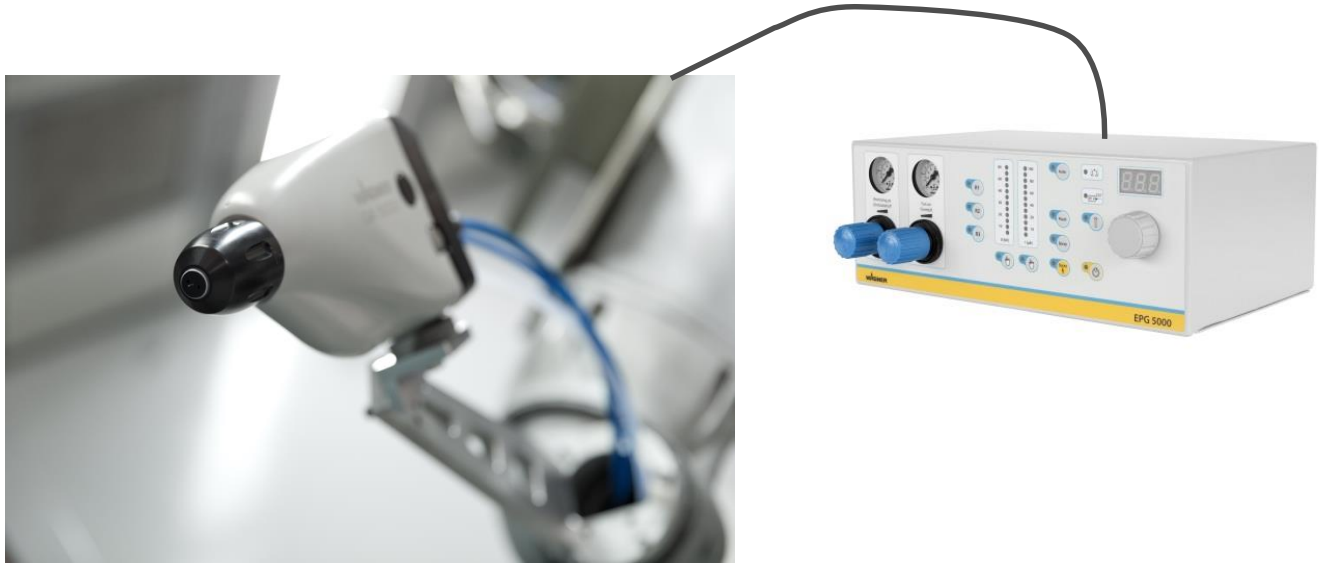
GA 5000 – automatic electrostatic gun

First in transfer efficiency with top finishing quality



- Up to 20 % material savings compared to other electrostatic guns
- High Voltage and pneumatic settings in one control unit with 9 operating modes
- Maximum safety level built in

GA 5000 & EPG 5000 - for automatic electrostatic coating

EPG 5000

1 **Up to 20% paint savings**
Higher transfer efficiency than main competitors

2 **Superior finishing quality**
thanks to the advanced atomization technology

GA 5000

3 **Maintenance cost savings up to 5.800 € pa** by Quick Change Nozzle and lower wearing cost

4 **20% higher productivity**
compared to non-electrostatic application

5 **Improved Process Safety**
Possibility to prevent unauthorized parameter changes or settings

6 **Highest safety functions built in**
automatic shut off High Voltage during flushing & breaks

7 **Optimum Control of Electrostatics**
Real time High Voltage adjustment by external signal to EPG 5000 controller

8 **All in one:**
High Voltage and pneumatic control functions are combined in the EPG 5000

Best finishing – Case Study
Agriculture Equipment Manufacturer

Tests made with ESTA Auto guns on a Robot:

- GRACO new Version PRO XP AUTO 85KV AA (Flat Jet and Round Jet Nozzle)
- Wagner old Version GA 2000EAC (Flat Jet Nozzle)
- Wagner new version GM 5000EAC (Flat Jet)

Coated Parts

- Drive trains for large tractor including hydraulic aggregates and connections. Base coat and top coat based on solvent based paints with high solid portion and middle gloss level.

Voice of Customer:

- “Concerning atomization the new Graco automatic gun has the same level as the old Wagner gun (GA 2800)”
- “The new GA 5000 from Wagner surprises with a better spray pattern and a better distribution of droplets.”

Thanks to the improved surface quality the customer replaced competitor spraying equipment with GA 5000.

