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Operating instructions and spare parts list

Classic Standard
Classic Open / Classic L-10
Powder coating booth

Translation of the original operating instructions

Documentation Classic Standard powder coating booth

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Table of contents

General safety regulations

This chapter sets out the fundamental safety regulations that must be followed by the user and third parties using the Classic Standard powder coating booth.

These safety regulations must be read and understood before the Classic Standard powder coating booth 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 Classic Standard powder coating booth 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 Classic Standard powder coating booth 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 conformity of use. The Classic Standard powder coating booth 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 Classic Standard powder coating booth 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 Classic Standard powder coating booth 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.

Technical safety regulations for stationary electrostatic 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 powder spraying equipment should only be started up and used once the operating instructions have been carefully studied. 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. The plug must be disconnected before the machine is opened for repair.
6. The plug and socket connection between the powder spraying equipment and the mains network should only be taken out when the power is switched off.

7. The connecting cable between the controlling device and the spray gun must be set up so that it 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! Smoking is forbidden in the entire plant area!
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 emphasize that the customer himself is responsible for the safe operation of equipment. ITW-Gema 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.

The powder spraying equipment should only be used by trained and authorized personnel. This applies to modifications to the electrical equipment, which should only be carried out by a specialist.

The operating instructions and the necessary closing down procedures must be followed before any work is carried out concerning the set-up, start-up, operation, modification, operating conditions, mode of operation, servicing, inspection or repairs.

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 the powder spraying equipment is to be avoided.

2. The operator should care about no non-authorized personnel works on the powder spraying equipment (e.g. this also includes using the equipment for non-conform work).
3. For dangerous materials, the employer has to provide an operating instructions manual for specifying the dangers arising for humans and environment by handling dangerous materials, as well as the necessary preventive measures and behavior rules. The operating instructions manual has to be written in an understandable form and in the language of the persons employed, and has to be announced in a suitable place in the working area.
4. 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.
5. The operator is obliged to check that the powder spraying equipment is only operated when in satisfactory condition.
6. As far as it is necessary, the operating firm must ensure that the operating personnel wear protective clothing (e.g. facemasks).
7. The operating firm must guarantee cleanliness and an overview of the workplace with suitable instructions and checks in and around the powder spraying equipment.
8. 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. The powder spraying device must be turned off while servicing is carried out. The operator must train and commit the responsible personnel to this.
9. Activities such as checking powder fluidization or checking the high-voltage spray gun etc. must be carried out with the powder spraying equipment switched on.

Notes on special types of hazard

Power

It is necessary to refer once more to the danger of life from high-voltage current if the shut-down 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.

Static charges

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

Grounding/Earthing

All electricity conducting parts and machinery found in the workplace (according to DIN VDE 0745, part 102) must be earthed 1.5 meters either

side and 2.5 meters around each booth opening. The earthing resistance must amount to maximally 1 MOhm. The resistance must be tested on a regular basis. The condition of the machinery surroundings as well as the suspension gear must ensure that the machinery remains earthed. If the earthing of the machinery includes the suspension arrangements, then 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 stand-still 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 operating firm must ensure that local conditions are met when repairs are made to the electronic parts or when the equipment is restarted so that there are additional measures such as barriers to prevent unauthorized access.

Prohibition of unauthorized conversions and modifications to machines

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

The powder spraying equipment should not be used if damaged, 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 is dangerous if the instructions in this operating manual are not followed.
2. All electrostatic conductive parts, in particular the machinery within 5 meters of the coating equipment, must be earthed.
3. The floor of the coating area must conduct electricity (normal concrete is generally conductive).
4. The operating personnel must wear electricity conducting footwear (e.g. leather soles).
5. The operating personnel should hold the gun with bare hands. If gloves are worn, these must also conduct electricity.

6. The supplied earthing cable (green/yellow) must be connected to the earthing screw of the electrostatic powder spraying hand appliance. The earthing cable must have a good metallic connection with the coating booth, the recovery unit and the conveyor chain and with the suspension arrangement of the objects.
7. The electricity and powder supply to the hand guns must be set up so that they are fully protected against heat and chemical damage.
8. The powder coating device may only be switched on once the booth has been started up. If the booth cuts out then the powder coating device must be switched off.
9. The earthing of all electricity conducting devices (e.g. hooks, conveyor chains) must be checked on a weekly basis. The earthing resistance must amount to maximally 1 MOhm.
10. The control device 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 operating area. The former protection must not be reduced.
16. 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) (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 the rules and regulations

The following is a list of relevant rules and regulations which are to be observed:

Guidelines and regulations, German professional association

BGV A1	General regulations
BGV A2	Electrical equipment and material
BGI 764	Electrostatic coating
BGR 132	Guidelines for the avoidance of the dangers of ignition due to electrostatic charging (Guideline “Static Electricity”)

VDMA 24371	Guidelines for electrostatic coating with synthetic powder[1)] - Part 1 General requirements - Part 2 Examples of use

Leaflets

ZH 1/310	Leaflet for the use of tools in locations where there is danger of explosion [1)]

EN European standards

RL94/9/EC	The approximation of the laws of the Member States relating to apparatus and safety systems for their intended use in potentially explosive atmospheres
EN 292-1 EN 292-2	Machine safety [2)]
EN 50 014 to EN 50 020, identical: DIN VDE 0170/0171	Electrical equipment for locations where there is danger of explosion [3)]
EN 50 050	Electrical apparatus for potentially explosive atmospheres - Electrostatic hand-held spraying equipment [2)]
EN 50 053, part 2	Requirements for the selection, installation and use of electrostatic spraying equipment for flammable materials - Hand-held electrostatic powder spray guns [2)]
EN 50 177	Stationary electrostatic spraying equipment for flammable coating powder [2)]
PR EN 12981	Coating plants - Spray booths for application of organic powder coating material - Safety requirements
EN 60 529, identical: DIN 40050	IP-Type protection: contact, foreign bodies and water protection for electrical equipment [2)]
EN 60 204 identical: DIN VDE 0113	VDE regulations for the setting up of high-voltage electrical machine tools and processing machines with nominal voltages up to 1000 V [3)]

VDE (Association of German Engineers) Regulations

DIN VDE 0100	Regulations for setting-up high voltage equipment with nominal voltages up to 1000V [4)]
DIN VDE 0105	VDE regulations for the operation of high voltage equipment [4)]
part 1	General regulations
part 4	Supplementary definitions for stationary electrical spraying equipment
DIN VDE 0147 part 1	Setting up stationary electrostatic spraying equipment [4)]
DIN VDE 0165	Setting up electrical equipment in locations in areas with danger of explosion [4)]

*Sources:

[1)] Carl Heymanns Verlag KG, Luxemburger Strasse 449, 5000 Köln 41, or from the appropriate employers association

[2)] Beuth Verlag GmbH, Burgrafenstrasse 4, 1000 Berlin 30

[3)] General secretariat, Rue Bréderode 2, B-1000 Bruxelles, or the appropriate national committee

[4)] VDE Verlag GmbH, Bismarckstrasse 33, 1000 Berlin 12

Product specific security measures

Installation

- The installation work, to be done by the customer, must be carried out according to local regulations
- Before starting up the plant a check must be made that no foreign objects are in the booth or in the ducting (input and exhaust air)
- It must be observed, that all components are grounded according to the local regulations, before start-up
- The booth grounding is to be checked at every start-up. The grounding connections are customer specific, and are made on the base of the booth. The grounding of workpieces and the other plant units is also to be strictly observed.

