AIR HANDLING UNIT FOR CLEANROOM

Healthcare and Industry

COMPANY

A2i is a manufacturer of air handling units specialized in cleanroom and operating theaters.

Our compact products come in two concepts:

- **SPCS (Health Concept) A.H.U.: operating theaters and clean areas (PACU, ICU, Recovery room, ...etc.)**
- **SPCI (Industry Concept) A.H.U.: Research laboratory, laboratory animal house, pharmaceutical and industrial production, ...etc.**

Our A.H.U. technicity combined with our experience and our know-how allowed us to work with the most renowned design offices and installers of the industry; and to see our products working both in France and abroad.

Our equipment complies with the NF S90-351 standard for healthcare and the NF EN ISO 14644-4 annex E standard for the industry.

A2i opened in April 2009. It is made of a design office, a sales unit and a production workshop; all located in the same building in Congenies, between Nîmes and Montpellier.

ISO 9001 CERTIFIED

Our objective is to constantly improve the quality of products; thus, our engagement in the ISO 9001 certification.

- Show our ability to supply a product that is in conformity with your requirements and the applicable rules.
- Increase your satisfaction thanks to an efficient application of the quality system.

OUR REFERENCES

SANOFI

Assistance Publique Hôpitaux de Marseille

RAMSAY GÉNÉRALE DE SANTÉ

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

HUG Hôpitaux Universitaires Genève

Capio

Hôpitaux de Toulouse

CHU de Martinique

HIGH TECHNOLOGY AND ENERGY SAVING

Our air handling unit are specifically designed to maintain temperature, humidity and overpressure in room and/or in which the control of the airborne contamination is mandatory.

SPCS (HEALTH CONCEPT) VERTICAL A.H.U.

Operating theaters and clean areas.

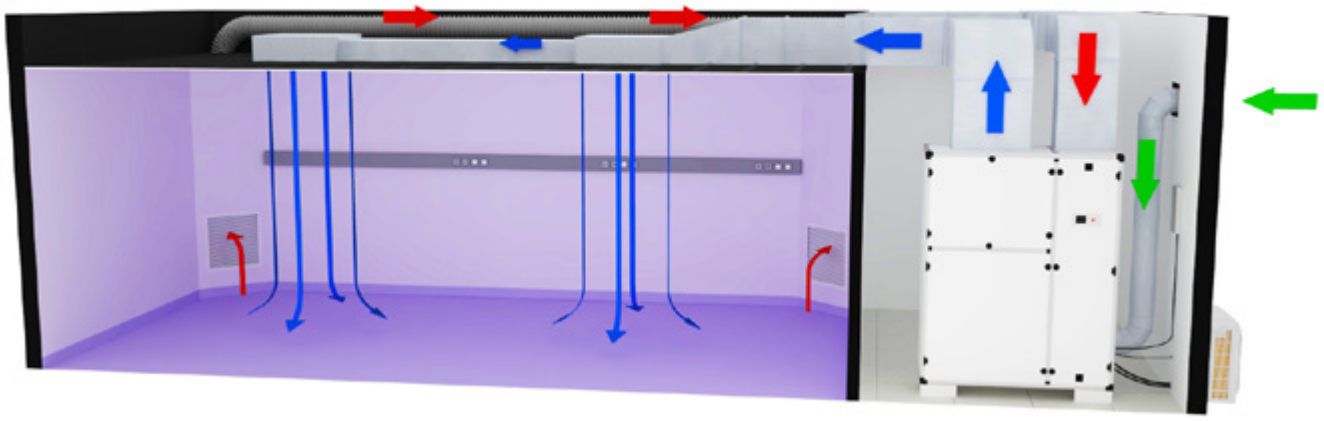
SPCI (INDUSTRY CONCEPT) VERTICAL A.H.U

Research laboratory, laboratory animal house, pharmaceutical and industrial production.

INTEGRATION AND ASSEMBLY EASINESS

Easy to integrate next to treated rooms. Vertical air handling unit allows simplifying the aeraulic, hydraulic and fluid networks conception, thanks to the left or right orientation flexibility, its compacity or customizable connections.