Maintenance Cost Savings 117.000€ - Case Study Leading Truck Manufacturer

Nozzle Changes with competitor gun for a population of 20 guns (low pressure)

Current situation: 8 nozzles / aircaps per week replaced / 15 mins per replacement

Competitor wearing cost: Weekly spend = 2.600€, annual spend = 130.000€

Labor to change parts: 15 mins/gun/week = 2 hours/week, 100 hours/year, Annual labor spend: ~3.000€

Total maintenance with Ransburg for nozzles/aircaps: = 130.000€ + 3.000€ = 133.000€

Without considering extra solvent and paint waste

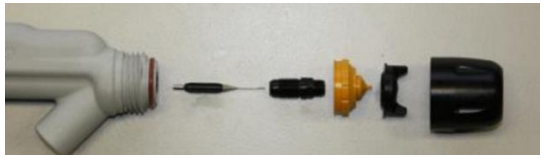
Wagner solution: based on trials and other installations, maximum estimated usage is: 1 nozzle per month & 1 aircap every 2 months

Wagner design does not require depressurization, flushing, or special tools so changeover is maximum 2 mins. Can be done by painters vs. maintenance if desired.

Wagner wearing cost: monthly: 1.300 €; annual spend = 15.800€

Annual labor: ~ 5 hours or 150 € annually

Total Wagner annual maintenance cost = 15.800€ + 150€ = 15.950€



Simple nozzle & aircap replacement

Annual savings of 133.000€ - 15.950€ = 117.050€ per year with Wagner solution

Typical savings of 5.800 € per year per gun vs. competitive applicators

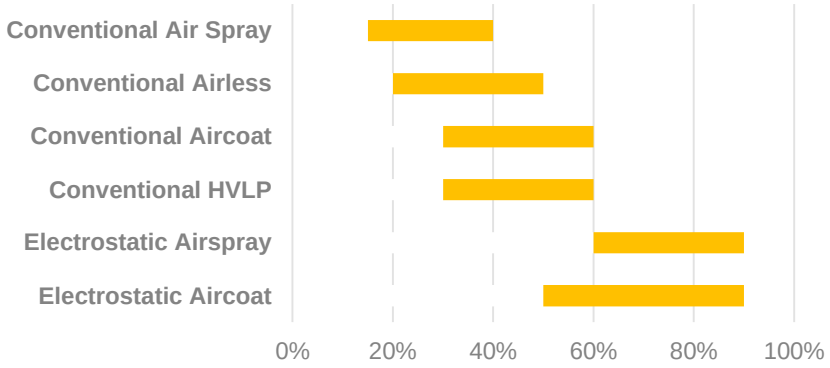
GA 5000 Maintenance Savings vs. Competitive Guns

Operation	Competitor	GA 5000
Labor Rate/Hour	30 €	
Working Days per Week	5	
Working Weeks per Year	50	
Number of Guns	20	
Nozzle Changes per Week	8	
Air Cap Changes per Week	8	
Nozzle Changes per Month		8
Air Cap Changes every 2 Months		8
Nozzle Cost	155 €	110 €
Air Cap Cost	170 €	110 €
Yearly Component Cost	130.000 €	15.840 €
Time to change parts mins/week/guns	15	
Time to change parts mins/month/guns		5
Yearly Labor Cost	3.000 €	160 €
Annual Cost	133.000 €	16.000 €
ANNUAL SAVINGS USING GM 5000	**117.000 €**	

Up to 20% paint savings

Wagner high performance Cascade combined with advanced air cap technology ensure superior transfer efficiency.

- Typical material savings:
  - up to 35% for high pressure and up to 50% for low pressure compared to non-electrostatic applications



  - Up to 20 % versus other electrostatic products

TE savings compared to	Daily Con. in Liter per day	Price per liter	Saving in %	Savings in liter per day	Savings pa (200 working days pa)
conventional coating	25	7,50 €	35%	8,75	14.438 €
TRP 501	25	7,50 €	20%	5,00	8.250 €
Graco	25	7,50 €	20%	5,00	8.250 €

Superior finishing quality due to outstanding nozzle technology

Newly designed Air-Caps for Airspray

- Unique atomization technology with paint film in between two air flows, it is possible to obtain a very fine and homogeneous atomization at a very low air pressure.
- Results are very high transfer efficiency and superior finishing quality

AirCoat Nozzle Systems

- 250 bar max, designed for use with high pressure applications
- Flatspray nozzle system
  - Red Aircap
    for low viscosity material
  - Blue Aircap
    for high viscosity material

    Electrode integrated in the Aircap

Minimizing maintenance cost

3

QuickChange nozzle and aircap system enables nozzle and aircap replacement in less than 2 minutes!

- No need to depressurize lines
- No need to shut off air to gun
- No need to flush gun

Savings up to 5.800 € per year including wearing parts savings

20% higher productivity due to electrostatic process advantages

4

Electrostatic coating minimizes coating process up to approx. 20 % compared to non-electrostatic.

