OC CLEANROOM

UDAF TROLLEY

Safe Transfer

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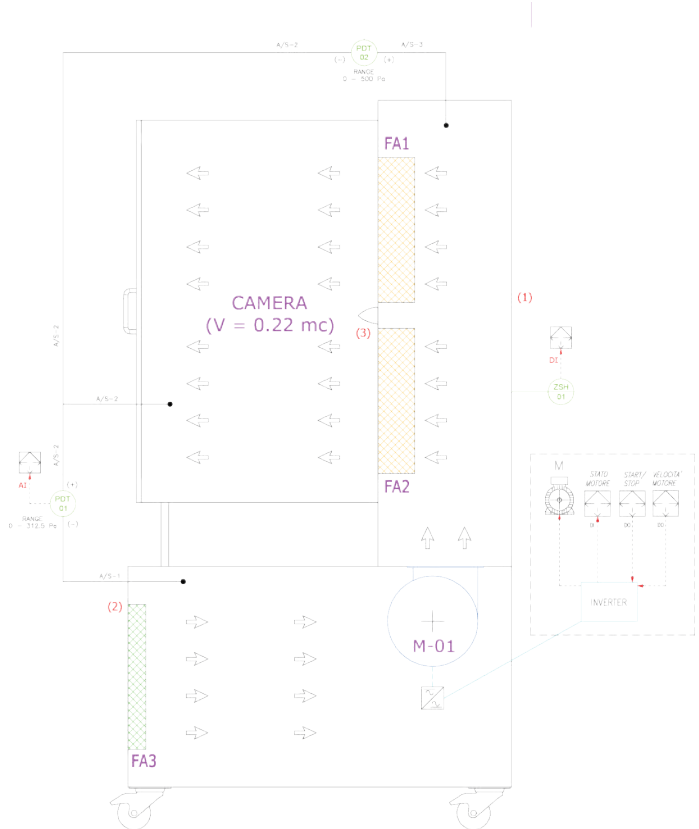
The system described in this document is a self-powered laminar flow trolley, referred to as the UDAF trolley.

The UDAF trolley is designed and built for the temporary storage and transport of products sensitive to environmental contamination, while optimizing space by accommodating the maximum number of trays in the smallest possible footprint.

Thanks to horizontal laminar airflow, generated by a fan powered by a dry-cell battery UPS and an H14 HEPA filter barrier, the system can maintain ISO Class 5 (Grade A) conditions inside the cabinet during load transfer operations.

The system also includes a PLC-based control logic, which regulates the fan's rotational speed via an inverter, ensuring positive pressure inside the chamber relative to the external environment and compensating for filter pressure drops due to clogging.



System Components

The UDAF trolley consists of the following main components:

- AISI 304 stainless steel casing consisting of various sections
- Laminar flow operating cabin
- Ventilation system
- Power supply and control system.

Casing

The casing is made of AISI 304 stainless steel sheet with a Scotch Brite satin finish, serving as the trolley's structural frame. All fasteners are made of stainless steel.

The casing houses the following components:

- Ventilation system
- Power supply system with rechargeable batteries
- Electrical panel, control system, and HMI panel

For easy and ergonomic handling, the trolley is equipped with four swivel wheels (diameter: 80 mm, polyamide), two of which have brakes for parking. Removable inspection panels provide access to internal components. All parts are easy to clean, with rounded corners.

Laminar Flow Working Chamber

The working chamber is the useful internal volume of the trolley, where the load is protected during transfer by horizontal laminar airflow.

The chamber is made entirely of 12 mm thick polycarbonate with rounded stainless steel corners to facilitate cleaning, and has internal dimensions of 450 x 580 x h910 mm.

Inside the chamber, there are removable and height-adjustable shelves made of AISI 316L stainless steel rods, supported by AISI 316L stainless steel brackets.

The front chamber door is made of 12 mm thick polycarbonate and includes 25 mm diameter holes to discharge air to the outside.

Ventilation System

The ventilation system consists of the following main components:

- Centrifugal fan
- G4 pre-filter
- H14 HEPA filter for laminar flow
- Pressure transmitter
- Filter clogging pressure switch
- DOP test ports

Air is drawn in by the fan, passing through the G4 prefilter intake at the base of the UDAF trolley, it is then delivered into the chamber via the H14 absolute filters mounted in the vertical housing.

The machine casing acts as a plenum, ensuring even air distribution across the supply filters. All air inside the chamber is expelled through perforations on the front door.

