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# TORnado SF91

# User Manual

## Copyright



**Version 0211_02_EN**

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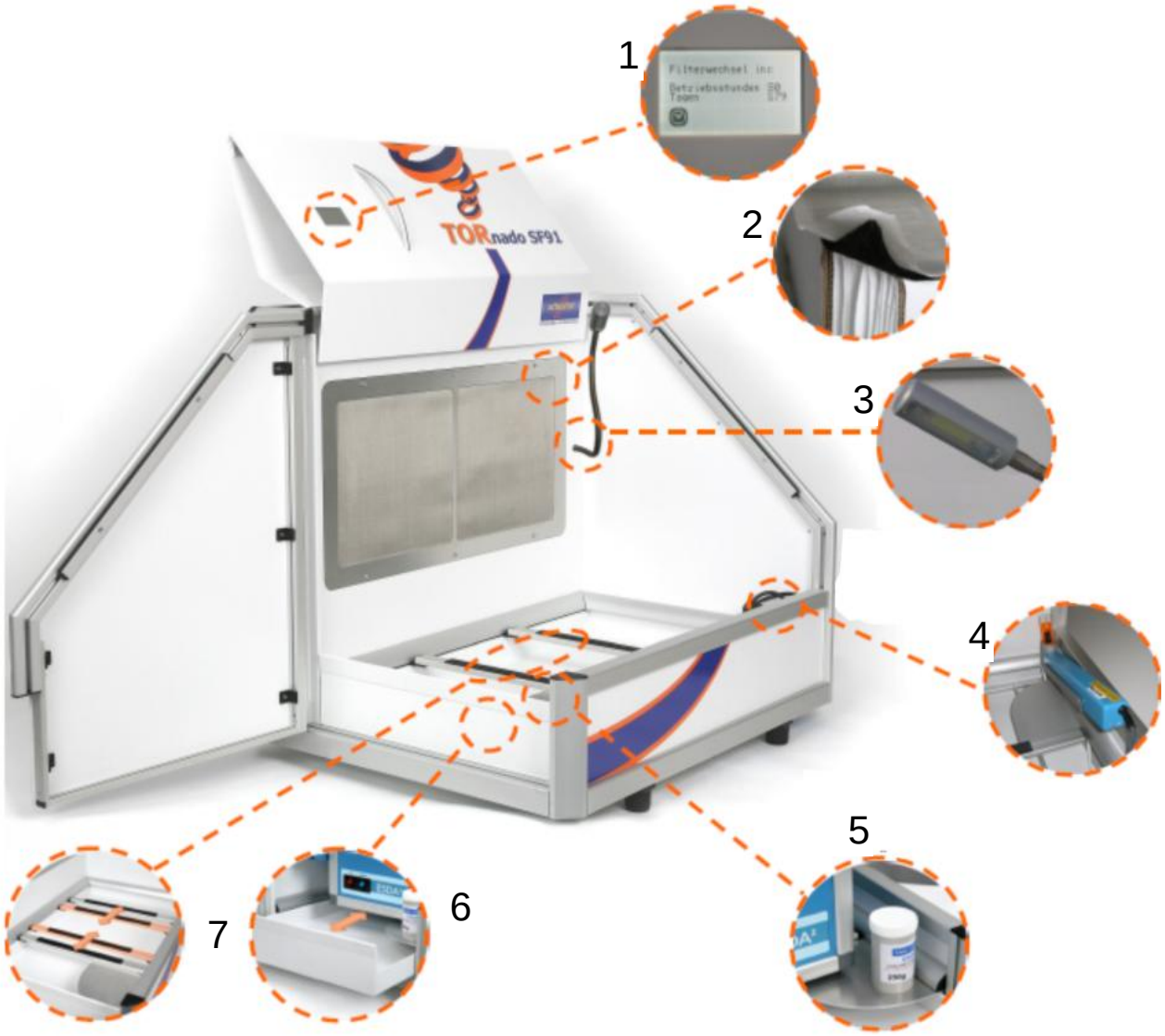
# 1 System Overview




| | |
|---|---|
| 1 | Touchpanel Control |
| 2 | Particulate and Activated Carbon Filter |
| 3 | Integrated Illumination Module (optional) |
| 4 | Mains Supply and Tray for Corona |
| 5 | Rack for Cascade Developer and TAD |
| 6 | Catch Tray for Cascade Beads and Toner |
| 7 | Adjustable Support Rails |