Electrostatic effect provide:

- Higher transfer efficiency which results in faster application time
- Wrap around effects allows simpler and less movements for coating and better covering of hidden areas
- More uniform film thickness – paint particle will be attracted to areas with no coating

Example: → Reduce production cost by 17.600 € pa

Assumptions:
based on 20% time saving on 220 days per year / 5 h operation per day,
production cost of coating line per hour: 80 €

Production Savings vs. non electrostatic applicators

Production improvemets pa	GA 5000
Working hours per day	5
working hours per year	220
performance improvements in %	20%
painting line cost per hour in €	**80 €**
Cost savaings	**17.600 €**

Cleaning improvement	Hours per cleaing service	# of cleaning services per year	Reduction	Cost per hour	Savings pa (20 cleaning shifts pa)
Cleaning Savings	4	24	50%	80 €	**3.840 €**

Improved Process Safety

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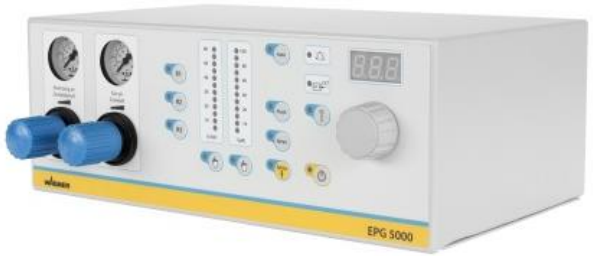
Multi Level Code function enable access to different level of settings only to authorized operators to prevent unauthorized parameter changes or settings

Ensure reproducible coating quality by secured access for recipes settings

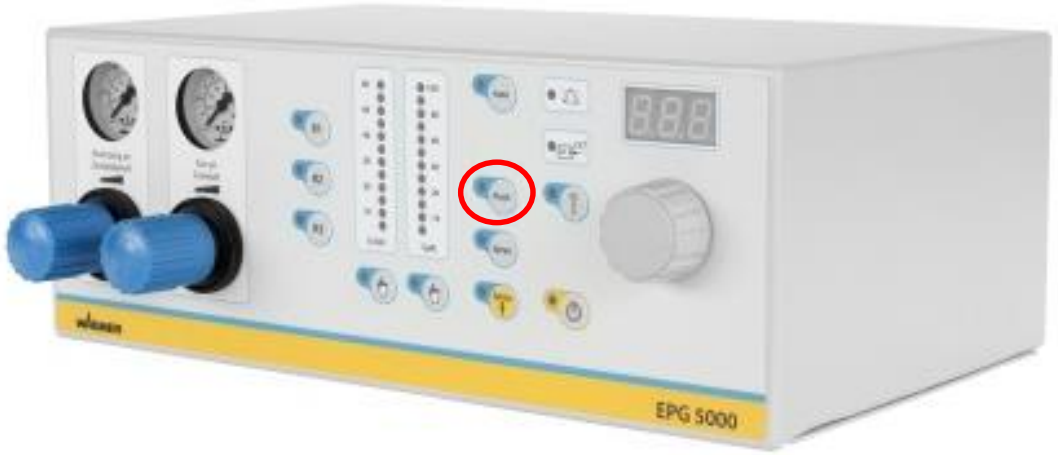


- Level 1:
  - No restriction (basic operation setting)
- Level 2:
  - No change of voltage and current possible
  - No receipt programming possible
  - Receipt selection possible
- Level 3:
  - Change of voltage and current are possible in manual operation
  - No receipt programming possible
  - Receipt selection possible
- Level 4:
  - Device is always in automatic mode
  - Change of voltage and current are possible in manual operation
  - No receipt programming possible
  - Receipt selection possible

Fail Safe Operation for highest operator safety

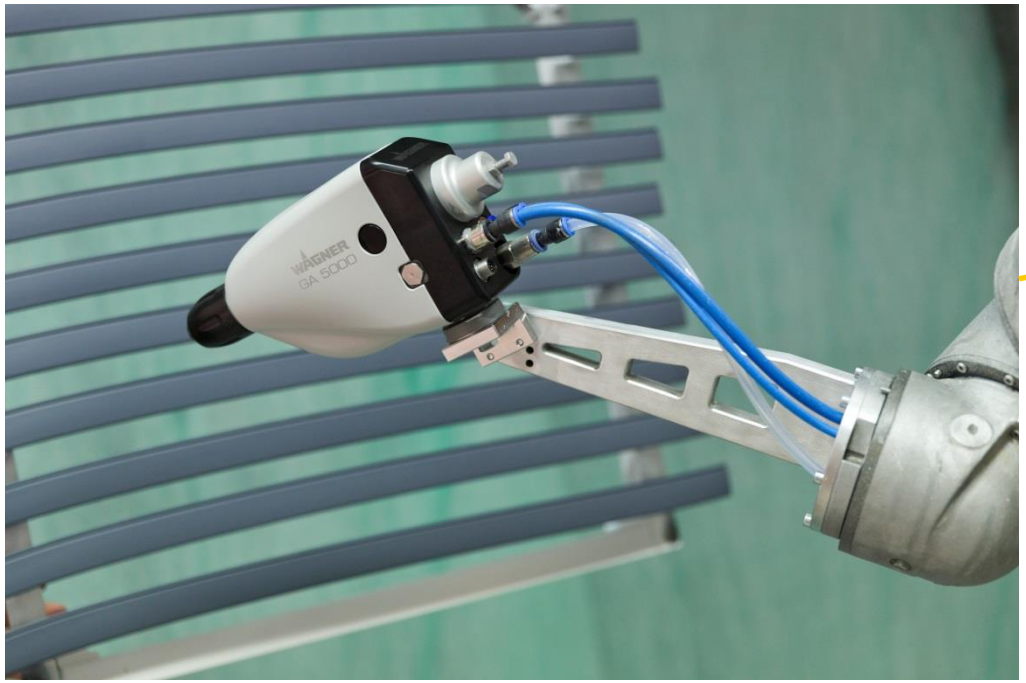
Unique standard controller with built in following safety functions:

- High Voltage is automatically shut off during flushing -> therefore prevent risk of explosion excluding any operator mistake.
- For additional safety High Voltage is also shut off during longer spraying breaks.
- Competitor units require external control box creating additional investment and integration cost



Always Best Coating Performance

- High Voltage settings can be optimized to the shape of work piece by external control unit e.g. robot control unit. This results in:
  - best coating result also in difficult spots
  - minimum overspray
  - maximum transfer efficiency
  - best wrap around



All in one

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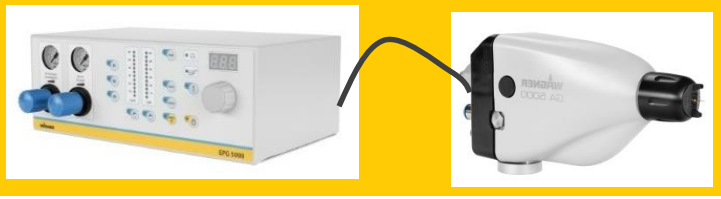
Unique professional solution: High Voltage and pneumatic control functions are combined in the EPG 5000 in a single unit providing:

- Easy operator handling -> everything at one place
- Ready to spray immediately -> minimized potential for installation failures
- CE approval for the complete solution -> no hassle for operator
- Minimal system integration effort -> Lower investment cost

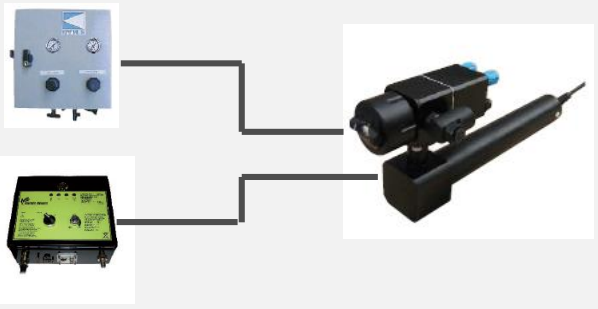
CE



Typical Competitor installation

Air Control

HV Control



Wide range of versions available

	Low Pressure	High Pressure	Internal Control	Externe Control	Solvent based Paint	Waterborne Paint
GA5000 EA IC	X		X		X	
GA5000 EA EC	X			X	X	
GA5000 EAC IC		X	X		X	
GA5000 EAC EC		X		X	X	
GA5000 EAW IC	X		X			X
GA5000 EAW EC	X			X		X
GA5000 EACW IC		X	X			X
GA5000 EACW EC		X		X		X

GA5000 wide Accessories range

to ensure the best fit to customer application requirements

LOW PRESSURE

2 x Round Jet Nozzles, fix and adjustable

2 different air caps types (small and wide)

