Operating instructions and spare parts list

FPS14
Fresh powder system
Documentation FPS14 Fresh powder system

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## Color change

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General safety regulations

This chapter sets out the fundamental safety regulations that must be followed by the user and third parties using the FPS14 Fresh powder system.

These safety regulations must be read and understood before the FPS14 Fresh powder system is used.

Safety symbols (pictograms)

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

DANGER!
Danger due to live electricity or moving parts. Possible consequences: Death or serious injury

WARNING!
Improper use of the equipment could damage the machine or cause it to malfunction. Possible consequences: minor injuries or damage to equipment

INFORMATION!
Useful tips and other information

Conformity of use

1. The FPS14 Fresh powder system is built to the latest specification and conforms to the recognized technical safety regulations. It is designed for the normal application of powder coating.

2. Any other use is considered as non-conform. The manufacturer is not responsible for damage resulting from improper use of this equipment; the end-user alone is responsible. If the FPS14 Fresh powder system is to be used for other purposes or other substances outside of our guidelines, then ITW Gema AG should be consulted.

3. Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of the conformity
of use. The FPS14 Fresh powder system should only be used, maintained and started up by trained personnel, who are informed about and are familiar with the possible hazards involved.

4. Start-up (i.e. the execution of a particular operation) is forbidden until it has been established that the FPS14 Fresh powder system has been set up and wired according to the guidelines for machinery (98/37/EG). EN 60204-1 (machine safety) must also be observed.

5. Unauthorized modifications to FPS14 Fresh powder system exempts the manufacturer from any liability from resulting damage.

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

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

<table>
<thead>
<tr>
<th>Explosion protection</th>
<th>Protection type</th>
<th>Temperature class</th>
</tr>
</thead>
<tbody>
<tr>
<td>0102 0102</td>
<td>IP54</td>
<td>T6 (zone 21)</td>
</tr>
<tr>
<td>II 3 D</td>
<td></td>
<td>T4 (zone 22)</td>
</tr>
</tbody>
</table>

Technical safety regulations for stationary electro-static powder spraying equipment

General information

The powder spraying equipment from ITW Gema is designed with safety in mind and is built according to the latest technological specifications. This equipment can be dangerous if it is not used for its specified purpose. Consequently it should be noted, that there exists a danger to life and limb of the user or third party, a danger of damage to the equipment and other machinery belonging to the user and a hazard to the efficient operation of the equipment.

1. The fresh powder system may be switched on and operated only after exact reading of this manual. Improper use of the controlling device can lead to accidents, malfunction or damage to the control itself.

2. Before every start-up, check the equipment for operational safety (regular servicing is essential)!

3. Safety regulations BGI 764 and VDE regulations DIN VDE 0147, Part 1, must be observed for safe operation.

4. Safety precautions specified by local legislation must be observed!

5. Before opening the devices for repair, they must be disconnected from the mains!

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

7. The connecting cables between the control unit and the spray gun must be laid out in such a way that they cannot be damaged.
during operation. Safety precautions specified by local legislation must be observed!

8. Only original ITW-Gema spare parts should be used, because the explosion protection will also be preserved that way. Damage caused by other parts is not covered by guarantee.

9. If ITW Gema powder spraying equipment is used in conjunction with machinery from other manufacturers, then their safety regulations must also be taken into account.

10. Before starting work, familiarize yourself with all installations and operating elements, as well as with their functions! Familiarization during operation is too late!

11. Caution must be exercised when working with a powder/air mixture! A powder/air mixture in the right concentration is flammable! Do not smoke during powder coating!

12. 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!

**WARNING:**
We advert that the customer himself is responsible for the safe operation of equipment. ITW-Gema AG is in no way responsible for any resulting damages!

**Safety conscious working**

Each person responsible for the assembly, start-up, operation, service and repair of powder spraying equipment must have read and understood the operating instructions and the “Safety regulations” chapter. The operator must ensure that the user has had the appropriate training for powder spraying equipment and is aware of the possible sources of danger.

The control devices for the spray guns must only be set up and used in zone 22. Only the spray gun should be used in zone 21.

GEMA electrostatic spraying equipment should only be operated by trained and authorized operating personnel. This applies to modifications to the electrical equipment, which should only be carried out by a specialist.

The shut-down procedures given in the operating instructions on all work concerning assembly, start-up, setting up, operation, modification of operating conditions and operating methods, maintenance, inspection and repair are to be observed as necessary.

The powder spray equipment can be turned off by using the main switch or failing that, the emergency shut-down. Individual components can be turned off during operation by using the appropriate switches.

