OC CLEANROOM

UDAF HOOD

Unidirectional Flow

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The hood described in this document is a walk-in type with unidirectional airflow, designed for the handling of non-active powdered excipients. It is GMP-compliant and designed to ensure containment of powders within a confined area, while protecting the operator from contact and inhalation.

The vertical unidirectional airflow (UDAF) guarantees:

- **Microbiological Grade C** (per GMP Volume 4 – Annex 1) and ISO 8 particle classification (ISO 14644-1) during operation
- **Microbiological Grade A** (per GMP Volume 4 – Annex 1) and ISO 5 particle classification (ISO 14644-1) at rest

The air handling system is designed for partial recirculation, generating inward airflow from the room into the hood, creating dynamic negative pressure within the hood's confinement area.
Air is drawn from the work area by a fan and passed through H14 HEPA filters located at the top of the hood. Air is collected through louvered intake grilles at the bottom, filtered, and recirculated through absolute filters. Exhaust air is released back into the room through ceiling-integrated H14 HEPA filters.

Filtration stages before reintroduction:

- **H14 HEPA filter**
- **G4 filters** are housed within the intake grilles
- **F9 filters** are installed in safety canisters with BIBO (Bag-In Bag-Out) filter change system

The fan is inverter-controlled, managed by a differential pressure transmitter monitoring pressure drop across HEPA filters. Filter clogging is monitored via differential pressure transmitters connected to the PLC system, with integrated alarms. A PLC-based control system and a touchscreen HMI are included. LED lighting is integrated in the top section of the hood.

System components

Central Column

Made of AISI 304 stainless steel sandwich panels with Scotch Brite finish, surface roughness Ra < 1.6 µm, and aluminum honeycomb core. All components are coplanar, with rounded, easy-to-clean corners.

The rear cover houses:

- G4 filter intake grilles
- F9 filter canisters
- DOP test ports
- HMI panel, emergency buttons, indicators
- Filter clogging pressure switches
- Electrical cabinet
- Optional: 2 industrial 220V sockets, 2 Schuko sockets, 2 LAN ports

Access to fans, canisters, instruments, and electrical cabinet is from the rear technical area.
Front access to G4 prefilters is also available.

Optional configuration: full front access without rear technical area for space-constrained layouts.
All joints are sealed with silicone sealant.

Upper Plenum (Hood)

Also made of AISI 304 stainless steel sandwich panels, Scotch Brite finish, Ra < 1.6 µm, aluminum honeycomb core. All components are coplanar, rounded and cleanable.
Houses:

- Supply fan feeding HEPA and exhaust filters
- H14 HEPA supply filters (box-type)
- H14 HEPA exhaust filters (box-type)
- Integrated LED lights

Filter and light replacement is accessible from below. Joints are sealed with silicone. Attached is a PVC flexible strip curtain containment system, standard access from the front.

Control System

All devices and components are controlled by a PLC via a touchscreen HMI.
Main functions:

- Fan management
- Alarm display for fan and filters
- Graphical interface

Two operation modes:

1. Local (default): manual start/stop by operator
2. Remote (optional): automatic start with HVAC system

Components of the Down Cross UDAF:

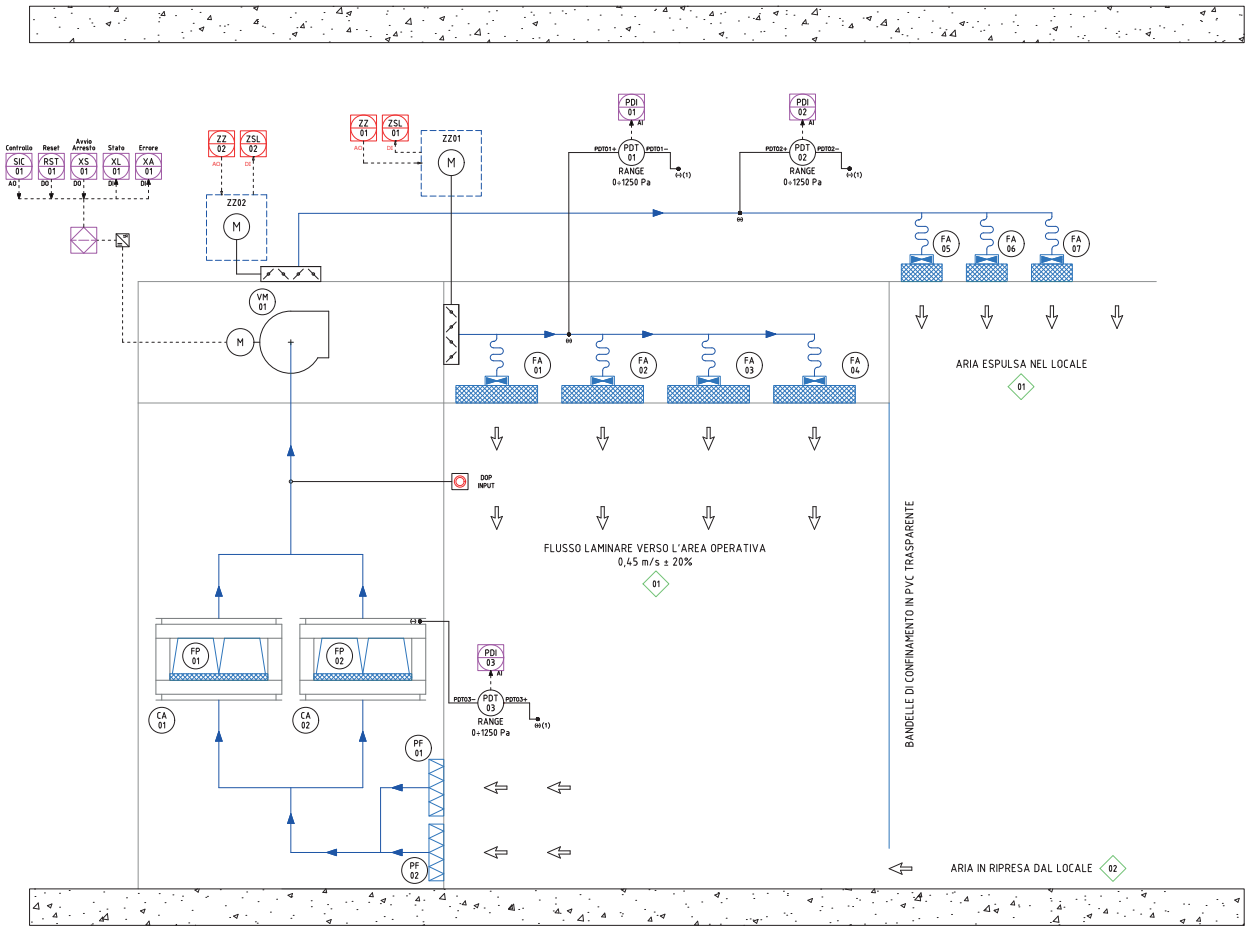
- Central column
- Upper plenum
- Control system

Technical Data

DESCRIPTION	UNIT	DCFH-01	DCFH-02
Cod		MCCAPPA0001	MCCAPPA005
Overall Dimensions (LxWxH)	mm	1470x2330x3630	1750x2440x3720
Working Area Dimensions (LxWxH)	mm	1410x1350x2225	1750x1450x2230
Weight	kg	530	660
UDAF Airflow Rate	m^3/h	2800	4300
Exhaust Airflow Rate	m^3/h	1400	1050
Noise Level	dB(A)	< 70	< 70
Illumination	lux	750	750
Power Supply	–	400V 3P+N+T @50Hz	
Power Consumption	kW	4.4	4.7
Electric Current	A	3.7	4.0

