
Quick reference guide

Manual equipment OptiFlex Pro F



The complete operating instructions with detailed information and spare parts lists can also be found at:

docs.gemapowdercoating.com/9d80a24e5f



Translation of the original operating instructions

Documentation OptiFlex Pro F

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Other applicable documents

In addition to the information contained in this manual, the following operating instructions and spare parts lists for the individual components must also be observed:



OptiStar CG21 Gun control unit

docs.gemapowdercoating.com/880b384645



OptiSelect GM04 manual gun

docs.gemapowdercoating.com/7729cd9516



OptiFlow IG07 injector

docs.gemapowdercoating.com/3f079832b3

Safety

General information

This chapter provides the user and third parties who operate this product with all essential safety regulations, the adherence to which is imperative.

These safety regulations must be read and understood in their entirety before the product is put into operation.

The standards and guidelines applied during the development, manufacture and configuration are described in the EC declaration of conformity and in the manufacturer's declaration.

WARNING

Working without instructions

Working without instructions or with individual pages from the instructions may result in damage to property and personal injury if relevant safety information is not observed.

- ▶ Before working with the device, organize the required documents and read the section "Safety regulations".
 - ▶ Work should only be carried out in accordance with the instructions of the relevant documents.
 - ▶ Always work with the complete original document.
-

Basic safety instructions

- This product is built to the latest specification and conforms to the recognized technical safety regulations and is designed for the normal application of powder coating.
- Any other use is considered non-compliant. The manufacturer shall not be liable for damage resulting from such use; the user bears sole responsibility for such actions. If this product is to be used for other purposes or other substances outside of our guidelines then Gema Switzerland GmbH should be consulted.
- Start-up (i.e. the execution of intended operational tasks) is forbidden until it has been established that this product has been set up and wired according to the guidelines for machinery. The standard "Machine safety" must also be observed.
- Unauthorized modifications to the product exempt the manufacturer from any liability from resulting damage.

- The relevant accident prevention regulations, as well as other generally recognized safety regulations, occupational health and structural regulations are to be observed.
- Furthermore, the country-specific safety regulations also must be observed.

Product specific security regulations

- This product is a constituent part of the equipment and is therefore integrated in the system's safety concept.
- If it is to be used in a manner outside the scope of the safety concept, then corresponding measures must be taken.
- The installation work to be done by the customer must be carried out according to local regulations.
- It must be ensured, that all components are earthed according to the local regulations before start-up.



For further security information, see the more detailed Gema safety regulations!

WARNING

These general safety regulations must be read and understood in all cases prior to start-up!



General information

This product is built to the latest specification and conforms to the recognized technical safety regulations and is designed for the normal application of powder coating.

Any other use is not considered as intended use. The manufacturer shall not be liable for damage resulting from such use; the user bears sole responsibility for such actions. Gema Switzerland GmbH must be consulted prior to any use of this product for any purposes or substances other than those indicated in our guidelines.

Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of the intended use.

The relevant accident prevention regulations, as well as other generally recognized safety regulations, occupational health and structural regulations are to be observed.

Furthermore, the country-specific safety regulations also must be observed.

Additional safety and operation notices can be found on the homepage www.gemapowdercoating.com.



General dangers

Start-up is forbidden until it has been established that the product has been set up and wired according to the EU guidelines for machinery.

Unauthorized modifications to the product exempt the manufacturer from any liability from resulting damages or accidents.

The operator must ensure that all users do have the appropriate training for powder spraying equipment and are aware of the possible sources of danger.

Any operating method, which will negatively influence the technical safety of the powder spraying equipment, is to be avoided.

For your own safety, only use accessories and attachments listed in the operating instructions. The use of other parts can lead to risk of injury. Only original Gema spare parts should be used!

Repairs must only be carried out by specialists or by authorized Gema service centers. Unauthorized conversions and modifications can lead to injuries and damage to the equipment and invalidate the Gema Switzerland GmbH guarantee.



