This product was developed for use with electrically non-conducting powders. The use of electrically conducting powders (like metallic or graphite powders) can cause a permanent decrease of functioning.
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About these instructions

General information

This operating manual contains all important information which you require for the working with the OptiFlow IG06-BN. It will safely guide you through the start-up process and give you references and tips for the optimal use when working with your powder coating system.

Information about the functional mode of the individual system components should be referenced in the respective enclosed documents.

Keeping the Manual

Please keep this Manual ready for later use or if there should be any queries.

Safety symbols (pictograms)

The following warnings with their meanings can be found in the Gema instructions. The general safety precautions must also be followed as well as the regulations in the relevant instructions.

⚠️ DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠️ WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠️ CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

⚠️ ATTENTION

Indicates a potentially harmful situation. If not avoided, the equipment or something in its surrounding may be damaged.
ENVIRONMENT
Indicates a potentially harmful situation which, if not avoided, may have harmful consequences for the environment.

MANDATORY NOTE
Information which must be observed.

NOTICE
Useful information, tips, etc.

Structure of Safety Notes
Every note consists of 4 elements:
- Signal word
- Nature and source of the danger
- Possible consequences of the danger
- Prevention of the danger

⚠️ SIGNAL WORD
Nature and source of the hazard!
Possible consequences of the danger
- Prevention of the danger

Presentation of the contents

Figure references in the text
Figure references are used as cross references in the descriptive text.

Example:
“The high voltage (H) created in the gun cascade is guided through the center electrode.”
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!
Product description

Intended use

The OptiFlow injector is used to convey powders containing Boron Nitride between the powder hopper and the powder gun.

![fig. 1: Powder injector with coded quick release connections](image)

Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of the intended use. This product should only be used, maintained and started up by trained personnel, who are informed about and are familiar with the possible hazards involved.

Any other use is not considered as intended use. The manufacturer is not responsible for any incorrect use and the risks associated with such actions are assumed by the user alone!

Reasonably foreseeable misuse

- Use of metallic, graphite or enamel powder
- Use with insufficient compressed air quality
- Use of moist powder
- Incorrectly assembled individual parts
Typical properties – characteristics of the functions

The OptiFlow Injector is a plug-in type and permits easy handling and quick cleaning. All connections are plug-in types and not interchangeable. The injector can be disassembled without special tools.

The injector is supplied with a PTFE insert sleeve as standard.

Structure

Overall view

1. Check valve unit (supplementary air)
2. Powder hose quick release connection
3. Powder hopper connection
4. Injector housing
5. Check valve unit (conveying air)
**Principle of the injector**

When air flows through a nozzle into a cavity with an attached outlet in the continuation of the airflow, a vacuum will be created in the cavity (see figure below). This effect is used now for aspirating powder through a suction opening – a powder/air mixture will be created.

![Diagram of the injector](image)

**fig. 3**

1. Conveying air
2. Supplementary air
3. Insert sleeve
4. Powder/air mixture
5. Vacuum
6. Suction tube
7. Fluidized powder
8. Powder container
9. Nozzle

This powder/air mixture is fed through to the powder hose to the gun. The concentration of the powder/air mixture and therefore the powder output amount, depends on the conveying and supplementary air volume, the powder quality, the powder hose length, the powder hose diameter, the number of coils in the hose, the height difference between the powder gun and the injector and the nozzle type. Place great importance on the insert sleeve condition, because wear causes the powder output to reduce drastically.

Experience with pneumatic material handling technology shows that pneumatic transport of fine solid matter (powder) in the form of tubing (hose), the transporting medium requires a certain volume of air per unit of time. If a hose diameter of 11 mm is used, the value is approx. 4 m³/h. In order to reduce the powder output, the vacuum in the cavity of the injector must be lowered by reducing the conveying air pressure. By reducing the conveying air pressure, the air volume in the powder hose sinks to below the optimum value of 4 m³/h, the powder transport becomes irregular and the so-called "pumping" takes place. In order to prevent this from happening, supplementary air is added until the total air volume in the powder hose is 4-5 m³/h once more. This takes place fully automatically by the Gema control unit.
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!

Cleaning the injector

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

ATTENTION
Injector parts may be damaged during the cleaning process.
- Remove the check valve units (1 and 6) with the correct sized spanner.
- Clean the component parts with compressed air and, if necessary, dissolve sintered deposits with nitro-thinner.
- Do not use acetone, do not scrape!

6. Reinsert the injector and fix it
Cleaning the check valve units

**ATTENTION**
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
Replacing the insert sleeve

1. 
2. 
3. 
4.
# Fault clearance

## Faults

The following lists possible faults during operation and their clearance.

