
Operating instructions and spare parts list

Smart W Series 4000 /6000/9000 Powder Coating Booth



Documentation Smart W Series powder coating booth

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General Safety Recommendations

This manual indicates to the user and any others who may handle the Smart Series coating booth the fundamental safety conditions which should be observed at all times.

These safety recommendations should be read and understood on all points before the Smart Series coating booth is operated.

Safety symbols (pictograms)

Below are listed the warnings found in the ITW Gema operating instruction manual and their meaning. In addition to the warnings in the operating instructions, general rules for safety and accident prevention should be observed.



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 Smart Series coating booth was developed with state-of-the-art technology and complies with accepted technical safety regulations. It is designed and constructed exclusively for use in normal powder coating operations.
2. Any other use is considered non-compliant. The manufacturer is not liable for damages derived from improper use of this equipment; the final user is responsible. Should the Smart Series coating booth be used for purposes other than those in our specifications, for any other type of operation and/or other type of material, then ITW Gema should be consulted.

3. Observation of the operation, support, and maintenance instructions specified by the manufacturer is also included as part of the conformity of use. The Smart Series coating booth should be used, put into operation and maintained by trained personnel, who shall be aware of and familiar with the possible risks involved.
4. Start-up (that is, beginning of operations in compliance with regulations) is prohibited until it is established that installation and wiring of the Smart Series coating booth comply with the corresponding directives regarding the machine.
5. In the case of unauthorized modifications to the Smart Series coating booth, the manufacturer shall be exempt from any liability for resulting damages.
6. Recommendations regarding accident prevention, as well as other accepted recommendations regarding safety and occupational health and those of a structural type must be observed.
7. In addition, safety recommendations specific to each country must be applied.

Technical safety regulations for stationary electrostatic powder spraying equipment

General information

ITW Gema powder spraying equipment has been constructed with state-of-the-art technology and is operationally safe. This installation can be dangerous if it is used improperly or for purposes other than its specified purpose. For this reason it should be observed that there is a danger to life and physical well-being of the user or others, danger of damage to the installation and other equipment of the user and danger to the efficient operation of the installation.

1. The powder spraying equipment should not be connected or put into operation until these operating instructions have been read. Incorrect handling of the system can result in accidents, operating failures or damage to the system itself or the installation.
2. Before each start-up, verify that equipment is operating safely (regular servicing is essential).
3. To insure safe operation, appropriate safety recommendations should be observed.
4. Local legal safety regulations should also be observed.

5. In case of repair, before opening the equipment, verify that it is disconnected from the electrical power.
6. Connections of the electrostatic powder spraying equipment to the power source should be unplugged only when the current supply is switched off.
7. The connection cable between the control and the powder gun must be placed so that they cannot be damaged during operation. Local legal safety regulations must also be observed!
8. Only original ITW replacement parts should be used, as in this way protection from explosions is preserved. If breakdowns occur due to the use of other parts, any guarantee becomes void.
9. If ITW Gema electrostatic powder spraying equipment is used in combination with products from other manufacturers, their safety rules and regulations must also be applied.
10. Before beginning work, it is necessary to become familiar with all operating installations and elements and their functions. If familiarization is attempted while working, it will be too late!
11. Always proceed with caution when working with a mixture of powder and air. Powder/air mixture at the right concentration is flammable. No smoking in the powder coating area!
12. Persons with cardiac pacemakers should not under any circumstances stay in the work area, where there are high-tension electromagnetic fields. This recommendation applies in general to all electrostatic powder spraying equipment. Persons with cardiac pacemakers should not, as a general rule, approach electrostatic powder spraying equipment while it is in operation.



Warning!

It should be noted that the customer is responsible for safe operation. ITW Gema is not responsible for any resulting damages.

Safe conscious working

Any person working in the operating company's plant on tasks of assembly, start-up, operation, support and repair of electrostatic powder spraying equipment must read and understand the operating instruction. The operating company must insure that the operator possesses specialized knowledge of the handling of electrostatic powder spraying equipment and its sources of risk.

Electrostatic powder spraying equipment should be used only by trained and authorized operating personnel. This is especially valid for work with the electrical system, which should only be undertaken by trained specialists.

