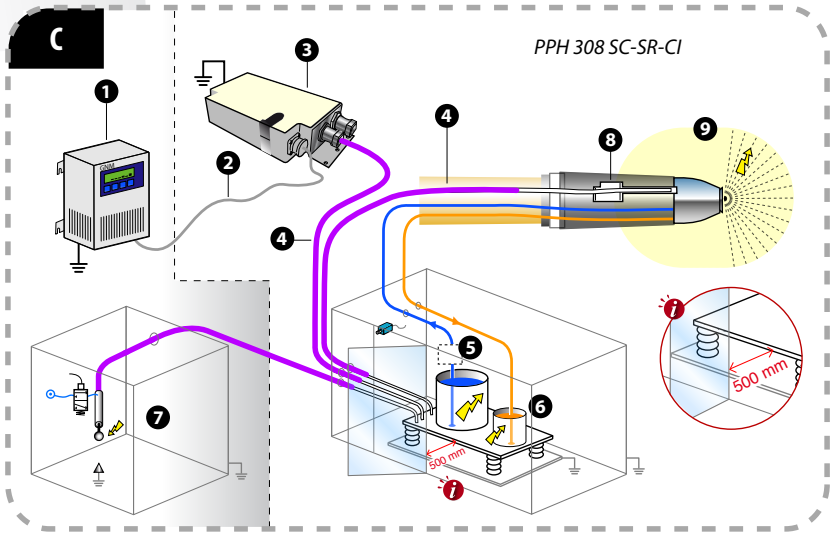
SC = single circuit, SR = without regulator, CI = Internal charge, coil = adapted to metallic paint

PPH 308 rotary atomizer

> Installation rules

Application of water-based paint

Illustration



Designation

C	Flammable or non-flammable paint
1	Control module GNM200
2	Low voltage connection
3	High voltage unit UHT288 EEx e
4	High voltage cable
5	Paint and supplies related to the flushing potential of the ground
6	Circuit purge grounded
7	Discharge system out of ATEX zone
8	Configuring supply block TRP without damping resistor
9	Safety distance between the elements at the high voltage and the ground

All conductive parts must be connected to the potential of the high voltage.

Discharge system of supply water-based paint

Picture

Reference

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

910003300

Safety lock 2x3: for left side position

110001586

Safety lock 2x3: for right side position

110001587

High voltage discharge rod assembly:

750207

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

PPH 308 rotary atomizer

> Automatic sets of paint

Sprayer PPH308 CI
+ Set bell/cup
+ Reciprocator support
+ fixing nut
+ GNM200
+ low voltage connection (8m)
+ UHT 155 or UHT 188 (with HV cable in 9m)
+ speed regulation or converter F/U

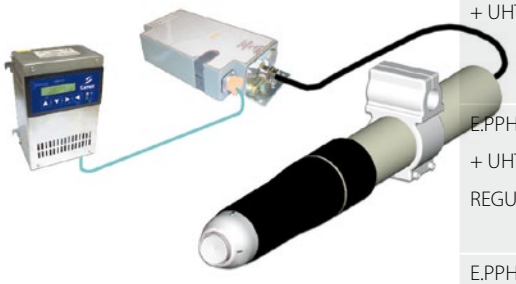
Warning: the tool kit for the bells and associated air cups does not come as standard with the equipment.

Use for solvent-based paint: R ≥ 6 MΩ.cm

Illustration	Designation	Rotation management	Bell Dxx	Reference
	E.PPH308AT-155-Dxx-GNM200	Without	D35	910002210
			D50	910002211
			D65	910001946
			D65 Straight(1)	910006019
	E.PPH308AT-155-Dxx-GNM200 + REGUL-VIT	Speed regulation module	D35	910002375
			D50	910002376
			D65	910002377
			D65 Straight(1)	910006020
	E.PPH308AT-155-Dxx-GNM200 + CONV-F/U	Frequency / voltage converter	D35	910003347
			D50	910003348
			D65	910003349
			D65 Straight(1)	910006021

(1): External shroud with straight air spray for wide impact

Use for solvent-based paint: R > 0.5 MΩ.cm

Illustration	Designation	Rotation management	Bell Dxx	Reference
	E.PPH308AT-Dxx-GNM200 + UHT188	Without	D35	910003524
			D50	910003525
			D65	910003523
			D65 Straight(1)	910006022
	E.PPH308AT-Dxx-GNM200 + UHT188 REGUL-VIT	Speed regulation module	D35	910003527
			D50	910003528
			D65	910003526
			D65 Straight(1)	910006023
	E.PPH308AT-Dxx-GNM200 + UHT188 CONV-F/U	Frequency / voltage converter	D35	910003530
			D50	910003531
			D65	910003529
			D65 Straight(1)	910006024

(1) : Cup with straight air outlets for wide impacts

PPH 308 rotary atomizer

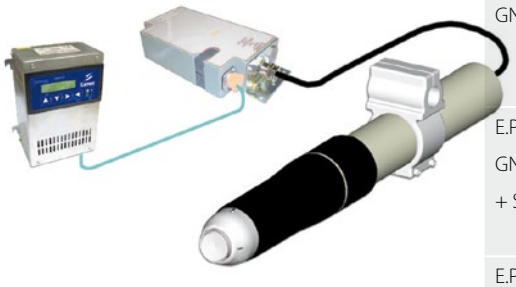
> Automatic sets of paint

Sprayer PPH308 CI WB
+ Set bell/cup
+ Reciprocator support
+ fixing nut

+ GNM200
+ low voltage connection (8m)
+ high voltage unit UHT288
+ high voltage cable (18 m)

+ speed regulation or converter F/V
Warning: the tool kit for the bells and associated air cups does not come as standard with the equipment.

Use for water-based paint

Illustration	Designation	Rotation management	Bell Dxx	Reference
	E.PPH308ATWB-Dxx GNM200-UHT288	Without	D35	910003533
			D50	910003534
			D65	910003532
			D65 straight(1)	910006025
	E.PPH308ATWB-Dxx GNM200-UHT288 + Speed regulator	Speed regulation module	D35	910003536
			D50	910003537
			D65	910003535
			D65 straight(1)	910006026
	E.PPH308ATWB-Dxx GNM200-UHT288 + CONV-F/U	Frequency / Voltage converter	D35	910003539
			D50	910003540
			D65	910003538
			D65 straight(1)	910006027

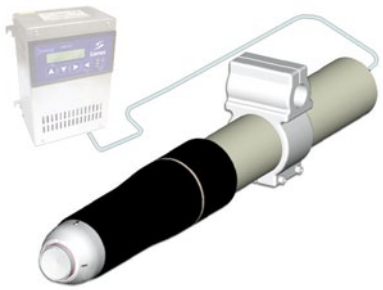
(1): Cup with straight air outlets for wide impacts

> Sprayer alone

Sprayer PPH308 CI
+ Set bell/cup
+ Reciprocator support

+ fixing nut
+ high voltage unit 155 or high voltage cable

Warning: the tool kit for the bells and associated air cups does not come standard with the equipment.

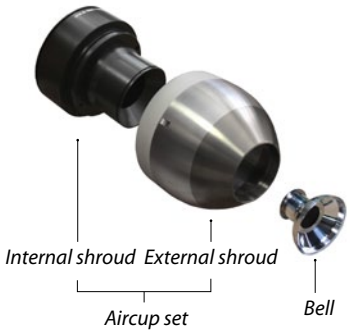
Illustration	Designation	Based paint	Bell Dxx	Reference
	PPH308AT-CI-Dxx-155	SOLVENT R ≥ 6 MΩ.cm	D35	910002208
			D50	910002209
			D65	910001945
			D65 straight(1)	910006018
	PPH308AT-CI-Dxx +cable HT (9m)	SOLVENT R > 0.5 MΩ.cm	D35	910003555
			D50	910003557
			D65	910003553
			D65 straight(1)	910006028
	PPH308ATWB-CI-Dxx +cable HT (18m)	WATER	D35	910003556
			D50	910003559
			D65	910003554
			D65 straight(1)	910006029

(1): Cup with straight air outlets for wide impacts

PPH 308 rotary atomizer

Components

Magnetic bell

Illustration	Bell ø (mm)	Reference
	EC 35	910000877
	EC 50	910000876
	EC 65	1527176
	EC35, 50 & 65 TITANE	Contact us
	EC35, 50 & 65 Un-notched	Contact us
	EC 65 For viscous product	Contact us

Aircup set

Shroud	Reference
Vortex air shroud	910001297
Hi-TE EC35 option	910008515
Vortex air shroud	910001298
Hi-TE EC50 option	910008514
Vortex air shroud	910001196
Straight air shroud	910001695
Hi-TE EC65 option	910008513

Complete set for assembly and disassembly of bells and air cups

Designation	Bell ø (mm)	Reference
Tools kit for PPH308 bell	EC 35	910008907
	EC 50	910008908
	EC 65	910008909

Choice of the bell

The choice of the bell is linked:
- To the flow of the paint to use
- To the size of the part to paint
- To the paint to apply

Recommended uses
From 12 to 45 sec. Ford cup # 4

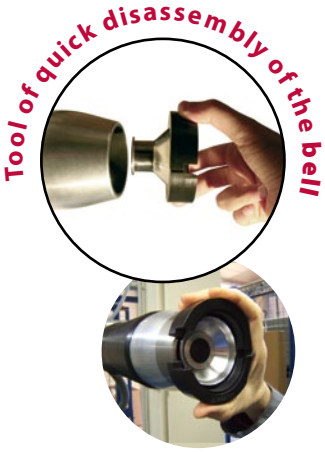
ø 35 mm

ø 50 mm

ø 65 mm

Paint flow (mini-maxi)	20 - 450 cc/min.	30 - 500 cc/min.	35 - 600 cc/min.
Spray pattern	75 - 350 mm	100 - 450 mm	150 - 550 mm

Primer solvent		✓	✓
Primer water		✓	✓
Solvent based	✓	✓	✓
Water based	✓	✓	✓
Metallic base	✓	✓	✓
Varnish	✓	✓	✓
Bi-components		✓	✓
High solids		✓	✓

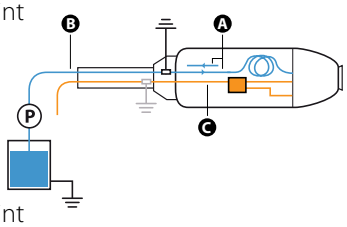


PPH 308 rotary atomizer

Recommendations of product/rinsing hoses

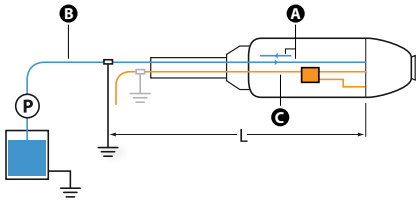
Depending on the type of application:

> for solvent-based paint
(R ≥ 6MΩ.cm)



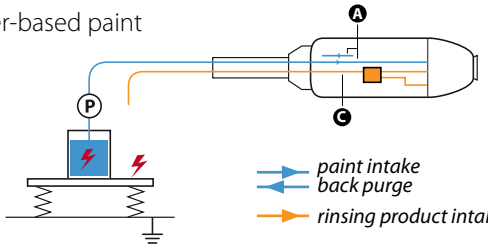
	A Sprayer	B Power supply	C
Paint intake	Integrated coil ø 4x6mm	ø 4x6 mm PTFE	
Back purge	Integrated coil ø 4x6mm	Ø 4 x 6mm for 1.5m then Ø 7x10 mm	
Product intake			ø 4x6 mm PTFE

> for solvent-based paint
(R > 0.5MΩ.cm)



Paint intake	ø 5x8 mm PTFE + duct ø 9x12 mm PTFE	ø 5x8 mm PTFE	
Back purge	ø 5x8 mm PTFE + duct ø 9x12 mm PTFE	ø 5x8 mm PTFE	
Product intake			ø 4x6 mm PTFE + duct ø 7x10 mm PTFE

> for water-based paint



Paint intake	ø 5x10 mm PTFE		
Back purge	ø 5x10 mm PTFE		
Product intake			ø 5x10 mm PTFE

Reverse Flush

- Reduced time of rinsing and color changes
- Rinsing product saving
- Paint saving
- Increased productivity
- Update the installation
- Compact
- Enhanced safety

Reverse Flush

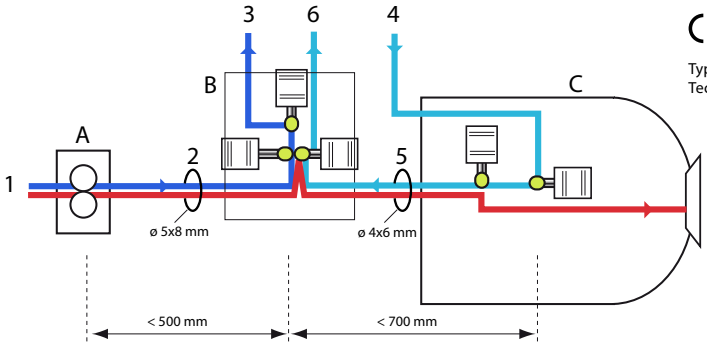
Solution for the optimization of the paint line rinsing system

Illustration

Reverse Flush block deported

The block is installed between the pump and the sprayer up to 1.5 m away.

Example of an installation for a single spray circuit:



A: Gear pump supply
B: Remote Reverse Flush deport
C: PPH308 sprayer single circuit
1: Arrival of colours or air/rinsing times
2: Arrival of paint (painting) or air / rinsing cycles from the pump
3: Exit allowing the purge of the pump without passing by the sprayer
4: Arrival air/rinsing times from the sprayer purge to the Reverse Flush
5: Arrival of paint up to the sprayer
5: cycles of rinsing for the sprayer, independently or not from pump rinsing
6: Exit (release) allowing to purge the atomizer without passing by the pump

Description

Reverse Flush is a block which allows dumping and rinsing of the product supply system without going through the sprayer.

Reverse Flush enables rapid implementation and updating of an existing installation, it can be implemented in all painting configurations: It depends on the distance there is between the pump and sprayer.

ATEX marking:

CE Ex II 2 G c T6

Type: REVERSE FLUSH
Technical file: BLOC PV

The Reverse Flush block can be installed with all types of sprayers, internal charge version (solvent paint) or external (water paint), single or double circuit equipped:
- a trigger valve
- a purge valve

Technical characteristics

Operating pressure	Pressure
Rinsing product (bar)	5.5 - 6
Rinsing air (bar)	5.5 - 6
Product supply (bar)	5.5 - 6

Reference

910007340(1)	Reverse flush block deproted (picture)
910007773(2)	Reverse flush built-it, directly assembled onto the pump

(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

The advantages are numerous and permit:

- The dump hose remains clean and dry, thus high voltage return is not possible = **Reinforced safety.**
- The pump is kept apart from the product circuit and rinsing is easier and is carried out in minimal time : moreover, 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 (ø4 mm instead of 5 mm) = **Paint saving**.
- The pump priming with circuit 2 during the end of the spraying of circuit 1 has become 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 anywhere on the paint circuit to cut the circuit, thus allowing separating the rinsing of both parts = **Optimization of rinsing time**.

PPH 707 EXT-ST HIGH SPEED ROTARY ATOMIZER

Illustration

Description

PPH 707 EXT-ST is dedicated for applying non-flammable or not easily flammable water-based paints.
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.

ATEX marking:

PPH 707 EXT:	***UHT 330 EEx e:***	***GNM200[1]:***
CE 0080 Ex II 2 G	Ex II 2 GD	CE 0080 Ex II (2) G
EEx > 350 mJ ISSeP06ATEX032X	EEx e II ISSeP01ATEX002U	[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.

The customer's benefits:

• Compliance with environment protecting regulations, as a drastic decrease of VOCs (Volatile Organic Compounds) is made possible.

• Cost effective solution: gives access to all benefits of the electrostatic charge and linked advantages: High-transfer efficiency, regular application, high quality of finishing.