Inspection check

Before the booth is switched on, the following points are to be checked:

- Powder trolley/powder collecting container must be in place, the clamps locked in, the pneumatic conduction and electric cables connected
- Filter cartridges are inserted
- Filter pads on the exhaust housing are not contaminated (a contamination indicates damaged filter cartridges)

Entering the booth / booth cleaning

To protect the personnel by entering the booth for inspection and cleaning purposes, the booth must be switched on with the ⏻ switch. The fan is started up with this, the ES control units and other plant units are interlocked, however, and cannot be switched on.

Repairs

Attention:
Carrying out of repairs is only permitted when the booth is switched off, and must be done only by trained personnel!

About this manual

General information

This operating manual contains all important information which you require for the working with the Classic Standard powder coating booth. 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 - reciprocators, booths, powder gun controls, powder guns etc. - you will find in the corresponding enclosed documentations.

Function description

Field of application

The Classic Standard powder coating booth is intended exclusively for the electrostatic coating with organic powders. Any other use is considered as non-conform. The manufacturer is not responsible for any damage resulting from this; the risk for this is assumed by the user alone.

Operation

Classic Standard and Classic Open powder coating booths with filter cartridges are used for electrostatic powder coating of all kinds of objects with plastic powder in small series range. As part of the coating plant, they are laid out for manual operation.

Function

The booth function is characterized by:

- The protection of the coating process from external influences, joined with the keeping clean of the booth environment
- The powder recovery

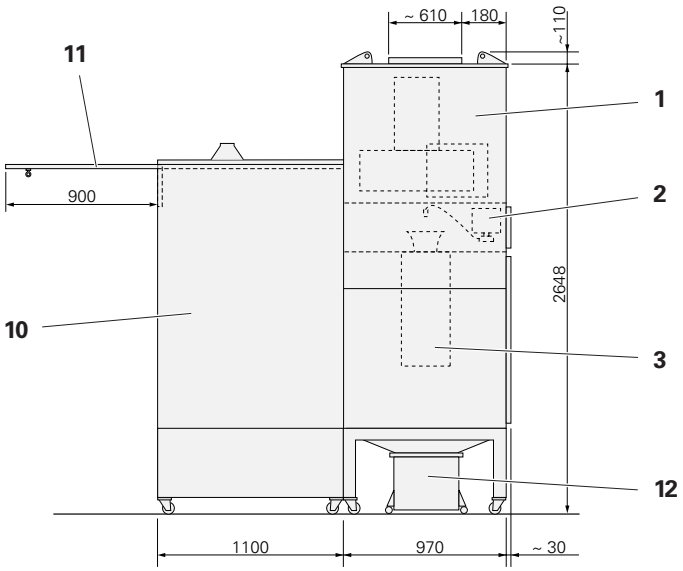
The booth function is based on a powerful exhaust air system, which sucks air from the booth interior through filter cartridges. The resulting negative pressure produces an airflow from the outside of the booth to the inside, thus preventing powder from escaping into the environment.

During cleaning procedure, the powder adhering on the filter cartridges arrives into the booth and then into a powder trolley, with which the powder recovery is guaranteed.

In order to have a full understanding of the booth operation, the booth functions are individually described in the following sections.

Classic booths with Jet cleaning

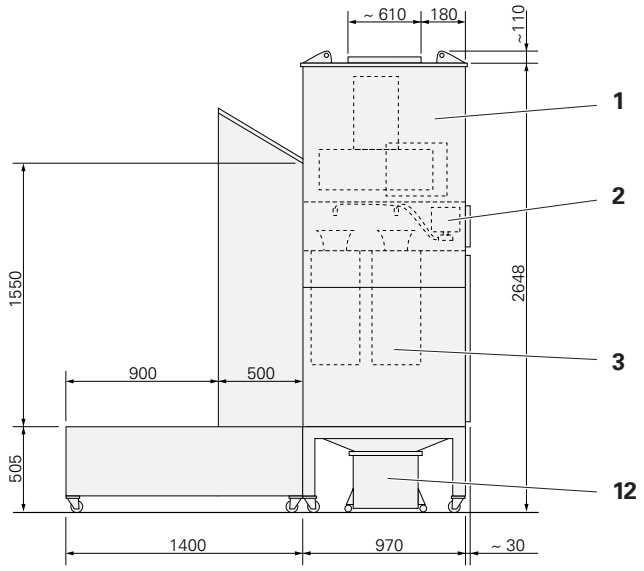
Classic Standard



Powder coating booth - Classic Standard

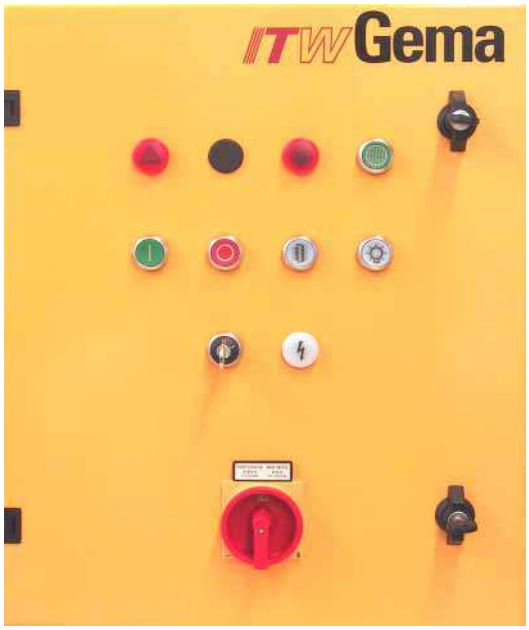
1	Exhaust air unit/fan housing	10	Coating room
2	Pressure tank - filter cleaning	11	Rail for workpiece suspension
3	Filter cartridges	12	Powder trolley

Classic Open



Powder coating booth - Classic Open

Control cabinet



Control cabinet

Operating elements

Main switch (-10Q1)

Key switch - control voltage ON (-13S6)

Plant ON (-14S1.1)

Plant ON (-14S1)

Filter cartridges cleaning ON/OFF (-16SH0)

Lightning ON/OFF (-12S6)

Sieve (-14S3)

Control voltage ON (-13H7)

Motor fault (-14H5)

Ventilator overpressure (-15H5)

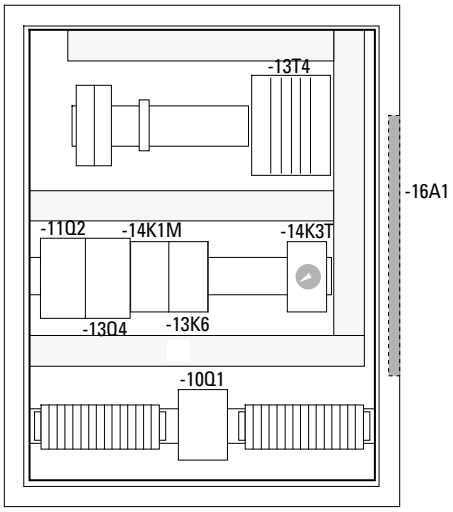
S = Switch/push button

H = Warning lamp

SH = Switch/push button-warning lamp combined

Equipment

Note:
The control cabinet is equipped with the corresponding operating elements dependent on the booth configuration!



