AIR HANDLING UNIT FOR CLEANROOM

Healthcare and Industry

COMPANY

Air Innovation Industrie (A2i) is a French manufacturer specializing in air handling units (AHUs) designed specifically for cleanrooms and operating theaters.

Located in the south of France near Montpellier, A2i was established in April 2009 and offers tailor-made solutions for air treatment systems dedicated to controlled environments.

With an in-house design office, a responsive sales team, its own production unit, and a global after-sales service, A2i provides comprehensive support from project design to the operation of your equipment.

The technology of our air handling units (AHU) combined with our experience and expertise have enabled us to work with the most famous design offices and installers in the sector. Our systems are installed in both healthcare and industrial environments, with numerous references in France and internationally.

ISO 9001 CERTIFIED

In constant research of excellence, A2i is commited in the quality certification process of ISO 9001 standard in order to:

- Demonstrate our ability to provide a product that meets your requirements and applicable standards ;
- Increase your satisfaction through effective application of our products.

OUR REFERENCES

SANOFI

APHM
Assistance Publique Hôpitaux de Marseille

Ramsay Générale de Santé

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

HUG Hôpitaux Universitaires Genève

ELSAN

LVMH
MOËT HENNESSY • LOUIS VUITTON

IBM

HIGHT TECHNOLOGY AND ENERGY SAVING

The A2i AHUs are designed and manufactured specifically to control temperature, humidity and overpressure conditions of environments in which the control of airborne contamination is mandatory.

SPCS (HEALTH CONCEPT)

Operating Theater, Laboratory, Isolation room.

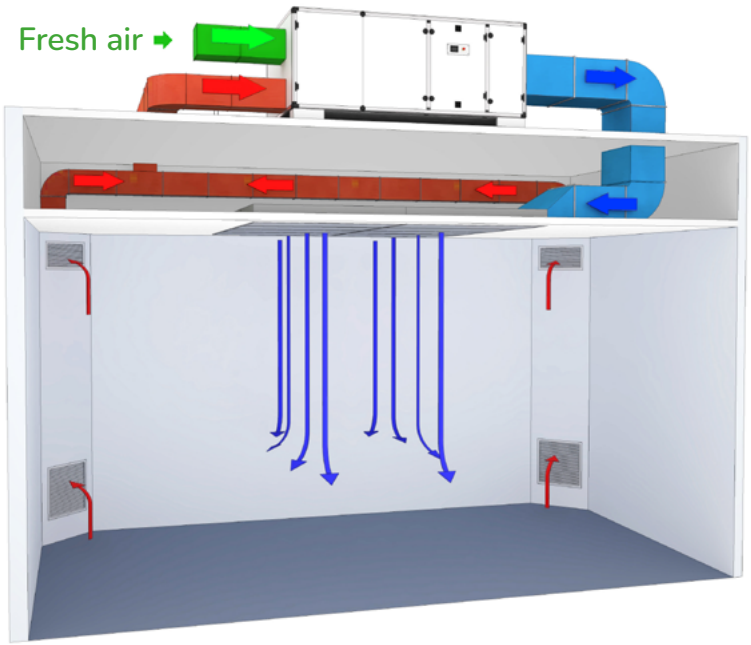
SPCI (INDUSTRY CONCEPT)

Research laboratory, pharmaceutical and microelectronic industry, mechanic and precision industrial process.

NEW GENERATION OF PLUG & PLAY AHUs

Drawing on our deep expertise in air treatment and automation, we have developed a new generation of air handling units that feature a fully integrated control system.

This innovative PLUG & PLAY concept offers a smart, efficient, and ready-to-use solution, making it the ideal alternative for your cleanroom projects.



Several possibilities to connect fresh, recycled and exhausted air.

TECHNOLOGY

Thanks to a robust structure and high-performance panel selection, our AHUs are fully suitable for outdoor installation

They are equipped with inlet filters ranging from G4 to F9 and outlet filters from F7 to H14, enabling compliance with all cleanroom classifications, including the most stringent.