• Easy operation for application of waterborne materials: PPH 707 EXT-ST can be mounted onto an existing line.

• Possibility to use unlimited number of colors and to achieve fast color changes.

• No insulation of paint circuits to consider, thus no paint tank under HV tension = increased safety.

PPH 707 EXT-ST HIGH SPEED ROTARY ATOMIZER

> Spray solution

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):

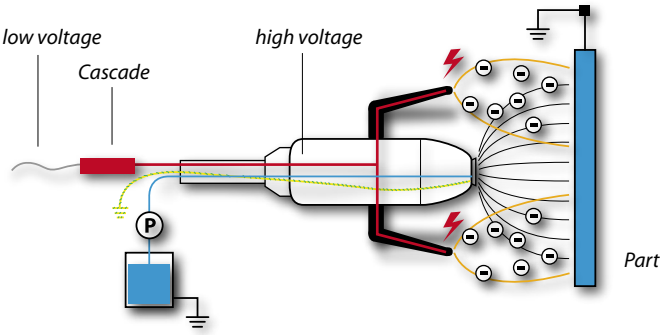
• particulate charge in the vicinity from external electrodes.

• 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.

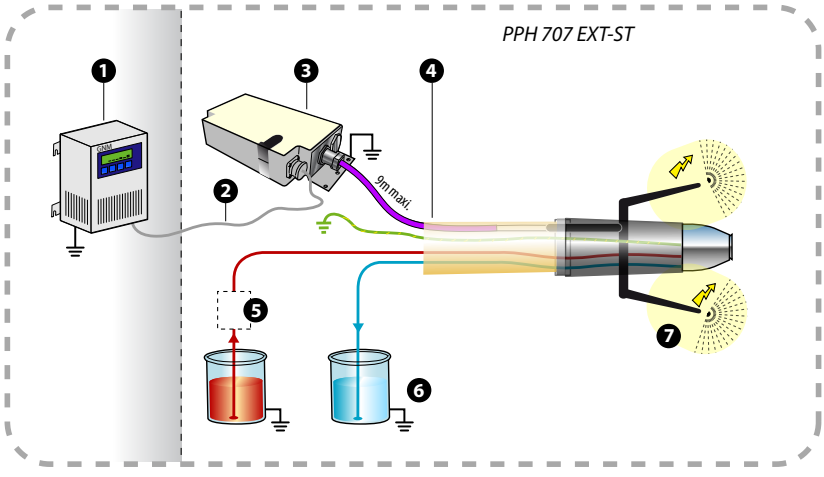
PPH 707 EXT-ST is equipped with a single version of bell EX65 Hi-TE EXT technology and shaping air assembly.

Illustration



> Installation rules

Illustration



All conductive parts must be connected to the ground potential.

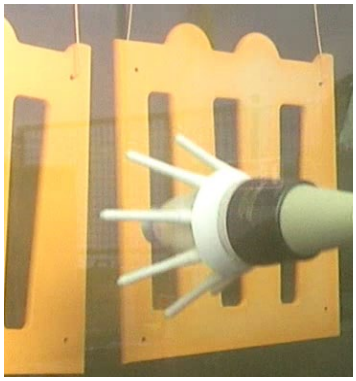
Designation

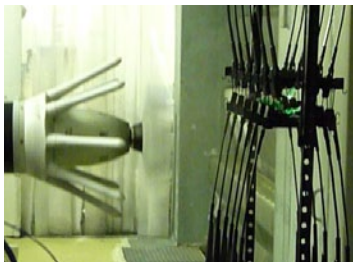
	Flammable or non-flammable paint
1	Control module GNM200 control module (out of ATEX ar ea)
2	Low voltage connection
3	High voltage unit UHT 330 EEx e (85 kV - 500 µA)
4	High voltage unit (9 m maxi.)
5	Paint and rinse material related to the ground potential
6	Circuit purge grounded
7	Safety distance (zone around each end of the electrode and ground potential)

PPH 707 EXT-ST HIGH SPEED ROTARY ATOMIZER

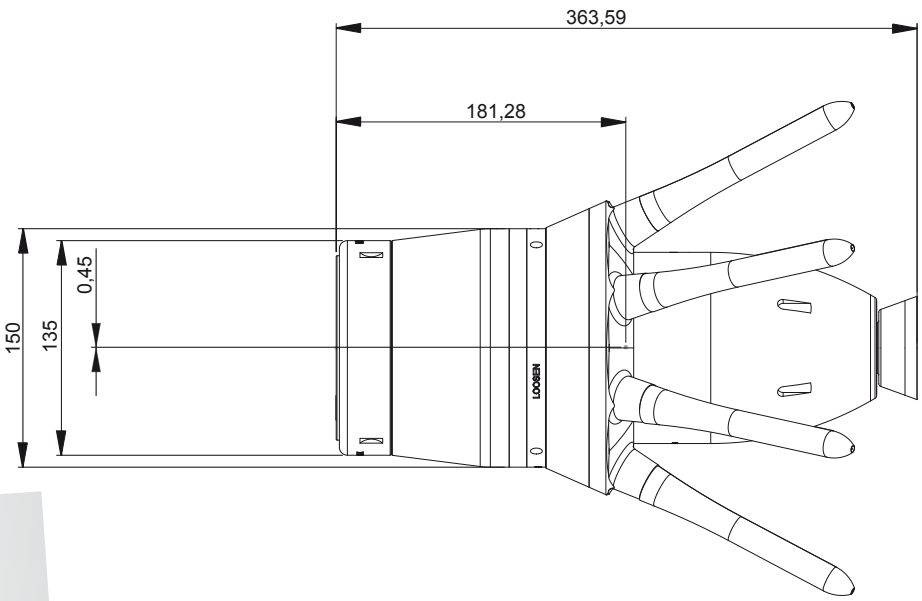
Technical characteristics

Weight	PPH 707 EXT-ST (external charge)
Without hoses and cables	6.59 kg
Pneumatic power	
Shaping air pressure maxi.(bar)	6 maxi (90 psi)
Nanovalve 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 mini - 7 maxi
Amount of air bearing backup (bar)	25 liters under 6 bar (90psi)
Rotation speed (rpm (loaded))	15 000 to 80 000 (During application)
Voltage	
Maximum operating Voltage (kV)	85
Maximum operating Current (µA)	500
Fluid supply	
Fluid pressure maxi. (bar)	10 (150 psi) and 6 to 8 normal pressure
Paint flow (cc/min)	up to 700 maxi
Viscosity range (seconds) Coupe FORD n°4	20 to 40
Air consumption	
Pilot (Nl/min.)	10
Bearing air (Nl/min.)	125
Shaping air 1 (Nl/min.)	100 to 600
Shaping air 2 (Nl/min.)	100 to 600
Turbine (Nl/min.) depending on use pressure/flow	135 to 685





> Dimensions

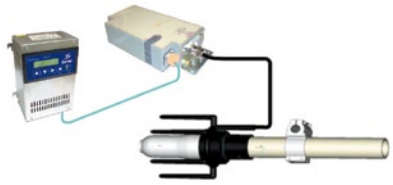


PPH 707 EXT-ST HIGH SPEED ROTARY ATOMIZER

> Automatic sets of paint

Sprayer PPH 707 EXT-ST
+ bell/cup set
+ Reciprocator support
+ fixation nut
+ GNM200
+ low voltage connection
+ high voltage unit UHT 330
+ high voltage cable
+ par speed regulation or converter F/U

Warning: the tool kit for the bells and associated air cups does not come as standard with the equipment.

Illustration	Designation	Rotation management	Reference
	E.PPH 707 EXT-ST - EX65 GNM200 - UHT330	Without	contact us
		Speed regulation module	contact us
		Frequency / voltage converter	contact us

> Automatic sprayer

Sprayer PPH 707 EXT-ST
+ bell/cup set
Reciprocator support
Fixation nut

Sprayer PPH 707 EXT-ST-EX65	-	910008759
Support tube	-	900007720
Fixing nut	-	1 204 441

Air shrouds and bell cup

Shaping air assembly	-	910008686
EX 65 EXT bell cup	-	910008549

Options

Paint regulator kit for water-based paint	-	910009592
Mano regulator kit (inside the cabinet)	-	900006957
2 x 24V feeding for speed regulator module (up to 8 modules fed)	–	910012209

NANOBELL® robotic atomizer

Illustration

Description

The NANOBELL robotic sprayer is compact, lightweight (3.3 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 Nanobell they all have access to an applicator which can significantly increase their paint savings, while improving the quality of their production. It can spray, according configuration chosen, solvent-based or water-based paints, mono or multi-components paints.

ATEX marking:

NANOBELL
Solvent-based product with R> 0.5 MΩ.cm:
CE 0080 Ex II 2 G
EEx > 350 mJ
ISSeP05ATEX032X

UHT 158 EEx e:
Ex II 2 G
EEx e II
ISSeP01ATEX002U

NANOBELL
Water-based paint:
CE 0080 Ex II 2 G
EEx > 350 mJ
ISSeP06ATEX032X

UHT 287 EEx e:
Ex II 2 GD
EEx e II
ISSeP01ATEX002U

GNM200[1]:
CE 0080 Ex 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.

Advantages are numerous and permit:

Integration for lightweight robots:
Its light weight (3.3 kg) allows a mounting on small robots and easily replacing guns on existing facilities. This enables significant paint savings for the customer.

Paint savings:

• The rotary bell cup technology allows a higher transfer efficiency, from 20 to 50% superior to an electrostatic or conventional spray gun.
• The variation of pattern while spraying permits to get:
- A narrow pattern on the edges and small surfaces = Less paint outside the target
- A large impact on the large surfaces = reduced time application.

Aspect of application:
• Hi-TE technology combines a very thin atomization of the paint droplets and a sharp control of the thickness applied. Quality of finishing meets the most severe criteria of surface tension and DOI (Distinctness Of Image).

Hi-TE technology "Combined airs bell Cup":
The combined air shroud Hi-TE enables a very fast and very marked variation of size of impact. Through better control of the spray, it is possible to adjust the width of impact during application on a proportional basis. Variable impact over a wide range (between 100 mm and 450 mm).
• Only a single air control for air cup Hi-TE, which facilitates implementation and adjustment of application.

Flexibility:
Exclusively developed for robotic application, the compact design of Nanobell facilitates its operation on complex trajectories or on difficult angles.

Robustness in production:
The high voltage units are high power, they operate under conditions of severe applications (Dirt / overspray, application of internal parts, or being close to the ground potential...).

NANOBELL® robotic atomizer

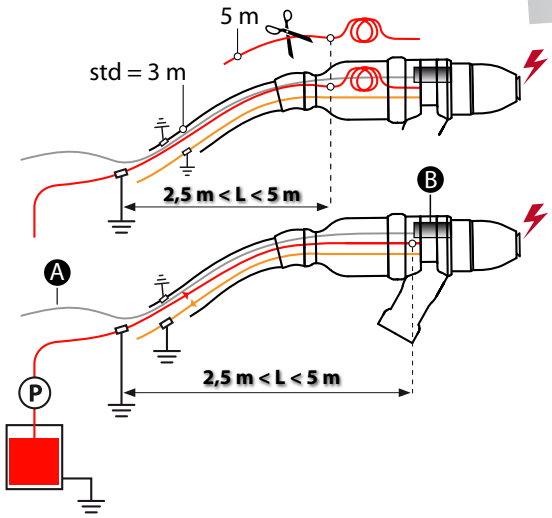
> Solutions of spraying «NANOBELL»

Range

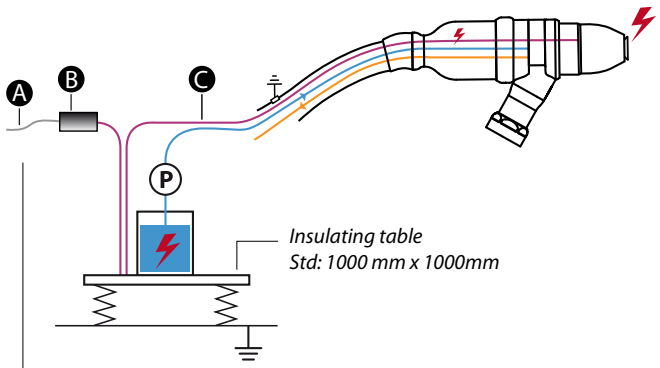
Depending on the type of application (solvent-based or water-based), the spray version NANOBELL differs through the wiring of the elements connected to the high voltage and circuits produced and rinsing:

• for an application of **solvent-based product** with a **resistivity ≥ 0.5 MΩ.cm (cf recommandations)**:
- The product distribution system is connected to ground potential.
- High Voltage Unit **(B)** UHT158 [70kV/100µA] is integrated to the spray.
- Two versions are available:
  • with Coil on circuit product (metallic paint)
  • Without Coil

Illustration



• 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/500µA] is remote from the sprayer.
- The number of colors is limited.

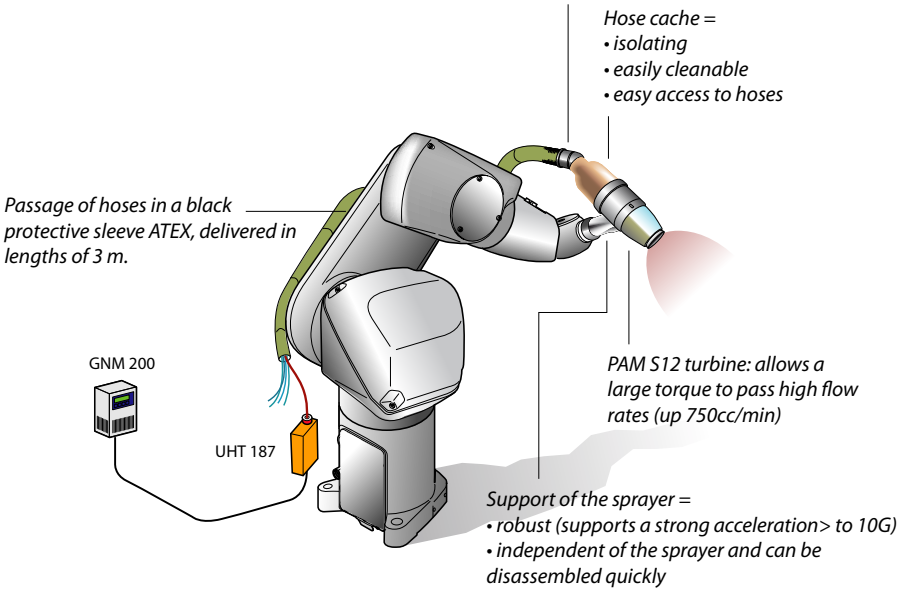


(A) : Low voltage connection
(B) : High voltage unit
(C) : High voltage cable

NANOBELL® robotic atomizer

> Advantages:

This new sprayer is dedicated to robotic applications in general industry.
It permits the application of paints :
- Solvent-based (low or high resistivity)
- Solvent-based metallic
- Water-based
- Bi-components



> Easy maintenance:

The sprayer slides perfectly backwards:
- *Quick access to micro-valves*
- *establishment and quick maintenance*

Support (1) guarantees the protection of micro-valves (2) excludes dirt and ensures a perfect seal.