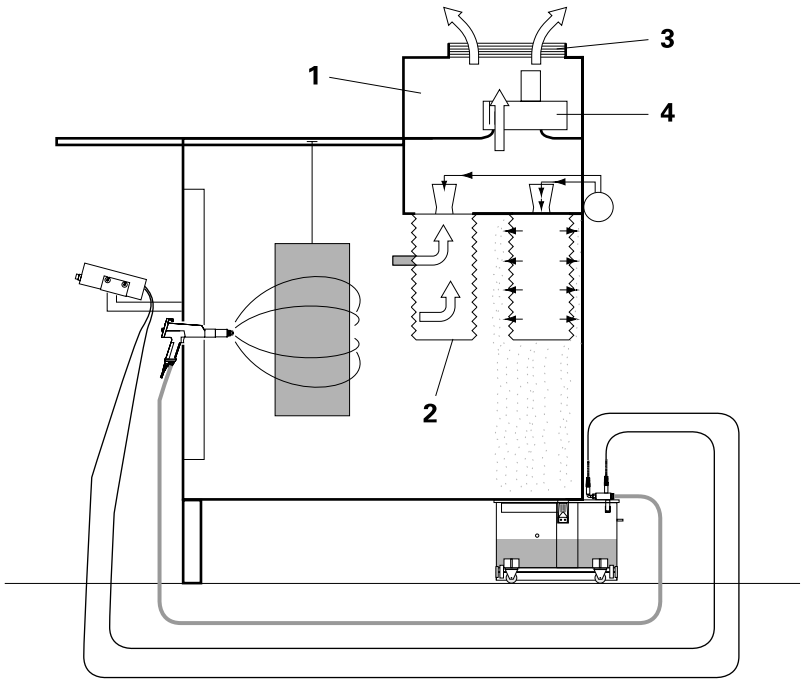
Control cabinet - equipment

The designations are explained in the enclosed wiring diagram.

Exhaust air system (recirculation air)

The exhaust fan (**4**) of the exhaust system is located in the fan housing (**1**) above the filter cartridges (**2**). It sucks air from the booth interior through the filter cartridges, and returns the clean air through the filter pads (**3**) to the environment.

The filter pads in the fan housing are intended as visual inspection only. Should one of the filter cartridges become damaged or develop a leak, powder will be deposited on this filter stage. The efficiency of the exhaust system depends on how severely the filter cartridge is clogged. For this reason, the suction efficiency is determined and indicated by measuring the differential pressure between the clean air side and the booth environment (pressure monitoring). A pressure rise indicates an increasing clogging of the filter cartridges.



Classic Standard - exhaust air system (recirculation air)

Filter cleaning

Each filter cartridge (**2**) is equipped with a cleaning device and can be cleaned while the booth is in operation. The cleaning procedure is activated manually by the relevant switch on the control cabinet.

Note:
The filter cartridge should not be cleaned more than 1-2 times per shift!

The cartridges are cleaned by compressed air impulses, injected by pressure pipes inside the cartridges. The powder drops onto the booth floor, from where it arrives into the powder trolley or the powder recovery container.

The filter cleaning air is supplied from the pressure tank on the exhaust air unit. The cleaning process and consequently the blow off duration per filter cartridge and the pause time, before the next cartridge is blown off, are controlled by an electronic control unit. The blow off time for the cleaning impulse must be 60-80 msecs and is preset by factory:

- Blow off time = 80 msecs (factory setting)
- Pause time = 20-30 secs

Note:
These settings should only be changed if the differential pressure rises frequently (pressure limit: 1,4 kPa)!

Powder circuit

A powder trolley is a prerequisite for working with a closed powder circuit. In the closed powder circuit, the gun is connected to the powder trolley. The powder is fed from the powder trolley via the gun to the workpiece. The over-sprayed powder drops to the booth floor or is retained by the filter cartridges, from where it also drops down inside the booth when the filters are blown off. The powder is scraped manually into the powder trolley, where it can be reused for coating operation.

If the booth is equipped with a powder collecting container, coating in a closed powder circuit is not possible. The powder is fed into the container manually and is not provided for coating operation.

Powder trolley

The powder trolley is installed at the rear of the booth, under the booth floor. The powder trolley can be rolled out and is pressed against the booth in its working position. Herein, the powder is fluidized, then sucked up by the injector and fed to the gun.

The powder which has dropped to the booth floor is fed back into the powder trolley through a vibrating sieve. Thereby, contamination in the powder is eliminated. The sieve can be switched on with the  button, when required.

Powder collecting container

If the booth is equipped with a powder collecting container instead of a powder trolley, working with a closed powder circuit is not possible. The collecting container is not equipped with a fluidizing bed, vibrating sieve or injector, therefore the powder can not be processed for a direct reuse. The powder collecting container can be rolled out and is pressed against the booth in its working position.

Technical Data

Classic powder coating booths

Electrical data

Classic	Standard	Open
Input voltage	220/400 V, 50 Hz	

Pneumatical data

Classic	Standard	Open
Input pressure	min. 6 bar / max. 10 bar	
Recommended input pressure	7 bar	
Water vapor content of compr. air	max. 1,3 g/m³	
Oil vapor content of compr. air	max. 0,1 mg/kg	
Max. compressed air consumption: with collecting container with fluidizing powder trolley	 12 m³/h 47 m³/h	 15 m³/h 50 m³/h

Dimensions

Classic	Standard	Open
Width	1500 mm	2500 mm
Height	2758 mm	
Depth	2100 mm	2400 mm
Manual coating opening	1300x1300 mm	
Number of filter elements	3	5
Filter surface	29,25 m²	48,75 m²
Cleaning system	Jet with Venturi	
Motor performance	1,5 kW	3 kW
Exhaust air volume: Initially Working area	 3200 m³/h 2500-2800 m³/h	 6200 m³/h 4500-5100 m³/h
Powder capacity: with collecting container with fluidizing powder trolley	 80 liters 30 liters	

Start-up

General

Note:
Before starting up, it may be necessary to run a function check. A start-up should be carried out before the start of every shift, and after the booth has been standing idle for long period!

Preparation for start-up

Procedure

- Observe the safety regulations
- Carry out the following checks and, if necessary, carry out the points listed below (the procedures are described in more detail in the further chapters):

1. Position the powder trolley/recovery container (see corresponding chapter)
2. Fill in powder, if necessary, top up with powder (see corresponding chapter)
3. Check that the filter cartridges are firmly seated
4. Replace the filter cartridges (at color changes or if defective, see chapter "Replacing the filter cartridges")

Positioning the powder trolley / recovery container

1. Push the powder trolley under the booth floor all the way to the stop position and press it on with the clamping lever
2. Connect the air hoses for fluidization and vibrating sieve
3. Connect the injector

Note:
To remove the trolley, it must first be lowered. Take care that the trolley does not drop down when it is being lowered!