The fan is a centrifugal type with an integrated speed control system.

- The G4 pre-filter has a stainless steel frame and dimensions of 400 x 500 x 24 mm.
- The H14 HEPA filters are laminar flow type with mechanical seal gaskets, sized 457 x 457 x 68 mm.
- The pressure transmitter measures internal chamber pressure.
- The pressure switch signals clogged filters.

Power supply and control system

The UDAF trolley remains powered even without connecting the power supply, thanks to the re-chargeable storage battery system. All devices, equipment, and components are managed by a PLC system, which, via the Human-Machine Interface (HMI), enables operator control and monitoring of the machine

In detail:

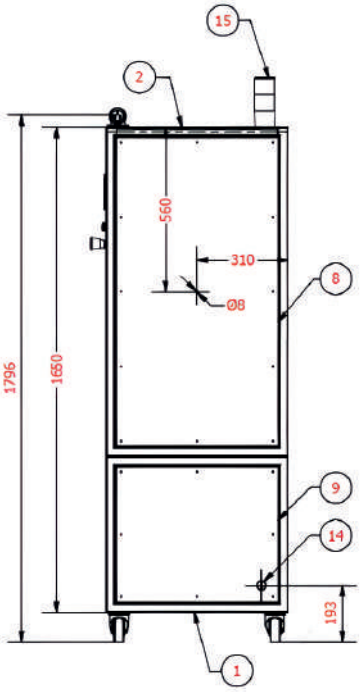
Main components:

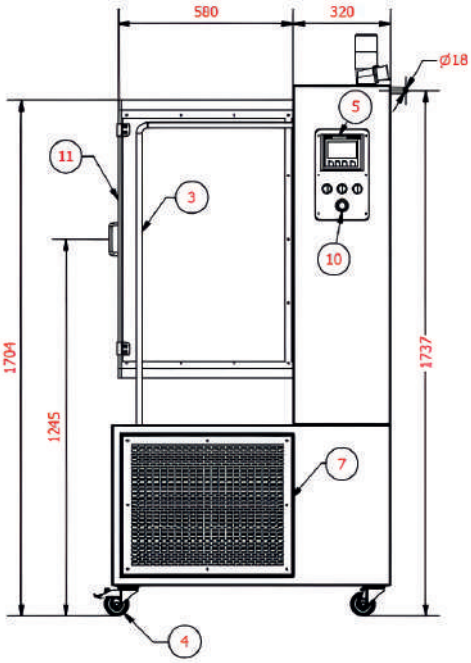
- Electrical panel integrated into the machine
- Rechargeable storage batteries
- Control PLC
- 4" HMI operator panel with color touch screen

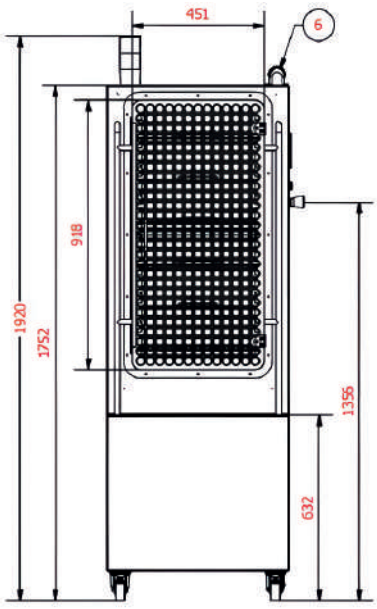
Description of the main functions:

- Battery charge level indication
- Display of the pressure value inside the cabin
- Alarm indication (H14 filter clogging, fan fault, etc.)

The batteries have an autonomy of approximately 2 hours of work in optimal conditions of use. Charging times can vary from 3 to 4 hours, with 230 V single-phase power supply.