Special spiral tube for metallic paint

HIGH PRESSURE

Round jet with variable insert tip size

2 different air caps for low and high viscosity

Special HP hose for metallic and high conductive materials

Accessories for GA 5000

9 different nozzle sizes

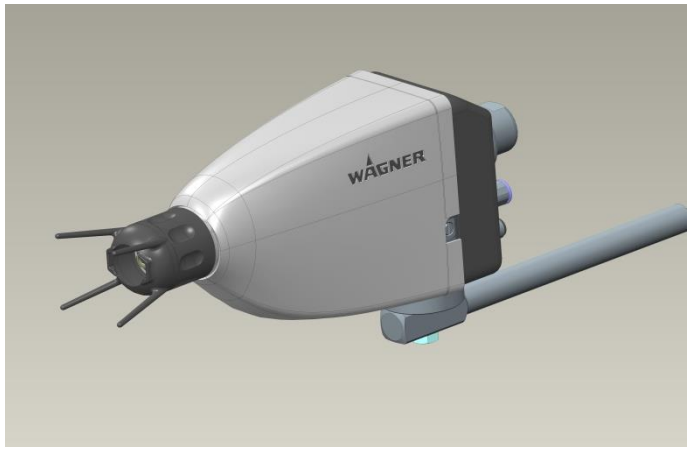
2 air caps

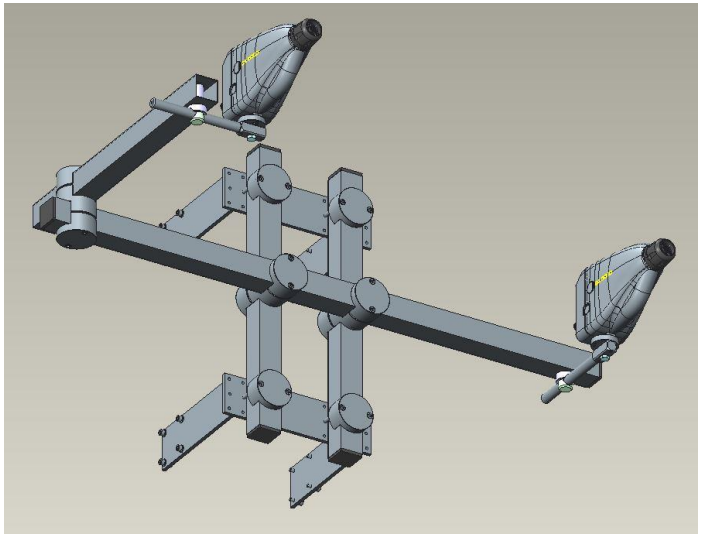
For Solvent & waterborne paint

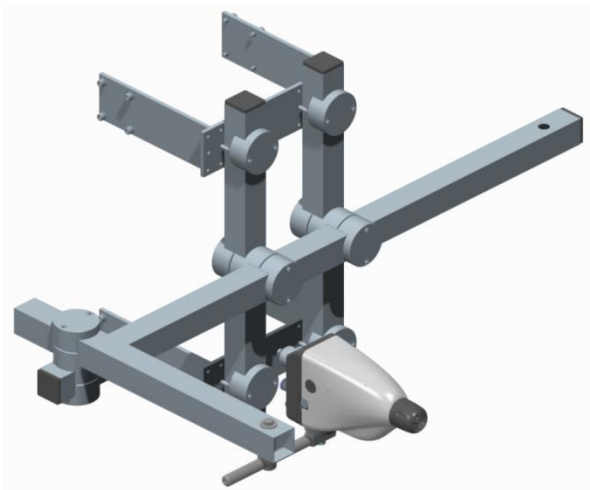
Aircap „WIDE“ (W)	Aircap „SMALL“	Nozzle color code
		0,4 mm
0,4 – 0,8 (W)	0,4 – 0,8	0,6 mm
		0,8 mm
		1,0 mm
1,0 – 1,4 (W)	1,0 – 1,4	1,2 mm
		1,4 mm
		1,6 mm
1,6 – 2,0 (W)	1,6 – 2,0	1,8 mm
		2,0 mm

Color coding of the nozzle helps to minimize mistakes of installing the wrong nozzle on a gun

GA 5000 – Mounting at the reciprocator

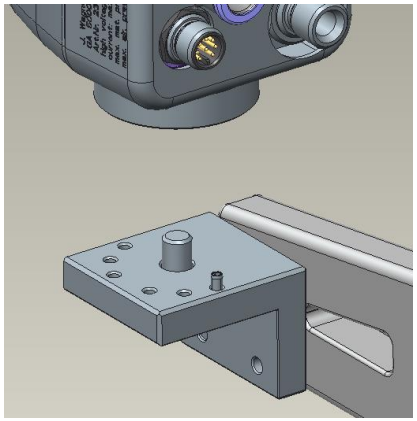




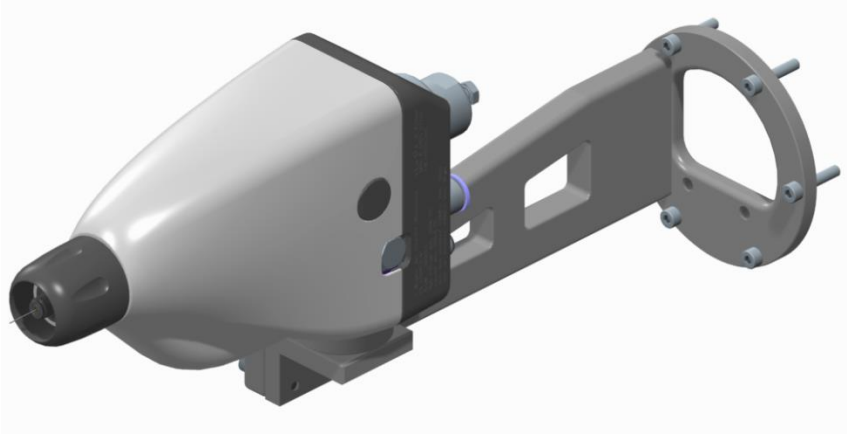


GA 5000 – Mounting at the robot

Mounting of GA 5000 can be adapted horizontally and vertically



- GA 5000 can be horizontally mounted in 15° steps on the adapter (-180° to +180°)
- GA 5000 can be vertically adjusted in predefined steps from 0° to 90°



Summary

- **Less material usage**
  - 35 % / 50 % Higher transfer efficiency compared to non–electrostatic applicators
  - 15 - 20 % higher transfer efficiency compared to competition -> Up to 8.250 € painting savings
- **Top finish quality**
  - Using GM 5000 technology finishing quality is outstanding minimizing part rejects
- **Higher productivity**
  - Increase productivity by 20% compared to non electrostatic applications

