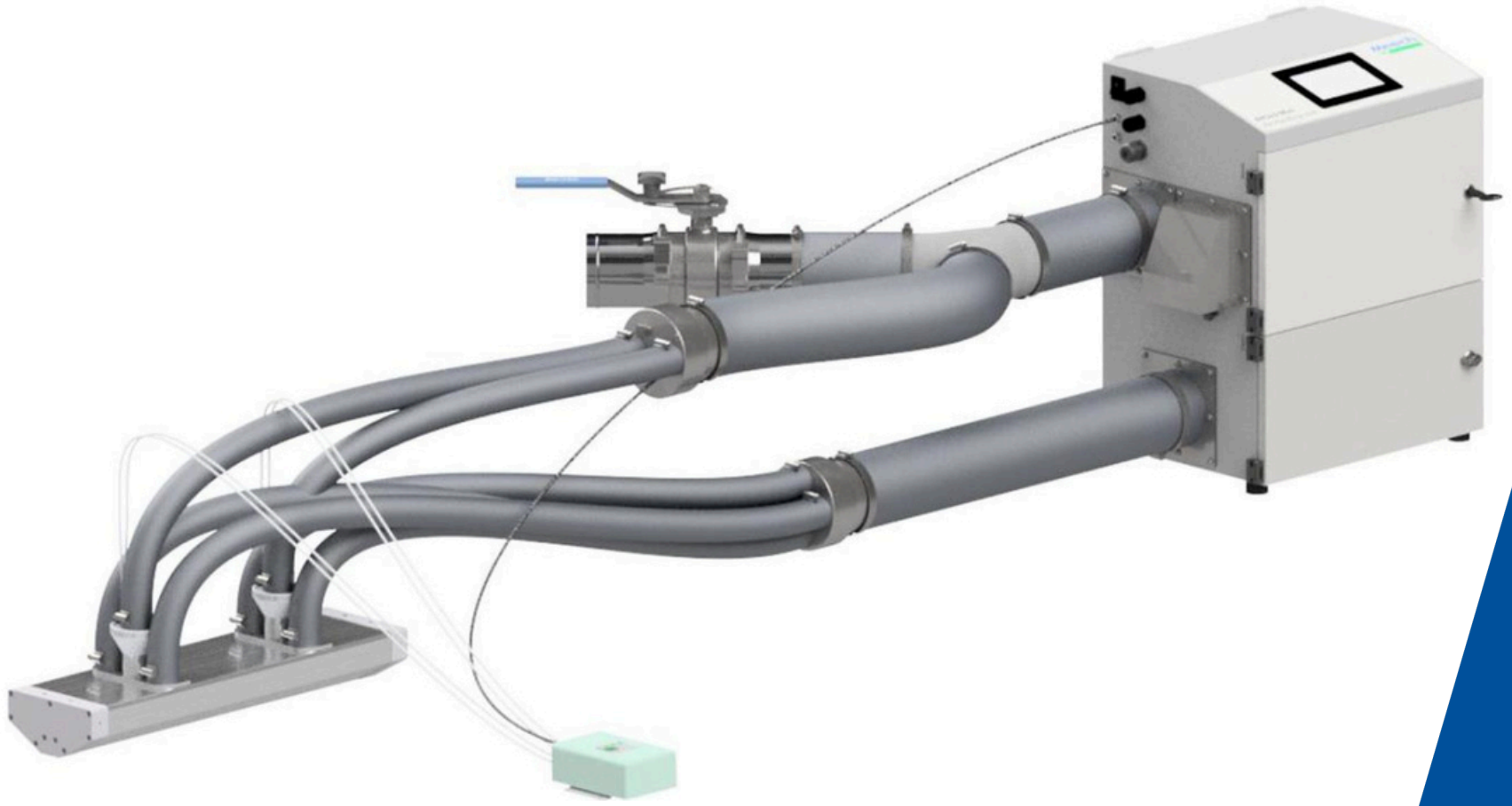
MECHATRONICS

Meech



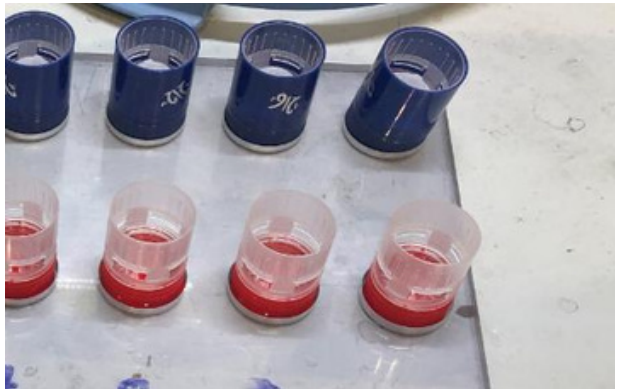
MEECH CAP CLOSURE CLEANING SYSTEM

Contamination in caps: How does it get there?

- During the production of cap closures, particles of “plastic swarf” contaminate the inside of the closure
- The contamination of plastic swarf occurs due to many reasons:

1. From general production processes
2. Motion during transport, causing wear to the caps through friction
3. Broken “bridges” when pressing together different internal components
4. Ambient air on the manufacturing site: static on the caps can attract contamination

These need to be removed and captured to prevent product contamination, and microplastics entering the bottles.



Closure cleaning solution

Combining Meech's technical expertise in surface cleaning and static control, the following slides demonstrate how contamination is safely removed from inside the closure and safely captured to prevent risks of recontamination without producing expensive compressed air