**Individual safety regulations for the operating firm and/or operating personnel**

1. Any operating method, which will negatively influence the technical safety of GEMA electrostatic spraying equipment, is to be avoided.
2. The operator has to ensure that no non-authorized persons work on the powder spraying equipment (e.g. this also includes using the equipment for non-conform work).

3. The operator is under obligation to check the powder spraying equipment at least once every shift for signs of external damage, defects or changes (including the operating characteristics) which could influence safety and to report them immediately.

4. The operator is obliged to check that the powder spraying equipment is only operated when in satisfactory condition.

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

6. The operating firm must guarantee cleanliness and an overview of the workplace with suitable instructions and checks in and around the powder spraying equipment.

7. No safety devices should be dismantled or put out of operation. If the dismantling of a safety device for set-up, repair or servicing is necessary, reassembly of the safety devices must take place immediately after the maintenance or repair work is finished. All maintenance activities must be executed when the powder spraying mechanism is switched off. The operator must train and commit the responsible personnel to this.

8. Activities such as checking powder fluidization or checking the high-voltage spray gun etc. must be carried out when the powder spraying equipment is switched on.

Notes on special types of hazard

**Power/tension**

It is necessary to refer once more to the danger of life from high voltage current if the shutdown procedures are not observed. High voltage equipment must not be opened - the plug must first be taken out - otherwise there is danger of electric shock.

**Powder**

Powder/air mixtures can be ignited by sparks. There must be sufficient ventilation in the powder coating booth. Powder lying on the floor around the powder spraying device is a potentially dangerous source of slipping.

**Electrostatic charging**

Static charges can have the following consequences: Charges to people, electric shocks, sparking. Charging of objects must be avoided - see "Grounding".

**Grounding**

All electricity conducting parts and machinery found in the workplace (according to DIN VDE 0745, part 102) 1.5 meters either side and 2.5 meters around each booth opening, have to be grounded. The grounding resistance must amount to 1 MOhm. The resistance must be tested regularly. The condition of the work piece attachments as well as the hangers must guarantee that the work pieces remain grounded. If the grounding of the work pieces takes place by their attachments, these must constantly be kept clean in order to guarantee the necessary conductivity.
The appropriate measuring devices must be kept ready in the workplace in order to check the earthing.

**Compressed air**

When there are longer pauses or standstill times between working, the powder spraying equipment should be drained of compressed air. There is a danger of injury when pneumatic hoses are damaged and from the uncontrolled release and improper use of compressed air.

**Crushing and cutting**

During operation, moving parts may automatically start to move in the operating area. It must be ensured that only instructed and trained personnel go near these parts. The operator should ensure that barriers comply with the local security regulations.

**Access under exceptional circumstances**

The user enterprise has to ensure due to the local conditions, that when repairs at the electrical part or restarting operation activities are done, additional measures such as providing with gates against the admission of unauthorized persons are absolutely executed.

**Prohibition of unauthorized conversions and modifications to machines**

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

The powder spraying equipment should not be used if damaged, and the faulty part must be immediately replaced or repaired. Only original ITW-Gema replacement parts should be used. Damage caused by other parts is not covered by guarantee.

Repairs must only be carried out by specialists or in ITW-Gema workshops. Unauthorized conversions and modifications may lead to injury or damage to machinery. The ITW Gema AG guarantee would no longer be valid.

**Safety requirements for electrostatic powder coating**

1. This equipment can be dangerous, if the instructions in this operating manual are not followed.
2. All electrostatic conductive parts within 5 meters of the coating area and in particular the work pieces, must be grounded.
3. The floor in the coating area must be electrically conductive (normal concrete generally is conductive).
4. The operating personnel must wear electrically conductive footwear (e.g. leather soles).
5. The operating personnel should hold the gun in the bare hand. If gloves are worn, they must be electrically conductive.
6. The supplied grounding cable (green/yellow) must be connected to the grounding screw of the manual electrostatic powder spraying equipment. The grounding cable must have a good metal to metal connection with the coating booth, the recovery unit and
the work piece conveyor system, especially with the work piece suspension.

7. The electricity and powder supply to the hand guns must be set up in such a way that they are fully protected against heat and chemical damage.

8. The powder coating equipment may be able to be switched on only if the booth is in operation. If the booth stops, the powder coating device must switch off too.

9. The grounding of all electricity conducting devices (e.g. hooks, conveyor chains) must be checked weekly. The grounding resistance must amount to 1 MΩ.