Cooling power can be delivered via chilled water coils or direct expansion systems, while heating options include hot water coils or electric heaters, depending on your project requirements.

All our units are fitted with high-efficiency EC motors, delivering up to 30% energy savings compared to conventional asynchronous motors, while ensuring quiet operation and optimal control.

FEATURES

AHUs available with direct expansion, chilled water, hot water, or electrical heaters.
Options for dehumidification and humidification are also available.
Units can operate in full fresh air mode, 100% recycle mode, or a combination of fresh and recycled air.

			Length (mm)		Air flow (m³/h)	
SPCS-H SPCI-H	Depth (mm)	Height (mm)	Regular	Extended	Max H14 supply Filter	Max F9 supply Filter
H2000	1350	1085	2350	2800	2000	2300
H4000					4300	4300
H8000		1980			7000	8400
H12000					9000	11200
H16000	1700	1980	2800	3250	13500	16800
H22000	2000				18000	22400
H26000	2450				22500	28000
H30000	2900				27000	33600

Frame / Aluminum profiles (L and T-shaped), assembled with nylon corner joints to prevent thermal bridging.

Panels / Double-skin panels made of painted electro-galvanized steel sheet.

Insulation / Thermal and acoustic insulation using 90 kg/m³ rock wool panels.

Flexibility / 42 mm thick front access panels, mounted on hinges and easily removable.

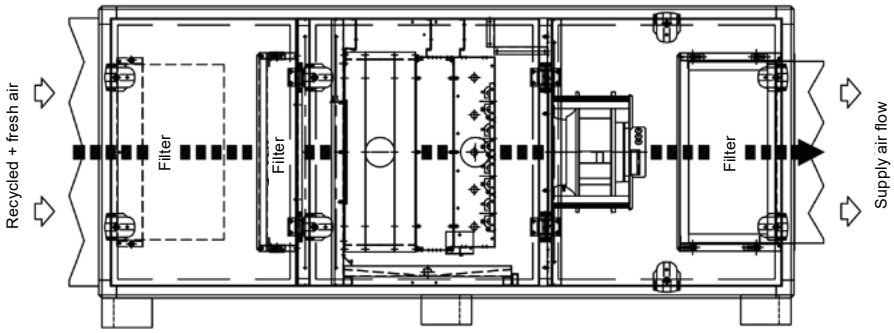
NFS 90-351 Compliance / Condensate tray equipped with droplet separator and siphon, in accordance with the requirements of the NFS 90-351 healthcare standard.

CONFIGURATION AND REGULATION

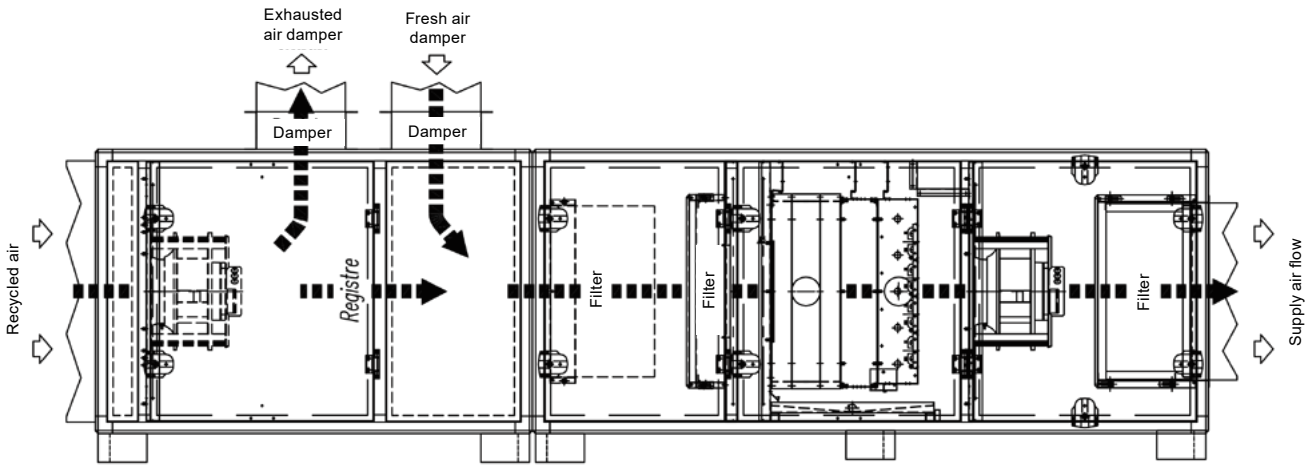
MECHANICAL PERFORMANCE OF OUR AIR HANDLING UNIT