Filling the powder trolley

The following section describes how the empty powder trolley is to be filled. The powder trolley can only be filled manually. Before filling the trolley, it may be necessary to carry out a coarse cleaning of the booth.

In order to eliminate a powder contamination, fresh powder should not be filled directly into the trolley; the following procedure is recommended:

1. Switch on the booth with the ⏻ button
2. Switch off the electrostatic control units
3. Switch on the sieve with the button
4. Evenly distribute portions of fresh powder directly over the sieve. The powder is passed through the sieve and freed from any contamination
5. Repeat this procedure until the required amount of powder is in the container
6. Check the powder level through the control flap of the powder container

The filling capacity by empty powder trolley is approx. 15 kg plastic powder (average value).

Attention:
The above mentioned powder amount must not be overstepped (danger of overflow by fluidization)!

Start-up

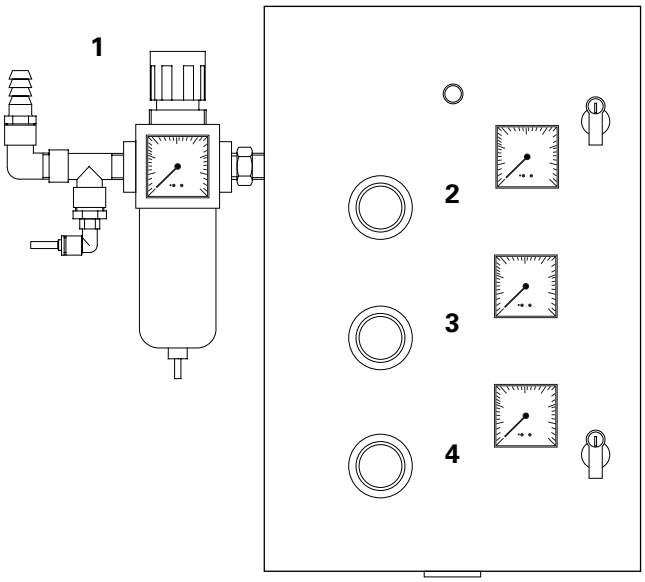
Procedure

1. Enable the compressed air circuit (input pressure must amount to approx. 6 bar)
2. Adjust the filter cleaning pressure in the pressure tank on the pressure reducing valve (**2**) to 2,5-3 bar

Attention:
This pressure may not be set higher, otherwise the safety valve at the other end of the pressure tank will be activated!

3. Switch on the booth (switch on the main switch, the key switch and press the ⏻ button)
4. Adjust the operating parameters on the pneumatics cabinet:
   - Sieve pressure reducing valve (4): approx. 2-3 bar, depending on the powder type
   - Fluidizing pressure reducing valve (3): approx. 0,5-1,5 bar, depending on the powder, the powder should lightly “boil” (check this through the inspection flap of the powder container)
5. Check the fluidization and regulate, if necessary. The adjustment of the required fluidization air pressure depends on the powder type, the air humidity and the ambient tempera-

ture. For this reason, only an arbitrary fluidization setting is possible and should be readjusted, according to previous experience for the powder type being used



Pressure reducing valves

Operation

Function check

Check the grounding of the booth and the other connected equipment and if necessary, ground. Before starting work, carry out a function check (see therefore chapter "Function check").

Start-up

A start-up should be carried out after the booth has stood still for a long period, or when starting work.

Safety recommendations

The safety recommendations are to be strictly observed!

Switching on the booth

Procedure

1. Switch on the main switch
2. Turn the key switch, the control unit is activated, the ϟ lamp illuminates and the key switch returns to its initial position
3. Press the ⏻ button, the fan starts up, the fluidization starts up and the interlocked plant units are released (electrostatic control units etc.)
4. Check the fluidization (through the inspection flap on the powder container), the powder must lightly “boil”, if necessary, adjust on the pressure reducing valve on the pneumatics cabinet
5. Switch on the electrostatic control unit, the gun begins to spray when the trigger is pulled

Switching off the booth

Procedure

1. Switch off the electrostatic control unit
2. Press the O button
3. Switch off the main switch, the ϟ lamp goes out
4. Check the powder container sieve for contamination and clean, if necessary

Switching on/off the lighting (Classic Standard only)

Classic manual powder coating booths are fitted with strip lighting in the roof of the booth as standard equipment.

The light is switched on with the turn switch. A prerequisite for this is that the control unit was switched on with the key switch.

Filter cleaning

The filter cartridges can be cleaned cyclically during booth operation. The cleaning cycle must be released manually with the switch. The cycle times are preset by factory.

Note:
The filter cartridges should not be cleaned more than 1-2 times per shift!

The too great differential pressure is indicated by the alarm horn, whereby the upper pressure limit is 1,4 kPa. The cycle times adjustment is described in the wiring diagram.

Color change

Procedure

Clean the booth (see therefore in chapter "Booth cleaning")

Clean the powder trolley thoroughly (see therefore in chapter "Cleaning the powder trolley")

Clean the injector separately, blow off the powder hose and clean the gun according to the corresponding operating manual

Replace the filter cartridges (see therefore in chapter "Replacing the filter cartridges")

Maintenance

Maintenance schedule

Time interval	Maintenance works
Daily or after each shift	Blow off the hose with compressed air Clean the outside of the gun and check for wear parts Coarse cleaning of the booth (see therefore chapter “Coarse booth cleaning”) Check the vibration sieve in the powder trolley and remove any contamination Clean the filter cartridges 1-2 times
Weekly	Clean the filter cartridges and check for damage, if necessary, replace (see therefore chapter “Replacing the filter cartridges”) Check the filter pads on the exhaust air exits of the fan housing, a large powder deposit indicates a defective filter cartridge, replace the defective filter cartridge or the whole filter cartridge (see “Replacing the filter cartridges”) Clean completely the booth (no wet cleaning!) **Attention:** A booth cleaning should not take place immediately after the powder trolley have been filled with fresh powder; danger of overflow! Empty the powder recovery container Check the oil/water separator and empty, if necessary (if oil is present, the customer should check the air compressor)
Biannually	Blow off the measure line to pressure gauge **Attention:** Disconnect the air line on the manostat and blow off in the following direction; manostat - line beginning (measuring point)

Note:
Booth parts which are to be replaced during maintenance work, such as filters, filter pads etc. are available as spare parts. Please refer to the spare parts list!

Coarse booth cleaning

Attention:
A coarse booth cleaning should not take place immediately after the powder trolley have been filled with fresh powder - danger of overflow!
Never blow off the filter cartridges with compressed air gun!