The shutdown procedures indicated in the operating instructions, especially in tasks of assembly, start-up, configuration, operation, modification of operating conditions and methods of operation, maintenance, inspection and repair must be observed as necessary, should circumstances require it.

ITW Gema electrostatic powder spraying equipment is switched off by means of a general switch or, if available, by means of an emergency shutdown switch. Each of the components can be switched on and off during operation with the respective switches.

Individual safety recommendations for the operating company and/or operating personnel

1. Any method of operation which may compromise the technical security of the electrostatic powder spraying equipment is to be avoided.
2. The operator must prevent unauthorized persons from working with the electrostatic powder spraying equipment (for example, the handling of devices by unauthorized use).
3. For dangerous materials, the employer must provide an instruction manual to specify the dangers to human beings and the environment in the handling of dangerous materials, as well as the necessary preventive measures and rules of behavior. The operating instruction manual must be written in understandable form and in the language of the persons employed and must be made available in a convenient place in the work area.
4. The operator is required to review the electrostatic powder spraying equipment at least once per shift, for signs of external damage, defect or change (including operating characteristics) which may affect safety and to report them immediately.
5. The operating company must verify that the electrostatic powder spraying equipment is always operating in satisfactory conditions.
6. Whenever necessary, the operating company must make sure that the operating personnel are wearing protective clothing (i.e. facemask).
7. The operating company must assure the cleaning and review of the workplace with adequate instructions and inspections in and around the electrostatic powder spraying equipment.

8. No safety device may be dismantled or made inoperative. If it is necessary for installation, repair or maintenance to remove any safety device, reassembly of the device must be carried out immediately after finishing the maintenance or repair work. All maintenance activities carried out on the ITW Gema equipment must be carried out with the equipment switched off. The operating company must train the personnel and require them to observe this point.
9. Activities such as, checking of the powder fluidization, checking of the high voltage gun and other similar activities must be carried out with the electrostatic powder spraying equipment switched on.

Notes on special types of hazards

Power

It is necessary to stress the risk to life posed by the high voltage current if shut-down procedures are not observed. The equipment must not be opened when under power. The power source connection must be unplugged, as otherwise there is a risk of electric shock.

Powder

Improper concentrations of powder/air may be ignited by sparks. Adequate ventilation of the coating booth must be assured. Any powder on the floor in the area around the electrostatic powder spraying equipment is a potentially dangerous source of slipping.

Static charge

Static charge can have various consequences: static charge of persons, electric discharge, and formation of sparks. Static charge of objects must be prevented (see "Grounding").

Grounding/Earthing

All electrical conducting elements located in the work area, and especially work pieces, must be grounded. The ground resistance of each work piece must be at least 1 MOhm. This ground resistance must be regularly verified. The condition of the equipment surroundings as well as the suspension gear must ensure that the equipment remains grounded. If the ground connection of the work pieces includes the suspension device, the latter must always be kept clean so as to maintain the necessary conductivity. To test the ground, it is necessary to use and keep calibrated the appropriate measuring instruments.

Compressed air

If prolonged pauses or stoppages are made between work phases with the electrostatic powder spraying equipment, it is recommended that the booth's compressed air lines be emptied. If the pneumatic hoses malfunction and an uncontrolled release of compressed air results, or if they are handled incorrectly, there is a risk of injury.

Crush and cutting points

During operation, moving devices automatically start to move about the work area. It is necessary to assure that only qualified and specially assigned persons approach these mobile devices. The operating company must establish appropriate barriers in accordance with local security regulations.

Limitation of access for special reasons

The operating company must assure that during repair work to electrical components or upon restarting equipment additional precautions are taken such as the placement of barriers (according to local conditions) to prevent access of unauthorized persons to the work area.

Prohibition of unauthorized conversions and modifications of equipment

For reasons of safety any type of unauthorized conversion or modification of the powder spraying equipment is prohibited. If a malfunction occurs with the electrostatic powder spraying equipment, it may not continue to be used. The defective element must be replaced or repaired immediately. Only original ITW Gema replacement parts should be used. If damages occur due to the use of other parts, the guarantee will be void. Repairs must be made exclusively by specialists or at authorized ITW Gema repair sites. Any unauthorized intervention may result in physical injury and material damage. In this case, the ITW Gema guarantee is void.