Electrical danger

The connecting cables between the control unit and the spray gun must be installed in such a way, that they cannot be damaged during the operation. Please observe the local safety regulations!

The plug connections between the powder spraying equipment and the mains should only be removed when the power supply is switched off.

All maintenance activities must take place when the powder spraying equipment is switched off.

The product may not be switched on until the booth is in operation. If the booth stops, the product must switch off too.



Explosion hazard

The control units for the spray guns must be installed and used in zone 22. Spray guns are allowed in zone 21.

Only original Gema OEM parts are guaranteed to maintain the explosion protection rating. If damages occur by using spare parts from other manufacturers, the warranty or compensation claim is void!

Conditions leading to dangerous levels of dust concentration in the powder spraying booths or in the powder spraying areas must be avoided. There must be sufficient technical ventilation available, to prevent a dust concentration of more than 50% of the lower explosion limit (UEG = max. permissible powder/air concentration). If the UEG is not known, then a value of 10 g/m³ should be considered (see EN 50177).

All unauthorized conversions and modifications to the electrostatic spraying equipment are forbidden for safety reasons.

No safety devices should be dismantled or put out of operation.

Mandatory operational and workplace notices from the operating company must be written in a comprehensible manner in the language of equipment operators and posted in a suitable place.



Slip hazard

Powder lying on the floor around the powder spraying equipment is a potentially dangerous source of slipping. Booths may be entered only in the places suitable for it.

Static charges

Static charges can have the following consequences: Charges to people, electric shocks, sparking. Proper grounding must be in place to prevent objects from becoming charged.

Grounding

Observe the grounding regulations



All electrically conductive parts found in the workplace of 5 meters around each booth opening, and particularly the objects to be coated, have to be grounded. The grounding resistance of each object must amount to maximally 1 MOhm. This resistance must be checked/tested regularly when starting work.

The condition of the work piece attachments, as well as the hangers, must guarantee that the work pieces remain grounded. The appropriate measuring devices must be kept ready in the workplace, in order to check the grounding.

The floor of the coating area must conduct electricity (normal concrete is generally conductive).

The supplied grounding cable (green/yellow) must be connected to the grounding screw of the electrostatic manual powder coating equipment. The grounding cable must have a good metallic connection with the coating booth, the recovery unit and the conveyor chain, respectively with the suspension arrangement of the objects.

Fire and smoke prohibition



Smoking and open flames

Smoking and igniting fire are forbidden in the entire vicinity of the system! No work that could potentially produce sparks is allowed!

The stay for persons with cardiac pacemakers is forbidden



Stay for persons with cardiac pacemakers

As a general rule for all powder spraying installations, persons with pacemakers should never enter high voltage areas or areas with electromagnetic fields. Persons with pacemakers should not enter areas with powder spraying installations!

Photographing with flashlight is forbidden



Photographing with flashlight

Photographing with flashlight can lead to unnecessary releases and/or disconnections by safety devices.

Disconnect from mains before maintenance works take place



Maintenance works

Disconnect the plugs before the machines are opened for maintenance or repair.

The plug connections between the powder spraying equipment and the mains should only be removed when the power supply is switched off.



As far as it is necessary, the operating firm must ensure that the operating personnel wear protective clothing (e.g. facemasks).

A dust mask corresponding to filter class FFP2 or N95 at minimum must be worn during any cleaning work.

The operating personnel must wear electrically conductive, steel-toe footwear (e.g. ESD shoes).

The operating personnel should hold the gun with bare hands. If gloves are worn, these must also conduct electricity.

Start-up

Initial start-up



If a malfunction occurs, see the troubleshooting guide, as well as the gun control unit operating manual!