Procedure

1. Switch on the booth
2. Check the powder trolley vibrating sieve and clean up any contamination with an industrial vacuum cleaner
3. Knock on the outside of the booth walls, so that any powder adhering to the inside falls to the booth floor
4. Move the powder manually onto the powder trolley sieve, the powder will be sieved

Booth cleaning

Attention:
A coarse booth cleaning should not take place immediately after the powder trolley have been filled with fresh powder - danger of overflow!
Never blow off the filter cartridges with compressed air gun!

Procedure

1. Switch on the booth
2. Turn the switch (filter cleaning) to **I** and wait until all filter cartridges have been blown off, then turn the switch to **0**
3. Check the powder trolley vibrating sieve and clean any contamination, if necessary
4. Clean the booth walls with a squeegee
5. Move the powder manually onto the powder trolley sieve, the powder will be sieved

Cleaning the powder trolley

Procedure

1. Start up the booth
2. Start the vibrating sieve with the switch
3. Wait until the vibration time has finished, then switch off the booth
4. Lower the powder trolley and remove it

Attention:
Do not let the powder trolley fall when lowering!

5. Clean the vibration sieve with an industrial vacuum cleaner, remove it and place it next to the trolley. Caution: Do not bend the air hoses of the vibrator!
6. Disconnect the hose connections on the injector
7. Remove the injector, clean it and put it aside
8. Put the powder into a plastic bag with a plastic scoop. Wipe the remaining powder with a soft brush and put it also into the plastic bag
9. Clean the container with an industrial vacuum cleaner
10. Check the sieve for damage, if necessary, replace the defective sieve
11. Clean the inside and outside of the container with a clean, dry cloth
12. Clean thoroughly the fluidizing bed with an industrial vacuum cleaner
13. Check the condition of the rubber seals, the rubber profiles of the sieve frame and the injector plate seating, if necessary, replace
14. Reassemble the container

Replacing spare parts

General

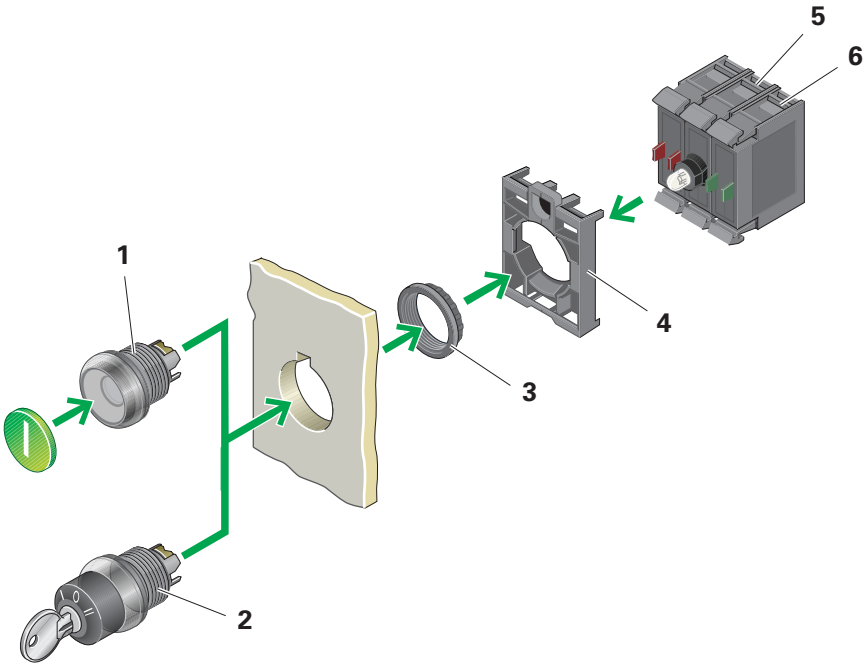
The replacement of spare parts may only be carried out by trained personnel!

The plant must be switched off before replacing spare parts!

Spare parts can be ordered according to the spare parts list.

Replacing the push button lamp/switch elements

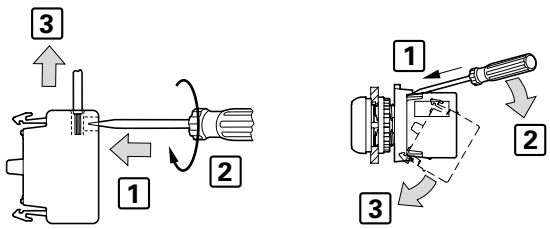
(Control panel on the control cabinet)



Replacing the push button lamp/switch elements

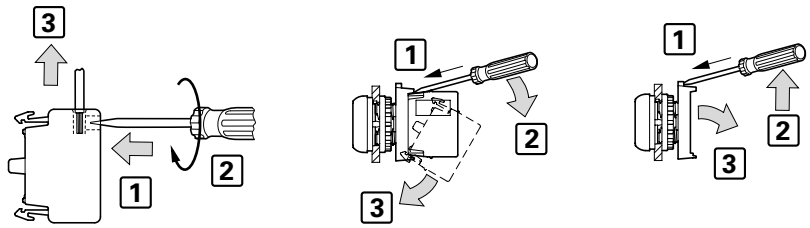
1	Push button	4	Fixing adaptor
2	Key switch	5	LED elements
3	Locking ring	6	Contact elements

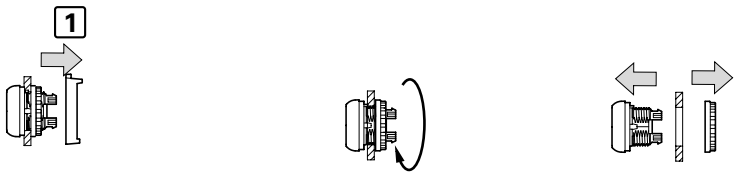
Procedure for replacing the push button lamp/switch elements

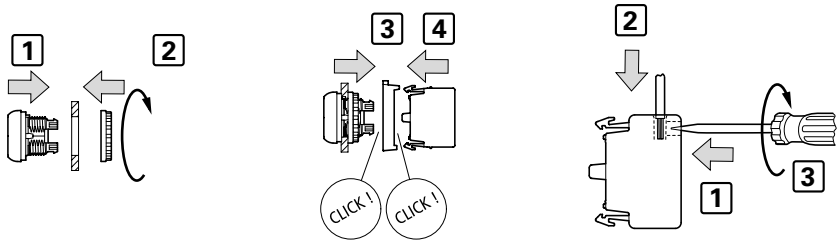


Procedure for replacing the push button lamp/switch elements

Procedure for replacing the push button lamp/key switch elements







Procedure for replacing the push button lamp/key switch elements

Replacing the filter cartridges

Before each replacing, the filter cleaning operation must be carried out:

1. Start up the booth
2. Switch on the switch (filter cartridges cleaning) and wait until all filter cartridges have been blasted off and then turn off the switch
3. Switch off the booth

Procedure for replacing the filter cartridges

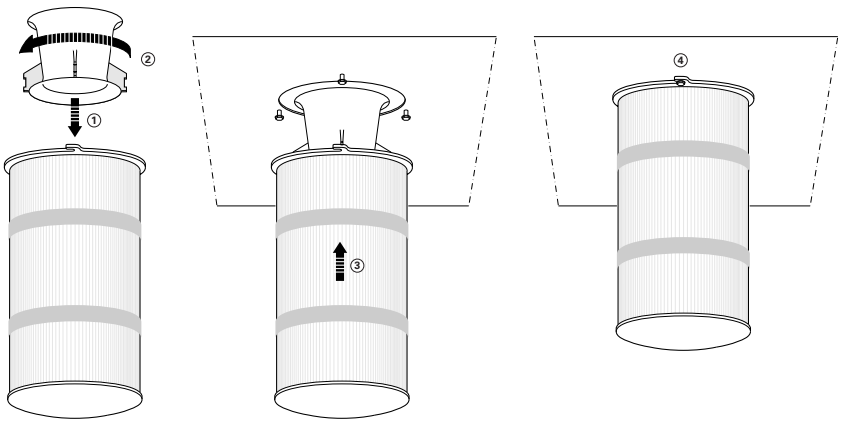
If a filter cartridge is damaged, but the damage can not be found, then the complete filter cartridges set must be replaced. The access to the filter cartridges takes place from the rear of the booth.