It allows optimizing in a maximum way the technical premises and installation costs. The height of all A.H.U. is 1970 mm, including plinth, which allows an introduction in buildings by all classic doors.



Customizable connections: hydraulic, refrigerant, electric and aeraulic.

A2i air handling units integrate perfectly in a building conception type HQE (high environmental quality)

Our fans are equipped with EC engines (Electronic Commutation) with incorporated anti-failure elements, including integrated individual electronic circuits, self-regulated engines and internal protection.

Advantages

- Reduced energy consumption,
- Functioning low costs,
- Constant and easy speed control on all range,
- Low sound standard compared to a similar installation with alternating asynchronous engine,
- High outputs,
- Long life length.

MODULAR A.H.U. CHARACTERISTICS

			Supply air flow (m³/h)		
SPCI-SPCS A.H.U.	Depth (mm)	Length (mm) (*)	Mini	Maxi H14 Supply Filter	Maxi F9 Supply Filter
600	645	1300	550	700	700
601	645	1510	700	2000	2300
810	845	1510	2000	4300	4300
911	975	2000	4300	7000	8400
920		2490	7000	9000	11200
921		2980	9000	11500	14000
930		3470	11500	13500	16800
940		4450	13500	18000	22400
950		5430	18000	22500	28000

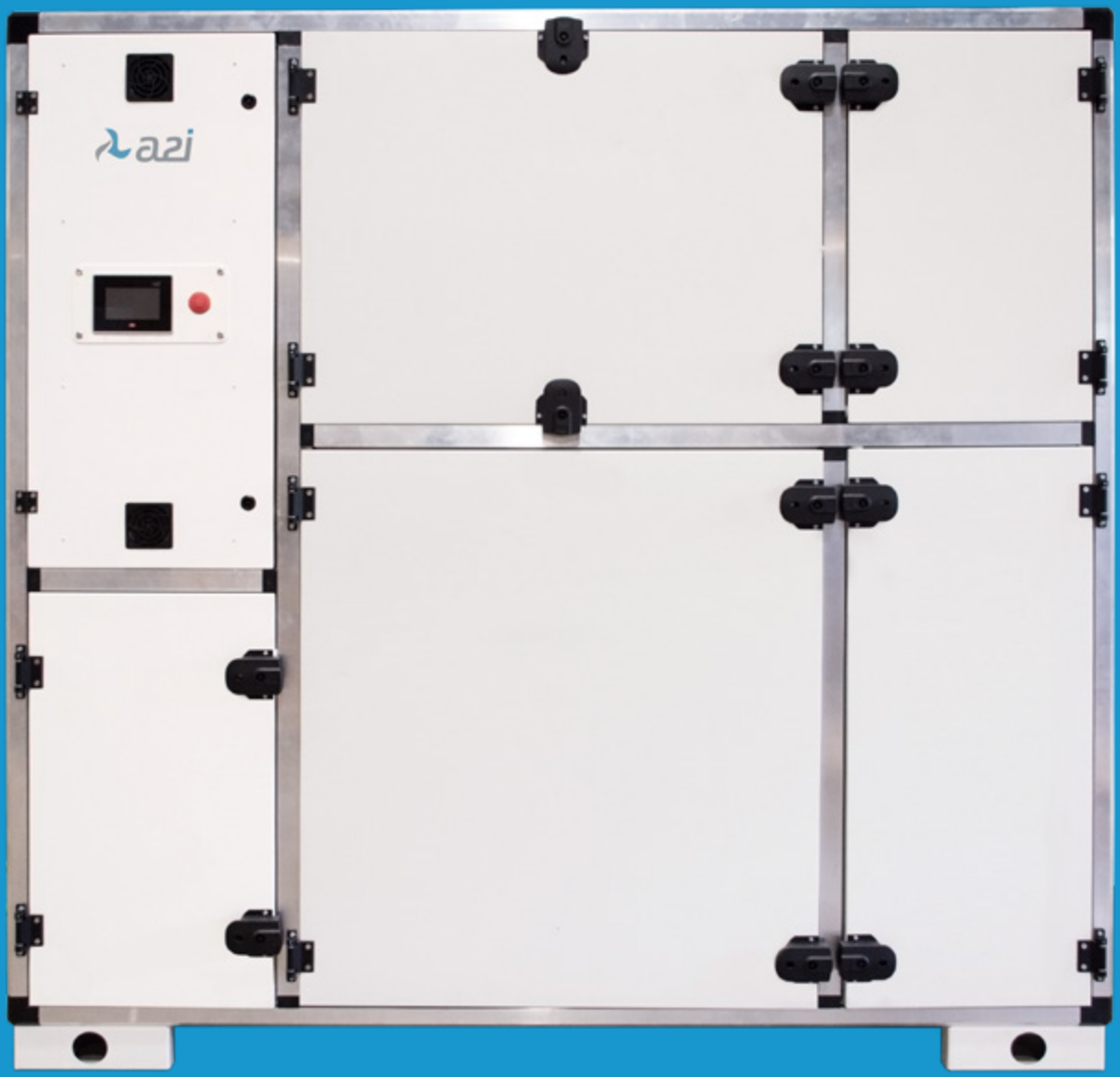
Available static pressure: from 50 to 1 200 Pa according to configuration.
(*) according to options: electrical cabinets and lateral technical module.