[1] Before transport, the machine is disassembled into smaller parts to facilitate the transport and move-in phases of the equipment

[2] Clean filters and active lighting



Model Specifications

DCFH-01	
Supply Air Filtration	No. 4 x HEPA H14 filters, dimensions 610x610x150 mm
Supply Airflow Velocity	0.45 m/s ± 20% at 150 mm from the filter
Airflow Management	Inflow from the room into the hood
Return Air Filtration	No. 2 x G4 prefilters, dimensions 592x592x48 mm No. 1 x F9 prefilter (in BIBO canister), dimensions 592x592x287 mm
Exhaust Air Filtration	No. 2 x HEPA H14 filters, dimensions 610x305x150 mm
Supply Ventilation	Centrifugal fan with inverter control
Lighting	No. 4 x LED lights integrated into the UDAF system
Compartmentalization	Flexible transparent PVC strip curtains with AISI 304 stainless steel frame
Instruments	Differential pressure transmitters for filter clogging detection Differential pressure transmitters for fan PID control
Environmental Classification under UDAF	Grade A and ISO 5 at rest Grade C and ISO 8 in operation
Installation	Floor-mounted with ceiling suspension

DCFH-02	
Supply Air Filtration	No. 4 x HEPA H14 filters, dimensions 810x660x150 mm
Supply Airflow Velocity	0.45 m/s ± 20% at 150 mm from the filter
Airflow Management	Inflow from the room into the hood
Return Air Filtration	No. 2 x G4 prefilters, dimensions 592x592x48 mm No. 2 x F9 prefilters (in BIBO canisters), dimensions 592x592x287 mm
Exhaust Air Filtration	No. 3 x HEPA H14 filters
Supply Ventilation	Centrifugal fan with inverter control
Lighting	No. 4 x LED lights integrated into the UDAF system
Compartmentalization	Flexible transparent PVC strip curtains with AISI 304 stainless steel frame
Instruments	Differential pressure transmitters for filter clogging detection Differential pressure transmitters for PID control of fans
Environmental Classification under UDAF	Grade A and ISO 5 at rest Grade C and ISO 8 in operation
Installation	Floor-mounted with ceiling suspension

Optional Features

1. Access to the work area from 2 or 3 sides
2. Access to inspectable components from the front side of the machine (machine without rear technical area, for layouts with limited space)
3. Additional electrical outlets:
   - 2 x industrial 220V sockets
   - 2 x Schuko sockets
   - 2 x LAN ports
4. Remote management (start/stop and alarm notifications)
5. Integration with the customer's **Active Directory**

Documentation Provided

Supplied in Italian, includes:

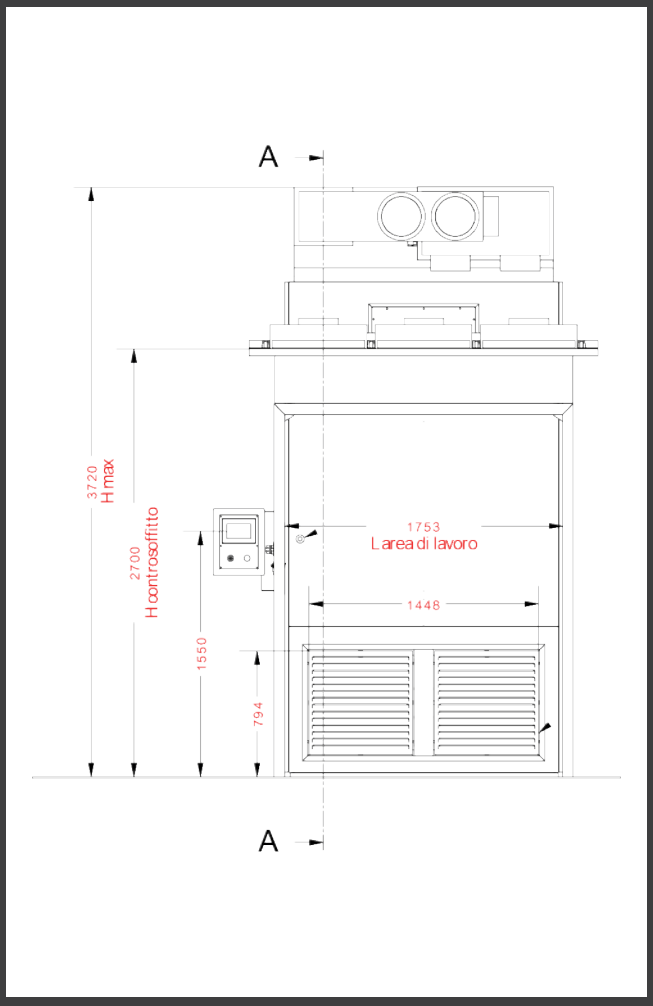
- Equipment construction drawing
- Electrical wiring diagram
- Functional specification
- User and maintenance manual
- Operator manual
- Component list and technical datasheets
- Certificates for product contact materials
- Alarm list
- Instrument calibration certificates (on-site calibration)
- CE Declaration of Conformity (Machinery Directive 2006/42/EC)
- Recommended spare parts list (2 years)
- FAT protocol
- SAT protocol