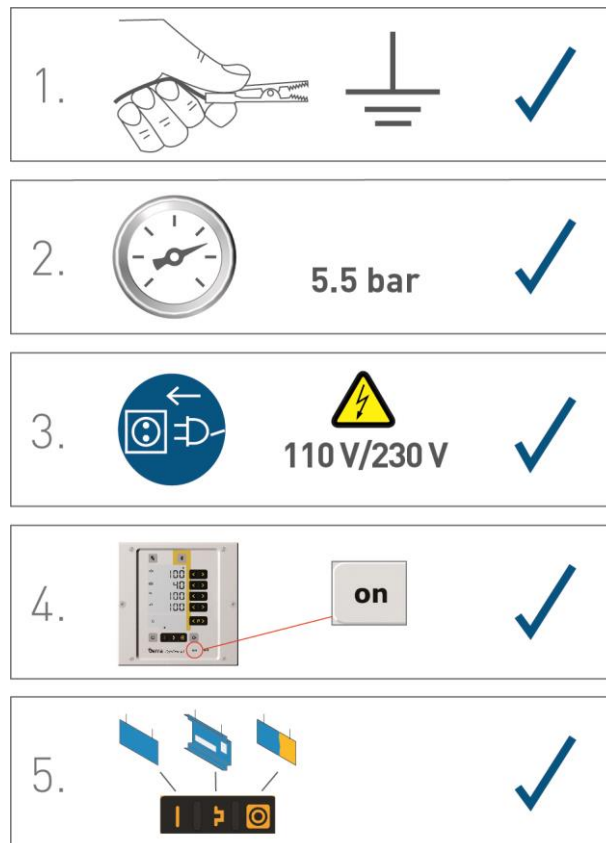


fig. 1



The remainder of the start-up procedure for the gun is explicitly described in the operating instructions for the OptiStar CGxx manual powder gun control unit (chapter "Initial start-up" and "Daily start-up")!

Operation

WARNING

Holding the gun incorrectly

During the coating process, the gun can discharge along the body of the coater if not held using its intended handle, which has been grounded.

- ▶ Always hold gun only by the handle!
- ▶ Do not touch any other parts of the gun!

Operation

CAUTION

Large dust formation possible!

If the manual equipment is not being used for coating in conjunction with a sufficiently powerful suction unit, then the stirred-up dust from the coating powder can cause respiratory issues or cause a slippage/falling hazard.

- ▶ The manual equipment may only be operated in conjunction with a sufficiently powerful suction unit (such as Gema Classic Open booth).

1. Swivel aside the fluidizing/suction unit
2. Place the open powder container on the vibrating table

CAUTION

Hand injury!

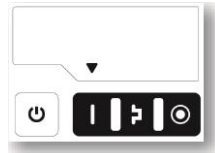
When placing a container on the vibrating plate, fingers caught in the gap between the two plates can be crushed.

- ▶ The container may weight a max. of 30 kg.

3. Place the fluidizing/suction unit onto the powder
4. Set coating parameters

Select predefined operating mode (Preset mode)

1. Turn on the gun control unit with the **ON** key
2. Press the corresponding application key.
The arrow above the desired button lights up.



The pre-defined application modes have preset values for high voltage and spray current:

Application mode		Preset kV	Preset μ A
	flat parts	100	100
	complicated parts	100	22
	overcoat	100	10

3. The air values for total air, powder output and electrode rinsing air can be individually defined and are saved in the programs.

Starting the individual adjustable programs

1. Turn on the gun control unit with the **ON** key
2. Press the **< P >** program key
3. Select the desired program (01-20)



Program 20 active

4. Change the coating parameters as required



Programs 01-20 are preset at the factory but can be modified at any time, after which they are automatically stored.

Description	Presetting
Powder output	60 %
Total air	4.0 Nm ³ /h
kV High voltage	80 kV
μA Spray current	20 μ A
Electrode rinsing air	0.1 Nm ³ /h
Fluidizing air	1.0 Nm ³ /h (for device type F) 0.1 Nm ³ /h (for device type B and S)

Setting powder output and powder cloud

The powder output depends on the selected powder output (in %), and the powder cloud on the selected total air volume.



