



---

# *SOLID AEROSOL GENERATOR SERIES SAG 410*

**Instruction Manual**



---

## Contents

Safety.....	iii
1 Introduction .....	1-1
2 Product Description.....	2-1
Feeding and Dispersing Unit.....	2-2
Control Unit.....	2-4
3 Operation and Maintenance .....	3-1
Packing .....	3-1
Operation .....	3-2
Maintenance .....	3-4
Dismounting and Mounting Feeding and Dispersing Unit.....	3-5
Dismounting and Mounting Scraper and Scraper Vessel .....	3-6
Transport.....	3-6
4 Feeding and Dispersing .....	4-1
Operation of the SAG 410 .....	4-1
Calibration of the Feeding Unit.....	4-3
5 Troubleshooting .....	5-1
6 Specification.....	6-1
Technical Data .....	6-1
Accessories.....	6-2
7 Appendix.....	7-1
Option Remote Control.....	7-1
Description of the Interface (D-SUB-Socket 15 Pins) .....	7-3
Characteristics of the Injectors .....	7-5
Disposal of End-of-Life Equipment.....	7-6
EC Declaration of Conformity .....	7-7

---

## Manufacturer and Service Address

### Topas GmbH

Technologie-orientierte Partikel-, Analysen- und Sensortechnik  
Oskar-Röder-Str. 12  
D-01237 Dresden  
Germany

Telephone +49 (351) 21 66 43 - 0  
Telefax +49 (351) 21 66 43 55  
E-mail office@topas-gmbh.de  
Internet www.topas-gmbh.de

Alternatively please ask your local distributor for further information.

### Warranty and Liability

Topas GmbH warrants that this product, under normal use and service as described in this manual, shall be free from defects in workmanship and material for a period of twelve (12) months from the date of shipment to the customer.

If the device is delivered by a transportation company, damages cannot be excluded. Therefore, the packaging must be thoroughly checked for external damage immediately after delivery. Any visible signs of transport damage should be reported to the insurance company or to us. Also the damaged instrument should not be switched on and the agent must be informed about it.

---

**Caution:** *Please read this instruction manual carefully before using the device. Topas GmbH does not assume any liability for damages caused by improper operation, application, cleaning or use of unsuitable materials.*

---

---

Reproduction, translation or transmission of this manual in whole or in part, in any form or by any means is prohibited without the written permission of Topas GmbH.

© May 13 Topas GmbH. All rights reserved.  
410 13 09 EHW

---

## Intended Use

The Solid Aerosol Generator SAG 410 (device for dosing and dispersing dusts) is intended to be used for generating defined aerosols for test purposes (filter testing, dust holding capacity tests, generation of tracer particles etc.).

For aerosol material dry and free flowing substances with particle size <200 µm can be used. The use of sticky or aluminium attacking substances is excluded.

The use of other substances than mentioned above is in the responsibility of the user. In no way biological or radioactive dusts have to be used.

All responsibility regarding the handling of the aerosol substance and the application of the generated dusts must be assumed by the user.

The apparatus must not be used in explosive environments and not with inflammable or hot gases.

## Safety

---

### **Caution: Danger of electric shock!**

*Disconnect the power cable from the mains supply before performing any cleaning or service activity.*

*The dispersing process may cause electrostatic charging of the injector and the aerosol by tribo-electric effects.*

*Check the proper attachment of the protective earthing conductor (designated by the green-yellow insulation) to the dispersing nozzle before setting the device into operation.*

---

---

### **Caution: Fire and explosion hazard!**

*Neither use inflammable nor hot gases as dispersant at any time.*

*Do not operate the apparatus in any explosive gas atmosphere.*

---

---

**Caution:** ***Risk of injury by moving components!***  
*During the operation of the generator any touching of the moving components (scraper) either by fingers or implements is prohibited.*  
*The operation of the device is only permissible with the cover closed.*

---

---

**Caution:** ***Avoid the inhalation of the generated aerosols!***  
*Make provisions for an adequate exhausting of the aerosol. Make sure that the aerosol outlet piping from the device is not clogged, closed or substantially throttled.*  
*The safety data sheets of the aerosol substances applied have to be obeyed.*

---

---

**Important:** ***Use only proper aerosol material for the operation of the aerosol generator.***

- *Use only dry and free flowing dusts with particle size <200 µm*
- *Do not use adhesive or aluminium-reactive substances.*
- *In order to avoid deposits, the internal surfaces of the equipment into which the generated aerosol is to be passed in should be completely dry.*

---

## 1 Introduction

Dust is defined as a dispersion of fine solid particles in gas. Although dust usually represents a pollution of our environment, it is often needed for tests and research. For that the particle concentration and the particle size should be known and adjusted. A typical example for such an application is determining the efficiency of various filters.

Generation of such special dusts requires two different steps – feeding and dispersing the powder. For dispersing powders the dual-stream injection nozzle is a suitable solution. Feeding fine powders is much more difficult. Suitable solutions are the feeding belt, the piston feeder and the rotary table.