10. The control unit must be switched off, if the hand gun is cleaned or the nozzle is changed.

11. When working with cleaning agents there may be a risk of hazardous fumes. The manufacturers instructions must be observed when using such cleaning agents.

12. The manufacturers instructions and the applicable environmental requirements must be observed when disposing of powder lacquer and cleaning agents.

13. If any part of the spray gun is damaged (broken parts, tears) or missing then it should not be used.

14. 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 ITW-Gema replacement parts should be used.

15. Repairs must only be carried out by specialists and under no circumstances should they be carried out in the ignition endangered area. The ignition protection must not be compromised.

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

A summary of rules and regulations

Observe the following list of relevant rules and regulations:

**Guidelines and regulations, German professional association**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGV A1</td>
<td>General regulations</td>
</tr>
<tr>
<td>BGV A2</td>
<td>Electrical equipment and material</td>
</tr>
<tr>
<td>BGI 764</td>
<td>Electrostatic coating</td>
</tr>
<tr>
<td>BGR 132</td>
<td>Guidelines for the avoidance of the dangers of ignition due to electrostatic charging (Guideline “Static Electricity”)</td>
</tr>
<tr>
<td>VDMA 24371</td>
<td>Guidelines for electrostatic coating with synthetic powder</td>
</tr>
<tr>
<td></td>
<td>- Part 1 General requirements</td>
</tr>
<tr>
<td></td>
<td>- Part 2 Examples of use</td>
</tr>
</tbody>
</table>
**Leaflets**

<table>
<thead>
<tr>
<th>Leaflet</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZH 1/310</td>
<td>Leaflet for the use of tools in locations where there is danger of explosion ¹</td>
</tr>
</tbody>
</table>

**EN European standards**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RL94/9/EG</td>
<td>The approximation of the laws of the Member States relating to apparatus and safety systems for their intended use in potentially explosive atmospheres</td>
</tr>
<tr>
<td>EN 292-1</td>
<td>Machine safety ²</td>
</tr>
<tr>
<td>EN 292-2</td>
<td></td>
</tr>
<tr>
<td>EN 50 014 to EN 50 020, identical: DIN VDE 0170/0171</td>
<td>Electrical equipment for locations where there is danger of explosion ³</td>
</tr>
<tr>
<td>EN 50,050</td>
<td>Electrical apparatus for potentially explosive atmospheres - Electrostatic hand-held spraying equipment ³</td>
</tr>
<tr>
<td>EN 50 053 part 2</td>
<td>Requirements for the selection, installation and use of electrostatic spraying equipment for flammable materials - Manual electrostatic powder spray guns ²</td>
</tr>
<tr>
<td>EN 50 177</td>
<td>Stationary electrostatic spraying equipment for flammable coating powder ²</td>
</tr>
<tr>
<td>PR EN 12981</td>
<td>Coating plants - Spray booths for application of organic powder coating material - Safety requirements</td>
</tr>
<tr>
<td>EN 60529, identical: DIN 40050</td>
<td>IP protection types; contact, foreign bodies and water protection for electrical equipment ²</td>
</tr>
<tr>
<td>EN 60 204 identical: DIN VDE 0113</td>
<td>VDE regulations for the setting up of high-voltage electrical machine tools and processing machines with nominal voltages up to 1000 V ³</td>
</tr>
</tbody>
</table>

**VDE (Association of German Engineers) Regulations**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN VDE 0100</td>
<td>Regulations for setting-up high voltage equipment with nominal voltages up to 1000 V ⁴</td>
</tr>
<tr>
<td>DIN VDE 0105 part 1</td>
<td>VDE regulations for the operation of high voltage equipment ⁴</td>
</tr>
<tr>
<td>part 4</td>
<td>General regulations</td>
</tr>
<tr>
<td></td>
<td>Supplementary definitions for stationary electrical spraying equipment</td>
</tr>
<tr>
<td>DIN VDE 0147 part 1</td>
<td>Setting up stationary electrostatic spraying equipment ⁴</td>
</tr>
<tr>
<td>DIN VDE 0165</td>
<td>Setting up electrical equipment in locations in areas with danger of explosion ⁴</td>
</tr>
</tbody>
</table>

*Sources:

¹ Carl Heymanns Verlag KG, Luxemburger Strasse 449, 50667 Köln 41, or from the appropriate employers association

² Beuth Verlag GmbH, Burggrafenstrasse 4, 10115 Berlin 30

³ General secretariat, Rue Bréderode 2, B-1000 Brussels, or the appropriate national committee

⁴ VDE Verlag GmbH, Bismarckstrasse 33, 10115 Berlin 12
Special security measures

- The installation work, to be done by the customer, must be carried out according to local regulations

- Before starting up the plant, check if no foreign objects are in the booth or in the ducting (input and exhaust air)

- It must be observed, that all components of the plant are grounded according to the local regulations
About this manual

General information

These operating manual contains all important information which you require for operating the FPS14 Fresh powder system. It will safely guide you through the start-up process and give you references and tips for the optimal use of your new powder coating system.