The cover (3) slides perfectly backwards:
- *Quick access to connections (hoses, air, low voltage connection, UHT / Placebo)*
- *quick establishment and maintenance*

Technical characteristics

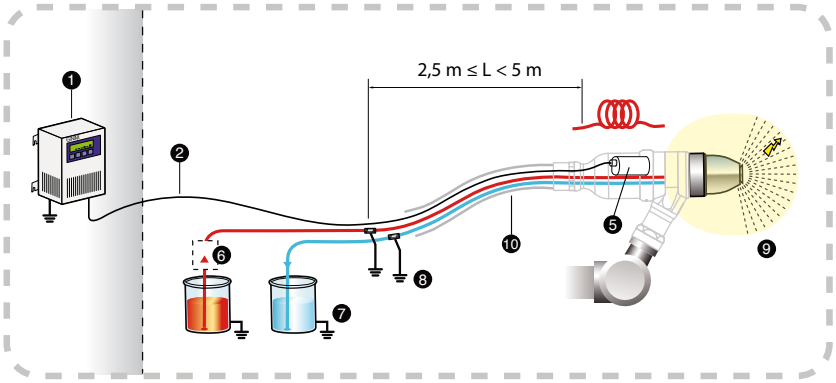
	NANOBELL
Weight	
Without hoses and cables (SB HR version)	3.3 kg
Pneumatic power	
Constant air cup pressure	6 (90 psi)
Constant micro air pressure	1.9 - 3
Normal pilot pressure (bar)	6 - 10 bar max. (90 - 150psi)
Magnetic bearing air pressure (bar) to 85 Nl/min.	6 - 10 bar max. (90 - 150psi)
Amount of air bearing backup (bar)	25 liters under 6 bar (90 psi)
Pilot consumption (Nl/min.)	10
Bearing air consumption (Nl/min.)	125
Air cup consumption (Nl/min.)	0 - 600
Turbine consumption (Nl/min.)	190 - 700
Rotation speed (rpm (loaded))	5 000 - 45 000
In micro air (mm)	ø4x6
Out micro air (mm)	ø4x6
Air supply turbine rotation (mm)	ø7x10
Air supply turbine braking (mm)	ø6x8
Magnetic bearing air supply (mm)	ø4x6
Supply air cup 1 and cup 2 (mm)	ø7x10
Fluid supply	
Fluid pressure maxi. (bar)	10 (150 psi)
Paint flow according paint type	30 - 750
Viscosity range Cup FORD n°4	15 - 50
Product supply hose (mm)	ø5x8
Power injector rinse / outdoor bell (mm)	ø4x6
Power steering flush injector (mm)	ø2.7/4
Supply hose control fluid (mm)	ø2.7/4
Power drain hose (mm)	ø5x8
Power drain hose control (mm)	ø2.7/4

NANOBELL® robotic atomizer

> Installation rules

Application of solvent-based paint

Illustration



All conductive parts must be connected to the ground potential (ex : moduclean, pump, etc…)

Designation

	Paint resistivity ≥ to 0.5 MΩ.cm
1	Control module GNM 200 (out of ATEX area)
2	Low voltage connection (20 m)
3	-
4	-
5	UHT 157 EEx e (70kV/100µA)
6	Paint and supplies related to the flushing potential of the ground
7	Circuit reverse drain grounded
8	Fitting up the potential of earth tubes (L = 2.5 m min or 5 m max. After coil or straight pipe)
9	Safety distance between the elements at the high voltage and ground
10	Special conductive protective sheath (3 m)

Recommandations:

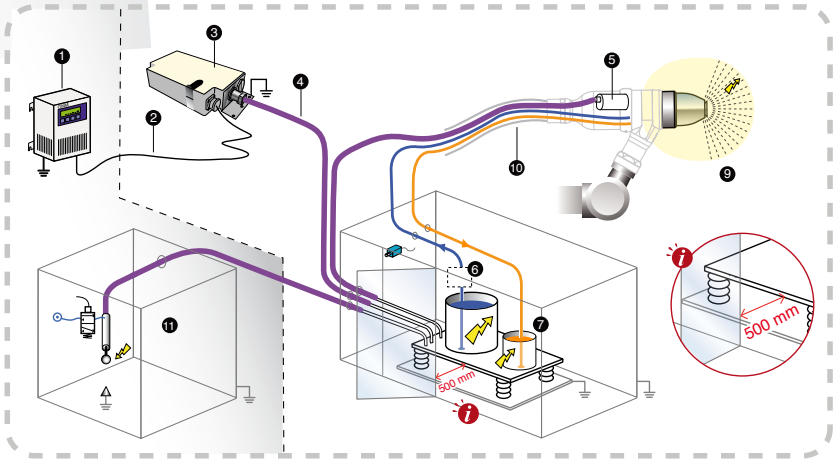
High voltage (kV)	Solvent paint resistivity
30 kV	0.5 to 1 MΩ.cm
50 kV	1 to 6 MΩ.cm
70 kV	> of 6 MΩ.cm

NANOBELL® robotic atomizer

> Installation rules

Application of water-based paint

Illustration



All conductive parts must be connected to the high voltage potential.

Designation

	Flammable or non-flammable paint
1	Control module GNM200
2	Low voltage connection
3	High voltage unit UHT287 EEx e
4	High voltage cable
5	Connector (Placebo cascade) of high voltage cable with a damping resistor
6	Paint and supplies related to the flushing potential of the ground
7	Circuit reverse drain grounded
9	Safety distance between the elements at the high voltage and ground
10	Special conductive protective sheath (3 m)
11	Discharge system with gas lift «out of area ATEX HT cable connected to the table insulating

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.

Picture	Reference
	**Short-circuiting**: it allows the potential of the ground from all supply water-based paint installed on table isolated safely. **910003300**
	**Safety lock 2x3**: for left side position **110001586** **Safety lock 2x3**: for right side position **110001587**
	High voltage discharge rod assembly: **750207**

NANOBELL® robotic atomizer

> Automatic set of paint

NANOBELL (Coil circuit version, hose length outlet of sprayer of 5m) or
NANOBELL (version without Coil, without hose and placebo HT)

+ GNM200
+ Low voltage connection (8m)
+ Connectors
+ UHT 158 [70 kV/100µA] or
UHT 187 [70 kV/200µA] (with high voltage hoses)
+ Speed regulation module
+ Microphone
+ Jacket hose (3 m)

Reference sets without bell and air cup

Use for solvent-based paint: R ≥ 0.5 MΩ.cm

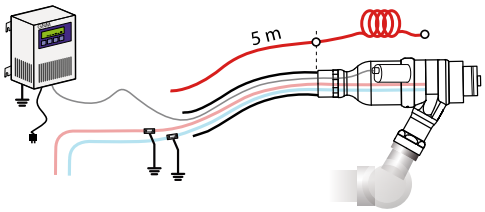


Illustration	Designation	Version	Rotation management	Reference
	NANOBELL Hi-TE SB	Without Coil	Without	910008613
			Speed regulation module + micro	910008614
	NANOBELL Hi-TE SB	With Coil	Without	910008619
			Speed regulation module + micro	910008620

SB: version for solvent-based paint, HR : high resistivity paint, Coil : dedicated to metallic paint

> Automatic set of paint

NANOBELL (version without Coil, without hose and placebo HT)
+ GNM200
+ Low voltage connection (8m)
+ Connectors

+ UHT 287 [70 kV/500µA]
+ High voltage cable
+ Speed regulation module
+ Microphone
+ Jacket hose (3 m)

Reference sets without bell and air cup

Use for water-based paint

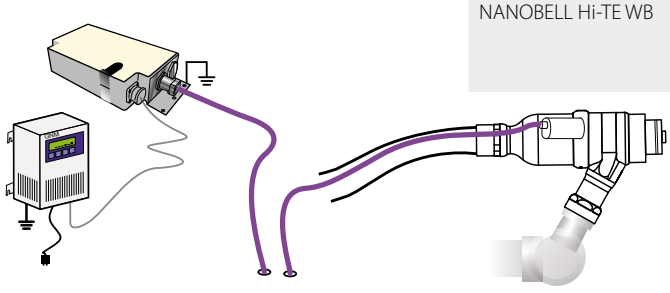


Illustration	Designation	Version	Rotation management	Reference
	NANOBELL Hi-TE WB		Without	910008617
			Speed regulation module + micro	910008618

WB: version for water-based paint

NANOBELL® robotic atomizer

> Sprayer alone

NANOBELL (Coil circuit version, hose length outlet of sprayer of 5m) or NANOBELL (version without Coil, without hose and placebo HT)

+ high voltage unit 158 or high voltage cable
+ jacket hose (3 m)

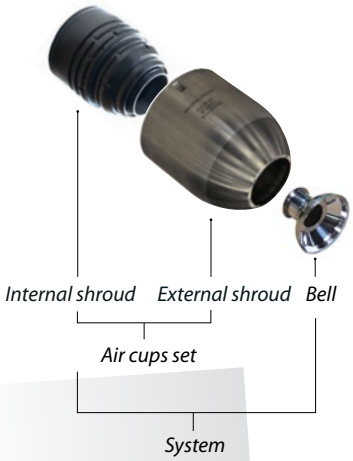
Reference of sprayers without bell and air cup

Illustration	Designation	Paint with	Version	Reference
	NANOBELL Hi-TE SB UHT 158 (Built-in)	SOLVENT R ≥ 0.5 MΩ.cm	Without Coil With Coil	910007462 910008402
	NANOBELL Hi-TE WB + cable HT (18m)	WATER	Without Coil	910008556

Robotic sprayer NANOBELL®

Components

Magnetic bell cup

Illustration	Bell ø (mm)	Reference
	EC 35 Hi-TE	Contact us
	EC 50 Hi-TE	910000876
	EX 65 Hi-TE	910008179
	35, 50 & 65 TITANE	Contact us
	35 & 50 un-notched	Contact us

Set of aircup

Air cups set	Reference
Aircups Hi-TE EC35	Contact us
Aircups Hi-TE EC50	910007433
Aircups Hi-TE EX65	910008211

System (bell & aircups set)

Designation	Reference
System EC 35 Hi-TE	910008515
System EC 50 Hi-TE	910008514
System EX 65 Hi-TE	910008513

NANOBELL® robotic atomizer

Components

Complete set for assembly/disassembly bell and air cups

Designation	Bell ø (mm)	Reference
Toolkit system NANOBELL	EC 35	910008977
	EC 50	910008976
	EX 65	910008978

Adaptations for assembly on robots

Illustration	Robot model	Reference
	PX 1450	910008322
	TX 60	910008323
	KF 121	910008324
	IRB 540	910008325

Dust cover

Illustration	Reference
	900006143

Electrical kits

Designation	Choice of kit	Reference
Electrical kit for PPH308 or NANOBELL	Without speed regulator (1)	910002212
	With speed regulator (2)	910002329
	With F/U box (3)	910003346

(1): CONTROL MODULE GNM200 (220V) +
LOW VOLTAGE SET CABLES GNM200A -> UHT +
POWER CONNECTOR 10A 250V LG:2,5 M BLACK +
CABLE 2.5M +
CLEAT PG11(7/12)6334 210 06 +
MALE PLUG. 7CTS 6387 070 06 +
FEMALE PLUG 19CTS 6376 190 06

(2): SPEED REGULATOR TURBINE BOARD BSC-100 +
MICROPHONE (PLUG+ASSEMBLED) +
BELL SPEED BOARD MODULE +
LOW VOLTAGE CONTROL (220V) +
FEMALE SOCKET 48 RECEP.

(3): CONVERTISSEUR F/T 10MS +
MICROPHONE SWITCH (PLUG & ASSEMBLED) +
LOW VOLTAGE CONTROL 220V

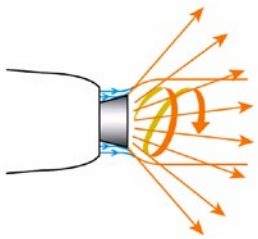
NANOBELL® robotic atomizer

New paint application systems

Technology «HI-TE is the new benchmark in automotive paint. It provides variable effects during spraying, ensuring great control with fast application speeds.

Many benefits are associated and provide:

- Single air control for easy implementation
- To work faster, to over 1 meter per second
- The use of high flow rates, up to 750 cc / min
- High results, up to 30% reduction in product losses.
- Ensuring the robustness of the material application, uniform and stable atomization throughout the variable range of spray painting
- Ensuring the best quality finish
- A reduced cost of cleaning
- To lengthen considerably the time between cleanings
- Long life time



The outer cup is formed of combined pairs of air holes. This cup allows the versatility of applications sought, the atomization can change rapidly in order to obtain a narrow jet or broad and penetrating and enveloping for optimal deposition efficiency.

Cup is formed with pairs of air ports, combined on the same diameter. ***Patented***

Choice of different systems

EC 35 Hi-TE

> High performance application
> Using high flows
> Shields (Primers, bases, varnish)
> Car body Interior
> Variable pattern trajectories
> Optimized for covering small areas and difficult access

EC 50 Hi-TE

> High performance application
> Using high flows
> High speed robot
> Variable pattern trajectories
> Shields (Primers, Bases, Clear)
> Car body Interior
> Car body exterior (Primers and Varnishes)
> Optimized for application to broadband and high speed

EX 65 Hi-TE

> Base covering (2nd layer)
> High transfer efficiency in a Bell / Bell process
> Exteriors (solvent bases and hydro)
> Very good color application
> Promotes the application metallic base

Bell with flared combined air cup

NANOBELL® robotic atomizer

Performances

The choice of the bell is linked:
- To the paint flow rate
- To the size of the part to paint
- To the paint to be applied

Recommended uses
From 12 to 45 sec. Ford cup # 4


ø 35 mm


ø 50 mm


ø 65 mm

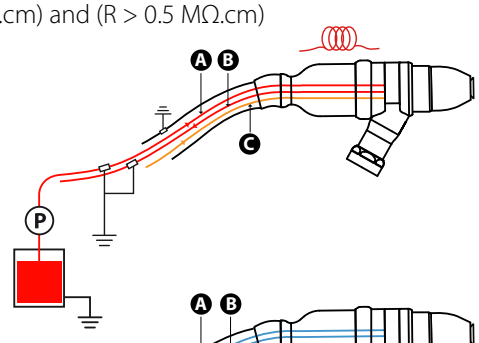
Paint flow (mini-maxi)	20 - 450 cc/min.	100 - 500 cc/min.	100 - 350 cc/min.
Spray pattern	75 - 350 mm	100 - 450 mm	approx. 300 mm

Primer solvent	✓	✓	
Primer water	✓	✓	
Solvent based	✓	✓	✓
Water based	✓	✓	✓
Metallic base	✓	✓	✓
Varnish	✓	✓	
Bi-components	✓	✓	
High solids		✓	

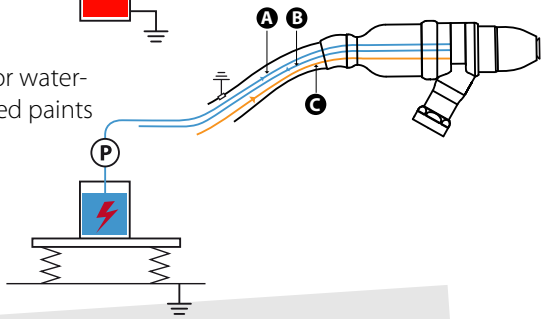
Recommendations of product/rinsing hoses

For the types of application:

> Solvent-based paints
(R ≥ 6 MΩ.cm) and (R > 0.5 MΩ.cm)



> For water-based paints



	A Paint intake	B Return paint	C Product intake
Wiring between fittings connected to ground and spray	ø 5x8 PTFE (straight or coil) + duct ø 9x12 PTFE	ø 5x8 mmm PTFE	ø 4x6 mm PTFE
Wiring connection between pump and connected to ground	ø 4x6 mm PTFE	ø 4x6 mm PTFE for 1.5 m, then ø 7x10 mm	
Wiring between the sprayer and pump	ø 5x8 PTFE (straight or coil) + duct ø 9x12 PTFE	ø 5x8 mmm PTFE	ø 4x6 mm PTFE

Sprayer Vortemail VEC

Illustration

Vortemail VEC
With cup product head

Description

The sprayer Vortemail VEC allows the application of solvent-free products, including liquid enamel, ceramic or water-based for general industry. It is dedicated exclusively to products without solvents, thus the equipment is not beyond the scope of ATEX. The liquid spray enamel does not create ATEX.

The implementation is usually done with a reciprocating machine or in fixed station.

Advantages

• Aspect of application: Vortemail round jet nozzle provides excellent finish by atomization of the product under the air vortex effect.

• Gain product: The transfer efficiency is high, it is superior to a conventional application.
The electrostatic paint application ensures a uniform spraying and a perfect cover of parts to paint.