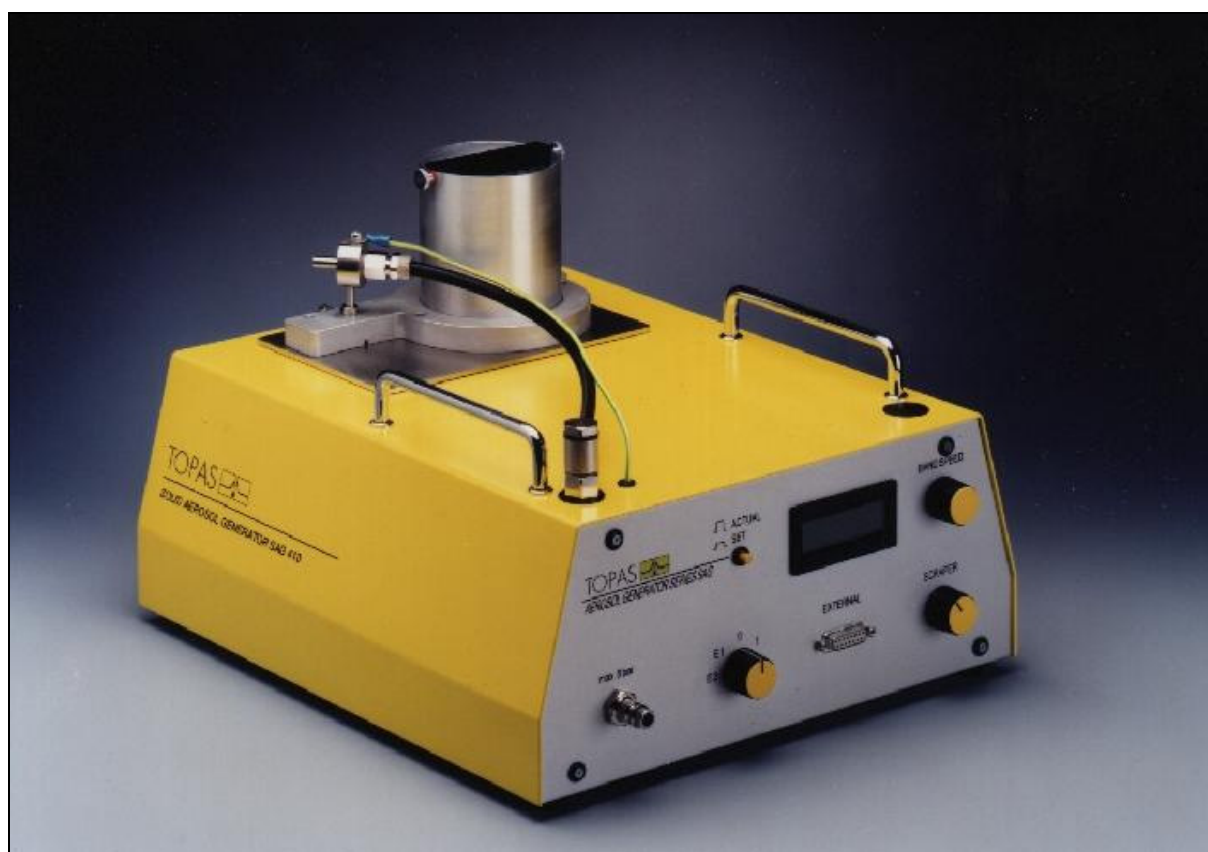


Figure 1: Solid Aerosol Generator SAG 410

Three various models of the Solid Aerosol Generator with different feeding ranges are available:

SAG 410/L (Low Flow) for low dosing amounts,  
SAG 410 for average dosing amounts and  
SAG 410/H (High Flow) for large dosing amounts

The dispersing unit can be easily dismounted by the user and changed. So varying feeding ranges can be realized with one instrument. You can also control the SAG 410 with a remote control system if you have ordered this additional device. Please ask Topas or the local distributor for more information about these options.



## 2 Product Description

The innovative idea of the SAG 410 is a special segmental feeding belt with defined constant small volumes. By these volumes small proportions of the powder are moved from the scraper to the injector. By this way the number of powder volumes which pass the injector can be easily set with the belt speed and thus the dosed powder bulk can adjusted in a wide range. Filling the powder is done by a specially developed scraper.

The knowledge of the parameters of the used bulk material enables to estimate the set dust concentration.

The design of the SAG 410 warrants a reproducible aerosol generation even for long time operations, because the powder can be fed continuously by a special developed scraper.

The control board on the front panel enables an easy operation of the generator. By using the external interface the SAG 410 can also be operated by a remote control system or a computer.

### ***Feeding Range of the Generator***

Due to the modular design, the user can easily dismount and change the feeding and dispersing unit against one with a different feeding range.

The feeding range of the 3 models (SAG 410, SAG 410/L and SAG 410/H) is described in the chapter "Specifications".

The additional feeding and dispersing unit is optional and can be ordered from Topas.

The injector can be easily and rapidly exchanged separately too.

Injectors are available in two sizes: The small injector is intended for SAG 410 and SAG 410/L and the large one for SAG 410/H (characteristics of the nozzles: see Appendix of this manual).

## Feeding and Dispersing Unit

This unit comprises the components for dosing as well as the dispersing unit. The dispersing unit consists of the injector and a tube for compressed air supply as well as a ground wire, both for connection to the housing.

The whole feeding and dispersing unit can be easily dismantled for cleaning, repairing or changing the unit against one with a different feeding range. Figure 3 shows the scheme of the feeding and dispersing unit.



Figure 2: Feeding unit with injector

Feeding the powder is done by a special feeding belt. The defined segments warrant a constant and reproducible supply of the powder even in small quantities. The resulting particle number concentration of the output aerosol can be easily adjusted by setting the feeding belt speed over a wide range.

Filling the small segments is realized by the scraper. Its design enables a constant dosing of the powder that is nearly independent of the powder reservoir filling level. The reservoir can be refilled during operation without any effects on the aerosol concentration.

For dispersing the dosed powder is extracted by suction from the feeding belt by means of an injector (ISO 5011) and fed into the carrier gas. Shear forces created in this injector disperse and deagglomerate the powder to form an aerosol.

The injector is plugged on the feeding unit and fixed with a knurled screw. In this way it can be easily dismantled and cleaned or replaced by another injector of the same type. For the models SAG 410 and SAG 410/H appropriate injectors are available in two sizes. Characteristics of these nozzles are contained in the Appendix of this manual.

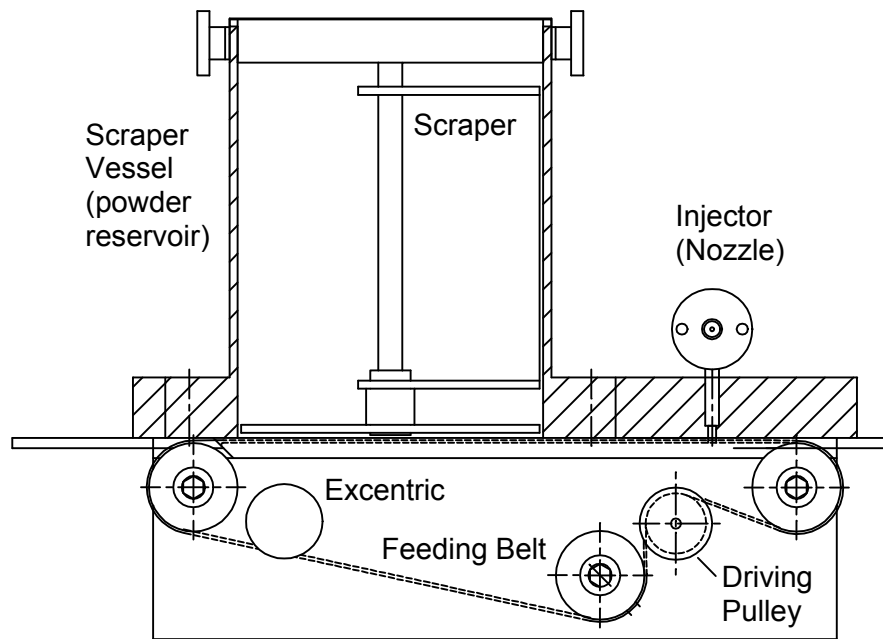


Figure 3: Scheme of the Feeding and Dispersing Unit

## Control Unit

The control unit is separately covered in the instrument housing of the powder disperser for protection from dust. The control unit is connected to the feeding and dispersing unit by means of control cable and compressed air hose. All important functional components can be found at the front panel of the instrument:

- rotary switch “CONTROL” for choosing the control mode
- one button, the display and the turning knob “FEED RATE” for adjusting and control/checking of the dosing (feeding belt speed)
- turning knob “PREPARATION” for controlling the scraper speed  
If the motor of the scraper is working outside the range of its specification, a beep signal will indicate this trouble.
- inlet for compressed air
- a special interface for external control of the device (D-SUB-Socket 15Pins) (description: see Appendix of this manual)

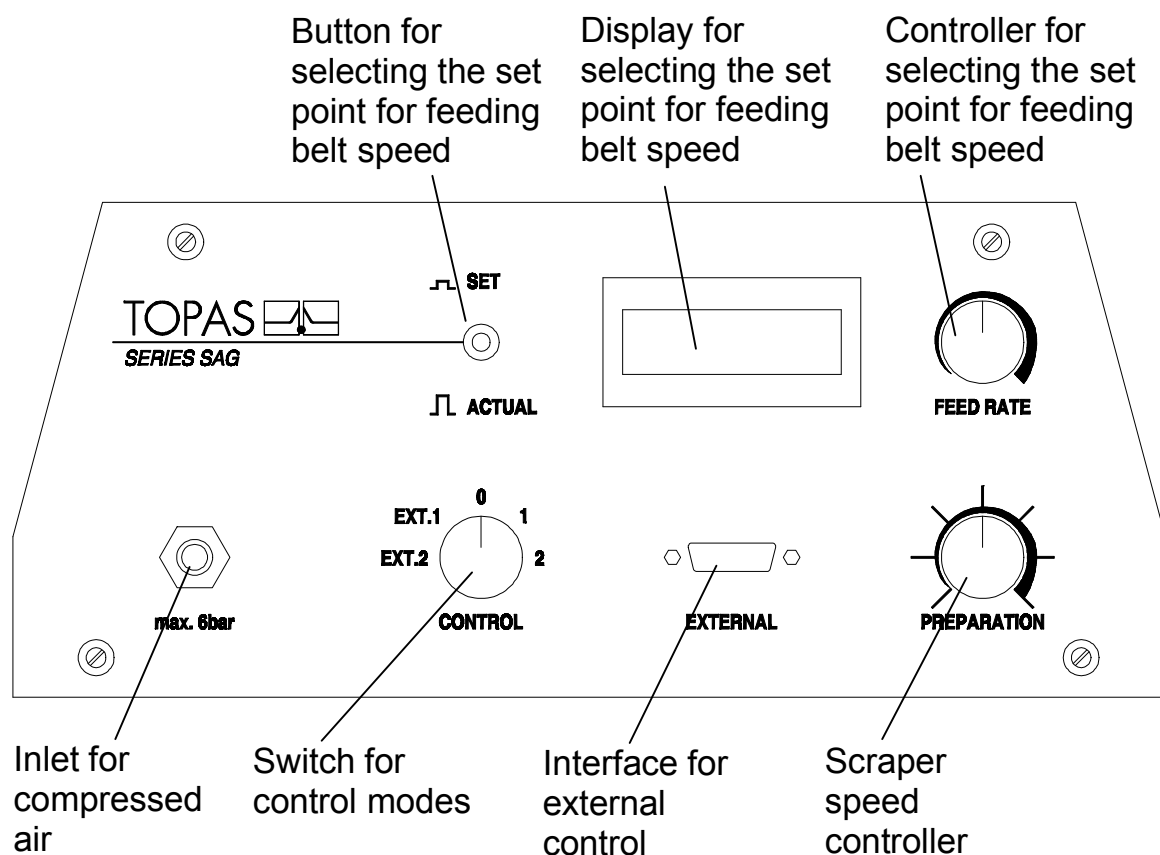


Figure 4: Front Panel of the SAG 410

### **Rotary switch “CONTROL” for Control Mode**

To choose one of the five control modes the rotary switch “CONTROL” must be set in one of the five positions which are described in following table.

0	All components are switched off. The display shows the value „0“. By pushing the button „ACTUAL/ SET“ the last selected set value for the belt speed will be displayed. It can be changed by moving the turning knob „FEED RATE“ while pushing the button „ACTUAL/ SET“.
1	Scraper and dispersing unit are switched on. The scraper speed can be selected with the turning knob „PREPARATION“. Change the volumetric flow by setting the inlet pressure.
2	Additional to mode „1“ the feeding belt is working. The pre-adjusted set value for the belt speed is set and is shown in the display. It can be changed by using the turning knob „FEED RATE“.
EXT.1	All components are switched off. By using an external switch the scraper and the feeding and dispersing unit can be switched on via the interface. The device is working according to the set values preadjusted in control mode “1”. For configuration of an external controller the interface is described in the appendix of this manual.
EXT.2	All components can be controlled by using an external controller via the interface. For configuration of an external controller the interface is described in the appendix of this manual.

### **Button „ACTUAL/SET“, Display and Turning Knob „FEED RATE“ for Feeding Belt Speed**

The button „ACTUAL/SET“ is used to operate the display. When pressing this button the preselected set value for the feeding belt speed is shown on the display. That means the set value can be pre-selected even in the control modes „0“ and „1“ (feeding belt switched off). For this reason the button „ACTUAL/SET“ has to be pressed and at the same time the turning knob „FEED RATE“ is adjusted. During dosing the accordance of actual value and set value can be checked by pressing the button.

### **Turning Knob “PREPARATION”**

Scraper speed can be selected with the turning knob “PREPARATION”. The optimum value depends on the properties of the powder. It can be found out by some tests.

---

**Important:** *The segments of the feeding belt must be constantly filled by the scraper. Check this fact visually by removing the rear panel during the SAG 410 is operating. Do not touch moving parts in the powder reservoir.*

---

### **Compressed Air Supply**

The compressed air supply can be connected to the inlet on the front panel of the powder disperser.

---

**Caution:** *Do not connect a compressed air supply with more than 6 bar ( $6 \times 10^5$  Pa) operation pressure.*

---

With the pressure regulator, which is part of delivery, the injector-pressure can be adjusted to get a good dispersion of the powder. If the injector-pressure decreases below 1 bar ( $1 \times 10^5$  Pa) the controller stops any action of the feeding belt because the injector in such conditions can not take up and disperse the feeded powder.