Information about the function mode of the individual system components - booth, powder gun control unit, manual gun or powder injector - you will find in the corresponding enclosed documentations.
Function description

Field of application

The FPS14-1/2 Fresh powder system is a powder feeding system and serves for the promotion of the coating powder from the powder box to the powder container/powder center.

Note:
The operation of the FPS14 Fresh powder system must take place in the areas defined for it!

FPS14 Fresh powder system

FPS14-1 Fresh powder system

The FPS14-1 Fresh powder system is equipped with a powder pump and a fluidizing/suction unit.
FPS14-2 Fresh powder system

The FPS14-2 Fresh powder system is equipped with two powder pumps, two fluidizing/suction units and the corresponding pneumatical extensions.

Function

The powder box is placed on the vibration table of the FPS14-1/2 Fresh powder system. The coating powder is sucked in by the FPP01 powder pump (pinch valve with elastomer check valves, see corresponding manual) through the fluidizing/suction unit. Then, the powder is fed through the powder hose, which is fastened on the upper pump connector.

The pumps can be controlled by two separated valves or by pneumatic interconnecting to a valve. The valve is attached in the swivel arm of the trolley.

Fluidizing the coating powder

The fluidization of the coating powder with fluidizing air improves the conveying characteristics of the powder. For this purpose, the fluidizing air is fed into the external tube of the fluidizing/suction unit and exits by three fluidizing pads at the lower end of the tube. The area around the suction tube is thereby fluidized, the powder obtains fluid-like characteristics and is sucked in.

The table vibration causes an even sinking of the powder level and prevents depositing of residual powder in the corners of the powder box. That way, the powder can be used entirely (optimum powder utilization).
**Mechanical construction**

---

1. Trolley with vibration bed
2. Mobile frame with hand bow
3. Shelf
4. Fluidizing/suction unit
10. Fresh powder pump (see FPP01 operating manual)
11. Pneumatic line for fluidizing air
13. Pneum. Y-piece (for a second powder pump)
14. Screw-in nipple (for a second powder pump)
31. Pneumatic line for powder pump
32. Connecting cable control unit-solenoid valve
33. Control unit (see FPC03 operating manual)

**Note:**
For further information and connections of the FPC03 controller, see the corresponding operating manual!
**FPS14-1 scope of delivery (standard)**

- A FPC03 control unit (33) in a metal case with power supply cable
- A mobile trolley (2) with a shelf (3) and a gun/hose support
- A vibration table (1) with a fluidizing/suction unit (4)
- A pilot valve for the pump control unit, installed in the swivel arm
- A plug-in FPP01 Fresh powder pump (10), incl. wearing parts set and two elastomer check valves
- Pneumatic hoses (11, 31) for conveying air (red) and fluidizing air (black)
- Special cable jack for the connection of an external control signal
- A powder hose, 3 m, ID 12 mm (ITW Gema 1009 type)
- A powder hose for the extension of the conveying distance, 5 m, ID 12 mm (ITW Gema 1009 type)
- Adaptor for the additional conveying air supply (for conveying distances between 3 and 8 meters)

**FPS14-2 auxiliary supply (standard)**

- A second fluidizing/suction unit (4) with plug-in FPP01 Fresh powder pump, a holding device, a pneumatic extension kit and the corresponding screw joints
## Technical Data

### FPS14 Fresh powder system

#### Electrical data

<table>
<thead>
<tr>
<th>FPS14 Fresh powder system</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal input voltage</td>
<td>230-240 VAC (110-120 VAC)</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Power</td>
<td>120 VA</td>
</tr>
<tr>
<td>Protection type</td>
<td>IP54</td>
</tr>
<tr>
<td>Temperature range</td>
<td>+10°C - +40°C (50°F - 104°F)</td>
</tr>
<tr>
<td>Control unit</td>
<td>FPC03 type</td>
</tr>
</tbody>
</table>