• Reliability: The projector is entirely, resistant to abrasion and regular flow when spraying.

• The impact width is adjustable according to the form of parts to be glazed.

• Perfect rinsing of the sprayer due to the absence of elements in contact with the product.

• Easy maintenance: The disassembly of the nozzle is easy for a 100% rinse with water.

Description

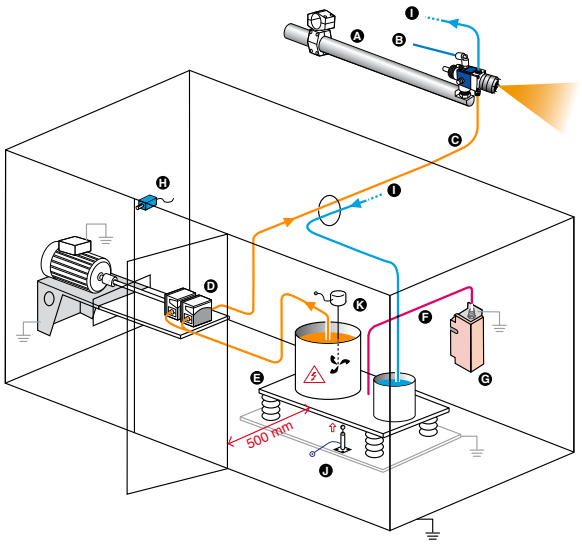
The body of the A28 sprayer is the base member, it is equipped with a stainless steel nozzle Vortemail round jet vortex. The full equipment is called Vortemail VEC. It is assembled on a swivel connector and an isolated support.
The sprayer Vortemail VEC allows a variation of the diameter of product impact. A pneumatic air control allows starting and stopping the spraying.
The needle is actuated by a stainless steel diaphragm which increases by 4 to 5 times the life of the gun. There is no jurisdiction in the circuit paint.
A nozzle is inserted into the tip of the needle, allowing a perfect seal to close.
Maintenance of the fluid channel is very fast with the movable flange (very high resistance to wear).
The arrival of the product in the gun is either from the top or bottom of the spray head.
It is possible to connect a second hose leading to allow continuous recirculation of the product (pin closed) and to avoid sedimentation.
A swivel allows the orientation of the sprayer for easy application.

Sprayer Vortemail VEC

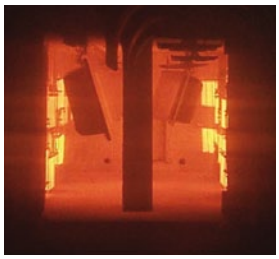
Operating principle

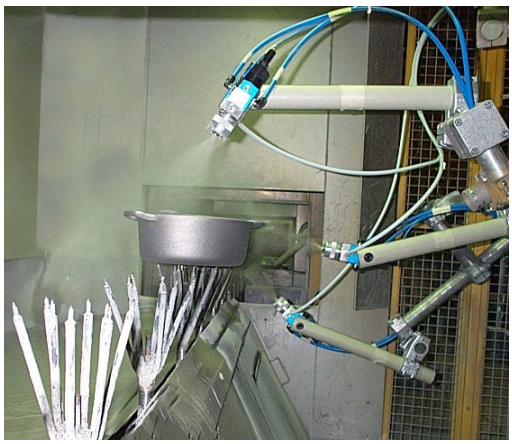
The optimal configuration of use, is associated with a supply system composed of peristaltic pumps and an isolated table for receiving the paint tank.
Two pumps (**D**) assembled per sprayer are recommended, which reduces the pulsation at the nozzle exit and delivers high fluid speeds. This delivery system works by the compression of a hose by three rotating wheels with a motor and thus achieves a constant and precise flow (see Section «Device» table pumping CTH 301/302).
The high voltage charges the paint from the isolated table (**E**) using a specific high voltage cable (F), connected to the high voltage unit 208 UHT EEx e (**G**). This latter is controlled by the control module GNM 200 (integrated into a cabinet).
Conduction of the water-based product (**C**) brings the high voltage to the head of the sprayer. The product hoses through the metal cage must be padded so as to maintain an isolation distance greater to 500 mm.
The operator must not touch the supply system or metal parts of the circuit during the operation. You must install a safety device to be grounded supply product as soon as you open the door of the protective cage.

Illustration



A: Spray gun insulating support
B: Spraying air
C: Product intake
D: Peristaltic pumps
E: Insulating table (placed under high voltage)
F: High voltage cable (100 kV)
G: High voltage unit
H: Door open contact switch
I: Recirculation product
J: Discharge system with pneumatic actuator
K: Pneumatic agitator



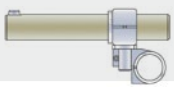


CTH 302 enamel pump table

> Vortemail VEC equipment

Designation	Reference
Vortemail VEC, support + fixing nut	1525939

> Sprayer Vortemail VEC

Designation	Reference
Vortemail VEC	1525482
support + fixing nut 	1525485

PPH 405 Disc sprayer

Illustration

Description

The sprayer PPH 405 allows the application of liquid paints, solvent-or water-soluble in general industry.
Implementation is always made with a reciprocating machine vertical axis generally inseparable from a conveyor describing a circle called «omega» to paint where the parts revolve around the disk. Very versatile, it can paint both the profiles, for example cycles or wooden furniture.

ATEX marking:

PPH 405-B
Solvent-based product with R≥ 0.5 MΩ.cm:
CE 0080 Ex II 2 G
EEx > 350 mJ
ISSeP06ATEX032X

UHT 188 EEx e:
Ex II 2 GD
EEx e II
ISSeP01ATEX002U

PPH 405-B
water-based paint:
CE 0080 Ex II 2 G
EEx > 350 mJ
ISSeP06ATEX032X

UHT 288 EEx e:
Ex II 2 GD
EEx e II
ISSeP01ATEX002U

GNM 200[1]:
CE 0080 Ex 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.

Advantages

Application appearance: The centrifugal effect of the paint spray combines very fine atomisation of the droplets and good control of the paint spray. With such effective penetration there is generally little or no need for touching up.

Versatility: The high application speed allows spraying of all products in wide ranges of flow rates and viscosities: paints, primers and solvent or water-based varnishes, paint with high solids paints, paint mono and bi-components.

Product saving: The application (horizontal shape of the spray paint and parts to be painted around the turn of the disc) can paint with very good results and very high production rates that would be impossible to achieve in correct conditions with other economic systems. The electrostatic painting ensures optimum performance regardless of the speed of the sprayer.

PPH 405 Disc sprayer

> Solutions of spraying

Range

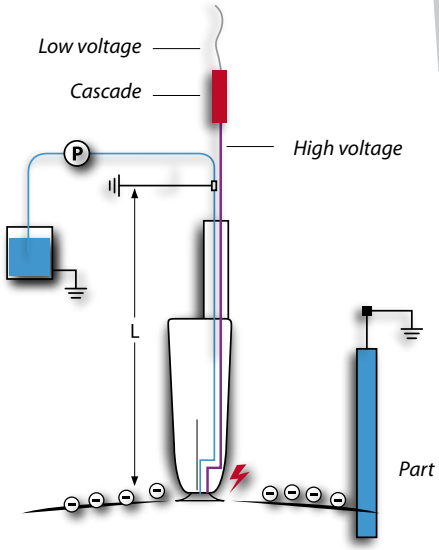
Depending on the type of application (solvent based or water-based), the version of the sprayer PPH 405 differs across the wire elements connected to high voltage and product circuits and rinsing:

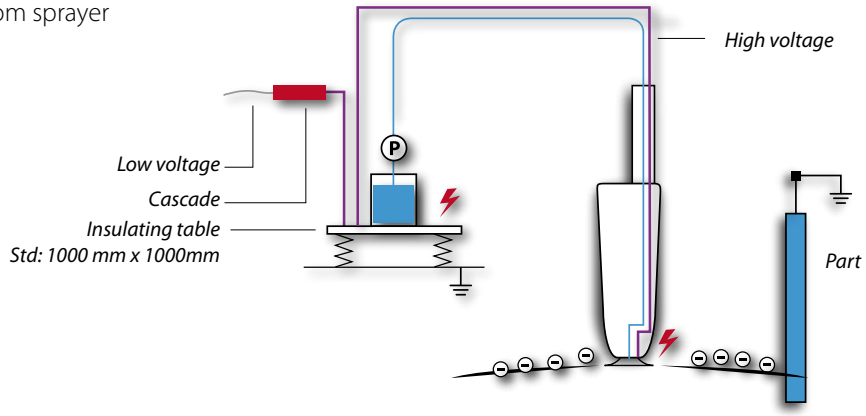
• for an application of **solvent based product** with a **resistivity ≥ 0.5 MΩ.cm**:
- The product distribution system is connected to ground potential.
- High Voltage Unit (UHT188) Remote Sprayer
- No tube Coil

Fittings on line painting / rinse and drain connected to the potential return of land outside of the sprayer.
L = 2.5 m if paint resistivity ≥ 1 MΩ.cm
L = 5 m if 0.5 ≤ paint resistivity <1 MΩ.cm

• for applying **water-based product flammable and non-flammable**:
- The product distribution system is isolated from ground potential, ex: isolated table or other.
- High Voltage Unit (UHT288) remote from sprayer
- The number of colors is limited

Illustration





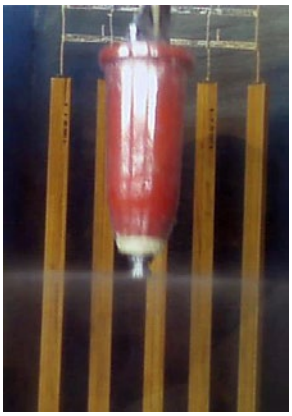
PPH 405 Disc sprayer

Technical characteristics

Mechanics	**PPH 405 B**
Weight (with cover and without pneumatic valve)	10
Height (mm)	985
Diameter (mm)	325
Functionalities	
Micro	With Acoustic
Braking	Brake air
Pneumatic supply	
Turbine air flow rate (Nl/min.)	6 (90 psi)
Turbine air flow rate (Nl/min.)	10 - 60
Shaping air pressure (bar)/Air flow rate	1.5 / 19 2 / 25
Rotation speed (according to disk) (rpm)	7000 to 21 000
Rotation air flow rate (Nl/min.)	12 - 40
Product supply	
Max. product pressure (bar)	6 (90 psi)
Paint flow rate (cc/min)	80 - 1200 (depending on product)
Viscosity range (seconds) (AFNOR cup 4)	< 120
Product resistivity (MΩ.cm)	< 500
High voltage	
Max voltage (kV) UHT 188/288	100
Max. current (µA) UHT 188	200
Max. current (µA) UHT 288	500
Connections	
Product supply (mm) (AP1 - connection-ready)	ø 6x8
Product supply (mm) (AP2 - plug)	ø 4x6 or 6x8 - 1/8"
Product supply (mm) (AP3 - plug)	ø 8x10 (high viscosity)
Shaping air supply (mm)	ø 8x10
Micro air intake supply (mm)	ø 4x6 - 1/8"
Micro air return supply (mm)	ø 4x6 - 1/8"
Rinsing product supply (mm)	ø 6x8 - 1/4"
Turbine air supply (mm)	ø 11x14

Omega conveyor

Wood stain application on doors



Application on bike frames

PPH 405 Disc sprayer

Choice of the diameter of the disc

Disk	Products	Comments
Ø 250 mm with holes	All types	- Standard disk - produces good penetration on concave parts. - Average rotation speed.
Ø 250 mm with slots	All types	- Average rotation speed. - Easy to clean. - Good penetration. - Easy passage for high flow rate or viscous product. .
Ø 150 mm with holes	Single component	- Fast rotation speed for improved application smoothness. - Product drying(1) during application.
Ø 150 mm with slots	Dual-component	- Fast rotation speed for improved application smoothness. - Product drying(1) during application. - Easy to clean. - Facility for viscous product

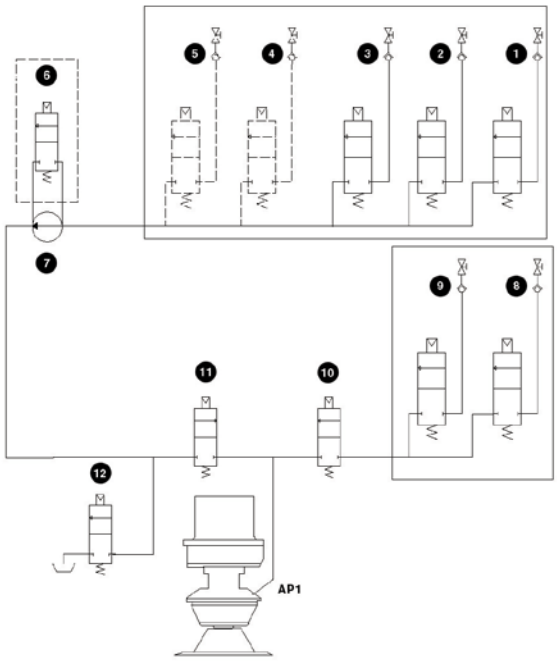
(1): The products must be suitable for disk application: if the product encounters a large contact surface area before being atomised, the binder evaporates quickly and the paint can tend to be dry when it reaches the part for painting.

> Possible set configuration

Illustration of the PPH 405 with pump and without recirculation of the product.

To stop spraying, turn off the pump and close the spray valve and rinse head spray according to the stopping time (short / medium / long term) and nature of the product:

1: Air flushing (full circuit)
2: Rinsing product (full circuit)
3: Product stain 1
4: Product color 2 (optional)
5: Product color 3 (optional)
6: Valve shunt pump
7: Pump
8: Air for rinsing head
9: Rinse aid head
10: Flushing valve head
11: Spray Valve
12: Drain valve

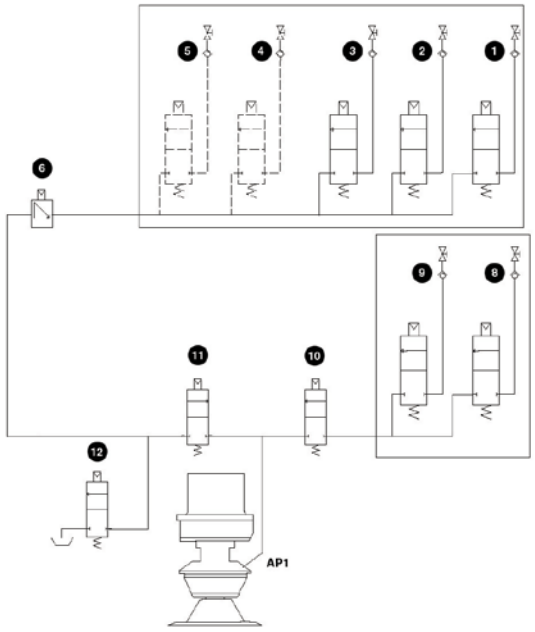


PPH 405 Disc sprayer

> Possible set configuration

Schematic diagram of spray PPH 405 with a fluid regulator (paint supply possibly made by a diaphragm pump) without recirculation of the product.

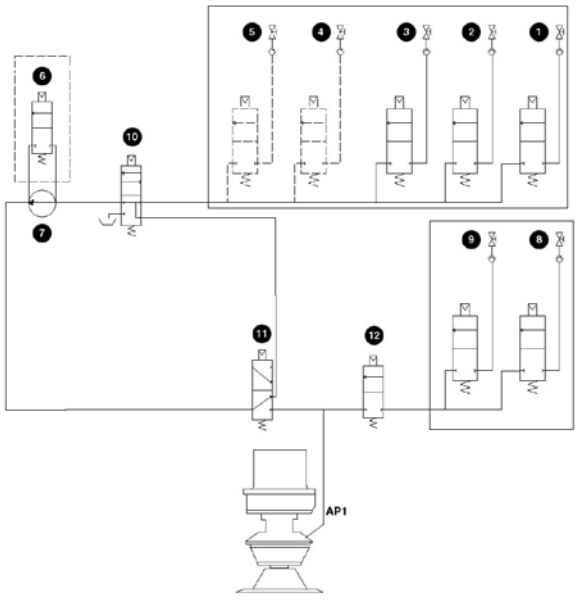
The spraying will stop when cutting the power to the system occurs, then close the valve and spray rinse the spray head (short / medium / long term) the cleaning time will be dependent upon the nature of the product being used:



1: Rinsing air (full circuit)
2: Rinsing product (full circuit)
3: Colour product 1
4: Colour product 2 (optional)
5: Colour product 3 (optional)
6: Product regulator
8: Head rinsing air
9: Head rinsing product
10: Head rinsing valve
11: Spraying valve
12: Drain valve

Schematic diagram of spray PPH 405 with a pump and with recirculation of the product.