### **Interface for External Controlling – “EXTERNAL”**

Via the interface on the front panel of the SAG 410 the powder disperser can be externally controlled. For this operation the switch “CONTROL” must be set on “EXT.1” or “EXT.2”. One can find the description of the interface in the appendix.

### **3 Operation and Maintenance**

#### **Packing**

After unpacking the completeness of the consignment should be checked.

The standard scope of supply comprises:

- SAG 410
- Mains cable
- Pressure regulator
- Quick coupling
- Allen wrench
- Instruction manual

Please contact Topas GmbH if any items are missing or appear to be damaged.

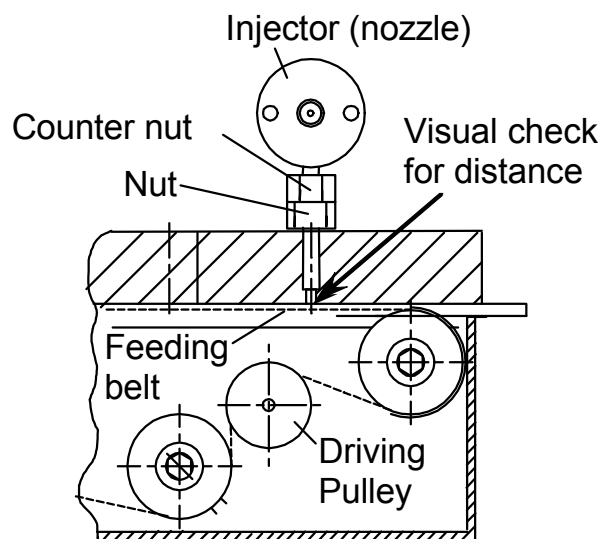
## Operation

1. Place the SAG 410 on even and rigid surface.
2. Mount the injector into the feeding unit and fix it with the knurled screw.  
Check visually that injector inlet does not touch feeding belt (distance 0.5...1 mm).

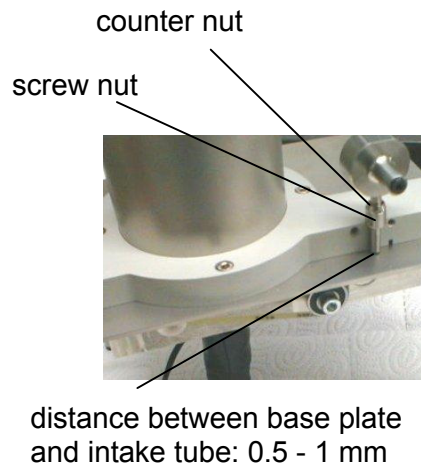
---

**Important:** *The injector must not be in contact with the feeding belt (Danger of blocking the feeding belt). Before delivery nut and counter nut are adjusted by the manufacturer. Their position has not to be changed by the user.*

---



**Important:** Do not change these settings.



3. Check the connection of the protection wire to the dispersing unit (injector) before operating the aerosol generator. Connect the power cord first to the instrument before connecting to the power supply.

---

**Caution:** *During operation electrostatic charging is possible. Before operation check the proper attachment of the protective earthing conductor (designated by the green-yellow insulation) to the dispersing nozzle.*

---



4. Connect the compressed air supply.

---

**Caution:**     *The inlet pressure must not be higher than  
6 bar ( $6 \times 10^5$  Pa).*

---

## **Maintenance**

After operation the instrument (SAG) must be carefully cleaned. It can be done in the following way:

1. Switch off the instrument and disconnect the power supply.
2. Remove the injector from the feeding unit.
3. Dismount the scraper (unscrew the 2 knurled screws; adjust the scraper for pulling it out and remove the scraper).
4. Discharge the scraper vessel.
5. Dismount the scraper vessel (see “Dismounting and Mounting the Scraper and Scraper Vessel”)
6. Unscrew the 4 knurled screws of the rear panel and remove it.
7. Clean all components by using a rag, a brush or a vacuum cleaner.
8. Blow out the injector/dispersing unit with compressed air.
9. Mount all components again.

### *Injector*

After long operation periods the injector should be checked for damages caused by erosion. The life time of the injector depends of the properties of the dispersed powders. If the aerosol material is not extracted completely from the feeding belt, then check if the injector is worn out and has to be replaced by a new one.

New injectors can be ordered from Topas GmbH.

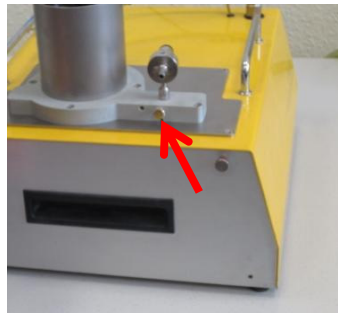
## Dismounting and Mounting Feeding and Dispersing Unit

For cleaning the feeding and dispersing unit or for changing it against another having different feeding range the Feeding and Dispersing unit can be dismantled.

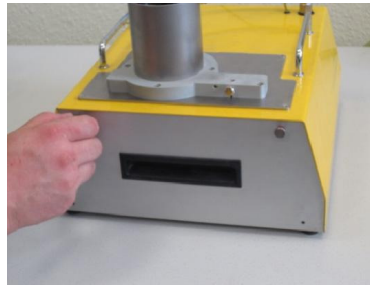
This can be done in following steps:

1. Pull out the mains cable.  
Dismount compressed air hose and protective earthing conductor from the dispersing nozzle (injector).

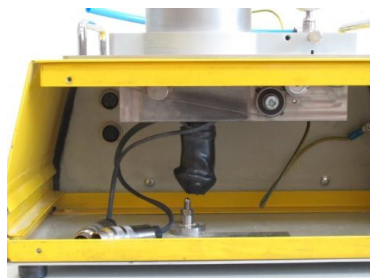
2. Dismount the dispersing nozzle (injector) by unscrewing the knurled screw.



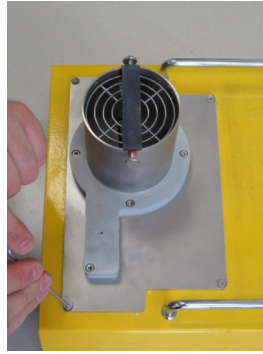
3. Unscrew the 4 knurled screws of the rear panel and remove it.



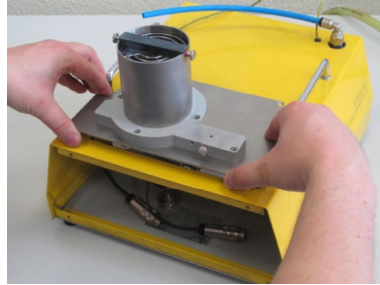
4. Pull out both control wires placed inside the powder disperser.