Safety recommendations for electrostatic powder equipment

1. This equipment may be dangerous if it is not used according to the indications in this instruction manual.
2. Elements which are conductors of electrostatic energy located at a distance of 5 m from the coating booth, and especially the work pieces, must be grounded.
3. The floor in the coating area must be an electrical conductor (concrete is generally a conductor).
4. Operating personnel must wear electrically conductive protective footwear (for example leather soles).
5. Operating personnel must hold the gun with bare hands. If gloves are used, they must be electrical conductors.
6. The grounding cable supplied (green/yellow) must be connected to the grounding screw of the manual electrostatic powder coating equipment. The grounding cable must have a good metal connection with the coating booth, the recovery system, the conveyor and the device for suspending objects.

7. The electrical power and powder supply to the guns must be handled so as to be amply protected against mechanical, thermal and chemical damage.
8. The powder coating equipment must be switched on only when the booth is in service. If the booth is not in service, the powder spraying equipment must also be switched off.
9. The ground of all conducting elements (for example, hooks, conveyors, etc.) must be inspected at least once a week. The ground resistance must be at less than 1 MOhm.
10. When the gun is cleaned and the nozzles are changed, the control unit must be switched off.
11. When working with cleaning agents, explosive vapors harmful to health may be generated. When using such products, it is necessary to observe the manufacturer's indications!
12. During elimination of residues derived from powder and cleaning agents, the manufacturer's indications and rules for environmental protection must be applied.
13. In case of damage (breakage of pieces, tears) or loss of components of the powder spraying gun, it should not continue to be used.
14. For your safety, use only additional accessories and equipment indicated in the service instructions. The use of non-ITW Gema replacement parts can lead to risk of injury. Use only original ITW Gema replacement parts!
15. Repairs must be made only by specialized personnel and in no case should be made in areas which have been exposed to risk. Previously used protection should not be reduced for this reason.
16. Conditions which may result in dangerous concentrations of powder in the booths or at powder spraying sites must be avoided. Technical ventilation must be sufficient to prevent a concentration of powder from exceeding 50% of the lower limit for explosion (UEG = maximum permissible powder/air concentration) on average. If the UEG level is not known, a value of 10 g/m³ should be used.

Special safety measures

Installation

- Installation, which is done by the customer, must be carried out according to local regulations.
- Before beginning plant work, a check should be made that there are no foreign objects in the booth or in the ducting (intake and exhaust air).
- It should be observed that all components are grounded according to local regulations.
- Verify the grounding of the booth before each start-up. The connection is specific to each customer and is found at the base of the booth. Also verify the ground connection of the work pieces and other necessary units of the plant.

Inspection checks

Before switching on the booth, the following points should be checked:

- The collector dropout hopper should be in position with the clamps closed and the pneumatic lines connected.
- The cartridge filters should be in place.
- The final filters should not be contaminated. (The presence of contamination indicates that the cartridge has been damaged.)

Entering the booth / cleaning of the booth

In order to protect personnel when they enter the booth to inspect it or clean it, Switch on the booth. However, the electrostatic control unit and the other plant units cannot be switched on.

Repairs



Warning: The carrying out of repairs is permitted only when the booth is switched off and should be done exclusively by trained personnel!

About this manual

General information

This instruction manual contains all the important information necessary to work with your Smart Series coating booth. It will guide you during the start-up and will also provide indications and advice for optimal use of your new powder coating system.

You will find information about the operation of the individual components of the system – booth, gun control, manual gun or powder injector – in their respective manuals.

Description of function

Field of application

The Smart Series is designed exclusively for electrostatic coating with organic powder. Any other use is considered non-compliant. The manufacturer is not liable for damages derived from improper use of this equipment; the final user is solely responsible!

Operation

Smart Series manual coating booths, equipped with cartridge filters, are used to electrostatically coat any type of piece in small batches, as they were designed to be operated manually as part of the coating system.