As a factory default value, a powder rate of 50% and a total air volume of 4 Nm³/h are recommended.

- If values are entered that the gun control unit cannot implement, then the operator is informed of this by a blinking in the relevant display and a temporary error message!

Setting the total air volume

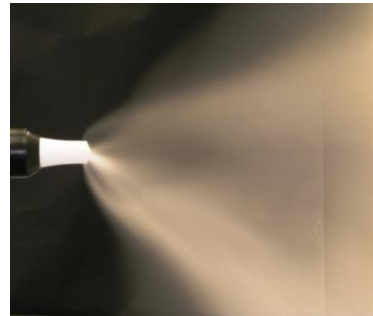
1. 

Adjust the total air volume on the gun control unit with the **T3/T4** keys

- Adjust the total air volume according to the corresponding coating requests



correct powder cloud



too little total air

Setting the powder output

1.  OR 



much powder



little powder

Adjust the powder output volume (e.g. according to the desired coating thickness)

- Factory default setting of 50% is recommended for initial operation. The total air volume is thereby kept constant automatically by the control unit.



To achieve maximum efficiency, we recommend avoided an overly high powder volume where possible!

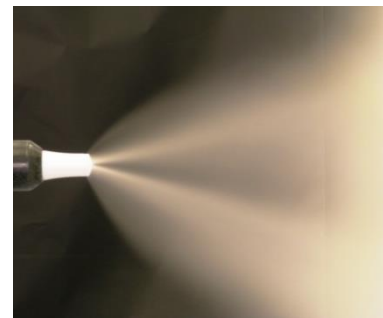
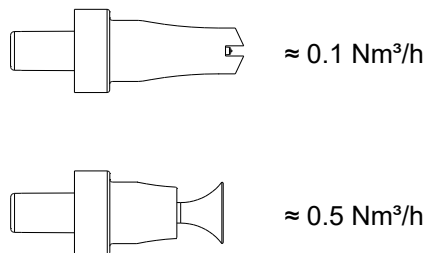
2. Check fluidization of the powder in the powder container
3. Point the gun into the booth, switch the gun on and visually check the powder output

Setting the electrode rinsing air

1. Press the  key.
The second display level will be shown.



2. Adjust the correct electrode rinsing air according to the applied nozzles (deflector plate, flat jet nozzle)



too much electrode rinsing air

3. If in this display level is no operation for 3 seconds, the first display level is switched over independently.


Setting the fluidization

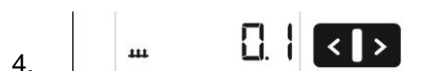
The fluidization can be adjusted on the manual units type B, Q, F, L and S.

The powder fluidization depends on the powder type, the air humidity and the ambient temperature. Fluidizing and vibration start by switching on the control unit.

Procedure:

1. Configure AirMover by opening the ball valve complete and adjusting with the flow control valve (equipment type F only)
2. Open the powder container cover (equipment type F only)

3. Press the  key
The second display level will be shown



Adjust the fluidizing air with the keys **T5/T6**

- If in this display level is no operation for 3 seconds, the device switches back to the first display level
 - The powder should only be touched gently, but should be "cooked" regularly and is also to be stirred using a rod
5. Close again the cover

Maintenance / Repairs

Cleaning

ATTENTION

Any unauthorized modifications and alterations to the product are not permitted for safety reasons and exclude the manufacturer's liability for any resulting damage!



Regular and conscientious cleaning and maintenance increase the service life of the product and ensure consistent high coating quality!

- The parts to be replaced during maintenance work are available as spare parts. These parts can be found in the appropriate spare parts list!

⚠ CAUTION

Large dust formation possible!

If no dust mask or one of an insufficient filter class is worn when cleaning the product, then the dust that is stirred up from the coating powder can cause respiratory problems.

- ▶ The ventilation system must be turned on for all cleaning work.
- ▶ A dust mask corresponding to filter class FFP2 or N95 at minimum must be worn during any cleaning work.

