



OUTDOOR
AIR QUALITY



INDUSTRIAL
EMISSIONS

Compliant with:
VDI 2066 Part.10, EN 13284-1,
EN 12341, ISO 23210-2009

Stack Impactors and Air Quality

Multistage Impactor
PM₁₀ PM_{2.5} PM₄ and PM₁ mod. MSSI

MAIN FEATURES

- ⌚ Multi-stage cascade impactor for emissions.
- ⌚ Complies with VDI 2066 Part. 10 to EN 13284-1, EN 12341 and ISO 23210-2009.
- ⌚ 3 particulate fractions on the same sample:

2 Stage Version

- PM₁₀ ➤ PM_{2.5}
- PM₄ ➤ Total

3 Stage Version

- PM₁₀ ➤ PM_{2.5}
- PM₄ ➤ PM₁
- Total

- ⌚ Material in contact with the sample:
Titanium (AISI 316 stainless steel version available)

**2 and 3
Stage Versions**



Fig.1 Assembled Impactor with nozzle and cone for sampling in vertical position



Fig.2 Assembled Impactor with nozzle for sampling in horizontal position

In order to meet the growing interest in fine particulate measurement and the progressive reduction of emission concentrations, **TCR TECORA®** has added to the already well established range of cyclones, manufactured according to the design provided by USEPA, the new multistage cascade impactor model **MSSI**.

The **MSSI** impactor is manufactured according to the design proposed by the **VDI 2066 Part.10** method and the **EN 13284-1** standard for reducing dust deposits on the walls and complies with the **EN 12341** standard on the "gravimetric reference method for determining the mass concentration of suspended particulate matter PM₁₀ or PM_{2.5}".

It also complies with the **ISO 23210-2009** method.

The use of filter cassettes avoids filter handling in the field.

The impactor can be supplied with two different inlet cones to allow both vertical and horizontal positioning with respect to the direction of origin of the gaseous flow in the duct (fig. 1 and 2).

The impactor is sized for a high sampling rate, approximately 2.3m³/h depending on the emission characteristics, to reduce sampling times and to be used with ambient PM heads.

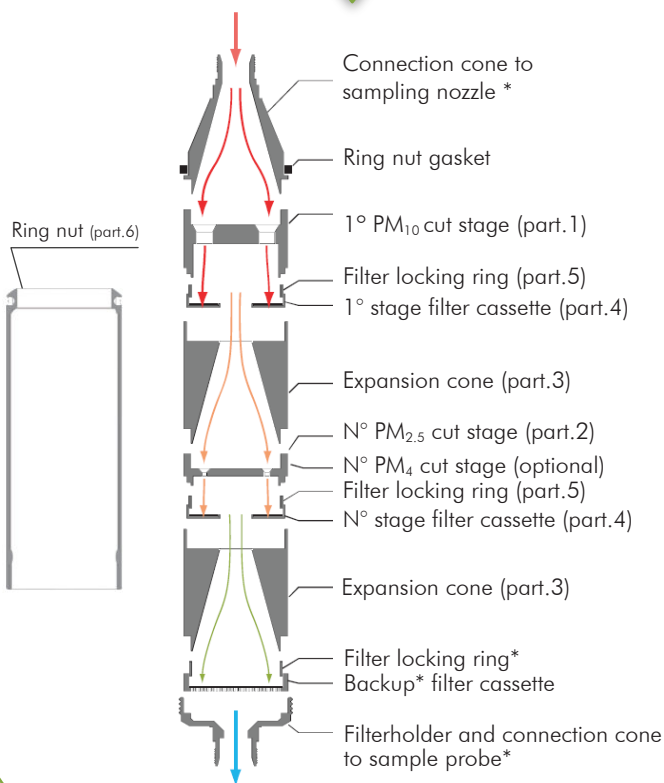
The software for calculating the sampling rate, nozzle and other factors to optimise the quality of the measurement is supplied.