Full System Solution:

CyClean-R

Cap closure cleaning manifold with central positive air slot and two vacuum air slots

Circular DC bars

Circular DC Bars are connected to a PulseDrive Plus PDC Controller

Circular DC Bars are installed into the positive spigot of the manifold

Mini 1 pump AHU

Mini Air Handling Unit provides positive and vacuum airpressureto System. Airpressures set using touch screen and combination of AHU bleed and ‘ducting throttle valve’.

3m M8 Extension Cable, connects PulseDrive to one of 24V Murr connections on AHU.

Cleaning process

Positive ionised air produced by a miniature Air Handling Unit (AHU) enters the central chamber and exits via the central slot

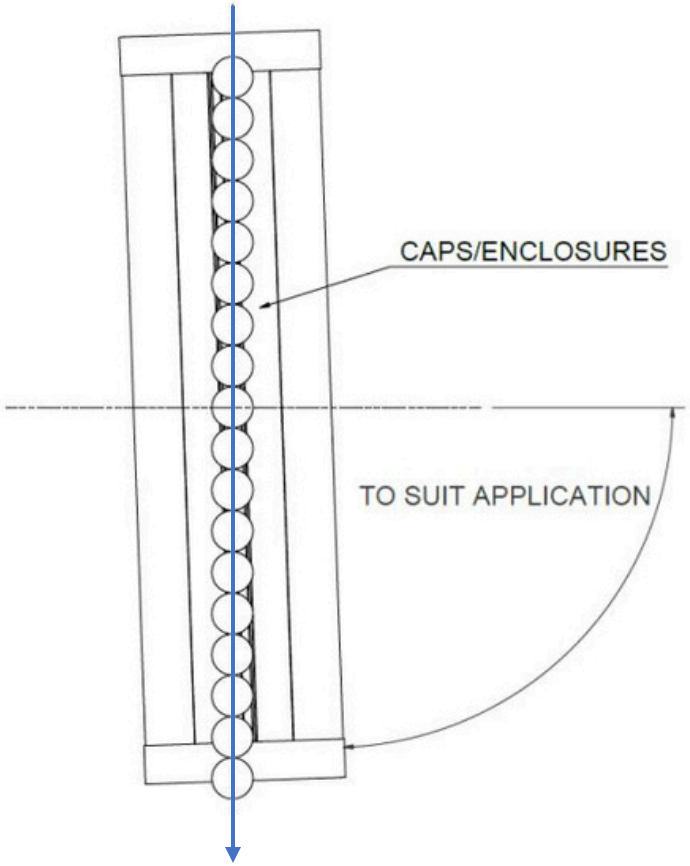
Static charges are neutralised by the ions produced by the ionising nozzles, allowing the airflow to removes the contamination from inside the closure