<table>
<thead>
<tr>
<th>Fault</th>
<th>Cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The gun does not spray powder although the control unit is switched on</td>
<td>Injector nozzle, check valve unit, powder hose or powder gun are clogged</td>
<td>Clean the corresponding parts and if necessary, replace them</td>
</tr>
<tr>
<td>Gun achieving only poor spray profile</td>
<td>Conveying vacuum too low</td>
<td>Increase the powder quantity and/or total air volume on the control unit</td>
</tr>
<tr>
<td></td>
<td>Insert sleeve worn, not or incorrect inserted</td>
<td>Replace or install the insert sleeve. Observe the indexing cam!</td>
</tr>
<tr>
<td>Insert sleeve is worn after a short operating duration</td>
<td></td>
<td>Clean the nozzle, if damaged, replace it</td>
</tr>
</tbody>
</table>
Disposal

Introduction

Requirements on personnel carrying out the work

The disposal of the product is to be carried out by the owner or operator. When disposing of components that are not manufactured by Gema, the instructions in the respective manufacturer’s documentation must be observed.

Disposal regulations

The product must be disassembled and disposed of properly at the end of its service life.

► When disposing of the product, the applicable local and regional laws, directives and environmental regulations must be complied with!

Materials

The materials must be sorted according to material groups and taken to the appropriate collection points.
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!
## OptiFlow IG06-BN – spare parts list

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>OptiFlow IG06-BN Powder injector – complete (pos. 1-13)</td>
<td>1015 810</td>
</tr>
<tr>
<td><strong>A</strong> Conveying air check valve unit (red marking) – complete (incl. pos. 6, 8, 9 and 12)</td>
<td>1005 589</td>
</tr>
<tr>
<td><strong>B</strong> Supplementary air check valve unit (black marking) – complete (incl. pos. 7, 8, 9 and 13)</td>
<td>1005 590</td>
</tr>
<tr>
<td><strong>C</strong> Injector body – complete (incl. pos. 1, 2, 10 and 11)</td>
<td>1015 812</td>
</tr>
<tr>
<td>1 Injector body (without pos. 2)</td>
<td>1006 484</td>
</tr>
<tr>
<td>2 O-ring – Ø 16x2 mm</td>
<td>1007 794#</td>
</tr>
<tr>
<td>3 Insert sleeve – PTFE, complete</td>
<td>1006 485#</td>
</tr>
<tr>
<td>4 Hose connection – Ø 10-12 mm, complete (incl. pos 4.1)</td>
<td>1006 531</td>
</tr>
<tr>
<td>4.1 O-ring – Ø 16x1.5 mm</td>
<td>205 141#</td>
</tr>
<tr>
<td>5 Threaded sleeve</td>
<td>1006 483</td>
</tr>
<tr>
<td>6 Connector (conveying air) – NW 5.5</td>
<td>1004 366</td>
</tr>
<tr>
<td>7 Connector (supplementary air) – NW 5.5</td>
<td>1004 367</td>
</tr>
<tr>
<td>8 O-ring – Ø 11x1.5 mm</td>
<td>1000 532#</td>
</tr>
<tr>
<td>9 Filter element – Ø 9/4x27 mm</td>
<td>1003 698</td>
</tr>
<tr>
<td>10 Nozzle – Ø 2.2 mm</td>
<td>1015 813</td>
</tr>
<tr>
<td>11 Nozzle fixation – complete (incl. pos. 11.1)</td>
<td>1007 792</td>
</tr>
<tr>
<td>11.1 O-ring – Ø 8x1 mm</td>
<td>1007 793#</td>
</tr>
<tr>
<td>12 Body (red)</td>
<td>1004 369</td>
</tr>
<tr>
<td>13 Body (black)</td>
<td>1004 370</td>
</tr>
<tr>
<td>16 Conveying air hose – Ø 8/6 mm (red)</td>
<td>103 500*</td>
</tr>
<tr>
<td>17 Supplementary air hose – Ø 8/6 mm (black)</td>
<td>1008 038*</td>
</tr>
<tr>
<td>18 Quick release coupling for conveying air hose – NW5-Ø 8 mm</td>
<td>261 645</td>
</tr>
<tr>
<td>19 Quick release coupling for supplementary air hose – NW5-Ø 8 mm</td>
<td>261 637</td>
</tr>
<tr>
<td>20 Kink protection</td>
<td>1008 844</td>
</tr>
<tr>
<td>Powder hose – PUR, Ø 12.5/9.5 mm</td>
<td>103 705*#</td>
</tr>
</tbody>
</table>

* Please indicate length

# Wearing part
OptiFlow IG06 – spare parts

fig. 6
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