## 1 Touchpanel Control

The microcontroller of the ***TORnado SF91*** communicates with the user via a touchpanel. The functions are controlled by simply pressing an icon on the display. Do not use any sharp touch pens or similar for operation.

## 2 Particulate and Activated Carbon Filter

***TORnado SF91*** uses a combination of stainless steel mesh, activated carbon filter and a particulate filter cassette type F9.
The filter cassette must be replaced after 125 hours of operation or no later than 12 months after installation (see page 21).

## 3 Integrated Illumination Module (optional)

***TORnado SF91*** offers an integrated LED-array based illumination module as an optional extra. It can be operated automatically by the process or manually by the user.

## 4 Mains Supply and Tray for Corona

For powering the ESD, ***TORnado SF91*** provides a mains supply inside the enclosure. The corona is safely stowed in a convenient tray.

## 5 Rack for Cascade Developer and TAD

Also consumables as Cascade Developer or the TADs find a suitable storage in the ***TORnado SF91.***

## 6 Catch tray for cascade beads and toner

For easier cleaning the catch tray of the ***TORnado SF91*** can be easily pulled out without lifting the ESD. The tray has its lowest point at the front left corner, where a hole with a plug enables the user to feed the cascade beads back to the container.

## 7 Audjustable support rails

Stable, adjustable support rails enable the ***TORnado SF91*** to suit all common ESD systems available (see page 12).

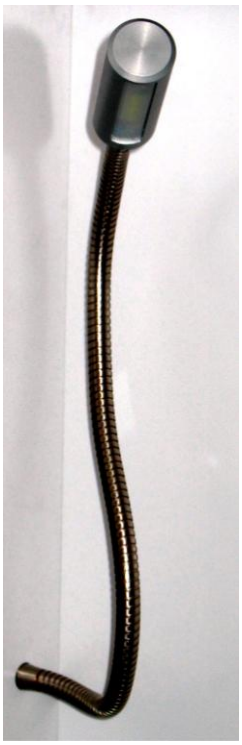
## 1.1 Power Supply


| | |
|---|---|
| Voltage requirements: | 110 – 230V AC / 50-60Hz |
| Current requirements: (without ESD) | approx. 0,5 A (1,0A on 110V) |
| Power requirements: (without ESD) | max. 120 W |

A power switch is situated on the back of the ***TORnado SF91*** next to the connector for the mains supply. The equipment can be switched off and on via the power switch. However the ***TORnado SF91*** is intended to remain switched on permanently, in order to run designated mini cleaning cycles from time to time (see page17).