The spraying will stop by closing the valve and turning off the recirculation valve and rinsing
the spray head (short / medium / long term) the cleaning time will be dependent upon the nature of the product being used:



1: Rinsing air (full circuit)
2: Rinsing product (full circuit)
3: Colour product 1
4: Colour product 2 (optional)
5: Colour product 3 (optional)
6: Pump shunt valve
7: Pump
8: Head rinsing air
9: Head rinsing product
10: Recirculating or drain valve
11: Spraying valve
12: Head rinsing valve

PPH 405 Disc sprayer

> Automatic set of paint

Spray PPH 405 (solvent or water-based version)
+ Reciprocator support
+ GNM200
+ Low voltage connection
+ High voltage unit UHT 188/288
+ High voltage cable (4.25m or 18m)
+ Valve with 2 heads (cutting product)

References of sets and sprayers delivered without disc.

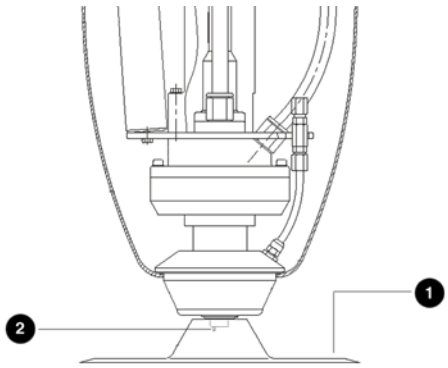
Designation	Paint base	Reference
E.PPH 405-B UHT 188 + HV cable (4.25m)	SOLVENT R ≥ 0.5 MΩ.cm	910005958
E.PPH 405-B UHT 288 + HV cable (18m)	WATER	910005959

> Sprayer alone

PPH 405-B	SOLVENT	910005185
	WATER	910005186

Components

Disc and injection screw

Illustration	Landmark	Designation	Reference
	1	Disc ø250 mm with holes	453475
		Disc ø250 mm with slots (1)	Contact us
		Disc ø150 mm with holes	453652
		Disc ø150 mm with slots (1)	456174
	2	IProduct injection screw ø0.6 mm	449 833
		Product injection screw ø0.7 mm	448 714
		Product injection screw ø0.8 mm	448 715
		Product injection screw ø1.2 mm	740 055
		Product injection screw ø1.5 mm (2)	448 713

(1): recommended for high flow rate and high viscosity product
(2) : comes in standard

SLR Rack «Plug-and-spray» control solution for bell & gun type sprayers

Description of the product

SAMES' new 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 :

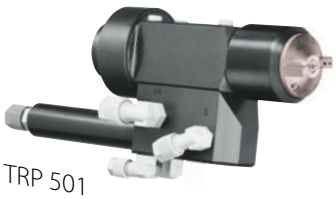
- in a «**SLR box**» (to drive one single sprayer)
- in a «**SLR cabinet**» (to drive up to 2 bell sprayers or 4 pneumo electrostatic guns.

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

PPH308

PPH707 EXT-ST

Nanobell



TRP 501

Vortemail VEC

Illustration

CE

«Plug-and-spray» control solution for bell & gun type sprayers

SLR Rack «Plug-and-spray»

> 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)

Customer interface (IN)

Information / Control:
- Emergency stop
- Ventilation default
- Conveyor default
- Part detector at the booth entrance
- External spray request (external trigger)
- Request for high voltage authorisation
- External bleed request
- safety contact (door, etc.)

SLR module

Power supply: 230 VAC PH+N
- 7 bar

Customer interface (OUT)

Customer feedback:
- Emergency stop
- System defect
- System in remote control mode
- High voltage for sprayer no 1 in service
- High voltage for sprayer no 2 in service
- Short-circuit management

«S-Box Bell» module = x1 Bell

Power supply:
- 230 VAC (GNM200)

- Consumption 45Nm3/h. per sprayer
- General air supply 7 bar

Adjustment of the value of high voltage

Adjustment of the speed of rotation

Air/solvent selector (injector/bell rinsing phase)

Adjustment of shaping air

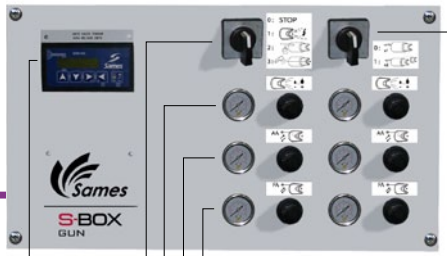
Adjustment of product flow (optional paint regulator*)

- Off
- On (Spray + HV)
- Open dump circuit
- Open rinsing/filling
- Open injector/bell rinsing

«S-Box GUN» module = x1 or 2 guns

Power supply:
- 230 VAC (GNM200)

- Consumption 45Nm3/h. per sprayer
- General air supply 7 bar



Adjustment of the value of high voltage

1 or 2 Gun(s) selector

Adjustment of fan air

Adjustment of atomizing air

Adjustment of product flow (optional paint regulator*)

- Off
- On (Spray + HV)
- Open dump circuit
- Open rinsing/filling

***The regulator** can be used to adjust the required flow and absorb paint variations caused by the feed system, and paint variations caused by the height of the column of paint (different reciprocator altitude).

«Plug-and-spray» control solution for bell & gun type sprayers

Description and options

> SLR maximum configuration

SLR Cabinet
2000 mm

SLR Module
4 U
voltage 2*230 VAC 50hz/60hz - 16 A,
input pressure 7 bar,
air consumption < 80 Nm3/h

REV600 Module
4 U
voltage 2*230 VAC 50hz/60hz - 16 A,

S-Box Bell Module
8 U

S-Box Gun Module
8 U

PFS Module
4 U
voltage 2*230 VAC 50hz/60hz - 1 A,
input pressure 7 bar,
air consumption < 10 Nm3/h

GPC Module
4 U
voltage 2*230 VAC 50hz/60hz - 6 A,

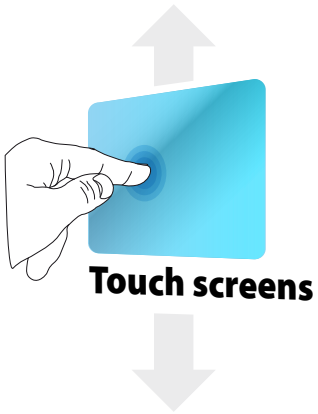
RLC Module
4 U
voltage 2*230 VAC 50hz/60hz - 10 A,

Installation:
in non-explosive zone

Many additional kits	Sprayer	Reference
Paint regulator kit for solvent paint	PPH308/ PPH707 EXT/ Nanobell	910009591
Paint regulator kit for waterborne paint	PPH308/ PPH707 EXT	910009592
	Nanobell	910009806
Mano regulator kit for improved precision	PPH308/ PPH707 EXT/ Nanobell	900006957
SLR panel air cooling system and IP65 upgrade	-	900006958
Setting kit for 1 sprayer	PPH308/ PPH707 EXT	910010913
Setting kit for 2 sprayers	PPH308/ PPH707 EXT	910010914

REV 600 control module

REV 600 integrates all of the functions of an application process:
- 1 or 2 «up and down» type reciprocators - 1 axis
- 3 spray zones per reciprocator
- 6 spray controls in each plane
- 20 spray tables



PFS control module

The PFS «Product Flush & Selection» module can be used to manage 2 colour change circuits, and up to 6 colors as well as cycles for the spray rinsing phase. (Excluding bi-component products)

GPC control module

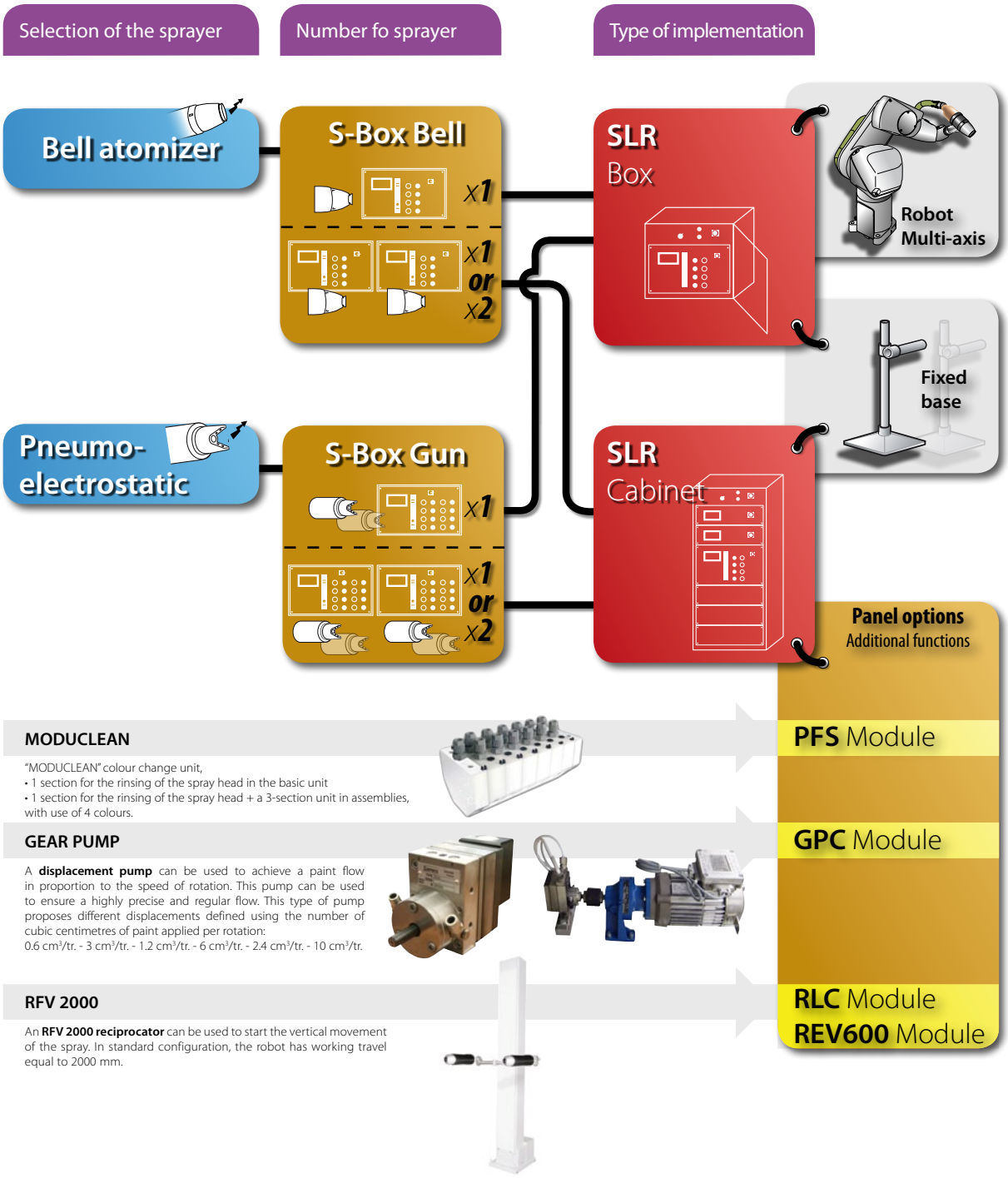
The GPC «Gear Pump Control» module can be used to manage product flow for 1 to 2 paint circuits. Paint flow precision is optimal, precise and stable thanks to the use of a gear type pump. The module can be used to manage up to 2 pumps operating simultaneously.

RLC control module

The RLC «Reciprocator Light Control» module can be used to start the vertical movement of the sprayer(s). The module replaces the REV600 in simple configurations.
RLC integrates all of the functions of an application process:
- 1 or 2 «up and down» type reciprocators - 1 axis
- 1 zone of stroke per reciprocator
- 5 table of stroke tables
- 2 fixed programmable positions (e.g.: dedicated rinsing or maintenance position, etc.).

SLR Rack «Plug-and-spray»

> Possible configurations



MODUCLEAN

"MODUCLEAN" colour change unit,
- 1 section for the rinsing of the spray head in the basic unit
- 1 section for the rinsing of the spray head + a 3-section unit in assemblies, with use of 4 colours.

GEAR PUMP

A **displacement pump** can be used to achieve a paint flow in proportion to the speed of rotation. This pump can be used to ensure a highly precise and regular flow. This type of pump proposes different displacements defined using the number of cubic centimetres of paint applied per rotation:
0.6 cm^3/tr. - 3 cm^3/tr. - 1.2 cm^3/tr. - 6 cm^3/tr. - 2.4 cm^3/tr. - 10 cm^3/tr.

RFV 2000

An **RFV 2000 reciprocator** can be used to start the vertical movement of the spray. In standard configuration, the robot has working travel equal to 2000 mm.

Paint configuration

> Automatic sets of paint

REV611/621 + SLR + PPH 308 (1 high voltage unit)

Base support	Control unit SLR	Qty sprayers	Bell Dxx	Reference: solvent paint R≥6 M.Ω.cm	Reference: solvent paint R>0.5 M.Ω.cm	Reference: waterborne paint
Fix foot not included	SLR Box		Dia.35	-	-	910009125
			Dia.50	-	-	-
			Dia.65	910009204	-	-
	SLR Cabinet		Dia.35	-	-	-
			Dia.50	-	-	-
			Dia.65	910009205	-	910011823 or 910011897(1)
REV 611			Dia.35	-	910009783	910009453
			Dia.50	-	-	910009589
			Dia.65	910009209	910010023	910009452
REV 621			Dia.35	-	-	-
			Dia.50	-	-	-
			Dia.65	910009210		910011170
			Dia.35	-	-	-
			Dia.50	-	-	-
			Dia.65	910009211	-	910012022 or 910012023(1)

(1): waterborn paint bell for high viscosity (Bell D65 wood)

REV611/621 + SLR + PPH 707 EXT-ST

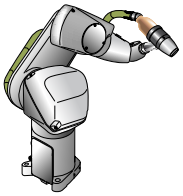
Base support	Control unit SLR	Qty sprayers	Bell Dxx	waterborne paint
Fix foot not included	SLR Box		Dia. 65	Contact us
	SLR Cabinet		Dia. 65	Contact us
REV 611			Dia. 65	Contact us
			Dia. 65	Contact us
REV 621			Dia. 65	Contact us

«Plug-and-spray» control solution for bell & gun type sprayers

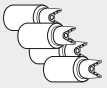
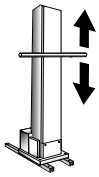
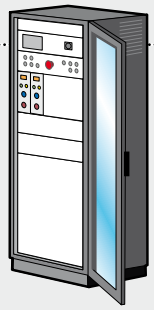
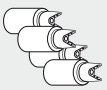
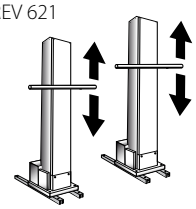
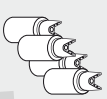
Paint configuration

> Automatic sets of paint

SLR + NANOBELL

Base support	Control unit SLR	Qty sprayers	Reference: solvent paint R≥0.5 M.Ω.cm	Reference: solvent paint metallic parts R≥0.5	Reference: waterborne paint
	SLR Box 		910009212	910009213	910009393

REV611/621 + SLR + TRP501

Base support	Control unit SLR	Qty sprayers	Nozzle	solvent paint R>0.5 M.Ω.cm	waterborne paint
 *Fix foot not included*	SLR Box 		JR08	Contact us	Contact us
			JR12	Contact us	Contact us
			JP	Contact us	Contact us
			JR08	Contact us	Contact us
			JR12	Contact us	Contact us
			JP	Contact us	Contact us
	SLR Cabinet		JR08	Contact us	-
			JR12	Contact us	-
			JP	Contact us	-
REV 611 			JR08	Contact us	Contact us
			JR12	Contact us	Contact us
			JP	Contact us	Contact us
			JR08	Contact us	Contact us
			JR12	Contact us	Contact us
			JP	Contact us	Contact us
			JR08	Contact us	-
			JR12	Contact us	-
			JP	Contact us	-
REV 621 			JR08	**910010614**	Contact us
			JR12	Contact us	Contact us
			JP	Contact us	Contact us
			JR08	Contact us	Contact us
			JR12	Contact us	Contact us
			JP	**910010655**	Contact us

JR: Round spray, JP: Fan spray

Control module «REV 600»

Illustration

Description of the product

The REV 600 module is intended to drive an automatic powder or electrostatic paint installation. It can operate:
• the "raise and lower" axis of one or two robot(s) type SAMES RFV 2000,
• spray gun activation and the input/output interfacing with the installation.