#### Pneumatic data

<table>
<thead>
<tr>
<th>FPS14 Fresh powder system</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressed air connection</td>
<td>G1/4&quot; - internal thread</td>
</tr>
<tr>
<td>Max. input pressure</td>
<td>10 bar / 145 psi</td>
</tr>
<tr>
<td>Min. input pressure</td>
<td>5 bar / 73 psi</td>
</tr>
<tr>
<td>Max. compressed air requiremen (powder hose Ø 12.5 mm)</td>
<td></td>
</tr>
<tr>
<td>FPS14-1</td>
<td>3.5 Nm³/h / 2.1 SCFM</td>
</tr>
<tr>
<td>FPS14-2</td>
<td>7 Nm³/h / 4.1 SCFM</td>
</tr>
<tr>
<td>Max. water vapor content of the compressed air</td>
<td>1.3 g/m³</td>
</tr>
<tr>
<td>Max. oil vapor content of the compressed air</td>
<td>0.1 mg/m³</td>
</tr>
</tbody>
</table>

#### Conveying performance

<table>
<thead>
<tr>
<th>FPS14 Fresh powder system</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Powder hose length until 3 m</td>
<td>1200 g/min per pump*</td>
</tr>
<tr>
<td>Powder hose length 3 m until 8 m (with additional conveying air supply)</td>
<td>1000 g/min per pump*</td>
</tr>
<tr>
<td>Fresh powder pump type</td>
<td>FPP01</td>
</tr>
</tbody>
</table>

* The indicated values are approximate values, possible deviations depend on the powder type!
## Dimensions

<table>
<thead>
<tr>
<th>FPS14 Fresh powder system</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>608 mm / 23.94 inches</td>
</tr>
<tr>
<td>Depth</td>
<td>846 mm / 33.31 inches</td>
</tr>
<tr>
<td>Height</td>
<td>1195 mm / 47.05 inches</td>
</tr>
<tr>
<td>Weight:</td>
<td></td>
</tr>
<tr>
<td>FPS14-1</td>
<td>41 kg / 90.39 pounds</td>
</tr>
<tr>
<td>FPS14-2</td>
<td>43 kg / 94.80 pounds</td>
</tr>
<tr>
<td>Max. powder box size (L x W x H)</td>
<td>500 x 485 x 390 mm</td>
</tr>
<tr>
<td></td>
<td>19.68 x 19.09 x 15.35 inches</td>
</tr>
</tbody>
</table>
Start-up

FPS14-1 assembly instructions

The FPS14-1 Fresh powder system is assembled in accordance with the following instructions:

1. 
2. 
3. 
4. 
5. 
6.
The FPS14-2 Fresh powder system is assembled in accordance with the following instructions:

Follow the steps of the FPS14-1 assembly instructions from picture 1 to picture 10 and afterwards consider the following instructions:

1.
2.
3.
4.
5.
6.
7.
8.
9. Pump connection
10. Fluidizing air connection
11. 
12. 
13. 
14. 
15. 
16. 
17. Pump connection
Fluidizing air connection
FPC03 control unit connections

The FPC03 Fresh powder control unit executes the control functions for the fresh powder pump, the vibration und the powder fluidizing during the operation. The control unit also allows the signal interchange with an external level sensor control unit.

Only a few cables and hoses must be connected on the rear side of the FPC03 control unit.

1. Connect the compressed air supply hose from the compressed air circuit directly to the 1.1 IN main connection on the rear side of the control unit - G 1/4" connecting thread
2. Secure the grounding of the device, if necessary, use the grounding screw on the rear side of the control unit
3. Insert the powder pump and connect the powder hose
4. Connect the red conveying air hose to the corresponding 1.2 OUT output on the rear side of the control unit and to the control valve
5. Connect the mains cable to the mains connection socket 2.1

Note:
The compressed air must be free from oil and water!

FPC03 control unit - back side

Note:
For further information and specifications of the FPC03 control unit, see the corresponding operating manual!
Preparing the powder container

1. Swivel the fluidizing/suction unit to the side
2. Place the open powder container on the vibration table
3. Place the fluidizing/suction unit onto the powder
4. Start up the plant

Powder fluidizing

The fluidization of the coating powder with fluidizing air improves the conveying characteristics of the powder. The fluidizing and vibration characteristics of the powder are dependent on the powder type, the air humidity and the ambient temperature.

The fluidizing and the vibration start by switching on the powder feed (see also "Functional check")

Functional check

1. Press the main switch on the FPC03 control unit. The yellow control lamp illuminates in the switch
2. Activate the powder transport (by the device or an external, superordinated control unit)
3. Fluidizing and vibration must be in operation
4. The fluidizing/suction unit digs itself into the powder and the powder pump conveys powder to the powder hose

For further information of the functional check, see the corresponding operating manual of the FPP01 powder pump and the FPC03 control unit!