5. Unscrew the screws on the upper side of the feeding unit.



6. Remove the feeding and dispersing unit.



Mounting the feeding and dispersing unit can be done with the same steps in reverse order.

### **Dismounting and Mounting Scraper and Scraper Vessel**

For inspections or cleaning the scraper it can be dismounted in following steps:

1. Dismount the scraper by unscrewing the two knurled screws on the top of the scraper vessel.
2. Dismount the injector (unscrew the knurled screw).
3. Unscrew the 5 allen screws at the flange of the feeding and dispersing unit by means of the provided allen wrench.
4. Remove the complete scraper vessel with flange.

When mounting the scraper make sure that the input shaft extension (journal) is in the right position. The scraper should be inserted before the screws of the flange are finally tightened (to avoid tensions between scraper and vessel)

### **Transport**

The SAG 410 is a very compact, rugged and reliable instrument which can be easily transported by using the handles on the top of the generator.

Protection of the dispersing unit (injector) during the transport is recommended by the manufacturer.

## 4 Feeding and Dispersing

### Operation of the SAG 410

---

**Caution:** *Check the connection of the protection wire (green/yellow coloured) to the dispersing unit (injector) before operating the aerosol generator. If the aerosol should be generated into a duct or something like that, this apparatus also should be protected accordingly.  
The exhaust system must be switched on.*

---

1. Connect the power supply and the compressed air supply to the SAG 410.
2. Switch on the SAG 410.
3. Fill the powder into the scraper vessel.
4. Install the injector into the feeding unit. Check the proper attachment of the protective earthing conductor to the dispersing nozzle.
5. Turn the rotary switch "CONTROL" on position "1". The scraper starts now and its speed can be adjusted with the turning knob "PREPARATION".
6. Adjust the inlet pressure to more than 1 bar ( $1 \times 10^5$  Pa), otherwise the feeding unit is blocked by safety control mechanism.  
Characteristics of the nozzles (Flow rate vs. pressure): see Appendix of this manual.
7. Choose the feeding belt speed (0 ... 100%) by simultaneously pushing the button "ACTUAL/SET" and adjusting the controller "FEED RATE". For defined feeding masses, the SAG must be calibrated with the needed powder (see chapter "Calibration").
8. Turn the rotary switch "CONTROL" on position "2". The feeding belt starts with feeding the powder. The scraper and the belt speed can be controlled by using the turning knobs "PREPARATION" and "FEED RATE".

### ***Stopping the Aerosol Generation***

1. Turn the rotary switch "CONTROL" on position "0". Feeding unit, scraper and compressed air supply are switched off in this position.
2. Close or disconnect the external compressed air supply.
3. Switch off the power switch.

## Calibration of the Feeding Unit

The feeding mass of the powder is defined by the belt speed and the powder bulk density. That's why the user must determine the dependency between belt speed and feeded mass for every new powder themselves.

A solution for calibration of the SAG 410 is to disperse the powder with various belt speeds in a special channel with a suitable filter (see Figure 5). The dependency between the mass flow and the belt speed can be calculated by determining the mass changes of the filter. For calibrating the SAG 410 following steps are recommended:

1. Determine the mass of a suitable filter.
2. Insert the filter into the channel.
3. Generate aerosol into the channel with one belt speed and measure the time.
4. Determine the filter mass again and note the data in following table.
5. Repeat this routine with the subsequent belt speeds.

Belt Speed [%]	Primary filter mass [g]	Measuring time [s]	Filter end mass [g]	Differential mass [g]
25	30	300	45	15
40	...	...	...	...
...				
...				
...				
...				

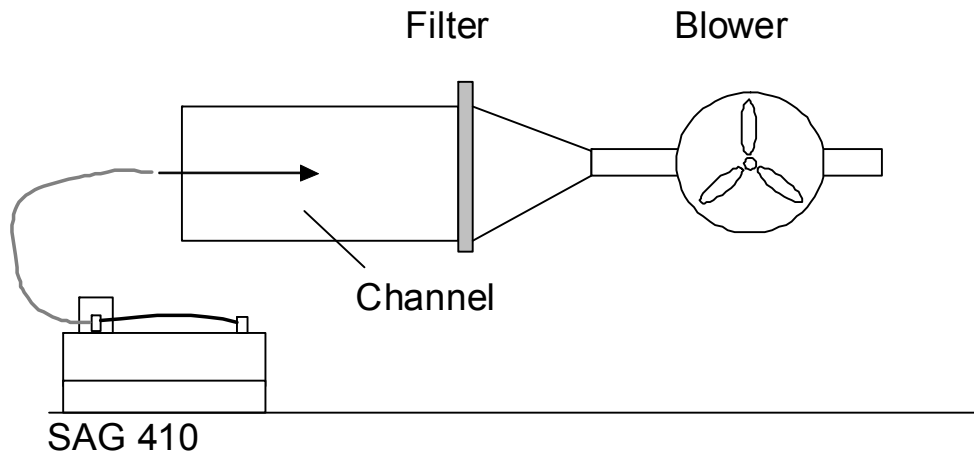


Figure 5: Apparatus for Calibration of the SAG 410

Once all calibration data is determined it should be shown as a calibration function in a diagram. Figure 6 shows an example of such a calibration function for some powders.

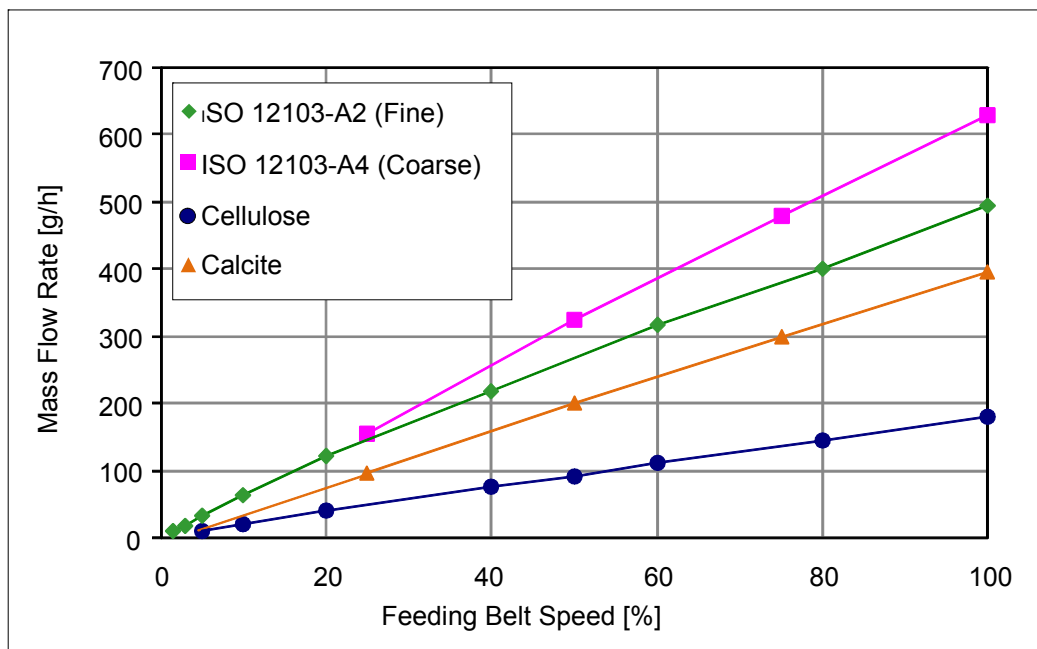


Figure 6: Calibration Functions for several powders (Model SAG 410)



