PRODUCT INFORMATION

Models 100 and 110—MOUDI™ Impactors

- *Micro-Orifice Uniform Deposition Impactors (MOUDI™) for precision, high accuracy aerosol sampling and collecting size-fractionated particle samples for gravimetric and/or chemical analysis.*
- *With 30-L/min sampling flow rate, sharp cut-size characteristics, and up to 2000 precision micro-orifice nozzles to reduce jet velocity, pressure drop, particle bounce and re-entrainment.*
- *Rotating stages to achieve nearly uniform particle deposit on substrate.*

Model 100NR (w/o Rotator)

Model 110R (with Rotator)

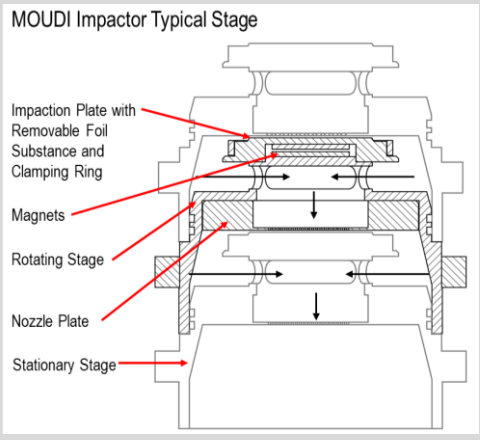
INTRODUCTION

These precision cascade impactors are designed for sampling and collecting size-fractionated particle samples for gravimetric and/or chemical analyses. The Models 100-R and 110-R Micro-Orifice Uniform Deposit Impactors (MOUDI™) both have a sampling flow rate of 30 L/min and are provided with an 18 µm cut-point inlet stage followed by additional stages to size-fractionate aerosol particle samples. The 8-stage Model 100-R has a lower cut-size of 0.18 µm while the 10-stage Model 110-R has a lower cut-size of 0.056 µm.

The MOUDI impactor differs from other conventional cascade impactors in the use of a large number of micro-orifice nozzles to reduce jet velocity and pressure drop, minimize particle bounce and re-entrainment, and enhance collection efficiency. As many as 2,000 nozzles with diameters as small as 50 µm are used. These impactors also have the uniform-deposit feature achieved by rotating the impaction plate relative to the nozzles so that the particle deposit under the nozzles can be spread out uniformly over a 25 mm diameter impaction area on a 47mm sampling substrate. The uniform deposit feature prevents heavy particle buildup under the nozzles to minimize bounce and re-entrainment. The mass of particles that can be collected without overloading can thus be greatly increased. Both the Models 100 and 110 are also available in non-rotating versions, Models 100-NR and 110-NR, with fixed nozzle and collection plates.

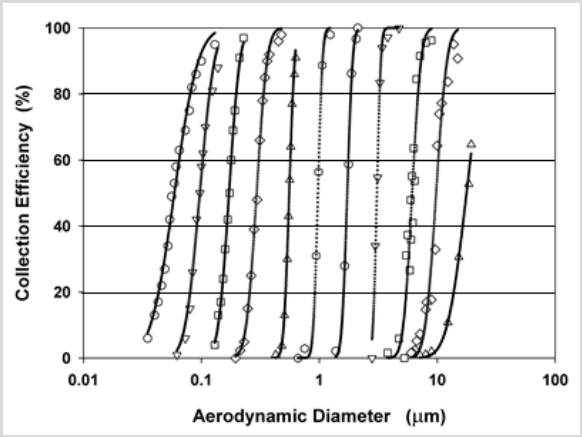
The MOUDI impactor is designed to size fractionate aerosol particles in four equal geometrical size intervals per decade of particle size. The stage cut-sizes would increase at a constant ratio of 101/4 =1.78 to 1.0. The nominal cut-sizes of the MOUDI Impactor stages are: 0.056, 0.1, 0.18, 0.32, 0.56, 1.0, 3.2, 5.6, 1.8, 10 and 18 µm.

Sampling Substrate and Stage Rotation—The MOUDI impactor can accept a variety of sampling substrates, including aluminum foils and 47mm diameter membrane filters. The substrate is held by a clamping ring on a substrate holder and is held by a magnet on the impaction stage (see diagram below). The substrate holder is easy to remove and replace. The collected samples can also be stored in a sample holder to prevent contamination during sample transport from the field to the laboratory or vice versa.