Function

The operation of the booth is characterized by:

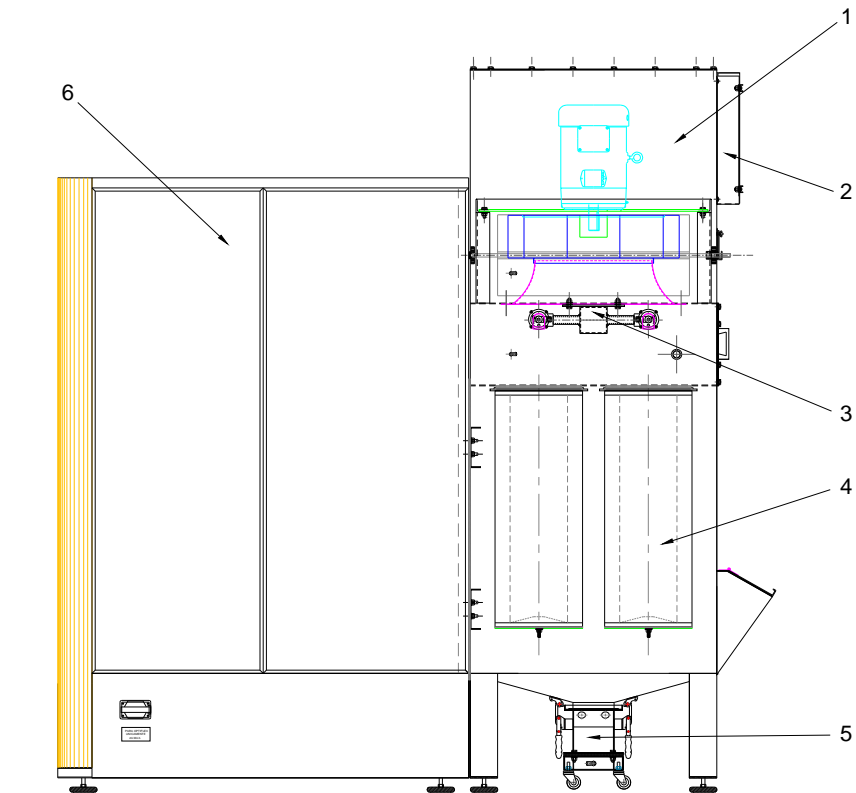
- Protection of the coating process from external influence and by the cleanliness of the booth environment.
- Recovery of powder

This operation is based on a powerful exhaust air system which draws air from the booth through cartridge filters. 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 the cleaning procedure, powder adhering to the outside of the filters drops down into the collector dropout hopper for subsequent re-use or disposal.

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

Smart Series coating booth



*Coating Booth-Series Smart
(Smart Batch Booth Shown illustrated)*

1. *Recovery Unit*
2. *Final Filter*
3. *Pulse Down Manifold*
4. *Cartridge Filter*
5. *Collector Dropout Hopper*
6. *Booth Cabin*

Exhaust Air System (Recirculating air)

The fan of the exhaust system is located in the fan housing above the cartridge filters. Air is drawn into the interior of the booth, passing through the cartridge filters, and is returned to the environment through the final filter as clean air.

Should one of the cartridge filters 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 cartridge filter is clogged. For this reason the filtration efficiency is determined and indicated by measuring the differential pressure of the booth (pressure monitoring). A rising pressure indicates increasing clogging of the cartridge filters.

Filter cleaning

Each cartridge filter is equipped with a cleaning device. The cartridge filters are cleaned while the booth is in operation.

The cartridges are cleaned by compressed air impulses injected by pressure pipes inside the cartridges. The powder drops into the collector dropout hopper.

The air for cleaning the filters is supplied from the diaphragm pressure valve mounted on a manifold inside the collector housing. The cleaning process, and consequently the duration of the cleaning cycle and the cycle between each filter is controlled an electronic control circuit. The duration of the cleaning cycle is preset by the factory:

Cleaning cycle = 100 milliseconds /0.1 seconds (factory
configuration)
Pause time = 13 seconds



Note: These settings should be changed only if the differential pressure rises frequently (Pressure limit = 6.0 inches WC).