The quality of the design and manufacture of the frame, panels and sheet metal work allow our AHUs to reach the best classifications of the EN 1886 standard.

- Casing deflection D1
- Leakage class L2
- Leakage rate of bypass filters class F9
- Thermal transmittance and Thermal bridging T2/TB2



SINGLE FLOW



DUAL FLOW

ENERGY SAVING

ERP (ESTABLISHMENT OPEN TO THE PUBLIC) REGULATIONS

We follow ERP regulations closely, however activities requiring the use of cleanroom are not directly affected. Indeed, the risk of contamination between the flow of fresh air and exhausted air prevents the use of crossflow exchanger or energy recuperator wheel. The new ERP requirements impose minimum yield of 73% of heat recovery, which cannot be reached with glycol water exchanger. Pending the evolution of ERP in our fields of activity, the A2i company set up all the means necessary to reach the highest yields in terms of energy recovery thanks to advanced automation solutions.

Our automation systems are designed to optimize energy efficiency through intelligent control features, including:

- Reduced operating mode: Automatic adjustment of airflow rates, temperature, and humidity levels. This mode can be triggered manually, via a programmable timer, or through the Building Management System (BMS).
- Free cooling functionality: Utilization of favorable outdoor air conditions to reduce mechanical cooling demand.
- Humidity control based on absolute humidity: Ensures more precise and efficient regulation compared to relative humidity control.
- Selective dehumidification: Activation only when required by standards or when the humidification cycle is not essential, avoiding unnecessary energy consumption.

PHARMACEUTICAL INDUSTRY

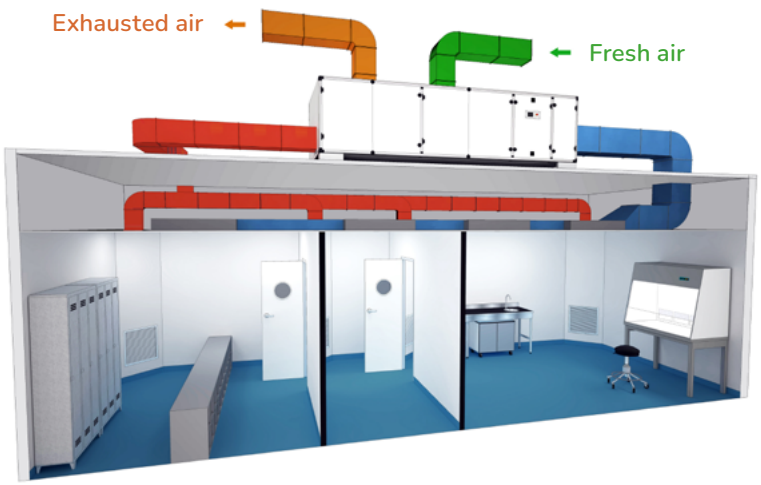
The ISO 14644-1 standard defines cleanrooms as room or a series of rooms where the particule concentration is controlled in order to minimize the introduction, the generation, the retention of particles inside, generally in a specific industrial or scientific research goal. Parameters such as temperature, humidity and relative pressure are also maintained at a precise level.

