

# REAL-TIME QCM-MOUDI™ IMPACTOR MODEL 140

The Real-Time, Quartz Crystal Microbalance (QCM) Micro-Orifice Uniform Deposition Impactor (MOUDI) is a precision research-grade impactor with real-time mass detection based on QCM sensors. A breakthrough in cascade impactor technology for size-fractionation and mass measurement of aerosols, MSP's MOUDI™ Impactor is now available with Quartz Crystal Microbalances (QCMs) for real-time mass measurement.



The QCM MOUDI provides excellent mass measurement accuracy thanks to the integrated humidity conditioning system that ensures reliable coupling of aerosol particles to the quartz crystal sensors, and eliminates undesirable solid particle bounce. With the QCM MOUDI, setup and measurement time has gone from hours to minutes allowing the user to collect size fractionated aerosol masses, in real time (1 Hz data collection), from tens of nanograms up to a few hundred micrograms.

## Applications

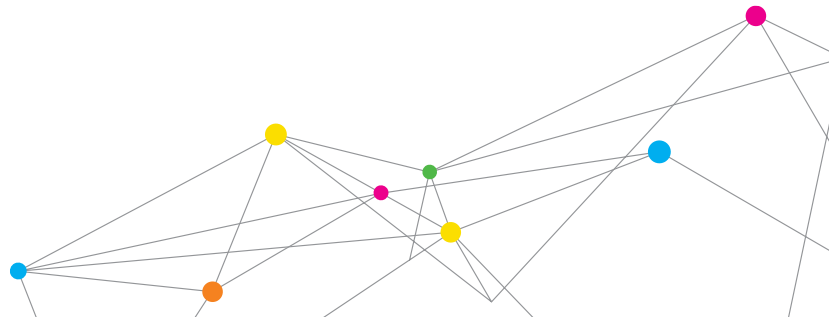
- + Sampling for air pollution and air quality research
- + Tobacco smoke testing
- + Industrial hygiene studies
- + Work place aerosol characterization
- + Inhalation toxicology testing
- + Testing aerosol drug delivery devices
- + Conditioned engine exhaust testing

## Features and Benefits

- + 2.5- $\mu\text{m}$  inlet and six QCM stages with sharp collection efficiency curves and calibrated cutpoints of 960, 510, 305, 156, 74 and 45 nm at 10-L/min inlet flow rate
- + Real-time mass detection
- + Accurate aerodynamic diameter fractionation using micro-orifice impaction stages
- + Nanogram resolution with true mass sensing of solid particles
- + Samples are still available for post-collection chemical analysis
- + Automatic humidity conditioning of sampled aerosol
- + Intuitive, advanced touch-screen control and user-friendly features
- + Low power consumption vacuum pump included with impactor



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# SPECIFICATIONS

## REAL-TIME QCM-MOUDI™ IMPACTOR MODEL 140

### Sampling flow rate

10 L/min

### Impactor Stages

6 (QCM) + PM2.5 inlet stage

### Stage Calibrated Cutpoints

45, 74, 156, 305, 510, 960, 2440 nm

### Dimensions (DWH)

QCM MOUDI 36 x 40 x 57 cm (12 x 16 x 22 in)  
PUMP 28 x 26 x 27 cm (11 x 10 x 11 in)

### Weight

QCM MOUDI 20.5 kg (45 lb)  
PUMP 8.2 kg (18 lb)

### Power

90-126 VAC, 50-60Hz or 210-240VAC, 50-60Hz;  
300W (includes pump)

### Operating Conditions

15-30°C, 0-100% RH (non-condensing)

### Operating Altitude

< 2000m

### Interface

Touch-screen color display (200 mm)

### Communications

Ethernet (RJ45 port)

#### Accessories

Specify	Description
140-HFSS	High Flow Sampling System
0140-01-1010	Impactor Stack, QCM MOUDI, 6 stages
0140-98-1308	Replacement QCM Crystal/Plate

#### TO ORDER

Specify	Description
140	Real-Time QCM-MOUDI Impactor, 6 Stage

Specifications are subject to change without notice.

#### REFERENCES

Marple, Virgil A., Kenneth L. Rubow, and Steven M. Behm. "A microorifice uniform deposit impactor (MOUDI): Description, calibration, and use." *Aerosol Science and Technology* 14.4 (1991): 434-446.

Chen, Modi, et al. "A novel quartz crystal cascade impactor for real-time aerosol mass distribution measurement." *Aerosol Science and Technology* 50.9 (2016): 971-983.

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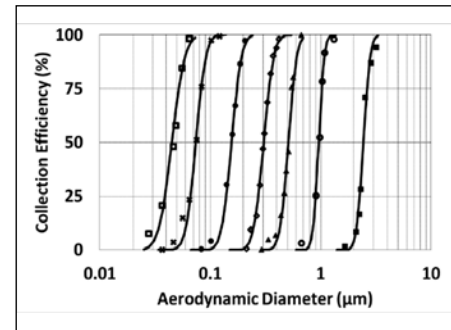
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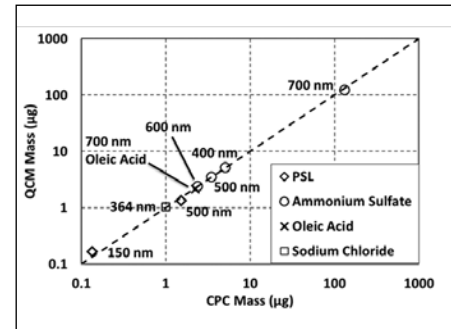
<b>USA</b>	<b>Tel:</b> +1 800 874 2811	<b>India</b>	<b>Tel:</b> +91 80 67877200
<b>UK</b>	<b>Tel:</b> +44 149 4 459200	<b>China</b>	<b>Tel:</b> +86 10 8219 7688
<b>France</b>	<b>Tel:</b> +33 1 41 19 21 99	<b>Singapore</b>	<b>Tel:</b> +65 6595 6388
<b>Germany</b>	<b>Tel:</b> +49 241 523030		



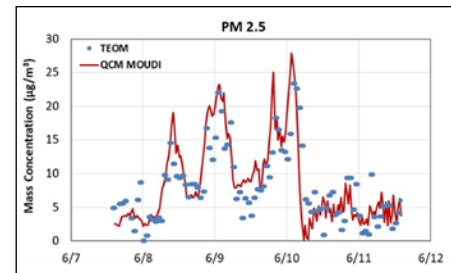
Picture of particle deposits on QCM for stage 5.



Stage collection efficiency curves measured experimentally with monodisperse aerosols.



Measurements of laboratory-generated monodisperse aerosol on a single QCM stage: mass comparison with CPC.



Comparison of PM<sub>2.5</sub> concentrations measured by QCM MOUDI and DF TEOM at Queens College, NY, June 2018.