Powder circuit

A collector dropout hopper is used for working with a closed powder circuit. In the closed powder circuit the powder can be returned for reuse or disposed. The over-sprayed powder is retained by the cartridge filters and drops down into the collector dropout hopper when the filters are cleaned.

Technical specifications

Smart Series coating booth

Electrical technical characteristics

Smart	4000	6000	9000
Input voltage	230/460/575 V, 60 Hz		

Pneumatic data

Smart	4000	6000	9000
Input pressure	Min 90 psig – Max 125 psig		
Recommended input pressure	90 psig		
Water vapor content of compressed air	1.3 g/m ³		
Air Quality	35 deg. F or lower		
Oil vapor content of compressed air	0.1 ppm		
Maximum compressed air consumption: with container with fluidized powder trolley	25 SCFM		

Other data

Smart	4000	6000	9000
Number of filter elements	4	6	9
Filter area	100	100	100
Motor	7.5	10	15
Exhaust air volume:	4000	6000	9000

Start-up

General information



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 below):
 1. Position collector dropout hopper.
 2. Check that the cartridge filters are firmly seated.
 3. Replace the cartridge filters (at color changes or if defective; see the chapter “Replacing the cartridge filters”).

Positioning of the Powder Trolley/Recovery Container

1. Push the collector dropout hopper under the collector housing and line up with the clamps with the fastening clip.
2. Fasten the clamps closed and lock into place
3. Connect the air hoses for fluidization.
4. Connect the air hoses for powder transfer pumps (if required)



Note:

To remove the collector dropout hopper it must first be lowered. Take care that the trolley does not drop down when it is being lowered!

Start-up

Procedure

1. Enable the compressed air circuit, and check that the input pressure is set to 90 psig bar.
2. Switch the main powder disconnect on at the booth electrical panel. A green light will illuminate indicating that the panel has been power on.
3. Switch on the booth by pressing the control system start button.
4. Set the pneumatic parameters on the main air manifold:
 - Set the pressure for filter cleaning as required (50 to 70 psig)at the regulator located on the main air manifold located on the outside of the collector housing.
 - Set the collector dropout hopper fluidizing pressure as required approximately 20 – 40 psig, depending on the type of powder. Proper fluidization is achieved when the powder should demonstrates an appearance of a light “boil” or “simmer” action (this can be checked through the inspection flap of the powder container).
5. The adjustment of the required air pressure for fluidization depends on the type of powder, the air humidity, and the ambient temperature. For this reason only arbitrary settings for fluidization are possible and these should be readjusted, according to previous experience, for the type of powder being used.

Operation

Function check

Check the grounding of the booth and other connected equipment, and if necessary, ground.

Safety instructions

Observe the safety recommendations!

Switching on the booth

Procedure

1. Switch the main powder disconnect on at the booth electrical panel. A green light will illuminate indicating that the panel has been power on.
 2. Switch on the booth by pressing the control system start button and the fan motor will begin to turn
 3. Check the fluidization (through the inspection flap of the powder container). The powder must lightly “boil” or “simmer”; if necessary adjust the pressure on the pneumatic manifold.
 4. Activate the electrostatic control equipment and begin to spray as required.
-

Switching off the booth

Procedure

1. Switch off the electrostatic control unit.
2. Press the control system stop button. The fan motor will lose power; however, the fan wheel will continue to spin until rotational momentum is depleted

Cleaning the filter

The cartridge filters are cleaned cyclically during booth operation. The cleaning cycle is initiated automatically when the booth is turned on. Cleaning times are preset at the factory.

If the differential pressure reaches maximum level (6" WC on the cartridge filter and 3.5" WC for the final filter) the booth will shut down. As the pressure differential rises from normal operation adjustments to the damper lever may be required to ensure maximum life of the filters. Adjustment of the preset cycle time may be performed but only as required for proper cleaning of the filters.

Static Pressure Readings

Collector Section

Magnehelic Gauge/Transducer located in the electrical control panel is a device that measures the difference in static pressure between the clean side and the dirty side of the cartridge collector. This is the static pressure on the cartridge filters or the pressure drop across the filters. The pressure tap on the clean side is connected to the low port on the magnehelic or the P1 port on the transducer. The dirty side pressure tap is relatively atmosphere so the high port on the magnehelic and the P2 port on the transducer are simply left open. (Note: On the magnehelic gauge the extra high and low ports should be plugged.)