Particulate air cleanliness classes, according to NF EN ISO 146441-1. 2016

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

Notes to the table of particulate classes above:

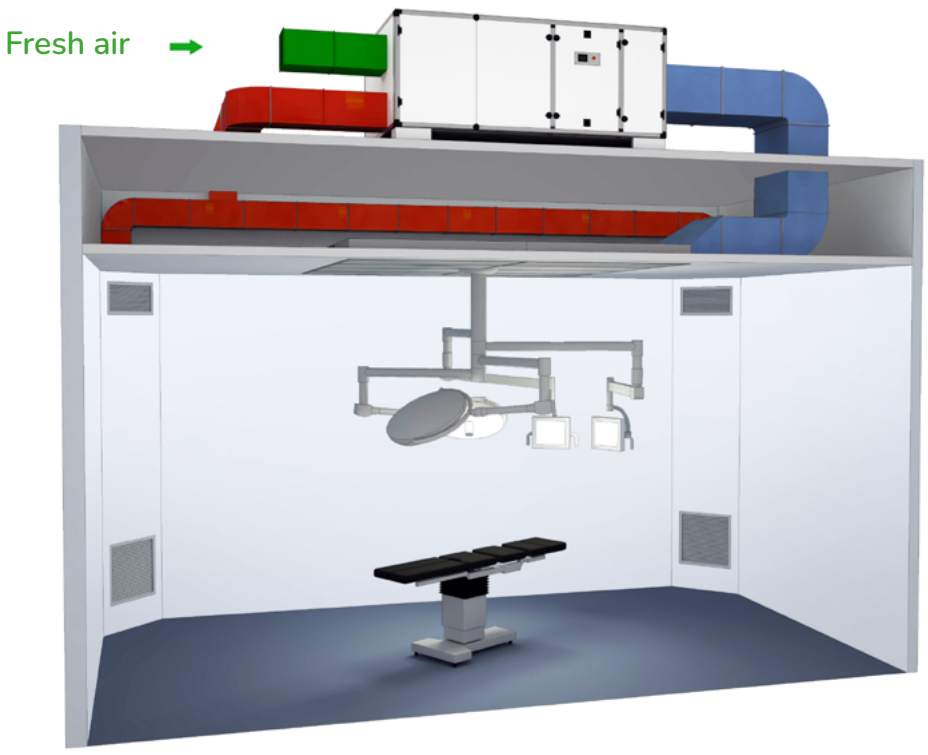
a: concentrations expressed as cumulative (relative to a diameter).
b: concentrations leading to the test of large volumes of air (use, if necessary, of sequential sampling).
c: maximum admissible concentrations not applicable because they are too high.
d: the sampling limits and the statistical limits on low concentrations make the classification inappropriate.
e: the particles retained inside the sampling system make the classification inappropriate.
f: possibility of using the descriptor M (concentration, measured or specified, of the macroparticles per cubic meter of air, according to definition ISO 14644-1,3.2.6) by associating it with at least one other particle size.
g: class applicable only in activity.



HEALTH CARE

Technical performances to reach in risk areas of healthcare establishments according to the french standard NF S90-351 April 2013.

Risk class	ISO class	Kinetic class of particulate	Microbiological class	Differential pressure	Temperature range	Diffusion mode	Other specifications
4	ISO 5	CP 5	M1	15Pa + OU – 5Pa	19°C à 26°C	Laminar air flow	Velocity under laminar flow from 0,25m/s to 0.35 m/s Fresh air rate > 6vol/h
3	ISO 7	CP10	M10	15Pa + OU – 5Pa	19°C à 26°C	Laminar or Turbulent air flow	Air change rate > 15 vol/h
2	ISO 8	CP 20	M100	15Pa + OU – 5Pa	19°C à 26°C	Turbulent air flow	Air change rate > 10 vol/h



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