## 1.2 Optional Accessories

### 1.2.1 Illumination Module BEL 91



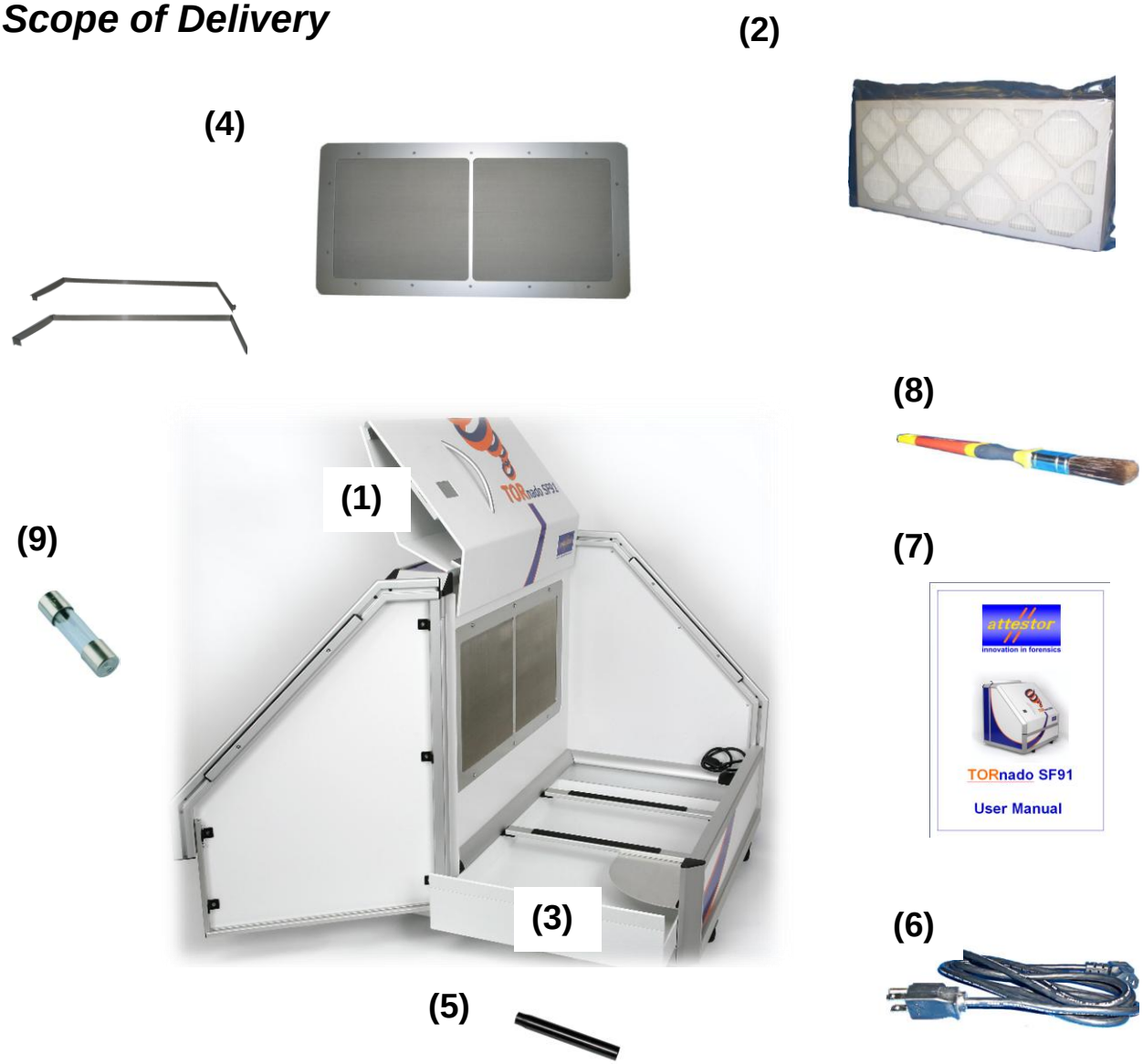
The optional illumination module consists of a white LED-array module mounted on a gooseneck assembly and fitted inside the ***TORnado SF91.*** It can be used for incident light as well as for sidelight. The lamp switches on automatically when any flap is opened and stays on for one more minute after the ESD has been switched off. The user can adjust or deactivate this automatic mode via the touchpanel (see page 14) and turn on/off the lamp manually (see page 17).

### 1.2.2 Wheeled Trolley FUG91

The optional trolley is made of the same aluminum profiles as the ***TORnado SF91*** and fits seamlessly. It has three shelf levels where the upper level is suitable to accommodate the ESDA-2 Humidifier. The working height of the document bed of e.g an ESDA-2 (of Foster+Freeman Ltd. UK) is approx. 80 cm (31.5“) when using the ***TORnado SF91*** on the wheeled trolley. Two of the casters can be fixed to ensure safe operation.