MODULARITY

Vertical A.H.U. with plenum diffuser.

The modular conception allows a simple manufacture of a complete and complex A.H.U. range from 700 m³/h to 28 000 m³/h supply air flow.

A.H.U. sizes: SPCS/SPCI from 600 to 950



Frame / Profile angle and Te Aluminum, joined in a Nylon block to avoid thermal bridge.

Panels / double white lacquered galvanized metal sheet (RAL9010).

Thermal and phonic Insulation / rock wool panels 90kg/m³

Flexibility / 42 mm thick front access panels on hinges.

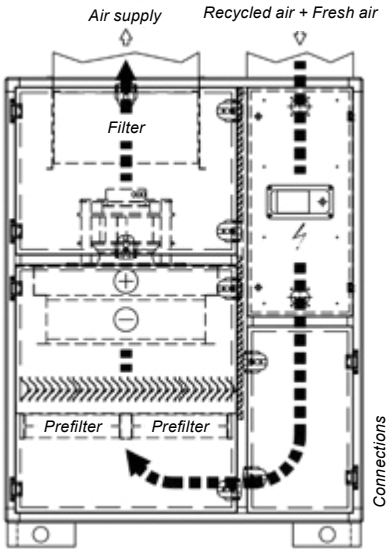
The condensate tray / droplets separators, condensate tray and siphons are in accordance with the recommendations of the 90-351 NFS standard.

AVAILABLE CONFIGURATION AND REGULATORY ASPECTS

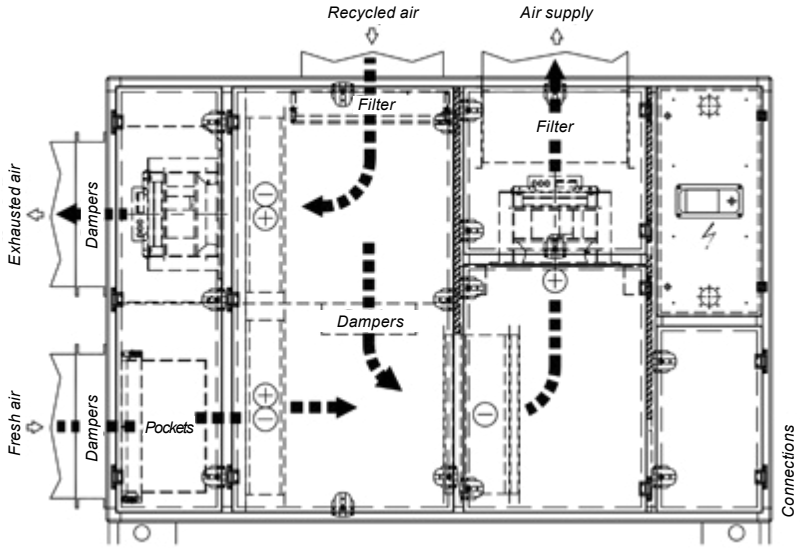
A2i A.H.U. in association with the A2i laminar air flow ceiling allow you to reach the ISO 5 class.