## 5 Troubleshooting

Problem	Possible Cause	Suggested Solution
Display does not light after switching	No power supply	Check Power supply
	Fuse faulty	Change the fuse
	Control unit fails	Contact Topas service
Feeding belt does not work	Inlet pressure <1 bar	Adjust the inlet pressure to more than 1 bar
	Feeding unit faulty	Contact Topas service
	Feeding belt blocked by material transport	Cleaning, material unsuitable?
	Feeding belt blocked by injector inlet	Adjust distance between injector inlet and feeding belt
Injector does not completely empty the feeding belt	Injector not mounted well	Check the installation of the injector
	Compressed air supply to the injector is loose	Check the tightness of the tube connection
	Unsuitable powder	Use another powder
Scraper and feeding belt do not work and a beep sound is heard	Scraper or feeding unit overloaded	Check the scraper and feeding belt, reset the rotary switch "CONTROL" in position "0" or switch off the SAG for operating it again
Scraper does not work	Scraper faulty	Contact Topas service



## 6 Specification

### Technical Data

Reservoir filling level	400 cm <sup>3</sup> (SAG 410 and SAG 410/L) 1420 cm <sup>3</sup> (SAG 410/H)
Maximum particle size	200 µm
Nonstop operation without refilling *)	0.8 ... 44 h (SAG 410)
Compressed air supply	min. 1 bar / 100 kPa max. 6 bar / 600 kPa
Power supply	100 ... 260 V AC 47...63 Hz
Fuse	2 x 4 F
Size (WxDxH):	
SAG 410	320 x 400 x 267 mm
SAG 410/H	320 x 400 x 325 mm
Weight SAG 410 and SAG 410/L	Approx. 10.4 kg
Weight SAG 410/H	Approx. 12.2 kg
Weight feeding and dispersing unit SAG 410 and SAG 410/L	Approx. 2.3 kg
Weight feeding and dispersing unit SAG 410/H	Approx. 4.1 kg

\*) depends on belt speed

**Feeding Ranges**

Type	SAG 410/L	SAG 410	SAG 410/H
Powder volume flow	2...260 cm <sup>3</sup> /h	9...520 cm <sup>3</sup> /h	120...6487 cm <sup>3</sup> /h
Powder mass flow**)	2...245 g/h	9...490 g/h	114....6162 g/h
Aerosol flow rate	1...4 m <sup>3</sup> /h	1...4 m <sup>3</sup> /h	5...20 m <sup>3</sup> /h
Powder concentration	0.5...245 g/m <sup>3</sup>	2...490 g/m <sup>3</sup>	6...1230 g/m <sup>3</sup>

*\*\*)* depends on bulk density (here calculated for AC-Fine-Dust, 0.95 g/cm<sup>3</sup>)

**Accessories**

- dispersing unit (injector)
- feeding unit (with or without dispersing unit)
- remote control unit RCU 411

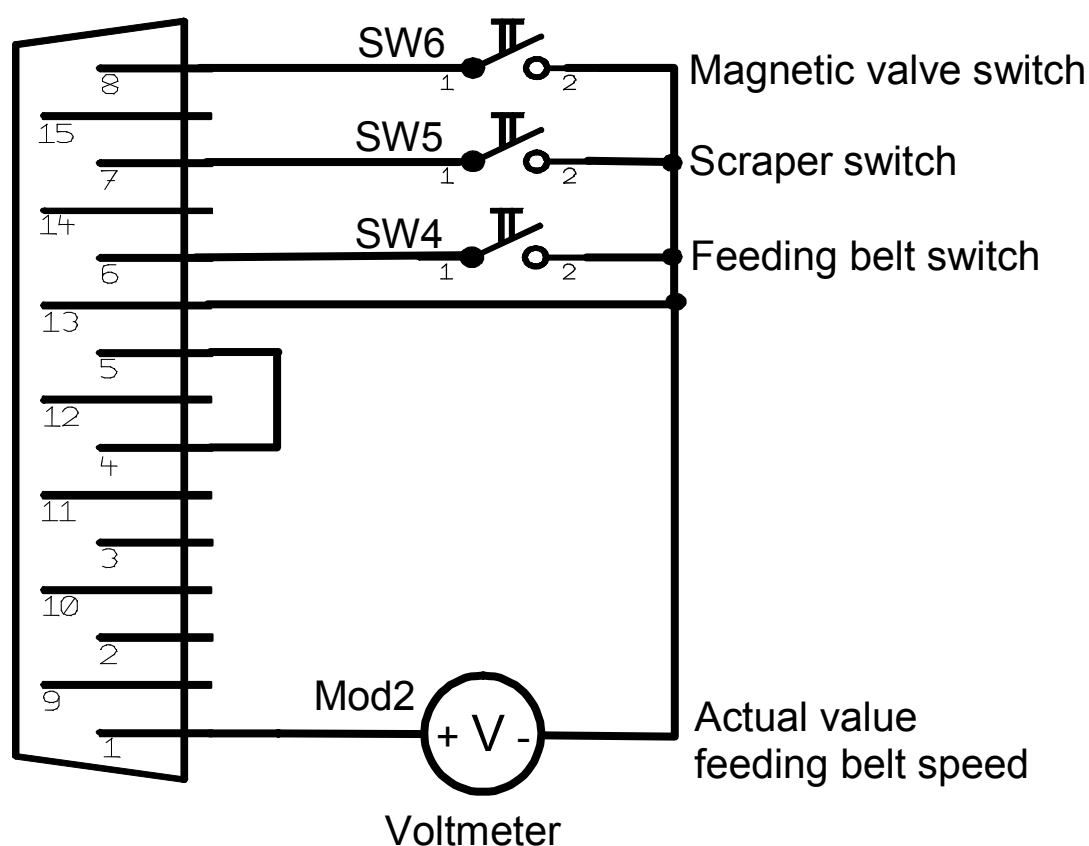
## 7 Appendix

### Option Remote Control

#### **Example 1 for Setting External Control via Interface**

Control Mode „EXT.1“ (Switching ON/OFF)