  → Reduce production cost by 17.600 €
- **Improved Process Safety**
  - Password protected HV settings as well as EPG 5000 remote control avoid setting mistakes minimizing part rejects
- **Cleaner production line**
  - Minimized cleaning and downtime of production → potential savings of 3.800 € pa
  - Green technology with avoiding solvent meeting VOC regulations
- **Superior safety standard enable users a reliable and safe operation**
  - EPG 5000 automatically shut down HV during coating breaks and flushing
  - Potential for accidents is reduced to a minimum = safety management secured

Back-up

GA 5000 – Key Features

- New up to date technology based on GM 5000 and GA 4000
- Design to be used by robots and reciprocator
- Airspray & Aircoat version for solvent and waterborne material
- Very low weight: ca. 1,2 kg
- Small and compact (266 x 135 x 75 mm)
- Programmable HV via EPG 5000 with external control
- Internal & External control
- Nozzles & Aircaps interchangeable with GM 5000
- Use accessories of GM 5000
  - spiral tube
  - 1,5 mm material joint hose

Customer Benefits

Feature	Benefit	Value add
1 High transfer efficiency	Compared to conventional coating methods up to 50% can be saved.	Saves Material & working time and reduces the dirt -> short RoI
2 Superior atomization	Excellent surface quality	Gives an competitive advantage to the coater
3 Easy to service	Low number of parts, wear & spare parts can easily exchanged	Minimum service down time for maintenance
4 Change nozzle without flushing and shut down of pressure	Minimum production interruption in case of nozzle blockings or changes	Increased productivity
5 Robust Set-up	Solid high quality gun with long lifetime	Investment is paid off via multiple years
6 Access to receipt settings can be restricted	“Receipts” can be set, access to settings can be restricted	Enables guaranteed repeatable production performance
7 High security concept	High voltage is switched off during breaks and during flushing	Minimize the danger of accidents -> meets highest safety standards
8 Online external control of High Voltage	Optimized HV at any point of workpiece	Providing minimum material consumption
9 Various operator modes	Operator mode can be chosen as required: manual or automatic via external interface control	Flexible platform which can be used in various customer environments
10 Internal & External control version	Preferred customer selection available on demand	Adapt to customer needs

GA 5000 & EPG 5000 – USPs

- Best Transfer Efficiency
- Superior atomization for best coating quality
- Single Box solution for control of High Voltage and Pneumatics ensuring highest safety level.
- Useable till 250 bar
- Dedicated versions for internal & external control of airs
- Versatility: Extensive possibilities for the optimal control of applications
  - Automatic operation via external interface (analogue or CAN bus)
  - Adaptive control of High Voltage in real time according to the shape of work piece
  - High Voltage can be switched off during spray gaps – optimal spray results with minimal material consumption e.g. for window frames
  - Operation with 2K mixing system possible

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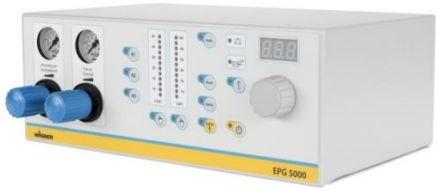


Internal & External Air Control Versions

	Internal Air Control	External Air Control
▪ Air Supply	▪ One air supply for shaping & atomization air	▪ Dedicated air supply for shaping air ▪ Dedicated air supply for atomization air
▪ Air Control	▪ Shaping and atomization air is mixed and adapted via screw at the gun	▪ Via dedicated regulators via control unit with high accuracy
▪ When used?	▪ Fast adaptation at the gun possible, see immediate the result; ▪ Experienced coater required ▪ Use with VM 5000	▪ Precise control of each air, provide reproducible results; for changing workpieces

Quick cleaning reversible nozzle

- Save time and prevent nozzle damage when cleaning a clogged tip
- Reversible nozzle reduce the need of using cleaning needle to remove the dirt
- This reduce yearly expenditure for nozzle; typically up to 500 € pa.

Unique Wagner technology: Reversible nozzle for Aircoat applications

- When the nozzle is clogged, just reverse the nozzle tip and spray out the dirt.

Less service cost

- Low number of parts with minimal repair time (< 1 hour)
- Use of available spare parts minimizing stock:
  - Use of GM 5000 adapter:
    - Same nozzles and air caps
    - Same needles
    - Same service set as GM 5000
  - Use of GA 4000 body
    - Includes same mounting plate to be able to mount on robots and reciprocator
    - Reuse of mounting accessories