To take the reading on a different gauge the lines cannot be removed while the booth is running. The booth must be turned off and both lines removed, then restarted to take the reading. The same thing applies when the lines are reconnected. This is because the difference is read between the clean and dirty side and if a line is removed then a high static pressure is sensed causing the booth to shut down.

Final Filter

Magnehelic Gauge/Transducer located in the electrical control panel is a device that measures the difference in static pressure in the final filter plenum. This is a pressure reading caused by the restriction of air passing through the final filters. The pressure tap on the final filter plenum is connected to the high port of the magnehelic or the P2 port on the transducer. The low port on the magnehelic gauge and the P1 port on the transducer are simply left open. (Note: The extra high port should be plugged and the two low ports should be unplugged on the magnehelic gauge.)

Setting the Pressure Switches for the Magnehelic Gauges

- Set the pressure switches only while the system off.
- Cut off a spare five foot piece of 1/4" tubing.
- Plug it into the cartridge filter fitting on the back of the electrical panel.
- Using a continuity meter, place it across the cartridge filter warning pressure switch terminals.
- Suck on the tube slowly until you get continuity. The magnehelic should read "4.0". If you don't get the correct reading, remove the red cap and adjust the screw on the bottom of the pressure switch.
- Perform the same procedure on the cartridge filter shutdown pressure switch until you reach "6.0" on the magnehelic.
- Switch the 1/4" tube to the final filter connection.
- Calibrate the final filter shutdown pressure switch to "3.5".
- Move to the final filter warning pressure switch and blow into the tube and calibrate to "2.5".

Settings Table	Warning	Shut Down
Cartridge	4.0"	6.0"
Filter	2.5"	3.5"

Setting Pulse-Down Timer

- Insure the regulated air pressure to the blower is between 50 – 70 psi. (Note: 90 psi is the maximum pressure the cartridge filters can withstand.)
- The timing board is located on the outside of the collector housing, inside the timer box. Remove the cover of the timer box.
- "On" time is the amount of time air is sent through filters. Typical setting is 0.1 seconds.
- "OFF" time is the amount of time between pulses. Typical setting is 13 seconds.
- Insure that the jumper is set to the same number as there are sets of collector filters.



WARNING: Adjusting the pulse down pneumatic circuit different than recommended settings may result in sporadic operation of the collector / blower system. This may lead to premature filter failure or nuisance shutdown caused by dirty filters!

Maintenance

Maintenance Schedule

Maintenance intervals	Maintenance tasks
Daily or after each shift	<p>Blow through the powder hose</p> <p>Clean the outside of the gun, and check parts for wear. Quick clean the booth (see chapter "Quick booth cleaning").</p>
Weekly	<p>Check for damaged cartridge, if necessary, replace (see chapter, "Replacing a cartridge filter").</p> <p>Check the final filters in the exhaust air exit of the fan housing. Large powder deposits indicate a defective filter - replace the damaged filter or all the filters (see chapter, "Replacing a cartridge filter").</p> <p>Clean the booth completely (No wet cleaning). Caution: After a thorough booth cleaning check the collector dropout hopper is not in danger of overfilling. If full, empty the dropout hopper.</p> <p>Check the oil/water separator and empty, if necessary (if oil is present, check the air compressor).</p>
Annually	<p>Replace fluidization plate on collector dropout hopper.</p>



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

Quick booth cleaning



Attention:

The cartridge filters must never be cleaned with compressed air guns !

Procedure

- 1 Switch on the booth.
- 2 Remove powder from the walls of the booth by using compressed air or a squeegee so that any powder adhering to the inside falls to the booth floor or is drawn into the collector
- 3 Any powder on the booth floor should then be pushed into the collector dropout hopper.