(Rotary switch „CONTROL“ in position „EXT.1“)



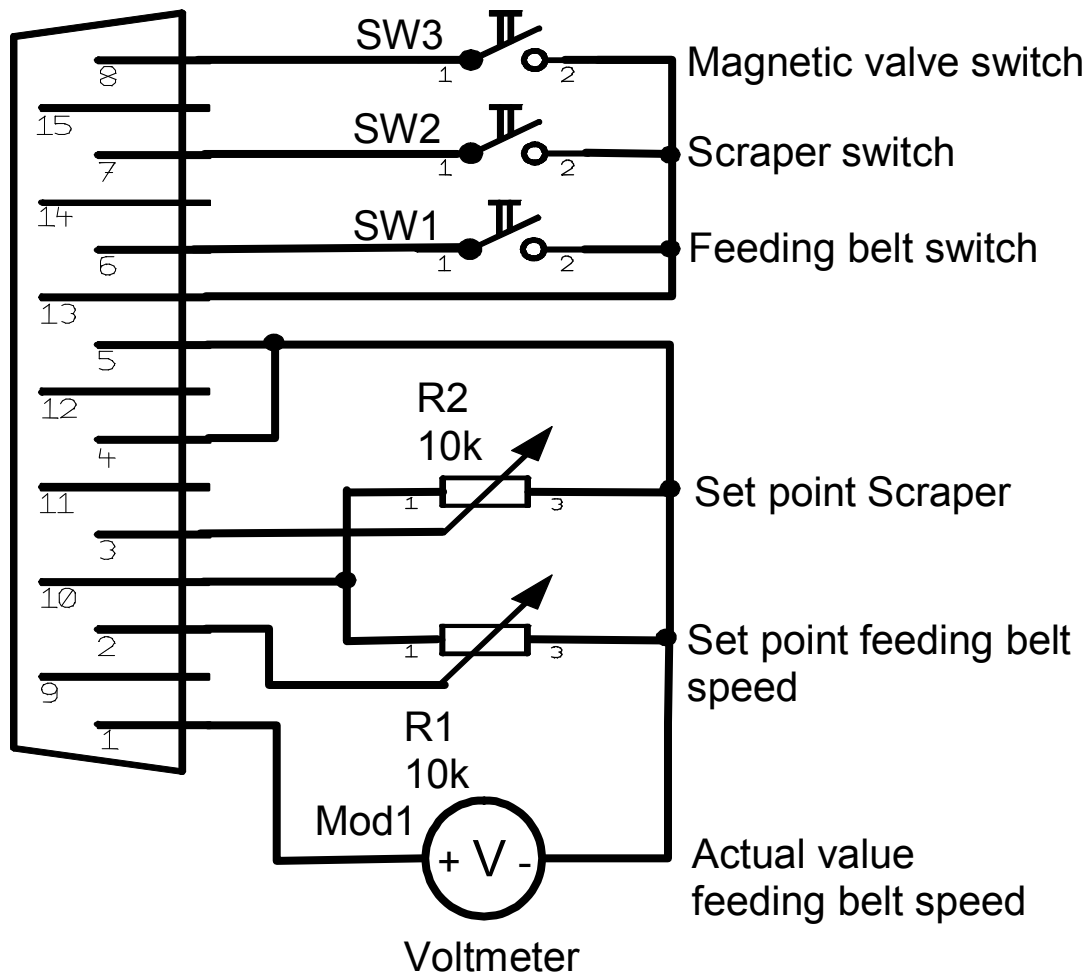
#### D-SUB-Socket 15Pins

Setpoint values for feeding belt speed and scraper speed are transferred from the turning knobs „FEED RATE“ and „PREPARATION“ (at the front panel of the device).

**Example 2 for Setting External Control via Interface**

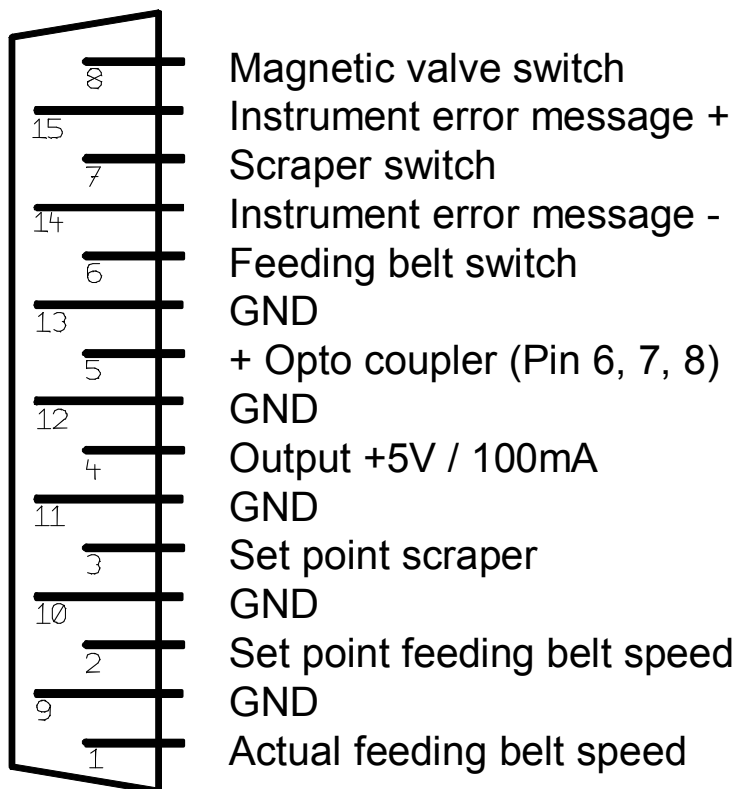
Control Mode „EXT.2“ (complete control)

(Rotary switch “CONTROL” in position “EXT.2”)