Dismantling:

1. Unscrew the knurled screws on the rear of the booth and remove the rear wall of the booth
2. Loosen the fixing screws a couple of turns with the correct size spanner. Do not unscrew completely!
3. Hold the filter cartridge in both hands, turn slightly and hang it out from the holding screws
4. Place the filter cartridge away
5. Clean all parts, especially the seating surfaces

Assembly:

1. Unpack the new filter cartridge and the enclosed Venturi tube
2. Insert the Venturi tube in the filter cartridge (**1**) and lock it in by turning (**2**)
3. Insert the filter cartridge on the fixing screws (**3**) and turn it to the stop
4. Tighten the fixing screws evenly (**4**), so that the sealing ring touches all round evenly and the filter cartridge hangs vertically
5. After all the new filter cartridges have been installed, fit the rear wall of the booth and tighten the knurled screws!



Replacing the filter cartridges

Replacing the filter pads on the fan housing

Procedure

1. Open the retaining grid on the exhaust air housing
2. Check the clean air chamber (for powder deposits), and clean the chamber, if necessary
3. Insert a new filter pad and close the retaining grid

Replacing the solenoid valve on the pressure tank

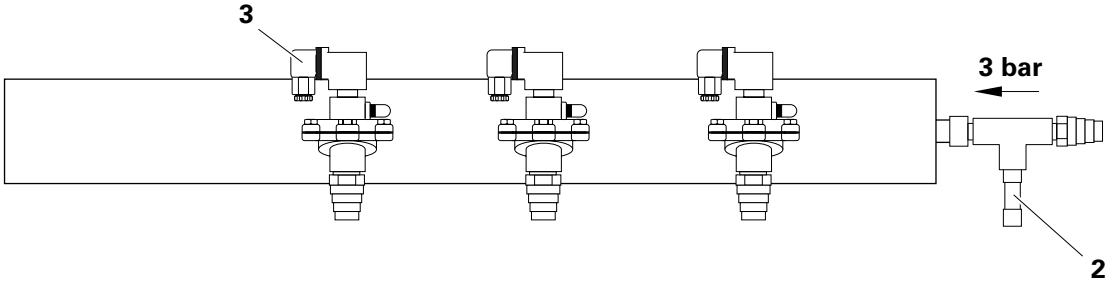
The solenoid valves are installed on the pressure tank in the exhaust air unit and numbered according to the allocation diagram.

Procedure

1. Vent the compressed air tank - close the pressure reducing valve (**2**) on the pneumatic control cabinet, and make sure that the pressure gauge is really **0**
2. Set the switch (filter cartridges cleaning) to **I** and check the filter cartridges cleaning (take note of the noise, until air escapes no longer from the pressure tank)
3. Set the switch to **0**

Warning:
Danger of injury!

4. Remove the rear wall from the exhaust air unit and place it away
5. Remove the air hose from the defective solenoid valve - if several solenoid valves are to be replaced at the same time, the air hoses are to be identified according to the valve
6. Unscrew the plug screw and remove the plug (**3**) with the electric cable
7. Unscrew the solenoid valve from the tube bend
8. Install the new solenoid valve and connect it (seal the end of the tube bend with PTFE tape or Locktite blue)
9. Set the cleaning pressure to 2,5-3 bar on the pressure reducing valve (**2**) and check the pressure tank for air leaks
10. Refit the rear wall of the exhaust air unit



Replacing the solenoid valve on the pressure tank

Replacing the pressure monitoring manostat

(Filter cartridges differential pressure)

Procedure

1. Open the pneumatic control cabinet
2. Loosen the manostat connections (electrical and pneumatical)
3. Dismantle the manostat
4. Blow off the air hose in direction of the measuring point
5. Install the new manostat and connect it

Function check

A function check is to be carried out:

- after a replacement of spare parts on the electrical/pneumatical part of the booth
- after manipulations on the control unit, respectively on the electrical part of the plant

Booth with powder trolley

A prerequisite for making a function check:

- Powder trolley is empty
- The switch (filter cartridges cleaning) is **Off**

Procedure

1. Turn on the main switch - it should not be possible to switch on the electrostatic control unit
2. Turn on the key switch - the lamp must illuminate, it should not be possible to switch on the electrostatic control unit
3. Press the button - the exhaust air fan must start up, after the start up phase:
   - the fluidization must switch on
   - the electrostatic control unit should be ready for operation
4. Press the button - the sieve must start up
5. Turn the switch (filter cartridges cleaning) on **I** and check the filter cartridges cleaning (take note of the noise)
6. Turn the switch on **0**
7. Press the button - the booth must switch off

Booth with powder collecting container

Procedure

1. Turn on the main switch - it should not be possible to switch on the electrostatic control unit
2. Turn on the key switch - the lamp ϟ must illuminate, it should not be possible to switch on the electrostatic control unit
3. Press the ⏻ button - the exhaust air fan must start up, after the start up phase the electrostatic control unit must be ready for operation
4. Turn the switch (filter cartridges cleaning) on **I** and check the filter cartridges cleaning (take note of the noise)
5. Turn the switch on **0**
6. Press the O button - the booth must switch off

Troubleshooting guide

General information

Note:
The fault elimination on the electrical part must be carried out only by trained personnel!

Error/fault	Cause	Fault elimination
The plant is switched off, the lamp ⚠ illuminates	Fan motor malfunction, the corresponding motor protection switch is released	Turn off the main switch, let the motor cool down, reset the corresponding motor protection switch (see wiring diagram) and switch on the booth If the malfunction occurs repeatedly, please contact an ITW Gema service center
Powder accumulation on the filter pads in the fan housing	Filter cartridge defective	Replace the filter cartridge, respectively the complete filter set (see therefore chapter "Replacing the filter cartridges")
Filter cartridge is not cleaned. The corresponding LED on the control print remains illuminated, while the next solenoid valve is activated	Solenoid valve (coil) is defective or cable is broken	Replace the defective solenoid valve (coil) Check the cable for cable break
The first filter cartridge is cleaned only after a long time interval, after the last filter cartridge was cleaned	The wire bridge (jumper) on the control print board for determining the number of filter cartridges to be cleaned, is not (correctly) set	Set the wire bridge (jumper) correctly (see enclosed wiring 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** Classic Standard powder coating booth
  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 yard/meter ware 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!