Gun cleaning

ATTENTION

Impermissible solvents

The following solvents may not be used to clean the gun:

- ▶ Ethylene chloride, acetone, ethyl acetate, methyl ethyl ketone, methylene chloride, premium gasoline, turpentine, tetrachloromethane, toluene, trichloroethylene, xylene!



Only cleaning agents with a flash point of a least 5 Kelvin above the ambient temperature, or cleaning places with technical ventilation are allowed!



Before cleaning the powder gun, switch off the control unit. The compressed air used for cleaning must be free of oil and water!

Daily:

1. Blow off the outside of the gun and wipe, clean etc.

Weekly:

2. Remove powder hose
3. Remove the spray nozzle from the gun and clean it with compressed air
4. Blow through the gun with compressed air, beginning from the connection in flow direction
5. Clean the integrated gun tube with the brush supplied if necessary
6. Blow through the gun with compressed air again
7. Clean the powder hose
8. Reassemble the gun and connect it

Cleaning the powder container

ATTENTION

Damage to the fluidizing plate

- ▶ Never clean the powder container with solvents or water!

1. Disconnect the fluidizing air supply
2. Remove the injector
3. Remove PowerClean module**
4. Remove the cover, blow out with compressed air and clean with a clean dry brush and cloth
5. Clean the injector and suction intake pipe (Please review injector manual for more on this)
6. Clean rinsing module**
7. Empty remaining powder into a container
8. Vacuum up the hopper and in particular the bottom
9. Clean container with a cloth
10. Reassemble the powder hopper



Do not refill the powder container until just before the next use!

Cleaning the injector

ATTENTION

Injector parts may be damaged during the cleaning process.

- ▶ Clean the component parts with compressed air and, if necessary, dissolve sintered deposits with nitro-thinner.
- ▶ Do not use acetone, do not scrape!

Cleaning intensity depends of the powder used. For optimal cleaning results, we recommend dismantling the entire injector into its dismantable components.

1. Remove the injector
2. Remove the powder hose from the hose connection
3. Clean the hose connection with compressed air which is free of oil and water, and check for wear
4. Clean the injector body with compressed air which is free of oil and water.
 - Any contamination can be seen through the opening of the hopper fitting
5. If the injector is severely fouled, it must be dismantled!

ATTENTION

Individual parts may be damaged during the cleaning process.

- ▶ Please dismantle carefully to avoid damages!
- ▶ Remove the check valve units (1 and 6) with the correct sized spanner.

6. Reinsert the injector and fix it

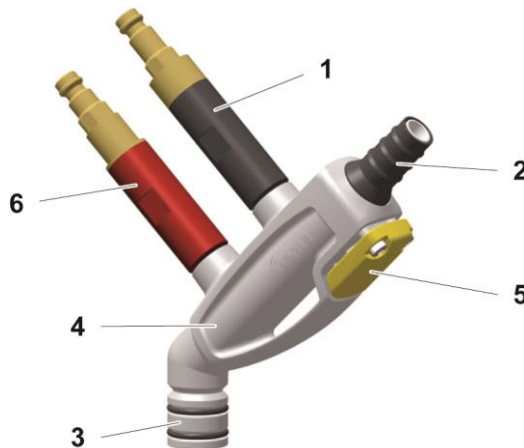


fig. 2

- | | | | |
|---|--------------------------------------|---|----------------------------------|
| 1 | Check valve unit (supplementary air) | 4 | Injector housing |
| 2 | Powder hose quick release connection | 5 | Release trigger |
| 3 | Powder hopper connection | 6 | Check valve unit (conveying air) |

Cleaning the check valve units

ATTENTION

Damage or loss of function!

Parts of the check valve unit may be damaged during the dismantling process.

- ▶ Blow off the filter elements from the inside to the outside!
- ▶ Do not immerse the filter elements in fluidities or solvents!!!
- ▶ Never remove the supporting ring!