# 2 Setup and Positioning Guidance

## *2.1 Scope of Delivery*




| |
|---|
| 1x ***TORnado SF91*** **(1)** |
| 2x filter cassettes (2) |
| 1x catch tray (3) |
| 1x filter frame including two tension springs (4) |
| 1x plug for the catch tray (5) |
| 1x power cable (6) ( the appearance can vary from country to country) |
| 1x user manual (7) |
| 1x brush (8) |
| 5x spare fuses MT6, 3A (9) |

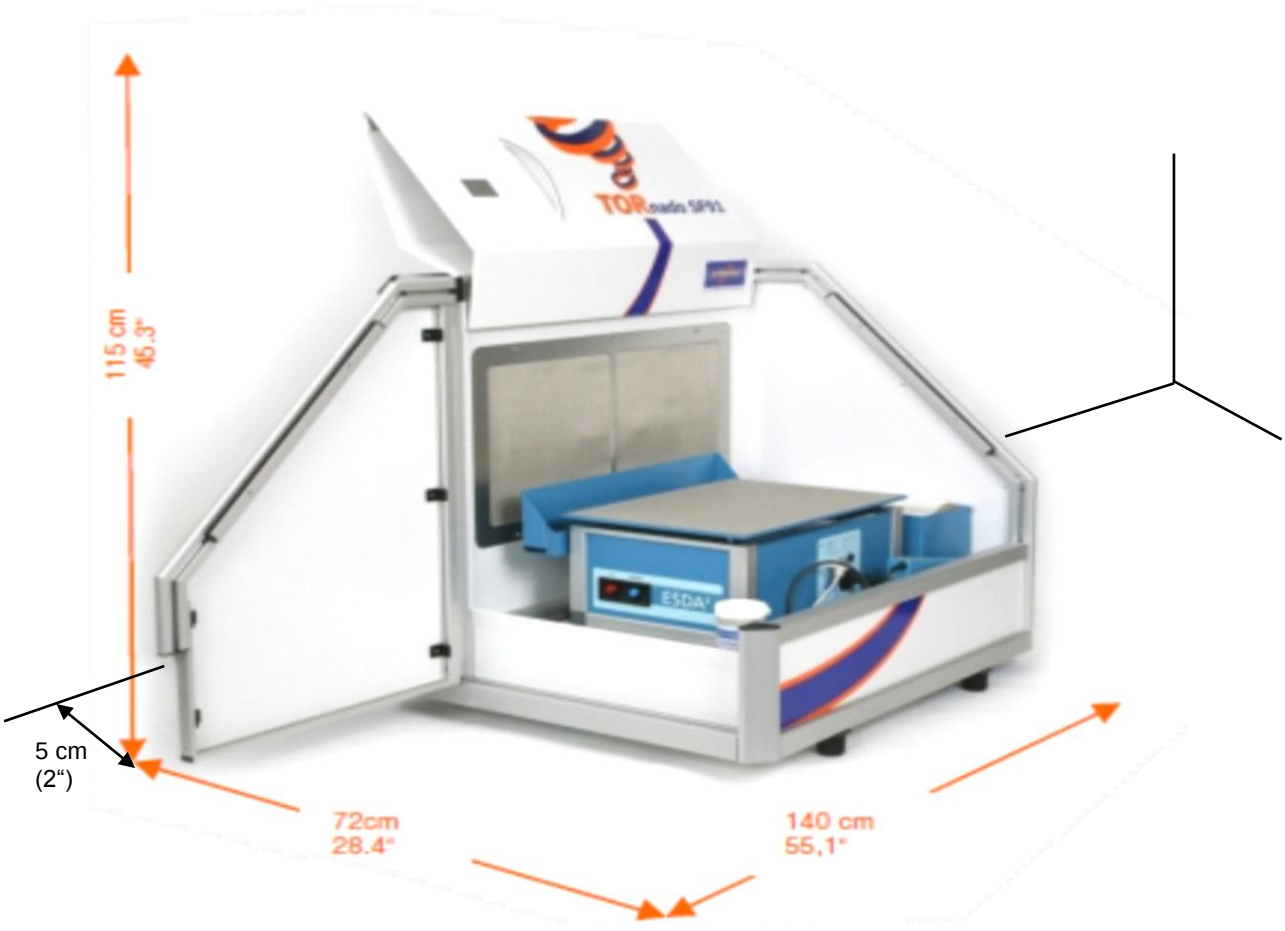
## 2.2 Guidance for Appropriate Positioning