Powder hose rinsing

In order to prevent hose clogging, the powder hose must be cleaned by powder residues, if a longer standstill takes place. Proceed as follows:

1. Remove the powder hose from the hose connection on the powder pump
2. Blow off the hose manually with a compressed air gun and clean all powder residues
3. Reattach the powder hose to the hose connection of the powder pump
Powder flow booster

The FPS14-1 and FPS14-2 Fresh powder systems are supplied with a 3 meters long powder hose as standard. By using this powder hose length, no additional conveying air is needed.

If the conveying distance of coating powder from the container to the powder center is however longer than 3 meters, after 3 meters a powder flow booster is inserted into the powder hose.

In addition, a 5 meters long powder hose is connected. This makes possible a powder conveying distance up to 8 meters.

The powder flow booster is inserted according to the following steps:

1. Remove the plug cap

![Image of step 1](image1.png)

2. Plug in the pneumatic hose for the powder flow booster in the corresponding air connection

![Image of step 2](image2.png)

3. Install the powder flow booster in the powder hose (the installation direction is free selectable)

![Image of step 3](image3.png)

4. Plug in the pneumatic hose in the powder flow booster and fix it to the powder hose with cable fixations

![Image of step 4](image4.png)
Color change

General procedure

The color change is executed in accordance with the following instructions:

- Clean the fluidizing/suction unit thoroughly (see "Cleaning the fluidizing/suction unit")
- Blow through the powder hose with compressed air. The powder hose is cleaned by taking a foam cube from the packing material and blowing it through the hose with compressed air. Therefore, it is recommended to use the special air gun (order no. 346 055). The foam cubes can be ordered in sheets of 100 pieces (order no. 241 717)
- Clean the FPP01 Fresh powder pump (see the corresponding operating manual)
- Prepare the FPS14-1/2 Fresh powder system with the new powder for start-up (see chapter "Start-up" and "Preparing the powder container")
Maintenance

Note:
A regular and conscientious maintenance increases the operating life of the unit and ensures a longer constant conveying quality!

Daily maintenance
- Empty the powder hose by removing the fluidizing/suction unit from the powder container when the conveying is activated

Weekly maintenance
- Visual check of the elastomer valves in the FPP01 Fresh powder pump for possible damages (see also the FPP01 Fresh powder pump operating manual)

Longer standstill of the fresh powder system
- Interrupt the power supply/remove the mains plug
- Clean the FPS14-1/14-2 Fresh powder system thoroughly (see "Daily maintenance")
- Turn off the compressed air main supply

Cleaning the fluidizing/suction unit
- Remove the FPP01 Fresh powder pump from the fluidizing/suction unit
- Remove the fluidizing/suction unit
- Clean the fluidizing/suction unit with compressed air. Blow off the suction tube also with compressed air
- Visual check of the fluidizing/suction unit for possible damages
- Clean the fresh powder pump (see the FPP01 Fresh powder pump operating manual)
- Reassemble the individual parts and reinstall the fresh powder pump
## Troubleshooting

### Problem fixing

<table>
<thead>
<tr>
<th>Problem / fault / malfunction</th>
<th>Cause</th>
<th>Procedures / remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains lamp does not illuminate after switching on</td>
<td>Mains cable not connected</td>
<td>Connect the mains cable</td>
</tr>
<tr>
<td></td>
<td>Power pack defective</td>
<td>Replace the power pack</td>
</tr>
<tr>
<td></td>
<td>Vibration motor malfunction has released the fuse in the control unit</td>
<td>Replace the vibration motor and the fuse</td>
</tr>
<tr>
<td>Vibration not running</td>
<td>Vibration motor not connected</td>
<td>Connect the cable</td>
</tr>
<tr>
<td></td>
<td>Vibration motor defective</td>
<td>Replace the vibration motor</td>
</tr>
<tr>
<td>Fluidizing not running</td>
<td>Compressed air not present</td>
<td>Assure the compressed air supply</td>
</tr>
<tr>
<td>Pump does not convey</td>
<td>Pinch-solenoid valve defective</td>
<td>Change valve coil or solenoid valve</td>
</tr>
<tr>
<td></td>
<td>Fluidizing air not connected</td>
<td>Connect the fluidizing air</td>
</tr>
<tr>
<td></td>
<td>Powder hose clogged</td>
<td>Clean the powder hose</td>
</tr>
<tr>
<td></td>
<td>Powder not present</td>
<td>Replace the powder box</td>
</tr>
<tr>
<td>Pump conveys too little</td>
<td>Rubber-pinch-hose defective or worn</td>
<td>Replace pinch-hose / send in the pump for repair</td>
</tr>
<tr>
<td></td>
<td>Elastomer valves worn</td>
<td>Replace the elastomer valves</td>
</tr>
<tr>
<td></td>
<td>Exhauster clogged</td>
<td>Clean and grease the exhauster valve</td>
</tr>
<tr>
<td></td>
<td>Powder level too deep, aspirated air rate too high</td>
<td>Change the powder box</td>
</tr>
<tr>
<td>Level control with level sensor (order no. 373 575) not running</td>
<td>Level control defective</td>
<td>Send in the level control for repair</td>
</tr>
<tr>
<td></td>
<td>Level sensor defective</td>
<td>Send in the level sensor for repair</td>
</tr>
</tbody>
</table>
Remarks to problem fixing