Classic Standard / Classic Open - spare parts list

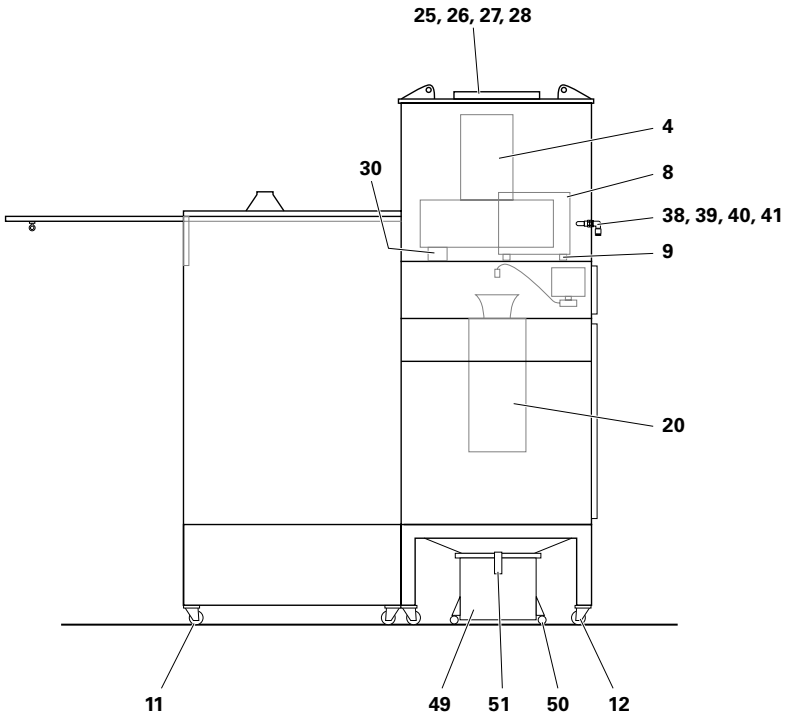
Note:
The spare parts mentioned and illustrated in this spare parts list are identical for all booth types!
Only the number of individual elements may vary!

4	Fan, incl. collar - 1,5 kW	245 577
4.1	Fan, incl. collar - 3,0 kW	245 658
5	Fan cable (for pos. 4 and 4.1) - 4x1,5 mm²	100 560
8	Silencer	352 896
8.1	Silencer	370 592
9	Vibrator element (for pos. 8)	222 992**#**
11	Swivel wheel, wheel Ø 100 mm	257 788
12	Swivel wheel, wheel Ø 100 mm, double stop	257 796
20	Filter cartridge - Ø 325x750 mm, without Venturi	257 818**#**
20.1	Filter cartridge - Ø 325x750 mm, with Venturi	257 800**#**
	Displacement body	390 240
	Venturi	258 857
25	Change-over frame	320 633
26	Filter pad	320 650**#**
27	Star wheel	223 700
28	Adhesive seal strip - 15x2,4 mm	100 145
30	Vibration pad - M8	223 000**#**
38	Adaptor nipple - 1/8"i-1/8"i	202 649
39	Elbow joint - Ø 6/6 mm	200 875
40	Silencer - 1/8"	237 264**#**
41	Connection sleeve - 1/8", Ø 6 mm	233 412
49	Collecting container - complete (incl. pos. 50 and 51)	010 120
50	Swivel wheel, wheel Ø 40 mm	217 581
51	Toggle clamp	211 028
	Grounding cable	301 140