Multistage Impactor PM₁₀ PM_{2.5} PM₄ and PM₁ mod. MSSI

2 Stage Version



3 Stage Version

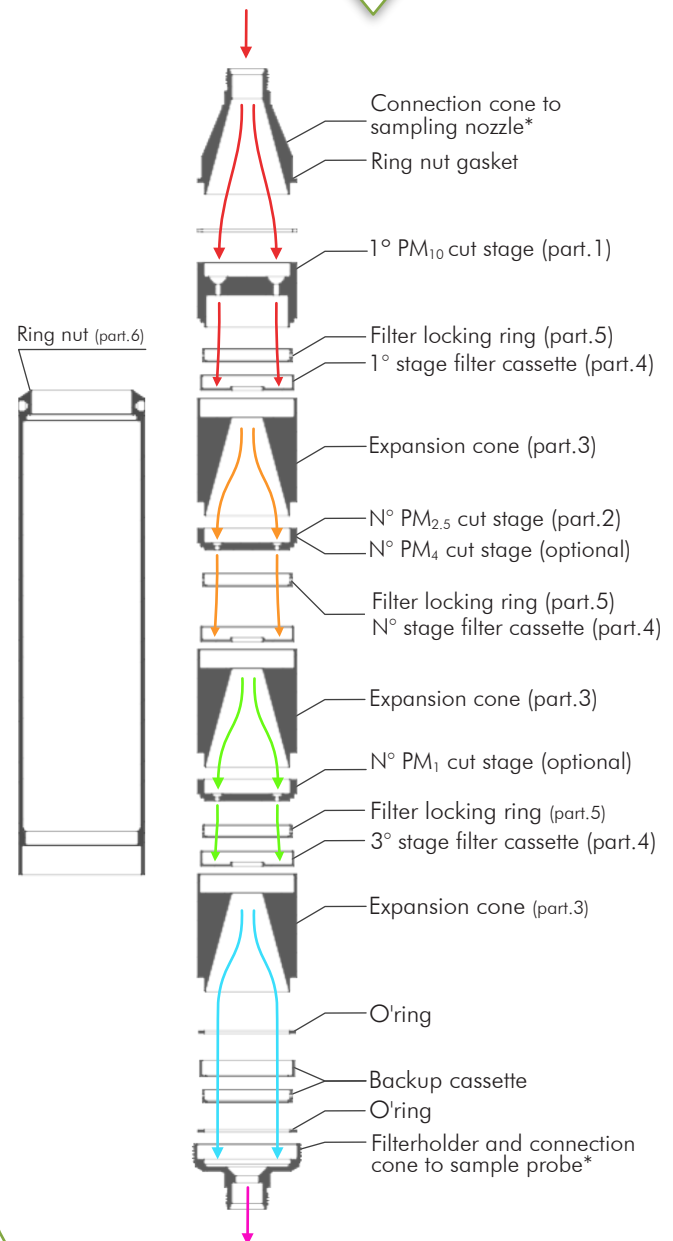
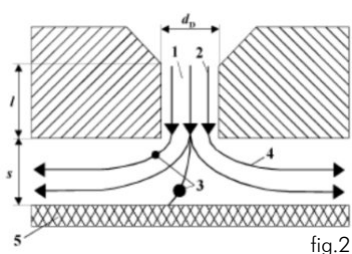


Figure 2 shows the operating principles of the PM₁₀ cyclone:



- 1. Nozzle
- 2. Flow
- 3. Particle dust
- 4. Trajectory
- 5. Plates collector
- l: Nozzle length
- S: Distance between nozzle and plate manifold
- n_d: Nozzle diameter

Particles suspended in the gas stream are sampled through the nozzle under isokinetic conditions.

The gas enters the impactor through the nozzle and the first expansion cone sorts the flow so that separation occurs equally at all nozzles of the separation plate.

This operation is repeated in subsequent stages until the final filter.

The different acceleration to which the particles are subjected allows separation by inertia.

As the forces applied to the particle are greater than the force of gravitation, MSSI can work in any position.

The smallest particles on the last separation cyclone (<2.5 Σ m) are collected on a final filter.

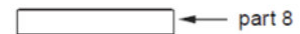
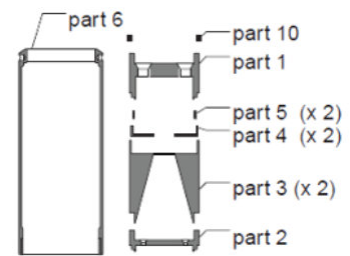
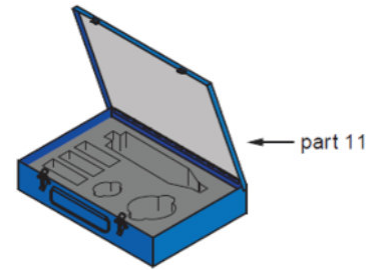