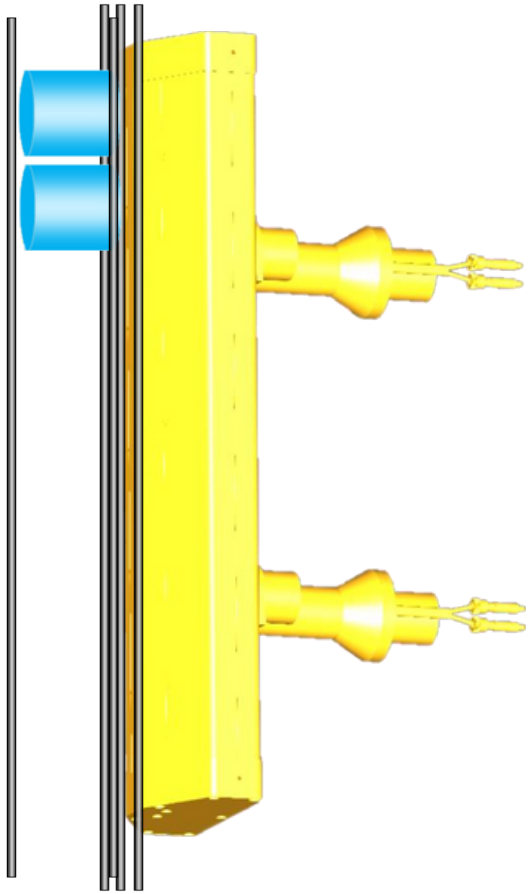
Negative pressure generated by the two outer chambers collect the airborne contamination, capturing it in the filter within the AHU

The system is to be installed before packaging or bottling stage

Cleaning process

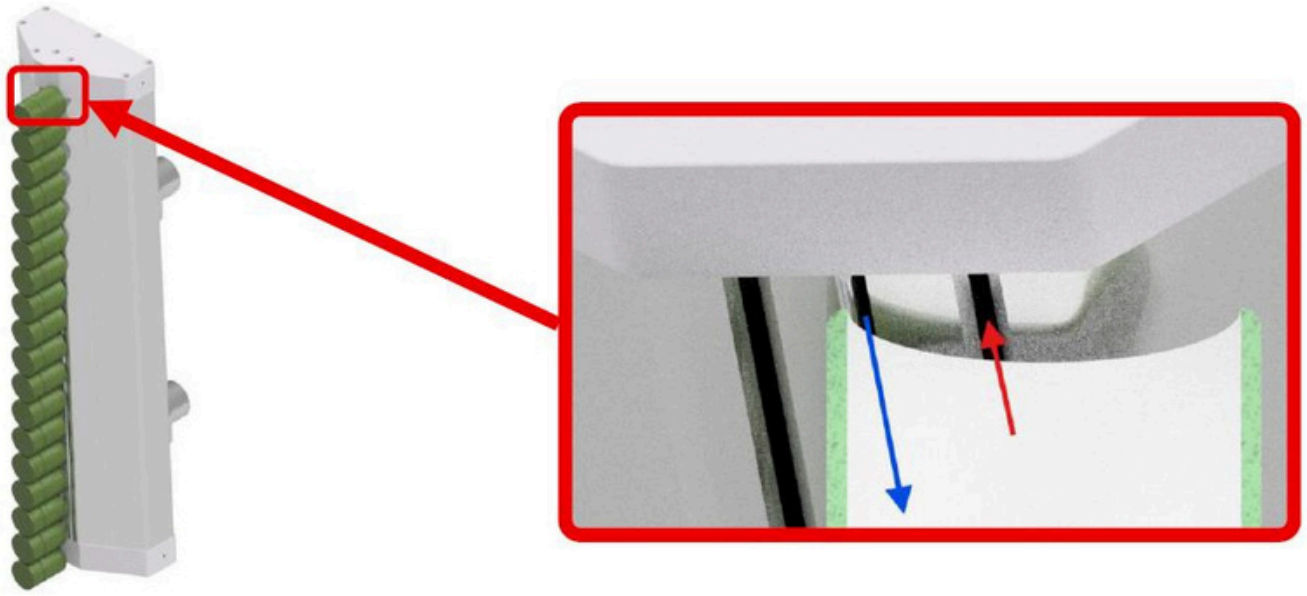
- The Cap Closure Cleaning Manifold requires off-centre line positioning to improve cleaning
- e.g. positive slot starts close to left edge of cap at start of 500mm cleaning process and moves to right edge of cap at the end of cleaning process.
- So, cleaning runs diagonally across the cap as it travels across the manifold.