The REV 600 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 REV 600 module is interfaced with the installation to:
• detect the presence of 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 : conveyer belt),
• manage timeouts for the application between parts, between two robots and three spray gun configurations.

Advantages

The REV 600 module allows the operator to run his installation extremely simply:

• Very user-friendly: the learning 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 from each menu to the maximum.

• Time saving: easy calibration of the high and low points and the robot axis. The table parameter choice can be made on line during production, without stopping the conveyor belt.
• Ergonomics: touch screen controls make action inputting simple and fast.

Technical characteristic

Supply	**REV600**
Inlet voltage (V)	230 single or three-phase
Inlet frequency (Hz)	47 - 63
Inlet current (A)	16
Supply of API (V)	24

Dimensions	
Weight (kg)	11,2
Height (U)	4
Width (inches)	19

Protection degree	
Rack version	IP65 (front face)
	IP20 (rear face)
Box version	IP54

Control screen	
Screen	backlit 5.6 inches
Display	resistive analogue touch display. For finger (unpointed) object and glove control.

Conditions of use	
Ambient temperature (°C)	< 45
Ambient humidity	< 85 % without condensation
Installation	**in non-explosive zone**

Control module «REV 600»

> Functions

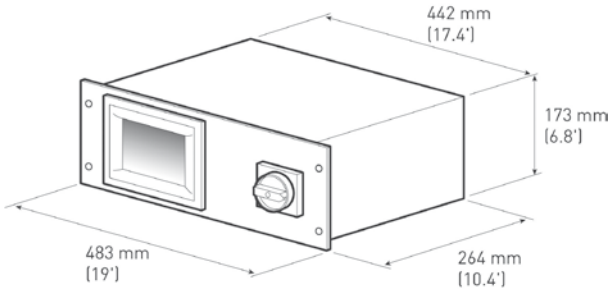
The REV 600 integrates the basic functions of an application process:
- 2 "raise and lower" type reciprocators - 1 axis
- 3 sweeping zones per reciprocator
- 6 spraying controls/reciprocator
- 10 parts production runs/reciprocator

The 19 inch standard dimensions of the REV 600 module allows easy integration into a SAMES CGR 200 modular cabinet and connection to the various SAMES spray gun control modules.
An autonomous, box version of the REV 600 is also available.

With the following functionalities, the REV 600 module interfaces easily with an industrial application:
- Possible automated spraying by detecting parts for painting using sensors or photo-electric cells.
- Emergency stop input
- External fault input
- External fault output
- Ventilation input during operation
- Conveyor input during operation
- Authorization output for conveyor belt operation

> Control module REV 600

Designation	Reference
REV 600 rack version	1523227
REV 600 sealed box version	Contact us
Sealed box alone to integrate a REV 600	1524220
Screen protection sheet (x10)	E1AAUZ090



Connexions

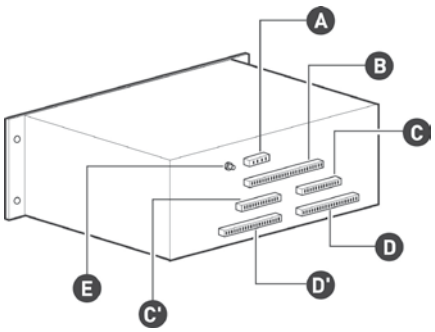
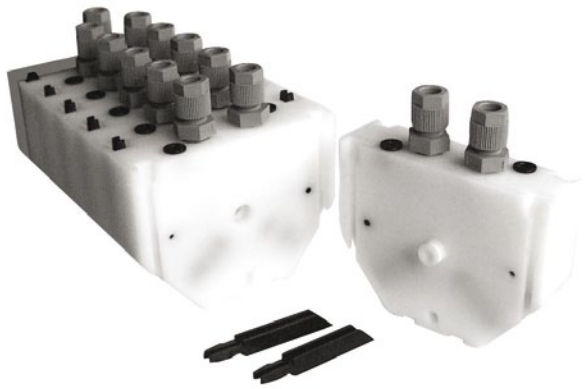


Illustration	Designation	Landm.	Function	mm2	Reference
	Electrical supply	A		4G1.5	E2CDKR004
	Inputs	B	Emergency stop	2x1	E2LAAB100
			Conveyor belt running	2x1	E2LAAB100
			Fan operating	2x1	E2LAAB100
			External faults	2x1	E2LAAB100
			Parts detection	3G0.75	E2LDAC075
	Outputs	B	Conveyor belt autorisation	2x1	E2LAAB100
			Function OK	2x1	E2LAAB100
	Spray gun control (1)	C-C'		2x1	E2LAAB100
	Motor control	D-D'	Motor	4G1.5	E2BAAD150
			Pre-cable, lg = 30m		1411222
			Temperature sensor	2x1	E2LAAB100
			Pre-cabled, lg = 30m		1411223
			Potentiometer	4G0.75	E2BAAD075
			Pre-cabled, lg = 30m		1409971
	Earth	E	Via supply cable		

(1): cable by the metre necessary for one spray gun, the C-C' connection can run 6 triggers

Module colour changer MODUCLEAN

Illustration



Description

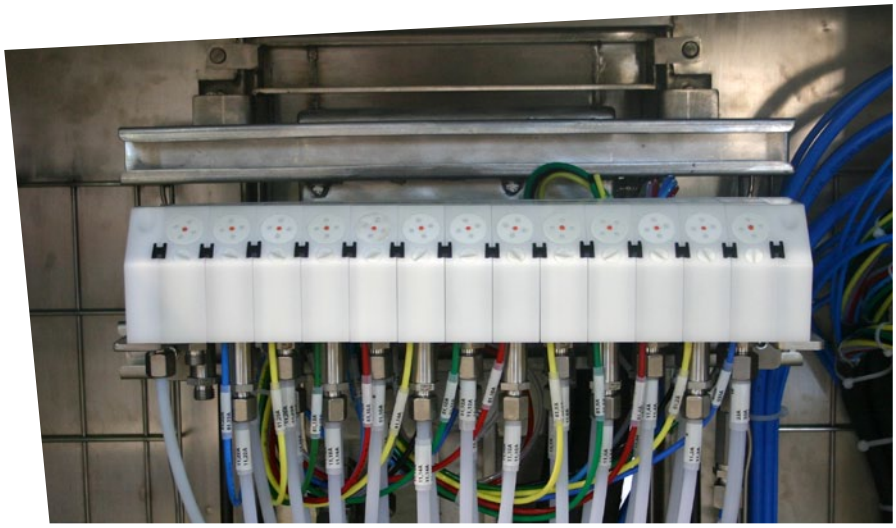
MODUCLEAN is colour-changer block, the compact and modular design allows adding several components (slices). Each slice allows the use of two products (paint or rinsing product) thanks to microvalves.
The color-changer block is used similarly with all the automatic spraying equipment:
PPH 308, TRP 500, etc...

Advantages

Modular:
The slices are easily added or removed thanks to a snap-on bar (no tool required). Each slice ensures a perfect seal for the product passage.

Gain product:
The reduced dimensions of the MODUCLEAN block allows fitment close to the sprayer, thus shortening the product hosing length: optimized color-change time, minimized rinsing product consumption and paint losses.

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



Module colour changer MODUCLEAN

Range

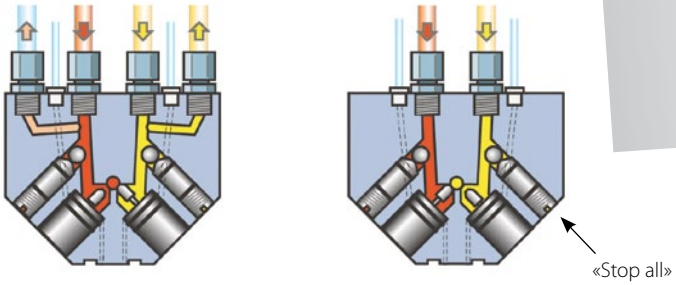
There are two models of slices:
the choice depends on the type of product: a constant circulation of the product avoids stagnation within the hosing; it is thus recommended using a slice equipped with product return. The micro-valve that comprises the slice allows using any type of products, either solvent or water based.

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 requirement for the addition of other colors.

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

Illustrations of versions



Slice with re-circulation

Slice without e-circulation

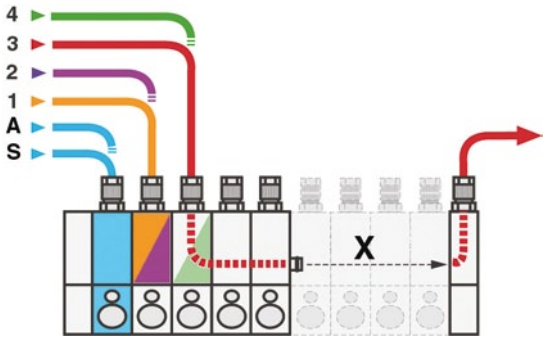


Fig. 1

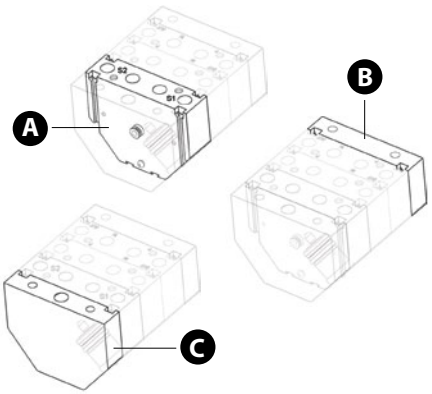
Technical characteristics

Dimensions	**Section**	**Element end (input / output)**
Length (mm)	28	20
Width (mm)	104	104
Height (mm)	80	80
Weight with connections (g)	250	

Supply	**Section / end element (input/output)**
Fluid pressure maxi (bar)	10 (150 psi)
Cons pressure maxi (bar)	40 (600 psi)
Pilot pressure maxi (bar)	8 (120 psi)
Pilot air	Filtered, dehydrated, de-oiled
Response time opening fluid	50 ms with 0.5m of pilot trigger hose ø 2.7x4 mm
Response time opening fluid	300 ms with 1.5m of pilot trigger hose ø 2.7x4 mm
Viscosity range Cup AFNOR n°4 (seconds)	40

Module color changer MODUCLEAN

> Block color changer

Illustration	Designation	Landmark	Type	Reference
	Section of MODUCLEAN	A	With return	1514627
			Without return	1514628
	Input element	B		1519870
	Output element	C	1 output	1519871

The whole block MODUCLEAN is held at its ends by four screws.

> Rinsing block

Rinsing block equipped	A + B + C	Without return	857723

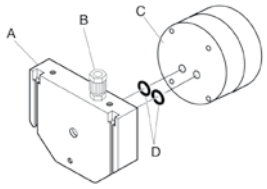
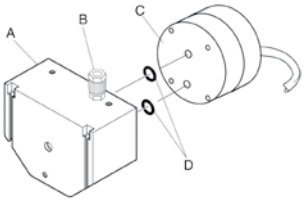
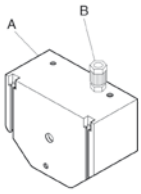
> Block colour changer equipped (nx**A** + **B** + **C**)

Illustration	Section MODUCLEAN (**A**) **without recirculation**		Section MODUCLEAN (**A**) **with recirculation**	
	Number of colours (n)	Reference	Number of colours (n)	Reference
	2	910001348	2	910001366
	4	910001349	4	910001367
	6	910001350	6	910001368
	8	910001351	8	910001369
	10	910001352	10	910001370
	12	910001353	12	910001371
	14	910001354	14	910001372
	16	910001355	16	910001373
	18	910001356	18	910001374
	20	910001357	20	910001375
	22	910001358	22	910001376
	24	910001359	24	910001377
	26	910001360	26	910001378
	28	910001361	28	910001379
	30	910001362	30	910001380
	32	910001363	32	910001381
	34	910001364	34	910001382
	36	910001365	36	910001383

The fittings are not part of the blocks with colour changer.

Colour-changer block MODUCLEAN

> Base plate option on paint output MODUCLEAN

Illustration	Designation	Type	Reference
	Output base for reading flowmeter	Connecting horizontal flowmeter	856040
	Outlet base plate for flowmeter with integrated ball regulator	Connecting vertical flowmeter	910000309
	Outlet base plate for flowmeter with integrated ball regulator	standard Inverted position of the regulator	910001891 910001604

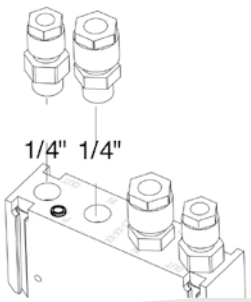
Legend

A	Adapter base plate, it is assembled instead of an outlet slice (1 519 871)
B	Product outlet, the product 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

Fittings

The product fittings are not provided with the MODUCLEAN / MODUFLOW slices as they can change from one system to another to match user fluid flow.
In the case of a slice with product return, the fittings are of same diameter.

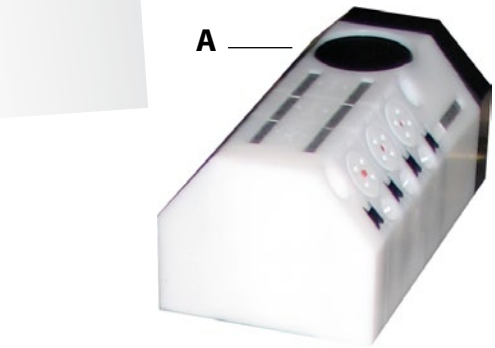
Please, consult Sames for the references and the assembly instructions with metallic fittings.

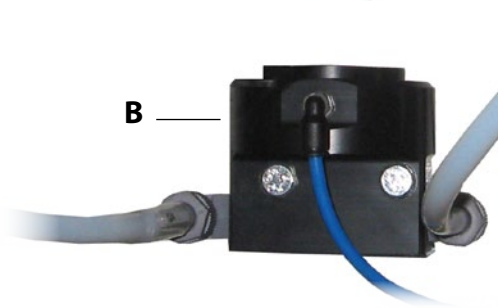
Illustration	Designation	Adaptable on	ø Hose (mm)	Reference
	Fitting 1/4 G	Section	6 x 8	F6RPUK320
			8 x 10	F6RPUK322
		Output element	6 x 8	F6RPUK320

The sales quantities are per unit.
For a section with product return, allow 4 connections.
For a section without product return, allow 2 connections.

Flow management "Product regulator"

Illustration





Description of the product

The ball paint regulator comes in two versions:

A > Ball regulator directly integrated within a special MODUCLEAN base plate (refer to § Optional base plates).