- Unpack the ***TORnado SF91*** and set it up allowing a distance of 5 cm (2“) to the wall (see picture below).

- Set up the ***TORnado SF91*** leveled horizontally.

- The feet of the ***TORnado SF91*** are adjustable to compensate uneven surfaces

- ⚠ ***TORnado SF91*** is for indoor use only!



## 2.3 Inserting the Filter Cassette

1. Unpack the filter.

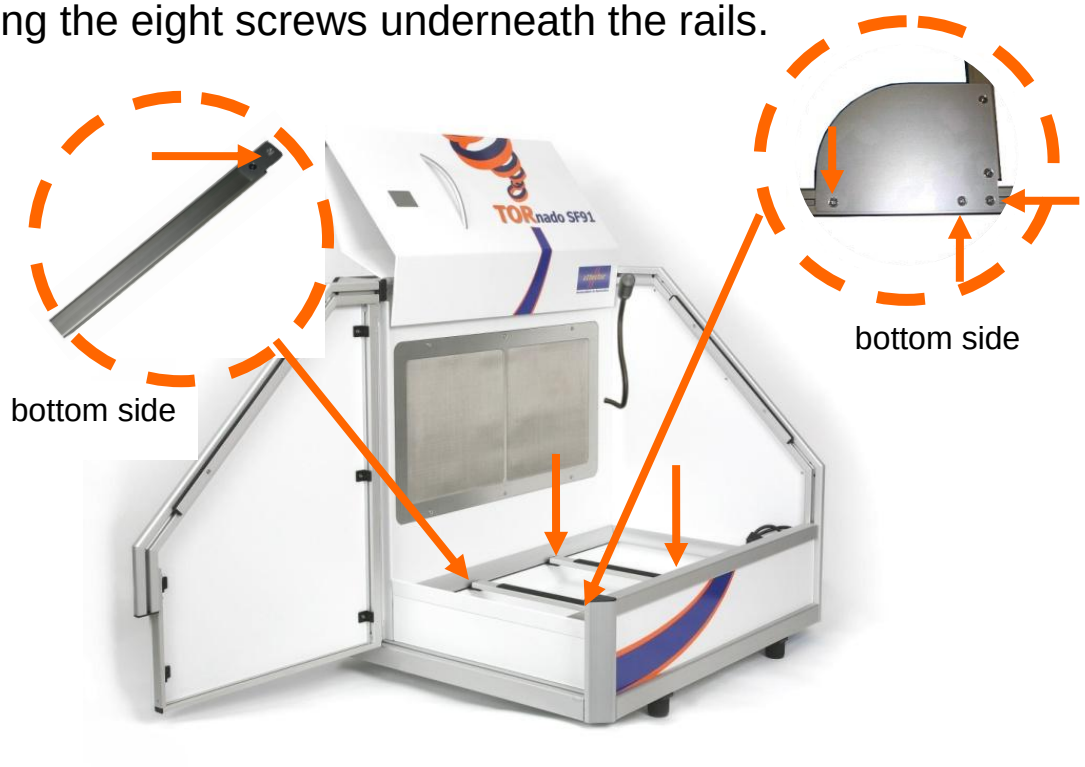
   Do not open the cardboard packing with a cutter knife!
   The filter cassette could be damaged by this.