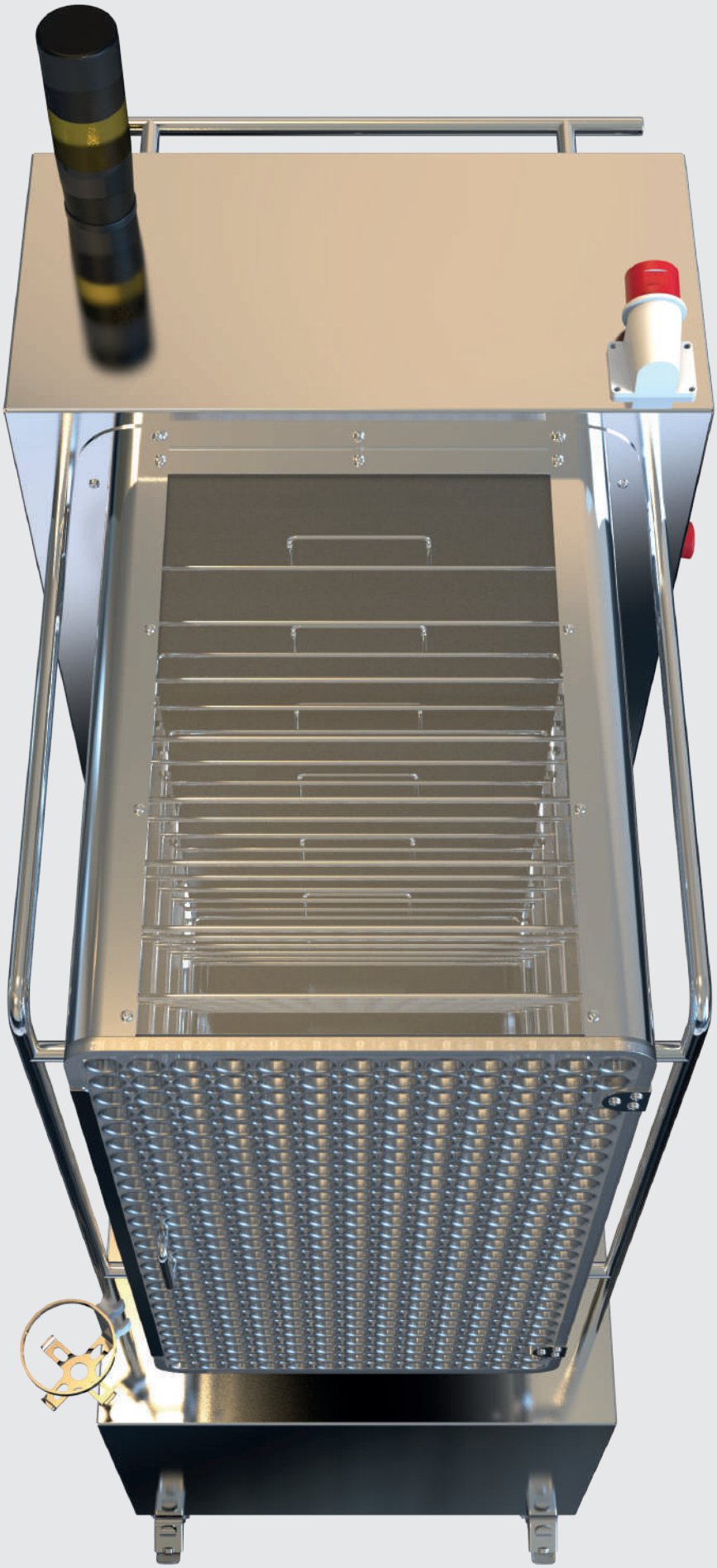






System Layout

ELEMENT	QTY	DESCRIPTION
1	1	Lower compartment
2	1	Upper compartment
3	1	Handle
4	2	Swivel wheel
5	1	Operator panel
6	1	Power socket
7	1	Air intake grille
8	1	Filter inspection door
9	1	Access panel
10	1	Emergency button
11	1	Working chamber
13	1	Bollard
14	1	DOP test port
15	1	Signal light



Technical Specifications

DETAILS	
Supply-side filtration	2 x H14 HEPA filters, 457x457x68 mm
Airflow velocity at discharge	0.45 m/s ± 20% at 150 mm from the filter
Airflow management	Air drawn from room into UDAF trolley
Return-side filtration	1 x G4 pre-filter, 400x500x24 mm
Supply-side ventilation	Centrifugal fan with inverter
Monitoring instruments	Differential pressure switch for clogged filters; pressure transmitters for PID fan control
Environmental classification under UDAF	Grade A and ISO 5 (at rest and in operation)
Electrical supply	230 V, 1P+N+T @ 50 Hz
Power consumption	2 kW
Current draw	10 A
External dimensions (LxWxH)	620 x 970 x 1920 mm
Internal working area (LxWxH)	450 x 580 x 910 mm
Weight	250 kg
UDAF zone airflow rate	670 m^3/h
Noise level	< 70 dB(A)

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