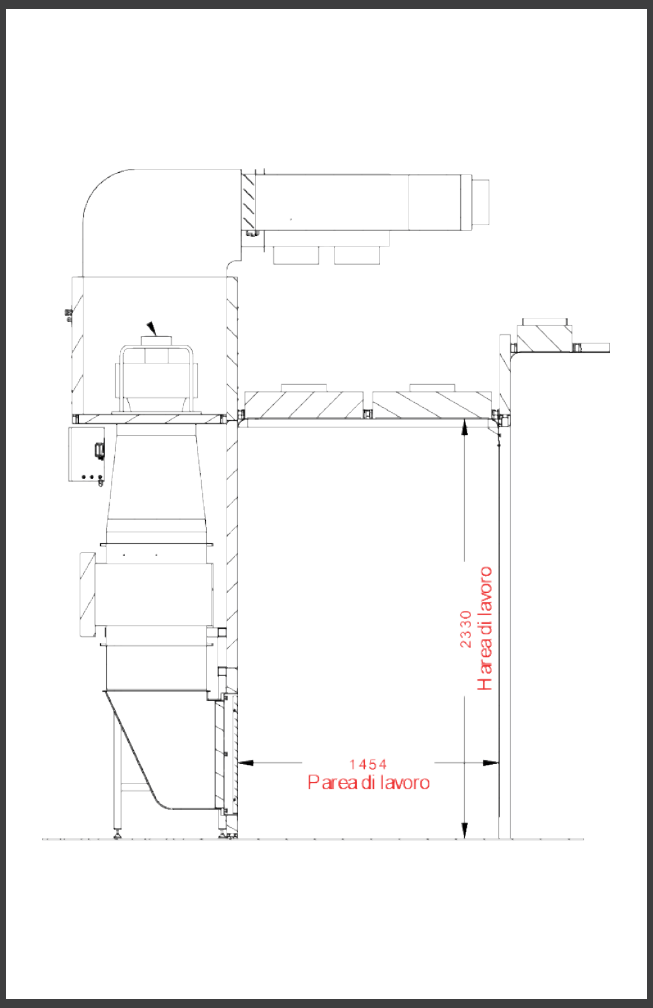
FAT (Factory Acceptance Test) – Test List

1. Verification of documentation (construction drawing, P&ID, electrical diagram)
2. Verification of certificates for construction materials and installed filters
3. Functionality check

SAT (Site Acceptance Test) – Test List

1. Verification of documentation (construction drawing, P&ID, electrical diagram)
2. Verification of certificates for construction materials and installed filters
3. Calibration check of process instruments
4. Airflow measurements
5. Functionality check





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