2. Insert the filter cassette as outlined on page 20.

3. Reset the filter counter in the display. How to do this also see page 20.

## 2.4 Inserting the ESD

The support rails are preadjusted to accommodate the ESDA-2 of Foster+Freeman. For other ESDs the support rails can be adjusted using the eight screws underneath the rails.




- Place the ESDA on the support rails.
- Connect the ESD to mains supply provided inside the ***TORnado SF91*** and stow the Corona in the tray.
- Check the catch tray for clearance.
- Make sure it does not interfere with any cables.

## 2.5 Warning Remarks


Don´t pinch your fingers when operating any flaps.

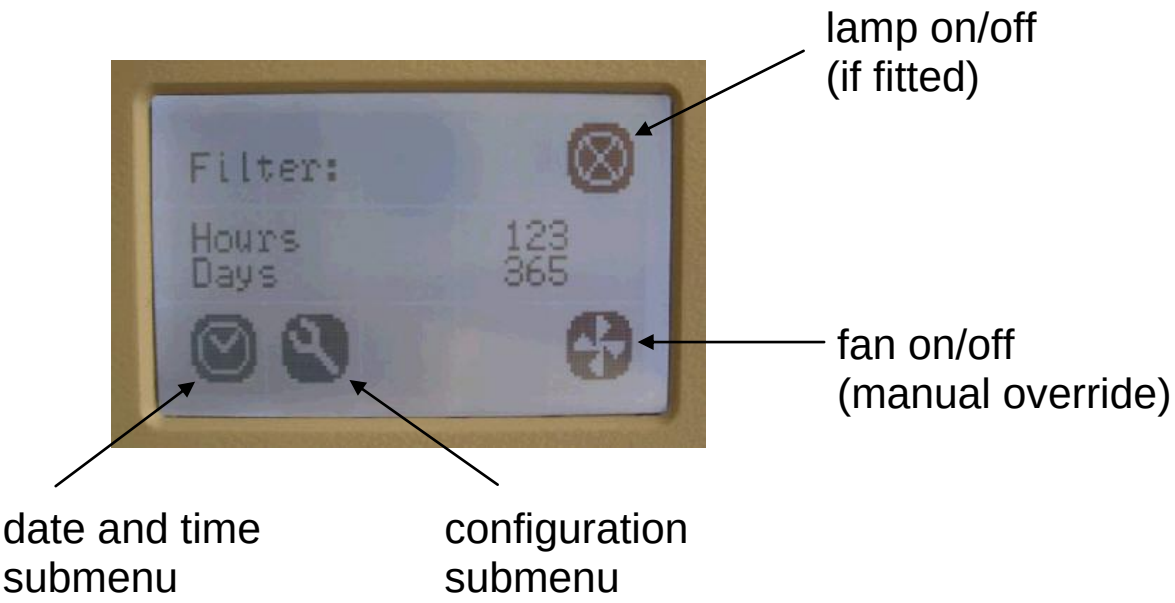

Connect only to mains supply with sufficient earthing.


Open and close the cover flap with care. Don´t let it drop.
Attention don´t pinch your fingers!

# 3 Touchpanel Control and Clock Adjustment

***TORnado SF91*** features a microprocessor system which communicates with the user via a touchpanel display in the cover flap. ***TORnado SF91*** has a counter for the operating hours and informs the user when a filter change is due.