The conception and manufacture quality of SPCI/ SPCS A.H.U. frame and panels allow to reach the best level EN 1886 norm classification (classification of air handling unit mechanical performances).

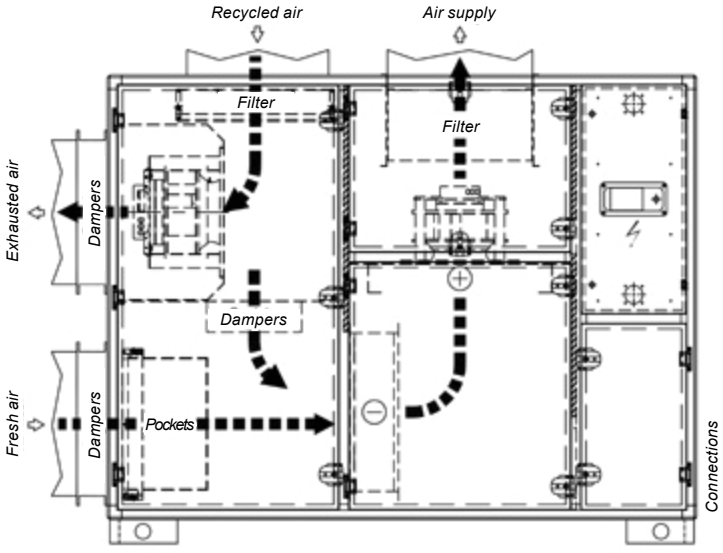
- Mechanical deformation class D1
- Tightness class L2
- Bypass leaks to the filters class F9
- Thermal bridge and transmittance class T2/TB2



Simple flow.



Double flow with energy recovery.



Double flow.

PHARMACEUTICAL INDUSTRY

Air particle cleanliness, based on the NF EN ISO 146441-1. 2016

ISO class	Pharmaceutical	Maximum allowable concentration of particles (particles/m³ of air) of diameter given below					
		0,1µm	0,2µm	0,3µm	0,5µm	1µm	5µm
ISO 1		10	d	d	d	d	e
ISO 2		100	24 b	10 b	d	d	e
ISO 3		1 000	237	102	35 b	d	e
ISO 4		10 000	2 370	1 020	352	83 b	e
ISO 5	**A & B**	100 000	23 700	10 200	3 520	832	d, e, f
ISO 6		1 000 000	237 000	102 000	35 200	8 320	293
ISO 7	**C**	c	c	c	352 000	83 200	2 930
ISO 8	**D**	c	c	c	3 520 000	832 000	29 300
ISO 9 g		c	c	c	35 200 000	8 320 000	293 000

Notes to the particle classes table

a: cumulative concentrations relative to a diameter

b: concentrations leading to a large quantity of sampled air (resort, when needed, sequential sampling)

c: highest acceptable concentrations, not applying because too high

d: the sampling and statistics limits on the lowest concentrations make the classification inappropriate

e: the particles that are restrained in the sampling system make the classification inappropriate

f: possibility to adopt the M descriptor (concentration, measured or specified, of the microparticles per air cube meter, according to the ISO 14644-1,3.2.6 definition) when associating it to at least another size of particle.

g: class applicable uniquely when in activity

LABORATORY

HEALTH FACILITY

RISK 4 / VERY HIGH INFECTION RISK

SCOPE OF APPLICATION

Salle d'orthopédie, salle de greffe d'organe, salle d'opération des grands brulés, chambre unités protégées (hématologie), reconstitution cytostatique, fabrication solution parentérale.

EQUIPMENT

- SPCS A.H.U. with M6/F7/F9 filtration.
- Laminar air flow ceiling with H14 filters (HEPA).
- Supply air velocity from 0.25m/s to 0.35m/s.
- Recycled air intake at the lower peripheral part of the operating theater.
- Exhausted air (lower than fresh air flow).
- Fresh air ≥ 6 volumes of the room per hour.