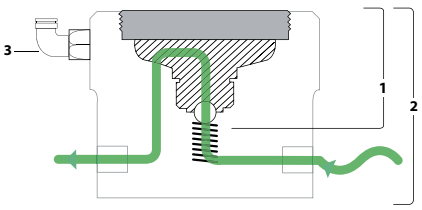
B > Stand-alone ball regulator that is independently installed onto the paint circuit as closely as possible to the sprayer (recommended).

Use

The regulator allows the **absorbtion** of 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 regulator (model B)

Illustration	Designation	Landmark	Reference
	Integrated ball regulator	1	1514104
	Complete isolated ball(1) regulator	2	1526677
	Elbow connection(2) (Pilot air)	3	F6RLCS304

(1): connection type paint circuit EU = 1/8 GAZ
(2): Only for insulated regulator (included with insulated regulator reference)

> Tools

Illustration	Designation	Landmark	Reference
	Regulator nut disassembly key	4	546351
	Automatic tool clamping nut	5	1403479

Notes

Electronically-controlled «Reciprocator RFV 2000»

Illustration

Description of the product

The RFV 2000 reciprocator allows the movement of every SAMES automatic sprayers and other brands.

ATEX marking:

RFV2000 (liquid paint)

CE Ex II 2 G c II B T4

Technical file: RFV

RFV2000 (powder paint)

CE Ex II 3 D c T125°C

Technical file: RFV

Operation

The RFV 2000 reciprocator comprises a vertical frame set into a horizontal base on wheels for ease of movement along the ground. Two optional rails can be added to improve guiding, for displacement perpendicular to the conveyor belt axis or for use over grating.
The frame constitutes a vertical rolling track along which the carriage holding the powder or paint spray guns and the counter balancing-weight moves. The carriage is driven by a transmission chain, an asynchronous electric motor and a reduction gear located on the base.
A potentiometer is used to link the sweeping movement to the control devices. All the controls are grouped in the REV 600 box which can be located remotely from the robot.
A second version is available as an option with a second motorized axis (RFV «forward-back» positioning).

Advantages

> Extremely simple construction and operation (very long service life).
> Sweeping 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.
> Installation requiring no special provision (the robot can be positioned or displaced manually without effort).

Electronically-controlled «Reciprocator RFV2000»

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:

1 > For **liquid paint** applications, mechanics 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 bowl PPH 308
- 1 or 2 paint sprayers PPH 707 EXT-ST
- 4, 6 or 8 spray paint TRP 501
- 2, 4 or 6 paint sprayers VORTEMAIL VEC

2 > For **powder coating** applications, mechanical 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 RVF 2000 reciprocator is controlled by:
- a control module 600 or REV MCR
- PLC in the case of a more complex automated installation

Illustration

Technical characteristics

	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	

Electronically-controlled «Reciprocator RFV2000»

> Mechanism of the robot «RFV 2000»

Designation	Landmark	Effective stroke (cm)	Reference
RFV 2000 for application of liquid paint	1	200	910006928-200
		80 < xx0 < 340	910006928-xxx
RFV 2000 for application of powder paint	1	200	910006929-200
		80 < xx0 < 340	910006929-xxx

XX0 = effective stroke in cm, ex: 280 cm

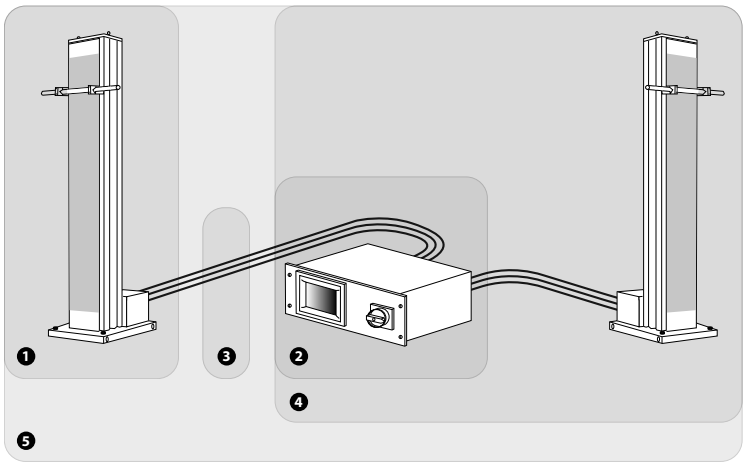
It is best to choose a standard mechanical robot (200 cm stroke), even if the race sweep is greater than the height of the pieces to be painted, it can adapt to the changing process. Otherwise, the choice will be made either because of environmental stress.
(ex : a cabin height of less than 3.4 m) or to the height of the components to be painted exceede's 2 m.

> Mechanism of the robot "RFV 2000" + Control module REV 600

The assembly includes the electrical control cables (approx. 30 m)
and the REV 600 (delivered as a rack version)

Designation	Landmark	Pilot of	RFV version	Effective stroke (cm)	Reference
REV 611	4	x1 RFV one axis	liquid paint	200	910002370
			powder paint	200	910002373
REV 621	5	x2 RFV one axis	liquid paint	200	910002371
			powder paint	200	910002374

Illustration



1. = Zone 1 or 2 (RFV for liquid paint)
   Zone 22 (RFV for powder paint)
2. = REV 600/MCR, out of ATEX
   area o 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 22**3 (2x1mm2)
   + potentiometer cable: **1 409 971** (4G0.75mm2)
4. = REV 611 (RFV 2000 + REV 600)
5. = REV 621 (2 x RFV 2000 + REV 600)

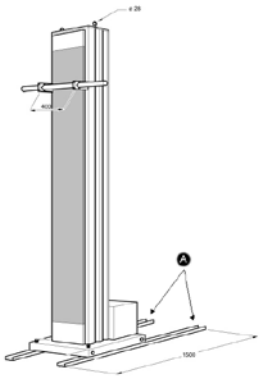
Electronically-controlled «Reciprocator RFV2000»

Components

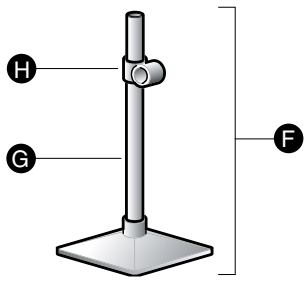
Optional underwinder

Illustration	Designation	Length (mm)	Reference
	Kit 1 underwinder *(2 kits per reciprocator)*	Hoses < 2000 Hoses > 2000	1514325 1525208

Guide rail kit

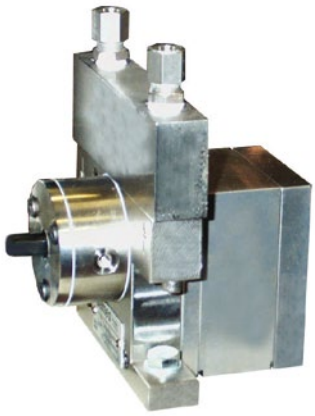
Illustration	Designation	Landmark	Length (mm)	Reference
	2 rails and anchors	A	1500	1525228

Components for fixed spray

Illustration	Designation	Landmark	Length (mm)	Reference
	Fix foot (base + tube)	F	1500	459127
	Tube alone	G	1200	744097
			1500	1410592
	Nut ø 50x50 mm	H		429104

Flow management "Gear pumps"

Illustration



ATEX marking:

CE Ex II 2 G c T4

Dossier Technique :
pompes à engrenages

Description of the product

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, PPH405 and TRP 500, NANOBELL, etc…).

The gear pump ensures a paint flow rate proportional to its rotation speed. A regular, accurate flow rate is achieved when using it. The pump has to be supplied with a product under a pressure of the order of 0.5 bar. For a circulating pump, a pressure regulator should be connected before the pump whereas a flowmeter should always be located after the pump. The upstream pressure makes priming easier and ensures that the flow rate corresponds to the displacement and speed of the pump.

Technical characteristic

Pressure	**Valve pilot**	**Supply**	**Use**
Operating air pressure maxi. (bar)	6 (90 psi)		
Operating air pressure mini. (bar)	3 (45 psi)		
Pilot air supply (mm)	ø2.7x4		
Fluid pressure mini. Inlet (bar)		0.5 (7.5 psi) pour faciliter l'amorçage	
Fluid pressure maxi. Inlet (bar)		2 (30 psi)	
Fluid pressure maxi. Outlet (bar)			10 (150 psi)
Rotation speed maxi. (tr/min)			220
Connexions	**Inlet**	**Outlet**	
Terminal strip on the pump (TSP)	1/4	1/4	

> Choice of the type of pump

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:

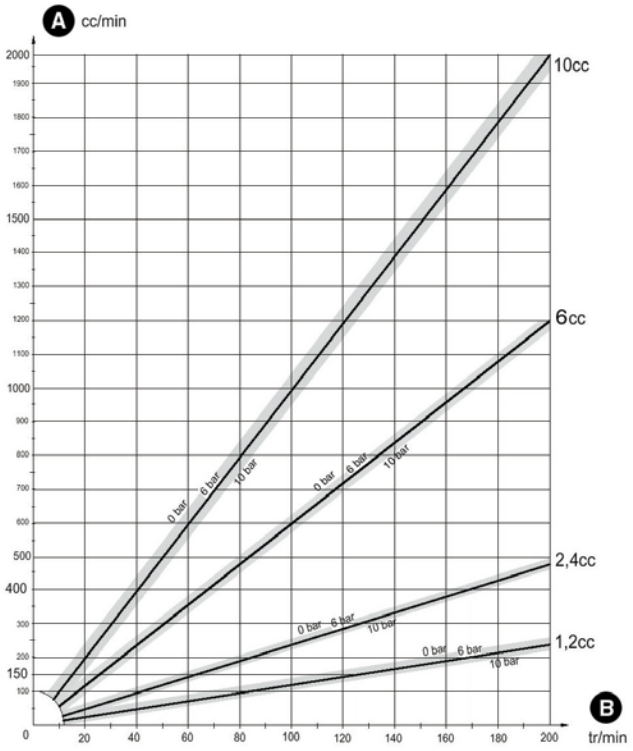
- Steel: for solvent-based product use,

- Stainless steel: for water-based product use,

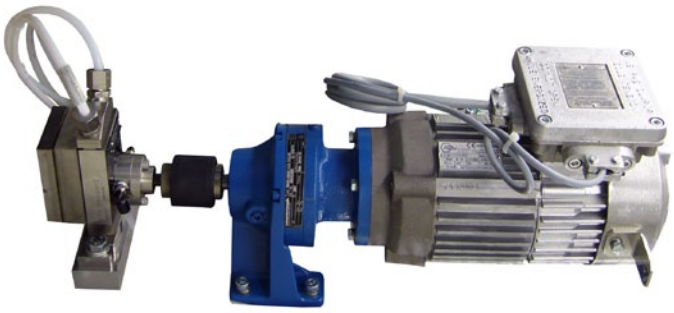
- ADLC: intense coating which increases surface hardness and has a better coefficient of friction. This type of pump cleans to 100% by injecting a powerful flow of rinsing product, the pump cleans itself very quickly therefore. The use of water-based products necessitates the use of suitable positive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

Flow management "Gear pumps"

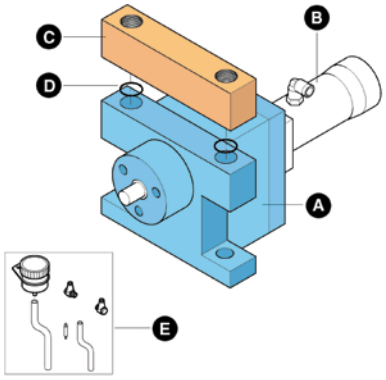
> Choice of the type of pump



A: Flow produced in cc/min
B: Speed in rpm
The curves indicate the pump flow rate used with a back pressure of 0 to 6 and 6 to 10 bar.
Do not select a pump with a flow rate bordering on the minimum or maximum speed, but close to 100 rpm.



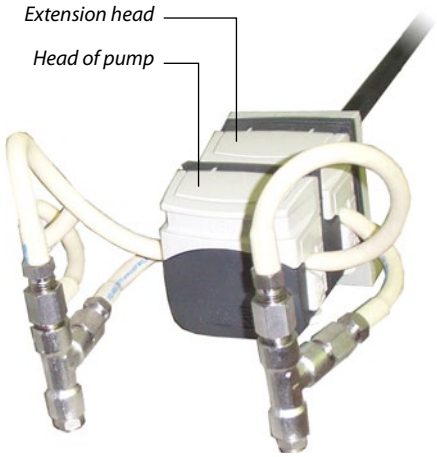
> Gear pumps

Illustration	Designation	Landmark	Cylindered cm3/R	Reference
	Pump STEEL**(3)**	A	0.6	Y1P CDL 026
			1.2	Y1P CDL 028
			2.4	Y1P CDL 030
			3	Y1P CDL 036
			6	Y1P CDL 037
	Pump INOX **(3)**	A	0.6	Y1P CDL 101
			1,2	Y1P CDL 053
			3	Y1P CDL 045
			6	Y1P CDL 055
	Pump INOX rinsable **(4)**	A	1.2	758 704
			2.4	756 515
			10	756 560
	Pump ADLC **(1)(4)**	A	1.2	1 410 767
			2.4	1 410 670
			6	1 410 031
			10	1 410 030
	Shunt valve	B	1.2 / 2.4 / 6 / 10	854270
	Connection base	C	1.2 / 2.4 / 6 / 10	730269
	Steals (x2)	D	1.2 / 2.4 / 6 / 10	J3TTCN011#
	Adaptation MESAMOL[2]	E	2.4 / 6 / 10	854279
			1.2	F6RBCL021
	Oil MESAMOL		1 liter container	H1HMIN037

(1): ADLC = coating with high surface hardness (good life)
(2): The pumps can be equipped with a sealing system to prevent the passage of air in the fluid circuit (if used with a hardener).
(3): Seal kit for Pump Steel and Inox, Ref: 752203
(4): Seal kit for Pump Inox rinsable & ADLC, Ref: Y1AJDP054

Flow management «Peristaltic pumps »

Illustration



Description of the product

The peristaltic pump allows abrasive products (without chemical aggressivity), principally liquid vitreous enamel, to be carried to the PRT 101 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 characteristic

Dimensions	**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 (cm3/min)**	**Speed (tr/min)**
Flow range corresponding (fluid hose length = 10 m)	ø 4.8	440	
	ø 6.4	720	
	ø 8	1000	
Speed range corresponding (density = 1.75, setup =1.050gr/m2, 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**	
Fluid hose connections	ø ext. 9	ø ext. 9	

Flow management «Peristaltic pumps »

> Choice of type of pump

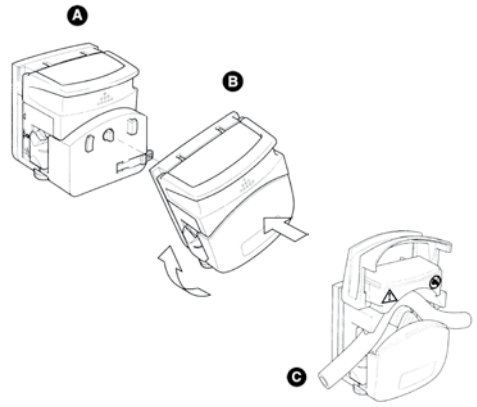
Range

Thanks to the quick flexible hose change, 3 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:

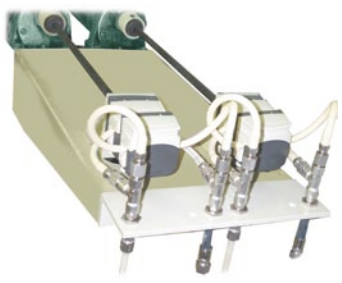
ø int. 4.8 mm ≈ 2.1 cm3 /R
ø int. 6.4 mm ≈ 3.1 cm3 /R
ø int. 8 mm ≈ 4.6 cm3 /R

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

Illustration	Designation	Landmark	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.			
	Flexible hose	C	4.8	Y1PACC446
			6.4	Y1PACC447
			8	Y1PACC448

> Fitted supply unit (without variable speed drive(s))

Illustration	Designation	Flow (cm^3/min.)	ø int. (mm)	Reference
	CTH 301	440	4.8	1520130
		720	6.4	1524174
		1000	8	1524175
	CTH 302	440	4.8	1524176
		720	6.4	1524177
		1000	8	1524178

AP 1000

Measuring devices of resistivity of paintings

Illustration

Metal box with an open lid, a controller board within, can be seen:
> A reading of three separate measurement scales.
> The colored red, black or blue buttons denote the appropriate scale of measurement, corresponding to a range of resistivity of the paint measured.