D-SUB-Socket 15Pins

## Description of the Interface (D-SUB-Socket 15 Pins)



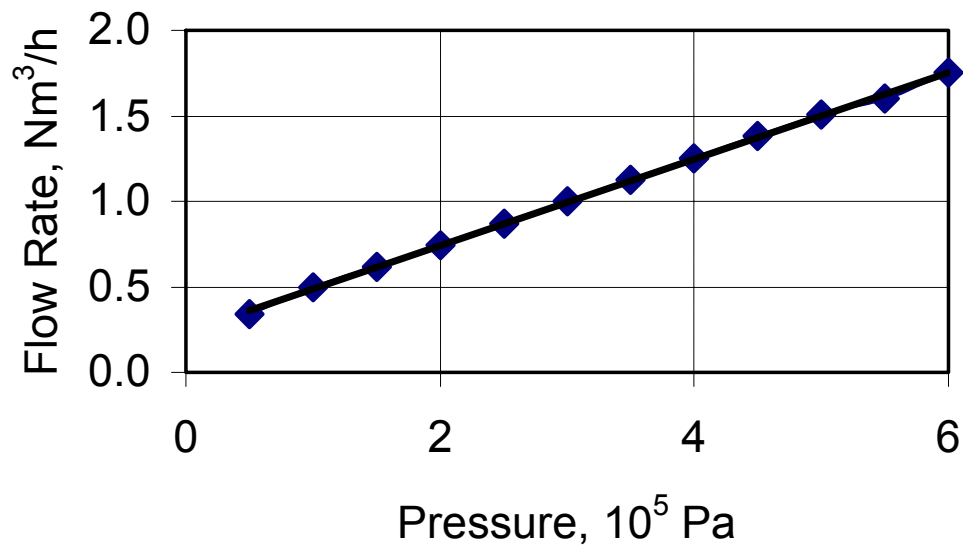
**Specifications for Interface (D-SUB- 15 Pins)**

<b>Pin-No.:</b>	<b>Name:</b>	<b>Level:</b>	<b>Information:</b>
1	actual feeding belt speed	0 ... 4,5 V ⇒ 0 ... 100%	R <sub>min</sub> 1 kΩ
2	set point feeding belt speed	0 ... 5 V	max. 30 V
3	set point scraper	0 ... 5 V	max. 30 V
4	supply	+5 V / 100 mA	
5	common + Pin for optocouplers (Pin 6, 7, 8)	5 ... 24 V	
6	feeding belt switch		potential free via optocoupler
7	scraper switch		potential free via optocoupler
8	magnetic valve switch		potential free via optocoupler
9, 10, 11, 12, 13	GND - Reference		
14, 15	potential free instrument error message -, +	10 mA, max. 30 V	instrument error = circuit closed

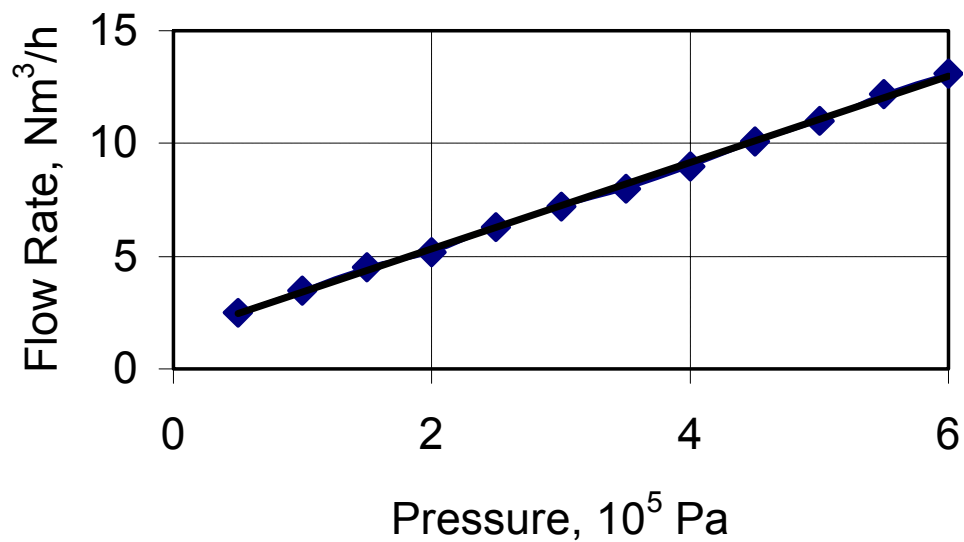


## Characteristics of the Injectors

### *Standard Nozzle (SAG 410)*



### *High Flow Nozzle (SAG 410/H)*



## **Disposal of End-of-Life Equipment**

End-of-life equipment has to be decontaminated in an appropriate professional manner.

Disposal must be handled according to legal provisions especially for electrical and electronic equipment as well as according to special local regulations and recycling instructions.

Waste electrical and electronic equipment can be returned to the manufacturer only with an attached completed declaration of decontamination. Topas GmbH will not bear any shipping costs.

## EC Declaration of Conformity

TOPAS 

SOLID AEROSOL GENERATOR SERIES SAG 410

### EG-Konformitätserklärung

Hiermit erklären wir, dass der oben bezeichnete Staubgenerator in der von uns in Verkehr gebrachten Ausführung folgenden EG-Richtlinien entspricht.

Maschinenrichtlinie 2006/42/EG vom 17.5.2006

Angewandte harmonisierte Normen: EN ISO 12100:2010

Richtlinie Elektromagnetische Verträglichkeit 2004/108/EG vom 15.12.2004

Angewandte harmonisierte Normen: EN 61000-6-1:2007  
EN 61000-6-3:2007

Die Schutzziele der Niederspannungsrichtlinie wurden gemäß Anhang I, Nr. 1.5.1 der Maschinenrichtlinie eingehalten.

Bei einer mit uns nicht abgestimmten Änderung am Gerät verliert diese Erklärung ihre Gültigkeit.

### EC Declaration of Conformity

We confirm that the conception and the design of the Solid Aerosol Generator Series SAG 410 meet the requirements of the following guidelines of the European Community (EC).

EC-Directive machinery 2006/42/EG (17 May 2006)

Harmonizing standards: EN ISO 12100:2010

EC-Directive for electromagnetic compatibility 2004/108/EG (15 December 2004)

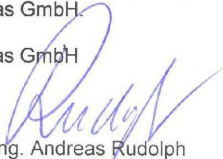
Harmonizing standards: EN 61000-6-1:2007  
EN 61000-6-3:2007

The safety objectives of the Low Voltage Directive in accordance with Annex I, No. 1.5.1 of the Machinery Directive are satisfied.

This declaration is no longer valid if the device has been modified without a written permission of the Topas GmbH.

Topas GmbH

Dresden, 21.05.13

  
Dr.-Ing. Andreas Rudolph  
Geschäftsführer  
Managing Director



Topas GmbH  
Technologie-orientierte  
Partikel-, Analysen- und Sensortechnik  
Oskar-Röder-Straße 12 · D-01237 Dresden

Telefon +49 (351) 21 66 43 - 0  
Fax +49 (351) 21 66 43 55  
E-Mail [office@topas-gmbh.de](mailto:office@topas-gmbh.de)  
Internet [www.topas-gmbh.de](http://www.topas-gmbh.de)