MSSI IMPACTOR CASE EQUIPMENT PM₁₀ - PM_{2.5}

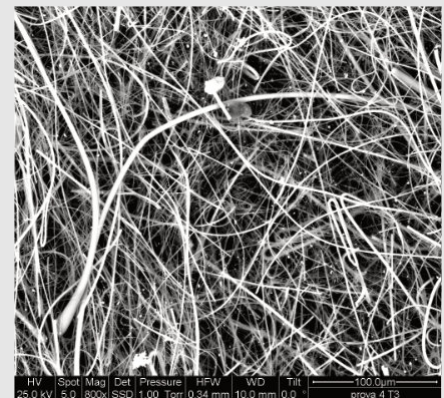
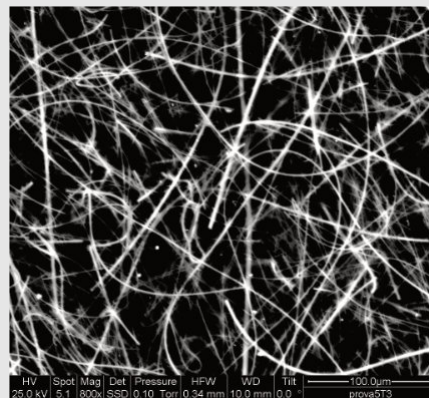
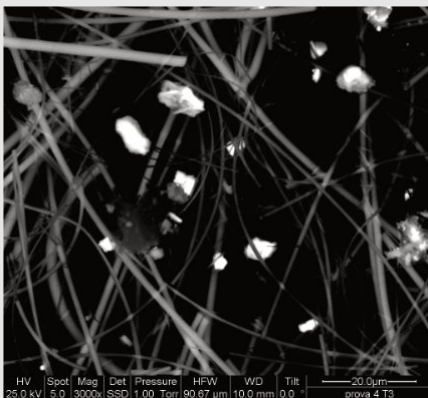
The MSSI PM₁₀-PM_{2.5} impactor can be equipped with a metal case with compartments.

In this case the following items are included:

MSSI Cascade Multistage Impactor Kit (Titanium)		AC99-107-0000KP	
Part	Quantity	Description	Codes
1	1	1 st PM ₁₀ cut stage	999TI175
2	1	2 nd PM _{2.5} cut stage	999TI174
3	2	Expansion cone	999TI173
4	2	1 st and 2 nd stage filter cassette	999TI170
5	2	1 st and 2 nd stage filter locking ring	999TI171
6	1	Ring nut	999TI172
7	1	Cutter device for filter diam. 47mm	999BB365
8	1	Assembling base impactor	-
9	6	Petri dish for filter diam. 47mm	BA99-001-0047CR
10	1	Spare gaskets set	AC99-107-9911KP
11	1	Carrying case	-
Optional:			
MSSI 3-Stage AISI 316L Stainless Steel Multistage Impactor Kit: AC99-107-0013KP			
MSSI 2-Stage AISI 316L Stainless Steel Multistage Impactor Kit: AC99-107-0010KP			
Impactor Stage PM ₄ in Titanium: AC99-107-9902SP			



Dimensional cutting studies carried out by SEM Microscope





The **MSSI Multistage Impactor** can also be used for dust control in combination with air quality sampling heads.

Emission and Environmental Sampling Heads



SAMPLING KIT

In order to allow the widest interchangeability with **TCR TECORA[®]** accessories, the **MSSI Impactor** can be used with the filter holders, curves and nozzles already in use for isokinetic total particulate sampling.

The impactor includes a die cutter to drill the required central hole in the 1st and 2nd stages, thus allowing the use of 47mm diameter flat quartz fibre filters or other commercially available media.

A base is also supplied to support the impactor during assembly.

Unified connections allow the **MSSI Impactor** to be used with **TCR TECORA[®]** monoblock probes and heated probes.

For more information on compatible kits see Product Data Line Emission EA.001.01.XX.EN.

MOUNTING DIMENSIONS FOR MSSI PM₁₀ - PM_{2.5} IMPACTORS ON ISOKINETIC PROBE WITH PITOT TERMINAL XL

The dimensions of the impactor and the duckbill curve for horizontal positioning allow the use of the the same type XL pitot tube used with the PM₁₀ - PM_{2.5} cylinders.

XL Pitot terminal:
P/N. AC99-099-0064SP