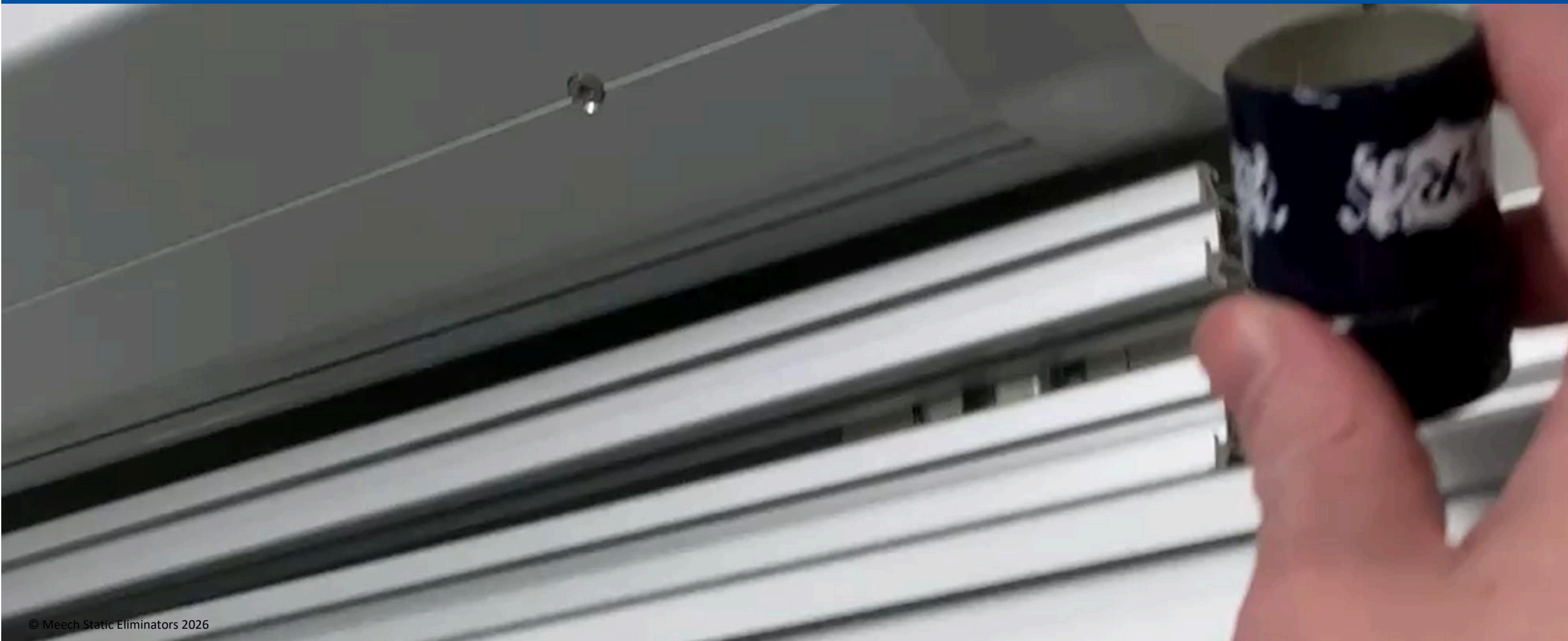


Cap Closure Cleaning Process

- Positive ionised air from Mini Air Handling Unit enters central chamber and exits via the **central manifold slot**
- Static attraction charges are neutralised by the ions produced by the ionising nozzles, allowing the airflow to remove the contamination from inside the closure
- Negative pressure generated by the **two outer chambers** collect the airborne contamination, capturing it in the F8 filter within the AHU