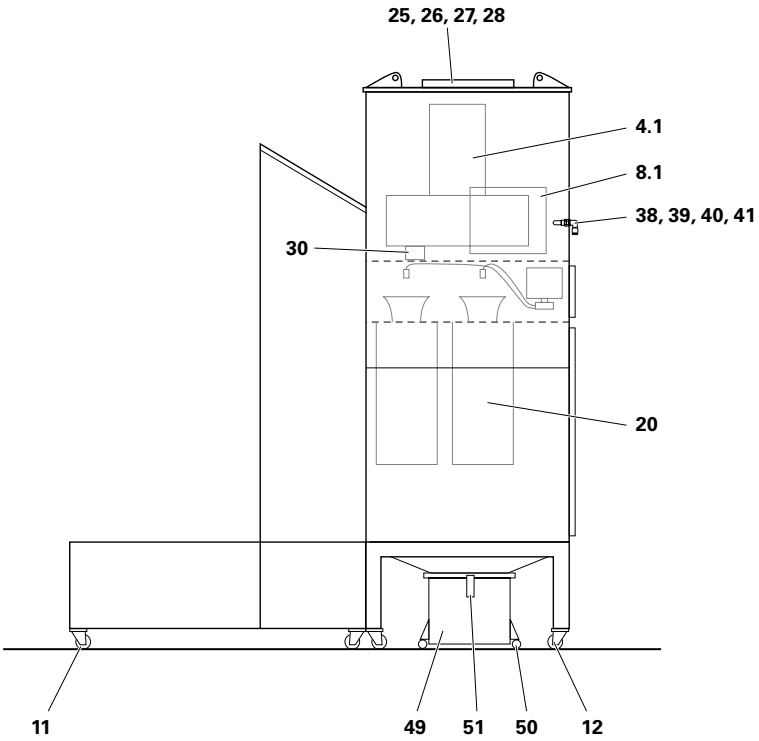
Wearing part

***** Please indicate length

Classic Standard / Classic Open - spare parts list



Classic Standard

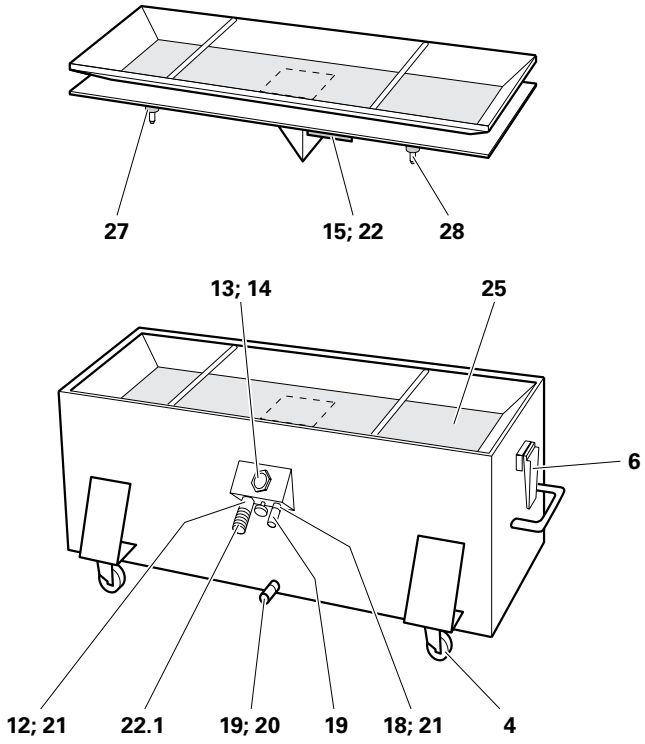


Classic Open

Fluidizing powder trolley - spare parts list

	Powder trolley - complete	010 375
4	Swivel wheel, Ø 40 mm	217 581
6	Toggle clamp	211 028
12	Connection sleeve - 1/4"-1/4"	201 200
13	Suction tube - complete	339 130**#**
14	Counter nut - PG21	234 869
15	Connection fitting - 1/4", Ø 8 mm (for pos. 22)	225 479
18	Connection fitting - 1/4", Ø 8 mm (for pos. 21)	201 332
19	Plug - NW 7,4 mm, 1/4"	244 953
20	Adaptor nipple - 1/8", 1/4"	202 606
21	Elbow joint - 1/4", 1/4" (for pos. 12 and 19)	202 835
22	Roller vibrator - type VT-17, blue (incl. pos. 22.1)	013 005
22.1	Silencer for VT-17	013 072
25	Wire mesh - RF 400 µm, 0,3 m²	012 386**#**
25.1	Wire mesh - RF 300 µm, 0,3 m²	013 030**#**
25.2	Wire mesh - RF 200 µm, 0,3 m²	013 226**#**
27	Rubber damper - Ø 20x20 mm, M6	223 808**#**
28	Bolt	313 718

Wearing part

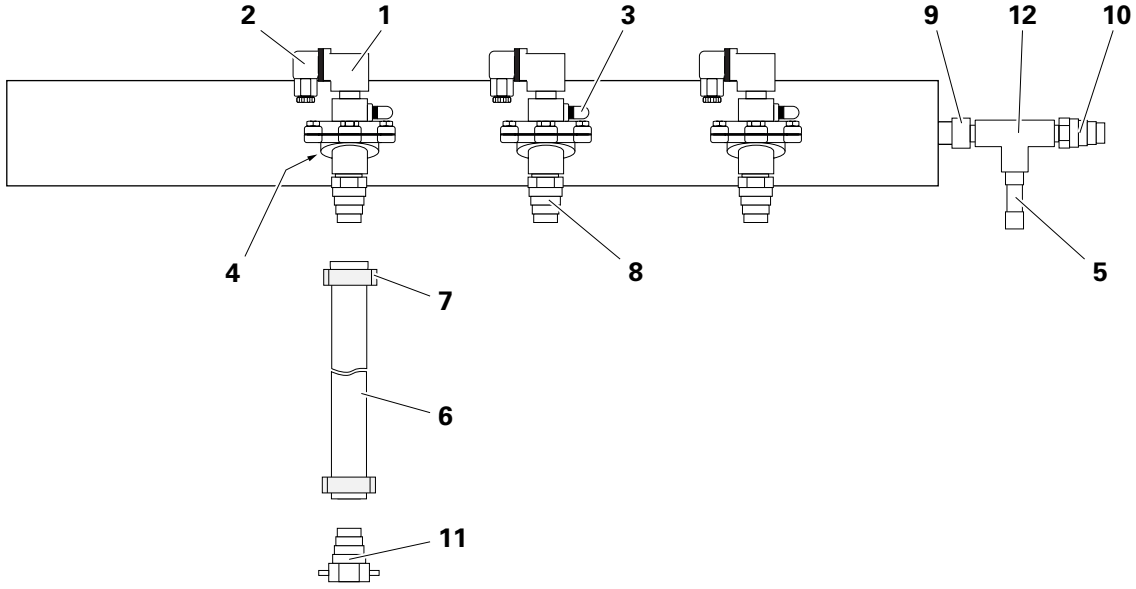


Fluidizing powder trolley - spare parts

Pressure tank - spare parts list

1	Membrane valve - 24 VDC, complete (without pos. 2, 3, 4 and 8)	245 615**#**
2	Plug-in connection	227 919
3	Silencer (for pos. 1)	237 264**#**
4	Double nipple - 3/4" (for pos. 1)	243 574
5	Safety valve - DN10, G 1/2", 6 bar	244 910
6	Hose - Ø 19/26 mm	104 213
7	Hose clamp	223 085
8	Hose connection - 3/4", Ø 19 mm	226 343
9	Adaptor nipple - 3/4"-1/2"	234 648
10	Hose connection - 1/2", Ø 17 mm	223 069
11	Hose connection - 3/4", Ø 19 mm	226 270
12	T-piece - 1/2"-1/2"-1/2"	223 131

Wearing part

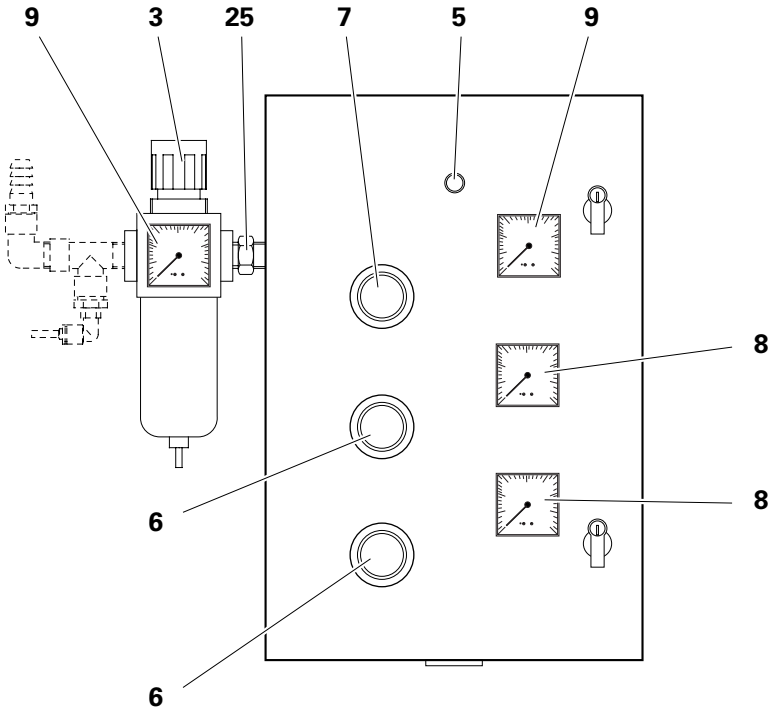


Pressure tank - spare parts

Pneumatic unit - spare parts list

3	Regulator/filter unit	240 133
5	Differential pressure switch - 0,5-2,5 kPa	243 736
5.1	Plastic tube - Ø 4/6 mm (for pos. 5)	100 706*
6	Pressure valve - 0-4 bar	240 028
7	Pressure valve - 0-10 bar	243 710
8	Pressure gauge - 0-4 bar	235 814
9	Pressure gauge - 0-10 bar	243 620
10	Solenoid valve - 230 V (for pos. 6)	257 214
14	Silencer - 1/8" (for pos. 5)	237 264
25	Connection fitting - 1/2"-1/2"	202 967

***** Please indicate length



Pneumatic unit - spare parts