A measurement probe connected to the box by a flexible cable has good resistance to solvents. When not in use the measurement probe locates within the housing of the box.

Description of the product

The resistance meter AP 1000 is specially designed for fast and accurate measurement of resistivity of paints and varnishes applied by electrostatic process.
We know that to enable the process to work at best effieciency the paint manufacturer may be required to add formulations which will aid the electrostatic application through optimizing the resistivity of material.
The resistivity factor plays a very important role. This unit aids paint laboratories development of paints, services control among providers or users of electrostatically applied paint.

Warning: the operator must collect a sample of paint so as to control it obligatory outside from the ATEX zone.

Designation	Reference
AP 1000	910005790

Resistivity measurements from 0.5 to 1000 MΩ.cm

HVP 125

Measuring devices of high voltage

Illustration

To use only in no explosive atmosphere

Description of the product

This «kilovoltmeter» device accurately measures the high voltage «kV» at the end of the sprayer. Ensure the electrical connection of the device HVP 125 is grounded and touch with the ball the tip of the sprayer head (bell or head).

CE *- EMC Directive (2004/108/EEC and corrections),*
With the following harmonized standards:
- EN 61000-6-2(ed2005) / EN 61000-6-4(ed2007) / EN 61326-1(ed2006)

Designation	Reference
HVP 125	R9KVXM030

Notes

Operators accessories

2 **Hat**, grey cotton, one size fits all

4 **Dust mask**

Meets European standard EN-149-2001, class FFP2.
Provides protection only from non-volatile aerosols, solid and liquid.
May be used to protect against concentrations up to 10 times the Average Exposure Value (AEV), Belgium upper limit (VLB).

1 **Coverall anti-static;** size 2 to 6, grey.
Extremely sturdy, recommended for liquid paints. Contamination limited, reduced risk of electrostatic charge accumulation.

5 **Anti-solvent mask**

Meets European standard EN 405:2001.
Provides protection against most vapors/gas and particles like:
• Inorganic vapors 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 fits all

Operators accessories

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

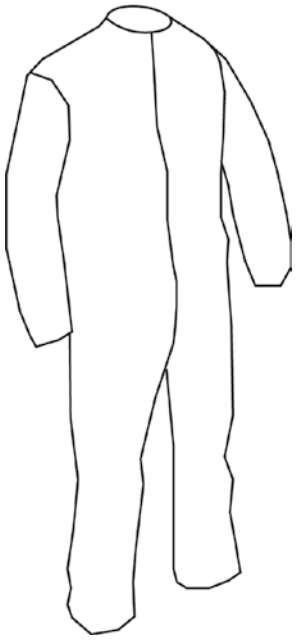
One size fits all.
Provide protection against numerous chemicals such as alcohols, aromatic and chlorinated solvents (within the provisions of the table of chemical resistance).
Meet the dispositions of European directive 89/686/CEE.

7 **Gloves (Neoprene)**, one size

One size fits all, 38cm long (15 inches).
Supplied with a 0.7mm thick, cotton-flock liner provide protection against mechanical, chemical and micro-organic hazards during general cleaning operations.
Meet the dispositions of European directive 89/686, code EN 420 (level 5) and codes EN 388 and EN 374.

8 **Everclean Hand**

Woven paper cover for hand guns, very sturdy provides full hand protection.



Light protection coverall **9**

Woven paper coverall very sturdy, one size fits all. Recommended against micro-particles, splashes from spraying.
Efficient only according to the level of toxicity of the materials, and working conditions.
Meet European codes EN 13982/1 and EN 13034.
Certified types 5 and 6.

N°	Reference
1	(T2) W5G MAS 059
	(T3) W5G MAS 060
	(T4) W5G MAS 061
	(T5) W5G MAS 062
	(T6) W5G MAS 063
2	W5G MAS 070
3	W5G MAS 071 = x10
4	W5G MAS 018
5	W5G MAS 035
6	W5G GAM 039
7	W5G GAM 040
8	100 000 081
9	W5G MAS 024

T2, 3, 4, 5, 6: coverall anti-static size

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 paticule atomization with a maximum penetration
> Swirling air alone = gives large paint paticule 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 cm 3 / min or more known cc / min)
> Fan pattern length
> Scanning speed of the robot

> Determination of application settings

> TRP sprayer

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%.

> Determination of application settings

> TRP sprayer

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

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

By equipping the TRP500 with a pressure indicating air cap (See § «Accessories» - Measure), 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.

Impact 1

Small impact = curved tears $\frac{FA}{AA} < 0,3$

Ex : 0,6 bar (FA) / 2 bar (AA) < 0,3

Impact 2

Optimal impact = flat tears $\frac{FA}{AA} \approx 1$

Impact 3

Wide impact = cut tears $\frac{FA}{AA} > 1$

> Determination of application settings

> TRP sprayer

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

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

$$\text{Scanning speed of the robot } Vb = Vc \times \left(2 \times \frac{H}{Li}\right)$$

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 (Li / 2 = Vb x 2) gives a faster scan and therefore more passes before the work part.

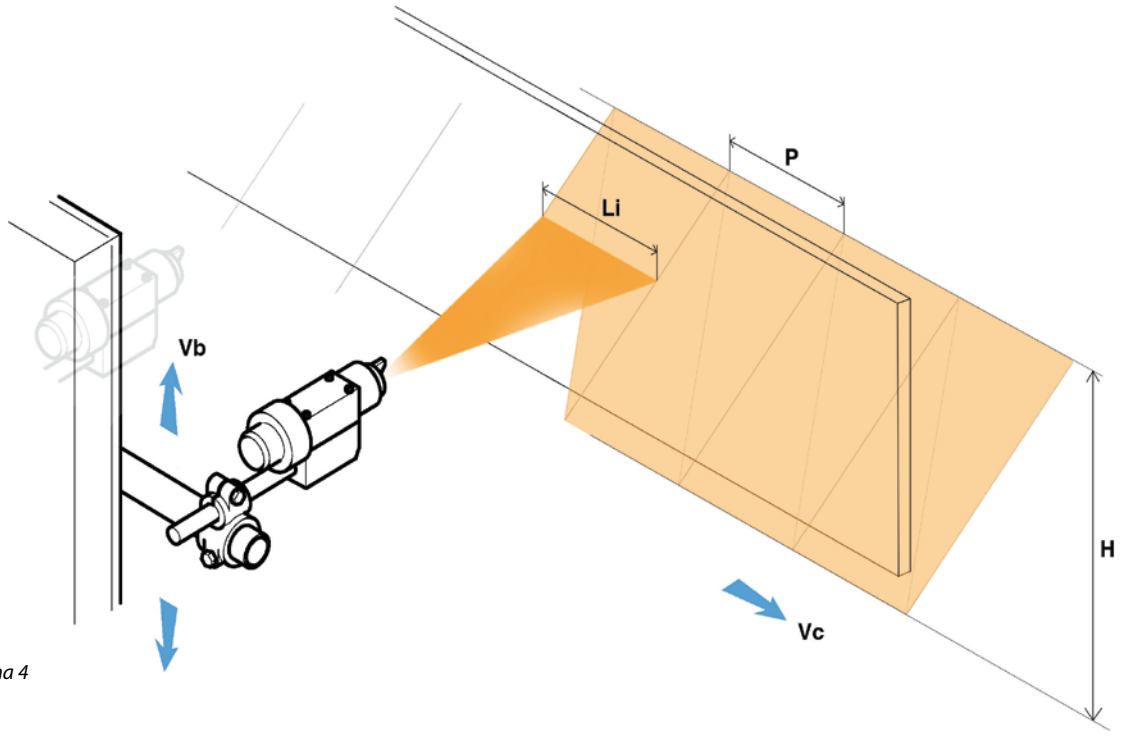


Schéma 4

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

> Sprayer PPH 308

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

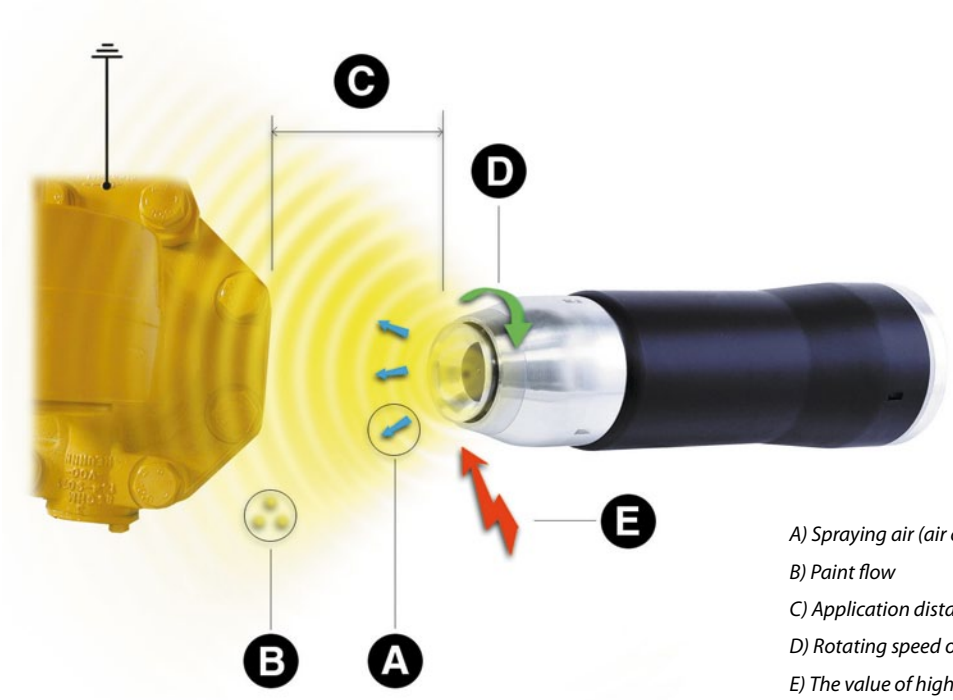
- Define areas to be painted automatically.
- Identify the need (or not) pre-keys or manual retouching
- Define the layers of paint to be deposited and the minimum and maximum tolerances
- Know the speed of the conveyor
- Obtain at least the 4 following characteristics:

(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

> Determination of application settings

> Sprayer PPH 308

The main parameters to adjust the application are:

A: 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

B: 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

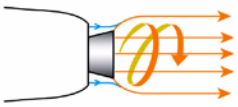
$$D = \frac{(100 \times H \times Vc \times Ed)}{(R \times ES)}$$

The flow will depend on several factors:

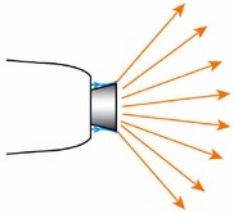
H: height scanning robot in cm (fixed parameter, this corresponds to the height of the part to which is added about half the width of impact. These are the high points and low points of the conversion part)
Vc: line speed in m / min (fixed parameter)
Ed: thickness to deposit, in microns (fixed parameter, 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

> Sprayer PPH 308

C: 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.

D: Rotation speed of the bell

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

> Sprayer PPH 308

E: 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 MΩ.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 kΩ.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

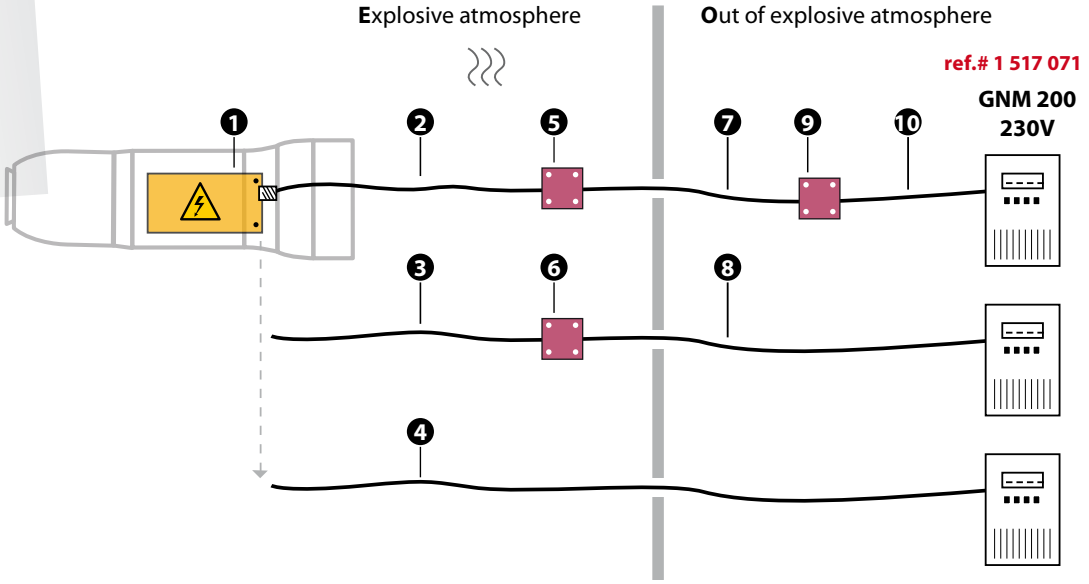
Example 1:

• Spray:
Flow = 200 cc / min
HV = 50 kV
Air cup = 300 L / min
Type of bell = ø 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 = ø 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.

Recommended configurations between the high voltage unit and the control module



> References of configurations per **Sprayer** (HVU «**1**» + LV connection + plug box)

Sprayers

	PPH 308 CI-SB	PPH 308 CI-SB PPH 405 SB	PPH 308 CI-WB PPH 405 WB TRP 501/502 WB	TRP 501/502 SB	NANOBELL SB	NANOBELL WB	PPH 707 EXT-ST	VORTEMAIL
1 HVU	UHT 155 EEx em 90 kV/100 µA 1520282	UHT 188 EEx e 100-70 kV/200 µA 910001759	UHT 288 EEx e 100-70kV/500 µA 910002864	UHT 180 EEx e 100-80 kV/200 µA 910005035	UHT 158 EEx e 70 kV/100 µA 910007566	UHT 287 EEx e 70 kV/500 µA 910008371	UHT 330 EEx e 85 kV/500 µA 910007139	UHT 208 EEx e (1) 100 kV/500 µA 910000692

Low Voltage connection (LV), 30 meters maxi.

	2	3	4	5	6	7	8	9	10
	Lg = 4,8 m 1527252 Lg = 8 m 910001236	Lg = 4,8 m 1527252 Lg = 8 m 910001236	Lg = 20 m 1514591	Plug box 1303899AT	Plug box 1303899AT	Lg = 5,2 m 910000086	Lg = 22 m 1520516	Plug box 1303899AT	Lg = 17 m 910000070
1 HVU High Voltage Unit	-	-	✓	-	-	-	-	-	-
		✓			✓		✓		
	✓			✓		✓		✓	✓

SB: solvent-based paint
WB: water-based paint
CI: direct electric charge
EXT: external electric charge
(1): Module GNM200 dedicated to UHT208EEx e, ref: **1517070**

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*The **finishing** experts*

INNOVATION FOR THE PLANET

INNOVATION FOR ALL PROTECTION

Thanks to our 60 years of know-how, our customers achieve the best quality in the coating industry by saving paint, increasing their productivity, protecting environment.

Product performance, reliability and ergonomics are constantly being improved in the spirit of innovation which has made the name of SAMES famous.

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