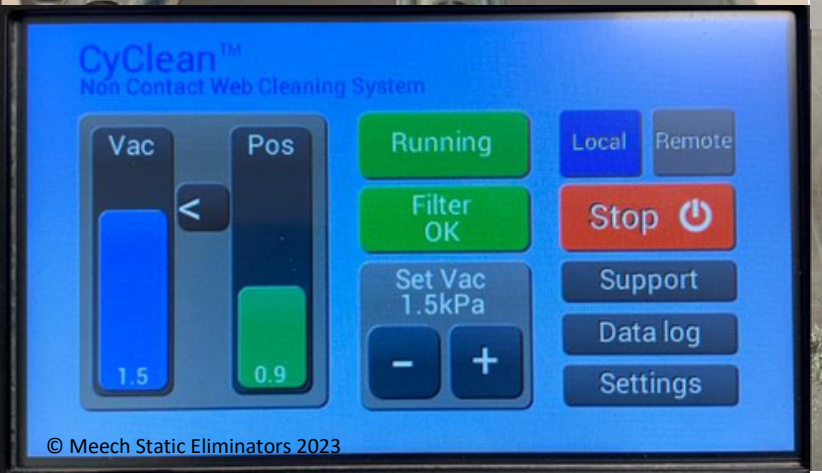
Slow motion showing cleaning performance



System is installed before packaging caps or the bottling stage

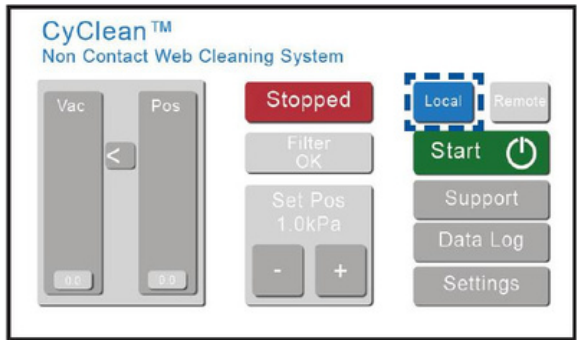
- The pressure settings of the AHU will depend on the characteristics of the cap to be cleaned. Deeper caps may require more positive pressure