Highest Versatility

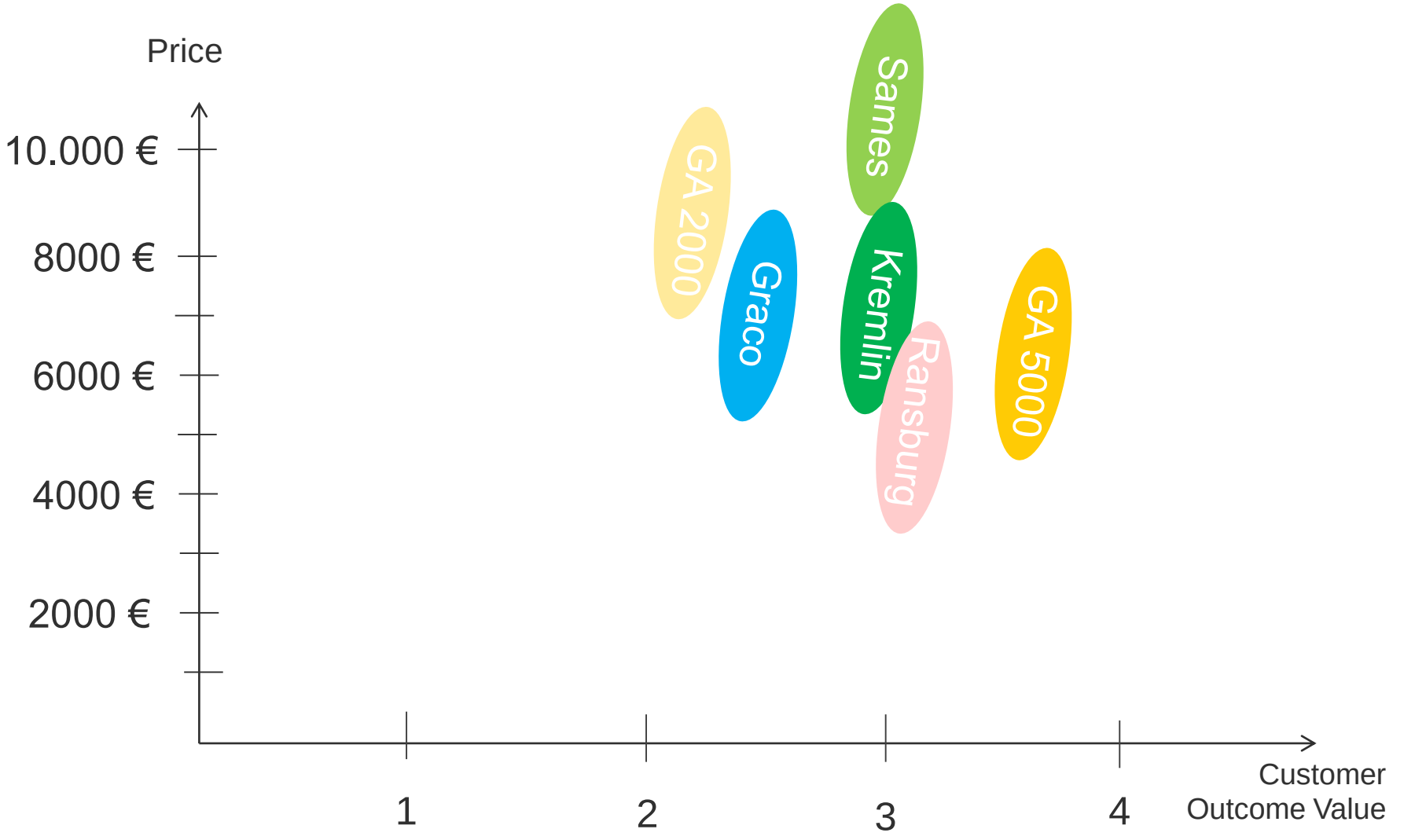
9 different Operator Modes available on EPG 5000

- Manual Mode
  - Setting of parameter at the control unit
- Automatic Mode via external interface
  - Setting of parameter via analogue interface
  - Setting of parameter via CAN bus
- Spraying with electrostatic
- Spraying without electrostatic
- Flushing
  - HV is shut off & air channels are blown free with reduced air
- 2K Operation
  - Integration with control unit of 2K system; 2K system releases spray process of GA 5000.
- Operation with external control air valve
  - Used to reduce switching time of spray gun in case of long hoses
- Operation with dedicated switching of control air and High Voltage (HV)
  - Used to keep HV in gaps when the gun is not spraying e.g. coating window frames to ensure that electrostatic effect is available when needed.
- Operation of GM 5000 possible

Competition

WAGNER GA 5000	Graco Pro XP Auto	Ransburg Evolver 560 SE Automatic	Kremlin KAP / KAX
▪ Highest Transfer efficiency	▪ Up to 20 % less efficiency	▪ tbd	▪ tbd
▪ Superior Atomization	▪ Medium atomization	▪ Very good atomization	▪ Very good atomization
▪ High pressure up to 250 bar	▪ Up to 210 bar	▪ Up to 13,8 bar	▪ Up to 120 bar only
▪ Highest safety standards, switch off HV during flushing	▪ External pneumatic control module required	▪ External cascade plus external pneumatic control unit required	▪ External pneumatic control module required
▪ Air control: Internal version & external version	▪ No internal version	▪ No internal version	▪ No internal version
▪ Remote control of HV	▪ not possible	▪ not available	▪ not available