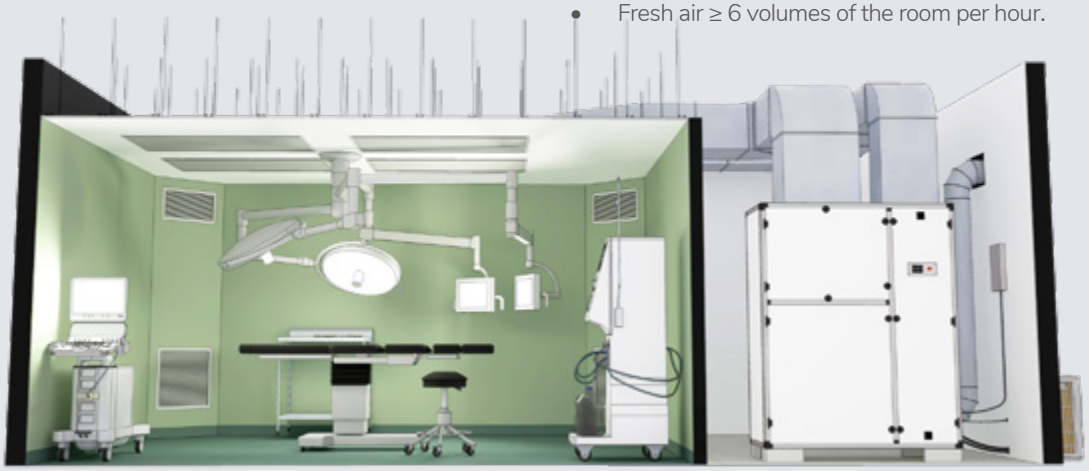
RISK 3 / HIGH INFECTION RISK

SCOPE OF APPLICATION

Polyvalent rooms, ORL/OPH and other orthopedic rooms, digestive and visceral surgery rooms, cardio-vascular surgery rooms, urology, neurosurgery, ...etc.

EQUIPEMENT

- SPCS A.H.U. with M6/F7/F9 filtration.
- Terminal H14 diffusers.
- Air mixing rate ≥ 15 vol/h.
- Recycled air intake at the lower peripheral part of the operating theater.
- Exhausted air (lower than fresh air flow).
- Fresh air ≥ 6 volumes of the room per hour.



RISK 2 / MODERATE INFECTION RISK

SCOPE OF APPLICATION

Pre-surgery care room, Recovery room, surgery corridors, sterile medical devices storage, PACU, ICU, ...etc.

EQUIPEMENT

- SPCS A.H.U. with M6/F7/H13 filtration
- Regular diffusers
- Air mixing rate ≥ 10 vol/h
- Recycled air intake at the lower peripheral part or in the ceiling of the treated area
- Exhausted air (lower than fresh air flow)
- Fresh air ≥ 6 volumes of the area per hour

Performances to reach according to risk zones in health facilities, following the NF S90-351 April 2013 standard

Risk class	Particle cleanliness class	Particle elimination kinetic	Bacteriological cleanliness class	Differential pressure (positive or negative)	Air temperature	Air flow mode of the zone to protect	Other specs
4	ISO 5 < 3500 particles ≥ 0,5 µm/ m³ air	CP 5	M1	15Pa + OR – 5Pa	19°C to 26°C	Laminar flow	Under the air flow area from 0.25m/s to 0.35m/s Fresh air flow ≥ 6vol/h
3	ISO 7 < 350 000 particles ≥ 0,5 µm/ m³ air	CP10	M10	15Pa + OR – 5Pa	19°C to 26°C	Laminar flow or not Laminar flow	Mixing rate ≥ 15vol/h Fresh air flow ≥ 6vol/h
2	ISO 8 < 3 500 000 particles ≥ 0,5 µm/ m³ air	CP 20	M100	15Pa + OR – 5Pa	19°C to 26°C	Not Laminar flow	Mixing rate ≥ 10 vol/h Fresh air flow ≥ 6vol/h

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