- If a short-circuit takes place in internal or external solenoid valves, the fuse in the FPC03 control unit is released!
Schematic diagrams

Pneumatical diagram

FPS14 Fresh powder system - pneumatical diagram
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** FPS14 Fresh powder system  
  **Serial no.** 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 yard/meter product is always marked with an *.  
The wear 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)

**WARNING:**  
Only original ITW-Gema spare parts should be used, because the explosion protection will also be preserved that way. The use of spare parts from other manufacturers will invalidate the ITW Gema guarantee conditions!
## FPS14 Fresh powder system - spare parts list

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Part Number</th>
<th>Unit Cost</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Trolley - complete (see corresponding spare parts list)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Mobile frame with hand bow - complete (see corresponding spare parts list)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Shelf - complete (see corresponding spare parts list)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Fluidizing/suction unit - complete (see corresponding spare parts list)</td>
<td>362 425</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Double arm</td>
<td>375 691</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Retaining bracket</td>
<td>390 445</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Guide sleeve</td>
<td>375 675</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Cable sleeve - ID 4 mm</td>
<td>265 276</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Locknut - M50x1.5 mm</td>
<td>260 657</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>FPP01 Fresh powder pump (see corresponding operating manual)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Pneumatic line for fluidizing air</td>
<td>378 763</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Pneum. Y-piece - 1/8&quot;a-1/8&quot;i-1/8&quot;l</td>
<td>263 087</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Screw-in nipple - 1/8&quot;a-Ø 8 mm</td>
<td>261 653</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Pneumatic line for powder pump</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Connecting cable control unit-solenoid valve</td>
<td>1000 686</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>FPC03 Fresh powder control (see corresponding operating manual)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Please indicate length

# Wearing part
FPS14 Fresh powder system - spare parts list
# FPS14 Fresh powder system - trolley

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Clamp element 30-1-1 - complete</td>
<td>376 183</td>
</tr>
<tr>
<td>4</td>
<td>Spacing ring</td>
<td>375 624</td>
</tr>
<tr>
<td>6</td>
<td>Fixing bow</td>
<td>375 586</td>
</tr>
<tr>
<td>7</td>
<td>Vibrator - OMB 100-110 V, 50/60 Hz</td>
<td>389 374</td>
</tr>
<tr>
<td></td>
<td>Vibrator - OMB 110-120 V, 60 Hz</td>
<td>389 382</td>
</tr>
<tr>
<td></td>
<td>Vibrator - OMB 220-240 V, 50 Hz</td>
<td>389 366</td>
</tr>
<tr>
<td>20</td>
<td>Rubber wheel - Ø 200 mm</td>
<td>260 592</td>
</tr>
<tr>
<td>21</td>
<td>Swivel wheel - Ø 50 mm</td>
<td>260 606</td>
</tr>
<tr>
<td>23</td>
<td>Rubber damper - Ø 20x25 mm, M6/2a, 43sh</td>
<td>246 000</td>
</tr>
<tr>
<td>24</td>
<td>Coupling socket - 4 poles (with pins)</td>
<td>206 466</td>
</tr>
<tr>
<td>25</td>
<td>Cable sleeve - 0.75 mm², blue</td>
<td>204 706</td>
</tr>
<tr>
<td>26</td>
<td>Pipe clip - Ø 27.8-31.2 mm</td>
<td>246 972</td>
</tr>
<tr>
<td>27</td>
<td>Clic-slider - M6</td>
<td>246 980</td>
</tr>
<tr>
<td>35</td>
<td>Snap ring - A-25</td>
<td>237 094</td>
</tr>
<tr>
<td>36</td>
<td>Cylinder screw - hexagon socket M10x20 mm</td>
<td>260 584</td>
</tr>
<tr>
<td>37</td>
<td>Cylinder screw - hexagon socket M8x16 mm</td>
<td>261 793</td>
</tr>
<tr>
<td>38</td>
<td>Cylinder screw - hexagon socket M6x25 mm</td>
<td>261 807</td>
</tr>
<tr>
<td>40</td>
<td>Cap screw - M6x12 mm</td>
<td>238 163</td>
</tr>
<tr>
<td>41</td>
<td>Hexagon ratchet nut - M8</td>
<td>244 449</td>
</tr>
<tr>
<td>42</td>
<td>Hexagon ratchet nut - M6</td>
<td>244 430</td>
</tr>
</tbody>
</table>