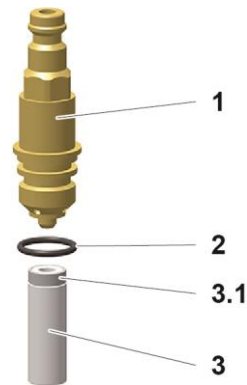
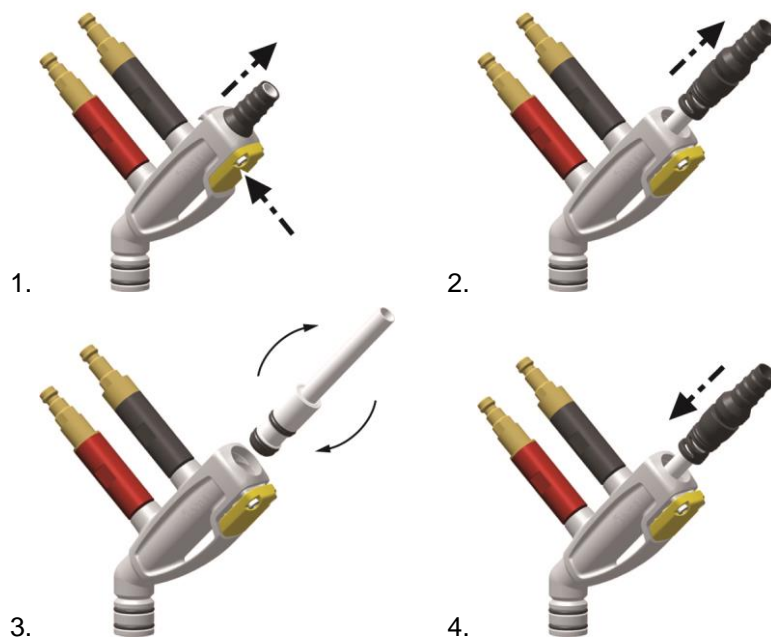


fig. 3

- 1 Connection/plug
- 2 O-ring

- 3 Filter element
- 3.1 Supporting ring

Changing the cartridge





Spare parts list

Ordering spare parts

When ordering spare parts for powder coating equipment, please indicate the following specifications:

- Type and serial number of your powder coating equipment
- Order number, quantity and description of each spare part

Example:

- **Type** OptiGun GA03 automatic powder gun
Serial number 1234 5678
- **Order no.** 203 386, 1 piece, Clamp – Ø 18/15 mm

When ordering cable or hose material, the required length must also be given. The spare part numbers of this bulk stock is always marked with an *.

Wearing parts are always marked with a #.

All dimensions of plastic hoses are specified with the external and internal diameter:

Example:

Ø 8/6 mm, 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d)

ATTENTION

Use of non-original Gema spare parts

When using the spare parts from other manufacturers the explosion protection is no longer guaranteed. If any damage is caused by this use all guarantee claims become invalid!

- ▶ Only original Gema spare parts should be used!
-

OptiFlex Pro F – Spare parts list

1	OptiStar CG21 Powder Gun Control	
2	OptiSelect Pro GM04 manual powder gun	
	Flat jet nozzle NF40 – complete	1018 166#
	Threaded sleeve	1008 326#
3	OptiFlow IG07 injector	
3.1	Cartridge – complete	1016 561#
3.2	Filter element	1015 832#
4	Pneumatic group	
	Filter cartridge – 20 µm	1008 239#
5	Powder hose – Ø 15/10 mm	1001 673*#










* Please indicate length

Wearing part






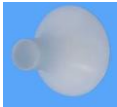
fig. 4:

Flat jet nozzles – overview (wearing parts)