Cleaning the booth and collector

Procedure

1. Switch on the booth.
2. Remove powder from the walls of the booth by using compressed air or a squeegee so that any powder adhering to the inside falls to the booth floor or is drawn into the collector
3. Any powder on the booth floor should then be pushed into the collector dropout hopper.
4. Ensure filter cleaning pressure is adjusted to proper setting and allow enough time for the cartridge filters to thoroughly pulse down and deposit powder into the dropout hopper. As this process in occurring the reading on the magnehelic gauges may decrease. Once sufficient filter cleaning has occurred, then proceed.

Cleaning the collector dropout hopper

Procedure

1. Switch on the booth.
2. Ensure fluidization pressure for dropout hopper is set to proper level.
3. If applicable, remove the powder from the dropout hopper by using the transfer pumps.
4. Lower the dropout hopper and remove it from underneath the collector, then manually remove or vacuum any remaining powder in the hopper.
4. Once all powder is removed inspect the fluidization plate for damage or blockages, and replace if necessary.
5. Reinstall the collector dropout hopper.



Attention:
Make sure the powder trolley does not fall when lowering!

Replacing spare parts

General

The replacement of spare parts must only be carried out by specialized personnel! The booth must be switched off before replacing spare parts. Spare parts should be ordered according to the Spare Parts List.

Replacing a cartridge filter

Before replacing a cartridge filter a filter cleaning operation must be carried out:

1. Start up the booth.
2. Ensure filter cleaning pressure is adjusted to proper setting and allow enough time for the cartridge filters to thoroughly pulse down and deposit powder into the dropout hopper. As this process in occurring the reading on the magnehelic gauges may decrease. Once a sufficient amount of powder has been removed from the filter, then proceed.
3. Switch off the system.

Replacement procedure for cartridge filters

If a cartridge filter is damaged, but the damage cannot be found, then the complete set of cartridge filters must be replaced.

Dismantling:

1. Enter the booth cabin to remove the filter.
2. Use the correct size wrench to loosen the three (3) nuts fastening the filter to the housing. Loosen the nuts enough turns to remove pressure off the filter gasket; this will lower the filter away from the housing. Unscrew completely only if necessary.
3. Hold the cartridge filter in both hands and turn slightly so that it can be lifted away from the mounting studs.
4. Place the cartridge filter away from the booth.
5. Clean all parts, especially the seating surfaces.

Assembly:

1. Unpack the new cartridge filter.
2. Place the cartridge filter into position and lock it into place on the mounting studs by turning the filter until it stops.
3. Tighten the nuts on the mounting studs evenly, so that the sealing gasket compresses to $\frac{1}{2}$ the original height all around. Ensure that the cartridge filter is hanging vertically straight

Replacing the final filters in the fan housing

Procedure

1. Final filters are located on the outside of the collector housing.
2. Use the correct size wrench to loosen the nuts fastening the filter support bracket to the housing.
3. Remove the bracket, and then remove the final filter.
4. If necessary, vacuum any powder or debris found in the clean air plenum area. Powder residue indicates a damage or improper installed cartridge filter(s). See replacing a cartridge filter section.
5. Unpack the new final filter and fit it into place
6. Reinstall the filter support brackets by tightening the nuts onto the mounting studs.

Replacing a Pulse-down Valve Diaphragm

The pulse down valve is located above the cartridge filters in the collector housing clean air plenum area.

Procedure

1. Close the main booth air supply in accordance with the operating company's Lock out/Tag out procedures.
2. Turn the booth on
3. Allow the timer run through a series of pulsing cycles to remove any pressure from the line and pulse down manifold.
4. Turn the booth power off and ensure fan/motor unit is no longer spinning.
5. Find the defective pulse-down valve and remove it from the manifold.
6. Replace the entire valve and solenoid if necessary. Otherwise a diaphragm repair kit can be used to repair the valve.
7. To replace the diaphragm: loosen the four bolts fastening the valve together. Remove the rubber seal and spring and replace with a new seal and spring.
8. Reassemble the valve body and reinstall the four bolts fastening the valve together

9. Reinstall the solenoid if needed, and then remount the valve onto the manifold inside the collector housing (seal the valve on the manifold with Teflon tape.)
10. Close up the collector and open the booth main air supply.
11. Turn the booth power on and listen for any compressed air leaks and proper pulsing cleaning sounds. Monitor the filter magnehelic gauges to ensure proper cleaning is occurring

Troubleshooting

General

Note:

Repairs to the electrical parts of the booth must only be undertaken by trained personnel!