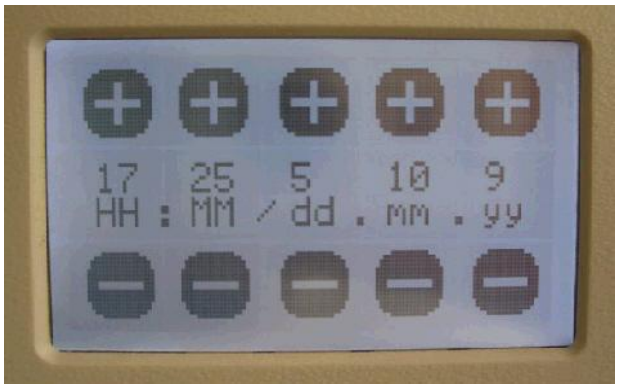
The following functions can be controlled via the touchpanel display:




The display indicates a due filter replacement. For details refer to page 20.

To adjust the time and date, press ✓. The settings can be changed via + and -. Following after five seconds the display message (right) appears.

For storing the new time and date, please press ✓ . If you would like to reject the settings, please press ✗
For adjusting the time and the date, please press ⏲.




## 3.1 Configuration Submenu

When opening any flap of the **TORnado SF91** the fan starts automatically on half power. If no further action is made, the fan switches off again after a preset time. This can be adjusted in the confirmation submenu.

To access the confirmation submenu controlling, please press 


To set the switch-off time (in seconds) press SET Fan and select a time between 0-300 seconds by repeated pressing of SET. The default settings are 60 seconds.

To ensure a clean ambient air also in the standby mode, the **TORnado SF91** can be programmed for mini cleaning cycles which are performed when the flaps are closed.

To set these cleaning cycles, please press SET Purge. The cleaning cycle has a default setting to start at 5 a.m every morning. A cleaning at this time does not disturb the user, as a laboratory is usually not occupied at this time. The short cleaning cyle takes one minute. Alternatively the system can be set up to perform a mini cleaning cycle every 4 hours or not at all. To select the required setting press SET Purge several times.

To select the language of the touchpanel, please press SET Language and select the desired language by repeated pressing of SET.

For adjusting this time, please press SET Light and select a time of 0-300 seconds by repeated pressing. The default setting of the lamp is 60 seconds.

After switching off the ESD, the optional illumination module remains switched on for a preset time.

# 4 Step-By-Step Guide

If the two-sectioned cover flap or the side flap of the ***TORnado SF91*** is opened, a powerful fan is automatically activated (half speed) and creates an air stream above the document bed of the ESD. Once the user switches on the ESD, the fan speed is automatically increased to maximum. The air is then filtered through a stainless steel mesh and a particulate filter Type F9, a combination, specific for the Cascade Developer. Particulate activated carbon fleece, integrated into the filter cassette reduces ozone in the air stream.
But not only during operation of the ESD, also in closed status in 'stand by' ***TORnado SF91*** runs short filter cycles in regular intervals to create optimum conditions during storage. For cleaning or to collect cascade beads, a catch tray can be pulled out without having to lift the heavy ESD equipment. ***TORnado SF91*** features a microprocessor system which communicates with the user via a touch panel display in the cover flap. This runs a counting backwards filter counter for the operating hours and informs the user when a filter change is due. If the maximum filter capacity is reached, ***TORnado SF91*** automatically switches off the fan as well as the power and inidcates the replacement of the filter.

# 5 Service, Care, Cleaning and Maintenance

## *5.1 Service*

Refer all servicing to qualified personnel, authorised by Attestor Forensics.

Unauthorised servicing may void the warranty on this product.

## *5.2 Care*

Protect the ***TORnado SF91*** from damage and contamination. Do not subject the ***TORnado SF91*** to excessive mechanical shocks. Handle the mesh of the filter unit with care.

## *5.3 Cleaning*

Do not use abrasive cleaning materials or those containing strong acids or alkalis.
Do not allow the ingress of liquids and or other contaminants.

For cleaning the ***TORnado SF91*** especially of the interior surface and of the catch tray the use of an anti-static spray is recommended.

## *5.4 Maintenance*

### Covers

> ⚠ Do not remove any covers except during authorised maintenance.