Typical MOUDI Impactor Stage

The MOUDI impactor is designed to prevent cross-flow interference between adjacent nozzles. The result is sharp cut-size characteristics not available with other cascade impactors that are less well designed aerodynamically. They are also designed to minimize inter-stage wall losses, i.e. loss of particles on the walls of the impactor, rather than being collected on the collecting substrate. The overall wall loss of the MOUDI impactor for all stages combined (not including the inlet) is typically less than 5%.



MOUDI Impactor Cut-Size Characteristics

Because of its superior aerodynamic design and outstanding performance characteristics, the MOUDI impactor is synonymous with high quality research impactors preferred by aerosol researchers worldwide for environmental and laboratory research. They have become the de-facto standard for such applications and have helped to generate hundreds of precise and accurate aerosol size distribution data in air quality and air pollution studies.

FEATURES

- Sampling flow rate
  - 30 L/min
- Size interval and stage cut-size
  - Four equal geometrical increments per decade of particle size
  - Model 100: 0.18, 0.32, 0.56, 1.0, 1.8, 3.2, 5.6, 10, and 18 µm
  - Model 110: 0.056, 0.1, 0.18, 0.32, 0.56, 1.0, 1.8, 3.2, 5.6, 10, and 18 µm
- Sharp cut-point characteristics
- Low inter-stage particle losses
- Up to 2000 micro-orifice nozzles to reduce jet velocity and pressure drop
- Mechanically rotated stages to achieve uniform particle deposits and reduce particle bounce and re-entrainment.

APPLICATIONS

- Environmental air sampling for air pollution and air quality research
- Testing aerosol drug delivery devices
- Diesel blow-by size analysis
- Engine emission testing
- Automotive air bag testing
- Industrial hygiene studies
- Work place aerosol analysis

Model 100S4 IMPACTOR

For environmental air sampling, a special 4-stage MOUDI impactor is available. The Model 100-S4 has an 18 µm inlet, followed by cut-point stages at 1.0, 2.5, and 10 µm, and a final filter. This particular combination of MOUDI stages is useful for ambient $PM_{1.0}$, $PM_{2.5}$ and PM_{10} measurement in special research applications.

Model 100-S4
3-Stage MOUDI

TO ORDER

MOUDI Impactors:

Specify	Description
110R	10 Stage Rotating MOUDI impactor
110NR	10 Stage Non-Rotating MOUDI impactor
100R	8 Stage Rotating MOUDI impactor
100NR	8 Stage Non-Rotating MOUDI impactor
100S4	3 Stage Non-Rotating MOUDI impactor

Accessories:

Specify	Description
0100-01-1050	Vacuum Pump, 100/110, 110V
0100-01-1051	Vacuum Pump, 100/110, 220V, EU
0100-01-1052	Vacuum Pump, 100/110, 220V, UK
0100-01-0079	Vacuum Pump, 100S4, 110V
0100-96-0573	Al Foil Substrates, 47 mm, Pkg. 300
0001-01-9953	Glass Fiber Filters, 47 mm, Pkg. 100
0001-01-5024	Quartz Fiber Filters, 47 mm, Pkg. 100
0100-01-0100	Silicone Impactor Surface Spray
0100-96-0558	Silicone Lubricating Grease, 5.3 oz

SPECIFICATIONS*

**Specifications are subject to change without notice*

	Model 100-R (with rotator)	Model 100-NR (w/o rotator)	Model 110-R (with rotator)	Model 110-NR (w/o rotator)	Model 100S4 (non rotating)
Impactor Stages	8	8	10	10	3
Pressure Drop, kPa (w/o final filter)	11	11	41	41	1.5
Cut-point diameter, µm	0.18, 0.32, 0.56, 1.0, 1.8, 3.2, 5.6, 10, 18		0.056, 0.10, 0.18, 0.32, 0.56, 1.0, 1.8, 3.2, 5.6, 10, 18		1.0, 2.5, 10, 18
Dimensions (DxH)	220 x 500 mm	80 x 360 mm	220 x 560 mm	80 x 420 mm	80 x 216 mm
Weight	11 kg (24 lbs.)	2.0 kg (4.4 lbs.)	12 kg (26 lbs.)	2.3 kg (5.1 lbs.)	1.5 kg (3.3 lbs.)
Power (rotating models)	115 VAC, 60 Hz,.3 A (100R and 110R available only in USA)				N/A
Vacuum Pump	Carbon Vane, 110–120 or 220–240 VAC, 50–60 Hz, 3/4hp (0.6 kW)				110–120 VAC, 50–60 Hz, ¼ hp (0.19 kW)

Environmental Operating Conditions 10–50 °C (50–122 °F)
0%–90% RH (non-condensing)

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