Problems	Solutions
Powder not transferring from collector	Assure there is compressed air going to the transfer pump. Check transfer pump regulator setting. Check for worn pump insert, check for obstruction in transfer hose or pump. Check fluidization.
Poor fluidization in collector.	Powder level too low (minimum 6 inches necessary for proper fluidization). Check and adjust fluidization air. Check for proper installation of fluid plate (if installed upside down would cause a problem).
Powder floats out of booth.	Cartridge filters may be plugged. Pulse down pressure may be set too low (should be 50-70 psi). Check for faulty pulse down valve or improper pulse down settings. Check fan for correct running direction. Check damper adjustment. Verify compressed air quality.
Powder leaking past the cartridge filters causing the final filters to blind	Check collector seal to frame, replace if damaged. Tighten all nuts on the clean side. Cartridge filter cover plates should be tightened down until the knob bottoms out on the threads.
Final filter static pressure raises to shutdown level	Filters may be plugged and need to be cleaned or replaced. Verify the reading is correct with another gauge. If filters are plugged, see above and correct any gasket or mounting problems.

<p>Cartridge filter magnehelic gauge does not read correctly.</p>	<p>Calibrate the gauge (readjust to zero with system off). Verify that the reading is good by using another gauge. If readings are the same, powder may be plugging up the pressure "T" tube inside the collector, or there could be a leak in the tube. Blow out the lines and inspect the "T" tube. Run a parallel "test" tube and check all fittings for leaks. Contact the ITW Gema service department before making any relocation changes.</p>
<p>The booth switches off, the lamp illuminates</p>	<p>Fault in the fan motor, the motor protection is activated. Turn off the main switch, let the motor cool down, activate the motor protection and switch on the booth; if the fault occurs repeatedly, please contact an ITW Gema Service Center.</p>
<p>Powder in the final filter of the fan housing.</p>	<p>Replace the defective cartridge filter or the complete set of cartridges (see the chapter "Replacing the cartridge filters")</p>
<p>The cartridge filter is not cleaned. The corresponding LED on the control print board remains illuminated until the next solenoid valve is activated.</p>	<p>Replace the defective solenoid valve (spool).</p>
<p>The first cartridge filter is only cleaned after a long time interval after the last cartridge filter is cleaned.</p>	<p>The jumper wire on the control print board for determining the number of cartridge filters to be cleaned is not (correctly) connected.</p>

Spare parts list

Ordering spare parts

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

- Model number of your powder coating booth
- Order number, quantity, and description of each spare part

Example:

- **Model** Smart W coating booth
- **Order number** 203386, 1 unit, clamp - Ø 18/15 mm

When ordering cable and hose material the length required must also be given. The numbers for spare parts provided in feet/yards/meters are always marked with an *.

Parts subject to wear are always marked with a #.
All dimensions of plastic hoses are given as external and internal diameters:

Example:

Ø 8/6 mm, 8 mm outside diameter / 6 mm inside diameter



WARNING!

Only original ITW Gema spare parts should be used, as in this way protection against explosion is preserved. If damage results from the use of non-original spare parts, the guarantee will be void!

Replacement Parts

Collector components

#105176 – GASKET,COLL,1.5"X2"x54",SMART

#139741 – FILTER,CRT,36X12.7,100SQF

#139787 - VALVE,DIA,PLUSE,1.0",SMART BOOTH

#139792 - DIAPHRAGM KIT,1.0", SMART BOOTH

#109619 – FILTER,FINAL,24"X19"X3.5"

#140392 – FLUIDPLATE,SMART B/W,2,3,4,6KCFM

#140535 – FLUIDPLATE,SMART B/W,9KCFM

Transfer Pump components (if used)

139748 – TRANSFER PUMP, ASSY

139745 – INJECTOR,TRANSFER PUMP

#139746 – HOSE CONNECTION,TRANSFER PUMP

#107499 – O-RING,1.012"ODX0.7834"ID

#107500 – O-RING,1.26"ODX0.984"ID

Part subject to wear

* Specify length