Competition – Positioning



Competitor situation

GA 5000 versus Graco Pro XP Auto :

versus

- **Higher transfer efficiency**
  - up to 15% higher as competitor products
  - cost advantage up to 5.600€/ year
- **Premium atomization**
  - Much higher coating and surface quality, see customer testimonial
- **No loss of Electrostatic Effect due to trigger delay**
  - Internal turbine need 2-3 seconds to generate High Voltage after switch on
  - High voltage remain switched on when no spraying during gaps e.g. when spraying window frames
- **Higher air consumption with turbine based guns**
- **Online control of High Voltage via external control unit possible**
  - High Voltage can be programmed and optimized according the shape of the work pieces
- **Ensure highest security standards**
  - High Voltage switched off during flushing & breaks
  - Single control unit for High Voltage and pneumatic control
- **Additional general advantages to other suppliers:**
  - Use same spare & wear parts of GM 5000

Competitor situation

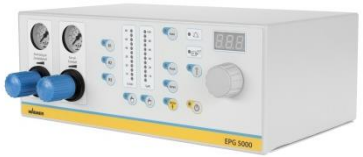
GA 5000 versus TRP501/502:

versus

- **Higher transfer efficiency**
  - up to 20% higher as competitor products
  - cost advantage up to 7.500€/ year

- **More compact, less size**
  - TRP 501: big size (L = 430mm) - high weight (W = 4.2kg)

- **Compact control unit**
  - Less size and cost
  - TRP control unit build on old expensive technology

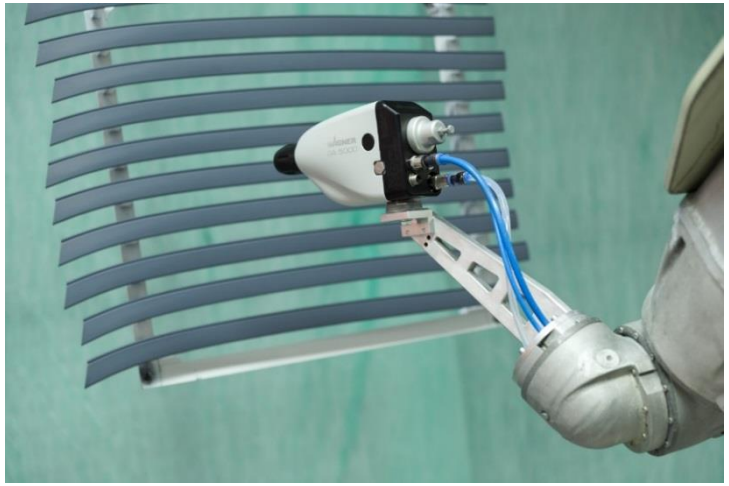


versus

References – Field Trials

NATÜRLICHE CARBO KOHLENSÄURE

GEWES



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TOYOTA MATERIAL HANDLING

ecco

autoneum

WAGNER

GA 5000 – Field Test References

Successful passed field trials and demos

No	Equipment	Region / Country	Company	Moving Device	Application	Segment Industry level 2	Industry Seg.
1	GA 5000EAC EC	Germany	L&S	Robot	Drive trains for agriculture machines	Tractors, combine harvesters & hay balers, planting equipment	ACE
2	GA 5000EAC EC	Germany	Thüma	Reciprocator	Cardan shafts	Automotive Suppliers metal part	Automotive
3	GA 5000EAC EC	US	Toyota Lift Truck		Fork lifts	Fork lifts	ACE
4	GA 5000EA IC	Vietnam	SUDIMA PANELS LTD.	Reciprocator	Wooden frame	Industrial Joinery	Wood
5	GA 5000EA EC	Italy	ESAM Spa / Colora	Robot	Electrical motors 2K epoxy metallic paint	Other metal parts for Gen. Ind.	Metall
6	GA 5000EA EC	US	Lacks Insdustry	Robot	Plastic Hub hub cap	Automototiv Plastic Exterior	Automotive
7	GA 5000EA EC	Turkey	Farplas / Eising	Robot	Plastic parts, Basiscoat	Automototiv Plastic Exterior	Automotive
8	GA 5000EA EC	Germany	Helbig/WMO	Robot	Metall parts, plastic parts		Job Coater
9	GA 5000EA IC	Swiss	Autoneum / Retech	Robot	Release Agent for Insulation of car underbody	Automototiv Exterior	Automotive
10	GA 5000EA EC	France	Selfid /Emmap	Reciprocator/ Robot	Metall parts, plastic parts	Other metal parts for Gen. Ind.	Metall
11	GA 5000EA EC	Portugal	Ecco / Janke	Robot	Release Agent (Solvent) for Shoes	Consumer Products	Lifestyle & Leisure Products
12	GA 5000EA IC	Germany	Carbo Kohlensäure	Reciprocator	Gas bottles	Other metal parts for Gen. Ind.	Metall