![Diagram of FPS14 Fresh powder system - trolley]
### FPS14 Fresh powder system - fluidizing/suction unit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part No</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Bottom piece</td>
<td>385 220</td>
</tr>
<tr>
<td>5</td>
<td>Fluidizing pad</td>
<td>237 264</td>
</tr>
<tr>
<td>6</td>
<td>Bezel - 0,3 mm</td>
<td>338 303</td>
</tr>
<tr>
<td>10</td>
<td>Adapter nipple - 1/8&quot;i-1/8&quot;a</td>
<td>200 930</td>
</tr>
<tr>
<td>11</td>
<td>Elbow - 1/8&quot;a-1/8&quot;a</td>
<td>235 733</td>
</tr>
<tr>
<td>12</td>
<td>Plug - NW5, 1/8&quot;i</td>
<td>200 859</td>
</tr>
</tbody>
</table>

Attention:
The bezel must absolutely be inserted and the installation position considered!
## FPS14 Fresh powder system - shelf

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shelf</td>
<td>375 616</td>
</tr>
<tr>
<td>2</td>
<td>Gun-/hose support</td>
<td>375 705</td>
</tr>
<tr>
<td>5</td>
<td>Plastic clamp - PKS21</td>
<td>260 630</td>
</tr>
<tr>
<td>6</td>
<td>Grounding spring - 0,6x4,4/7,4x25 mm</td>
<td>260 924</td>
</tr>
<tr>
<td>10</td>
<td>Hexagon ratchet nut - M6, galv.</td>
<td>244 430</td>
</tr>
</tbody>
</table>

![Diagram of FPS14 Fresh powder system - shelf]
## FPS14 Fresh powder system - frame with hand bow

<table>
<thead>
<tr>
<th></th>
<th>Item Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hand bow</td>
<td>375 640</td>
</tr>
<tr>
<td>2</td>
<td>Swivel ring</td>
<td>375 659</td>
</tr>
<tr>
<td>3</td>
<td>Swivel arm</td>
<td>375 667</td>
</tr>
<tr>
<td>4</td>
<td>Guide sleeve</td>
<td>375 675</td>
</tr>
<tr>
<td>5</td>
<td>Connecting cable control unit-solenoid valve</td>
<td>1000 686</td>
</tr>
<tr>
<td>6</td>
<td>T-piece connection</td>
<td>258 040</td>
</tr>
<tr>
<td>7</td>
<td>Vibrator cable</td>
<td>375 225</td>
</tr>
<tr>
<td>8</td>
<td>Special tube end sleeve</td>
<td>380 148</td>
</tr>
<tr>
<td>9</td>
<td>Retaining bracket</td>
<td>390 445</td>
</tr>
<tr>
<td>10</td>
<td>Screw-in nipple</td>
<td>245 933</td>
</tr>
<tr>
<td>11</td>
<td>Coupling socket - 4 poles (female jack)</td>
<td>206 482</td>
</tr>
<tr>
<td>12</td>
<td>Solenoid valve</td>
<td>269 123</td>
</tr>
<tr>
<td>13</td>
<td>Cable sleeve - ID 8 mm</td>
<td>260 622</td>
</tr>
<tr>
<td>14</td>
<td>Locknut - M50x1,5 mm</td>
<td>260 657</td>
</tr>
<tr>
<td>15</td>
<td>Silencer</td>
<td>268 933</td>
</tr>
<tr>
<td>20</td>
<td>Grub screw - Si Kk M8x10 mm, plastic</td>
<td>220 337</td>
</tr>
</tbody>
</table>