Application	A	B	A + B	Threaded sleeve
Profiles/flat parts	 NF20 1010 090		NF20 1010160	
Profiles/flat parts	 NF27 1010 752		NF27 1010 754	 1007 229
Complex profiles and depressions	 NF21 1007 935	 1007 683	NF21 1007 932	
Complex parts (deep recess); target spraying	 NF22 1008 145		NF22 1008 140	
Profiles/big flat parts (standard nozzle)	 NF40* 1018 165		NF40 1018 166	 1008 326
Large surfaces	 NF24* 1008 147	NF24 1008 142		

* not suitable for angled nozzles

Round jet nozzles – overview (wearing parts)

Application	A	B	A + B	Threaded sleeve	Deflectors
Suitable for large surfaces	 NS04 1008 151	 1008 152	NS04 1008 150	 1007 229	 Ø 16 mm 331 341
					Ø 24 mm 331 333
					Ø 32 mm 331 325

Gun extensions

	Gun extensions	
	L = 150 mm	L = 300 mm
without nozzle ¹	 1008 616	 1008 617
without nozzle ²	 1007 718	 1007 719
with Flat jet nozzle NF25	 1007 746	 1007 747
with Round jet nozzle NS09	 1007 748	 1007 749

¹ see NF27, NF20, NF21, NF24, NS04

² see NF25, NF26, NS09

ATTENTION

Connecting more than two extensions

It is not permitted to connect more than two extensions together, in order to prevent the gun from being damaged by arising leverage force.

- ▶ The extensions (150 mm/300 mm) may be connected TO ONLY ONE ADDITIONAL extension (150 mm/300 mm), if necessary.

Spray nozzles for extensions – overview (wearing parts)




1007 718



1007 719

Application	A	B	A + B	Threaded sleeve	Deflectors
Profiles/flat parts	 NF25 1007 735	 1007 684	NF25 1007 743	 1007 740	--
Complex profiles and depressions	 NF26 1007 742		NF26 1007 744		--
Suitable for large surfaces	 NS09 1008 257	 1008 258	NS09 1008 259		 Ø 16 mm 331 341 Ø 24 mm 331 333 Ø 32 mm 331 325

Powder hoses – overview

Powder hose (antistatic)	Application	Diameter	Parts No.*	Material	Type
 <p> Ø 12/ 18 mm Typ 75 Material POE </p> <p> Ø 11/ 16 mm Typ 66 Material POE </p> <p> Ø 10/ 15 mm Typ 74 Material POE </p>	Fast color changes	Ø 11/16 mm	105 139	POE	66
	Fast color changes - low powder flow	Ø 10/15 mm	1001 673	POE	74
	Fast color changes - high powder flow	Ø 12/18 mm	1001 674	POE	75

* Please indicate length

Declaration of Conformity

Gema Switzerland GmbH declares as manufacturer that the following Powder spraying equipment of the types:

OptiSelect Pro / Type GM04

Marking: II 2D EEx 2mJ IP64 85°C
 EC type-examination no. PTB 19 ATEX 5001

OptiStar 4.0 / Types CG2X

Marking: II 3(2)D IP54 85°C
 EC type-examination no. PTB 17 ATEX 5002

OptiFlex Pro / Types XX

Marking: II 3D T85°C

is in conformity with the following regulations and standards.



Regulations:

- A) EC Directive 2006/42/EC (Machinery Directive)
- B) EC Directive 2014/34/EU (Explosion Protection Directive)
- C) EC Directive 2014/30/EU (Electromagnetic Compatibility)
- D) EC Directive 2014/35/ EU (Low Voltage)

Harmonized standards applied:

EN ISO 9001:2015 EN ISO/IEC 80079-34:2020 EN ISO 12100:2010 EN 60079-31:2014, EN IEC 60079-0:2018, EN 60079-10-2:2015 EN 60204-1:2018	EN 55011:2016 + A1:2017 EN 61000-3-2:2014, EN 61000-6-1:2007, EN 61000-3-3:2014 EN 16985:2018, EN ISO 13849-1:2016 EN 50050:2006; EN 50050-2:2013; EN 50177:2009 + A1:2012
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Place, date:

St.Gallen, 20.10.2023

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