### Filter Replacement

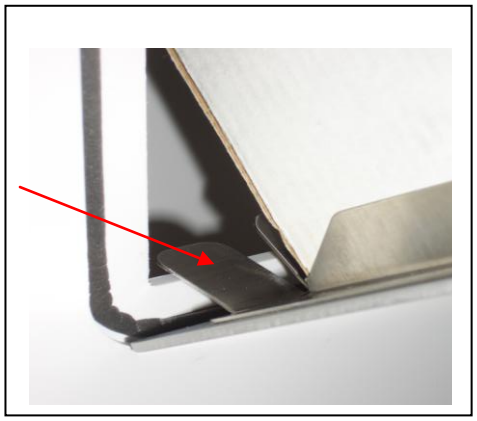
The lifetime of a particulate filter cassette is either 125 hours of solid ESDA operation, respectively 365 days standby (depending on which running time is first exhausted). After expiration of the filter capacity the ESD is being dropped out and the fan of the ***TORnado*** is being switched off.

1. Pull out the filter unit carefully from the filter tray, so that the sensitive filter grid doesn´t interfere with the ESDA. Place the filter unit with the mesh facing down on the edge of a table, so that the unit sits flat on the surface and not on the knob.

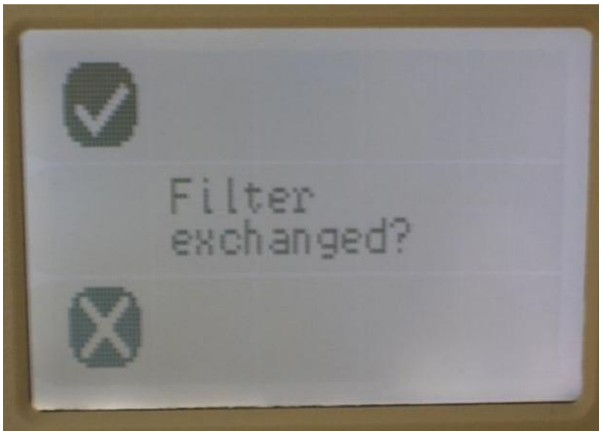
2. Remove the two clips on the frame of the filter unit by pressing and pulling. Newer versions might have a clip that can be opened by a buckle

3. Re-attach both clips again and re-insert the unit into the filter tray. Now reset the filter counter in the display.

4. Re-attach both clips again and re-insert the unit into the filter tray.



After replacement of the filter (see page 20) the following message appears:




When you replaced the filter cassette reset the filter counter by pressing ✓. If you did not replace the filter press ✗. The filter counter is not reset.

**Storage of New Filters**

The lifetime of the activated-carbon fleece and of the particulate filter cassette is 125 hours (respectively 12 months).
If the filter cassette (with the fleece) is taken out of the sealed packing, the efficiency of the activated-carbon filter process drops substantially after approximately 12 months due to interaction of the activated-carbon with the ambient air.

Filter cassettes which are sealed in foil do have a shelf time of approximately 5 years.

## Fuses

If the display of the ***TORnado SF91*** doesn´t turn on despite a turned on power switch (see page 7), a fuse might have been blown.

## Replacing Fuses

1. Switch off the ***TORnado SF91*** and remove the mains supply cable.

2. Lever out the fuse tray with a flat head screwdriver.

   ⚠ The fuse tray can only be moved when the power supply cord is taken off.


3. Remove the fuse tray and exchange the fuses. If you don´t have a tester to check the fuses, exchange both fuses. Now plug in the power supply again. If the mains fuse should release again, please contact qualified service personnel.

   ⚠ Never repair or bridge damaged fuses!

Attestor Forensics

**Attestor Forensics GmbH**
Ravensburger Str. 6
88410 Bad Wurzach
Germany

+49 (0)7564 949 838
+49 (0)7564 949 839
attestor@attestor-forensics.com
www.attestor-forensics.com