Closure cleaning system set-up



Mini AHU features

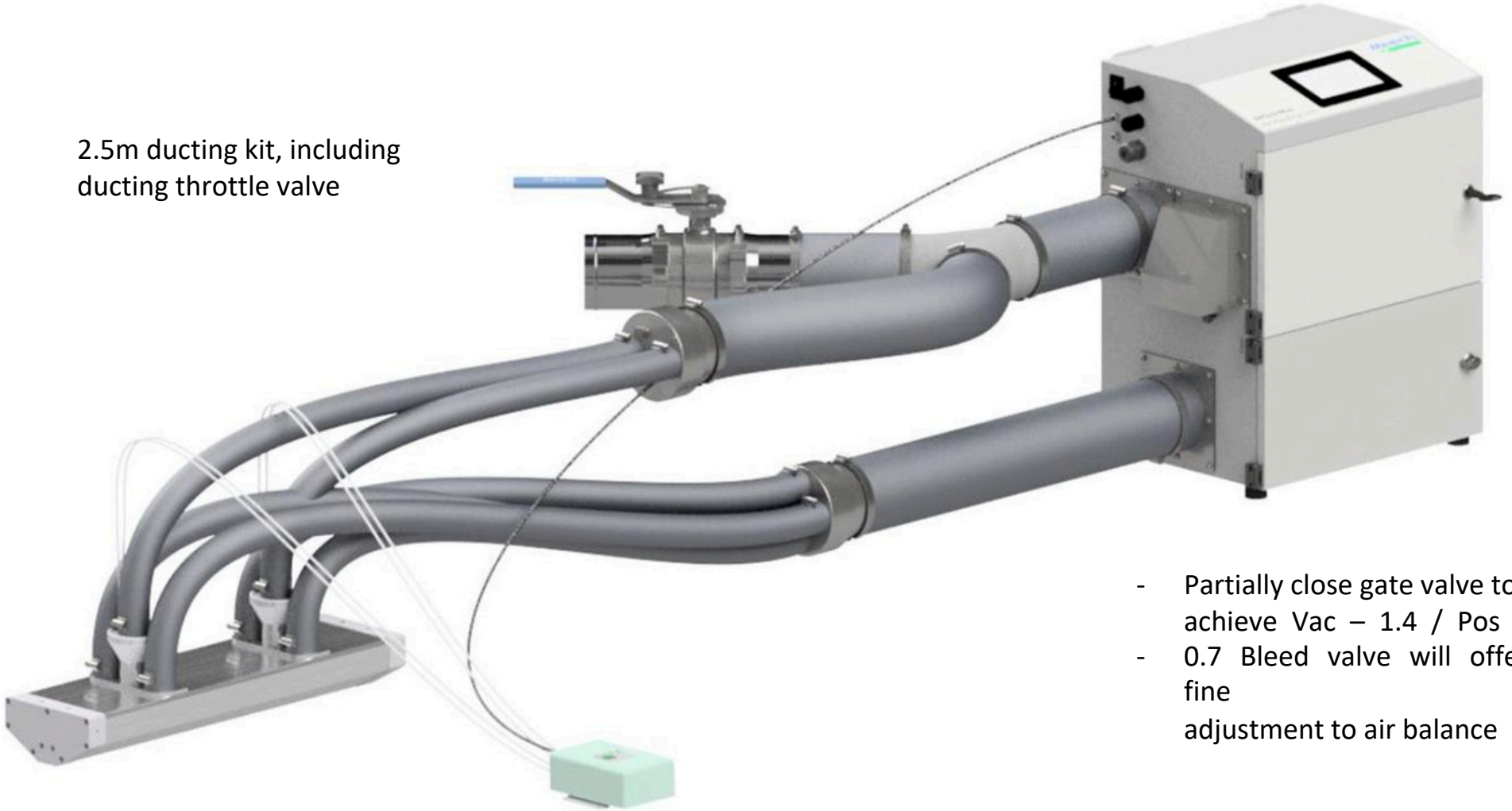
Output	1.1kW		
Capacity	366m³/hr		
Weight	22kg		
Noise Level	68dB		
Full Load Current	**Line**	**Neutral**	
	@240V: 6A*	@240V: 7A	
	@110V: 12A*	@110V: 12A	
Electrical Supply	110V/240V 1Ph		
Size (mm)	H520 x D300 x W450		
Exhauster	Tubine Fan		
Filters	**Style**	**Efficiency**	**Performance**
	Bag	F8	90-95% @ 0.4µ
Material	Stainless Steel: Grade 430		



- A touch panel display on the AHU provide control of the air flow balance and system functions
- Deeper caps may require more positive pressure

System configuration

2.5m ducting kit, including ducting throttle valve



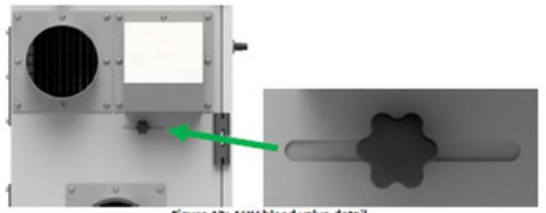
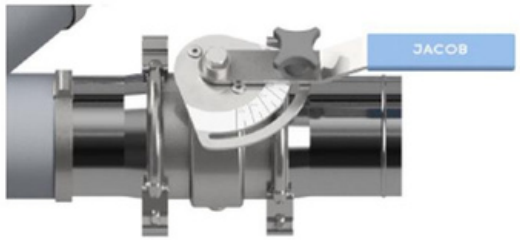


Figure 12: AHU bleed valve detail

- Partially close gate valve to achieve Vac – 1.4 / Pos – 0.7 Bleed valve will offer fine adjustment to air balance



Thank you!