



AIR HANDLING UNITS

AQX

Hygienic configuration



AIR CONDITIONING
AND AIR QUALITY
PARTNER

Inspiring Solutions since 1989

Applications

AQX in hygienic configuration air handling units are specially designed to meet any design requirement for air conditioning systems that demand high standards of hygiene.



Hospitals



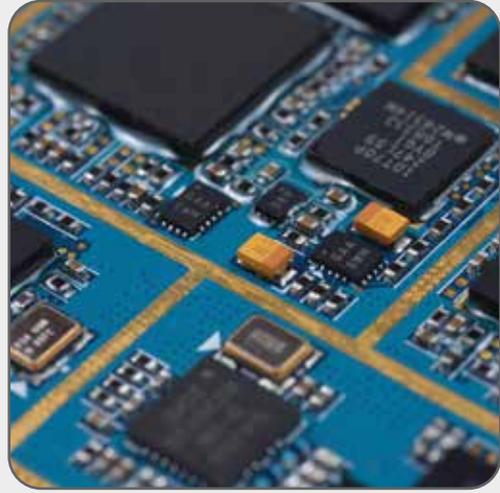
Food



This type of unit can be used for any application requiring a product with all the features needed to facilitate ordinary cleaning and sanitisation.



Pharmaceutical



Microelectronics



Certifications

ZERTIFIKAT ◆ CERTIFICATE ◆ 証書 ◆ CERTIFICADO ◆ CERTIFICAT ◆



Herewith it is confirmed to the company

Clivet S.p.A.
in
IT-32032 Z.I. Villapaiera

for the factory in
IT-37063 Isola della Scala (VR)

based on the positive results of the completed tests on the

Air handling unit in hygienic design
Range: "AQX...H"

according to the standards
VDI 6022 part 1:2018-01
VDI 3803 part 1:2020-05
DIN 1946-4:2018-09
DIN EN 13053:2020-05

that the requirements of the Certification Program of the
TUV SUD Industrie Service GmbH are fulfilled.

The company is allowed to use the following Certification Mark:



Compliance with hygienic requirements (used materials) www.tuv.com/health sec. 54

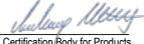
- VDI 6022-1
- VDI 3803-1
- DIN EN 13053

www.tuv.com/health

This certificate is valid up to and including 2024-03-31

Certificate registration number: 22/21/87




 Certification Body for Products
 Refrigeration and Air-Conditioning
 Munich, 2022-03-30



TUV SUD INDUSTRIE SERVICE GMBH, WESTENDSTRASSE 199, D-80686 MÜNCHEN
certification-TAK@tuvsud.com



CERTIFICATE

N° 13.05.001



Air Handling Unit / Centrales de traitement d'air
Range Name / Nom de Gamme :
AQX

Granted on May 14, 2013 - Date 1ere admission 14 mai 2013

This document is valid at the date of issue - Check the current validity on:
Document valable à la date d'émission - Vérifier la validité en cours sur :
www.eurovent-certification.com

Participant/Titulaire

CLIVET S.p.A.
Zona Industriale - Via Camp Lonc, 25
32032 Villapaiera - Feltre (BL), Italy

This product performance certificate is issued by Eurovent Certita Certification according to the certification rules:

ECP AHU - « Air Handling Unit » in force at established date.

Pursuant to the decision notified by Eurovent Certita Certification, the right to use the mark ECP shall be granted to the beneficiary company for the above Range in the conditions defined by the certification program mentioned.

Unless withdrawn or suspended, this certificate remains valid as long as the requirements for the certification program framework are met. The validity of the certificate is to be verified on www.eurovent-certification.com

THIS CERTIFICATE HAS BEEN ISSUED ON 17/03/2022
THIS CERTIFICATE IS VALID UNTIL 30/06/2022

Ce certificat de performance produit est délivré par Eurovent Certita Certification dans les conditions fixées par le référentiel :

ECP AHU - « Centrales de traitement d'air » en vigueur à date d'émission.

En vertu de la décision notifiée par Eurovent Certita Certification, le droit d'usage de la marque ECP, est accordé à la société qui en est bénéficiaire pour la gamme visée ci-dessus, dans les conditions définies par le programme de certification mentionné.

Sauf retrait ou suspension, ce certificat demeure valide tant que les conditions du référentiel du programme de certification sont respectées. La validité du certificat est à vérifier sur le site Internet www.eurovent-certification.com

CE CERTIFICAT A ETE EMIS LE 17/03/2022
CE CERTIFICAT EST VALIDE JUSQU'AU 30/06/2022

Paris, 17 mars 2022



MANAGING BOARD MEMBER / MEMBRE DIRECTOIRE



Organisme accrédité n° 5-0517
Certification Products and Services selon la norme NF EN ISO/CEI 17065:2013
Portée disponible sur www.cofrac.fr
Accréditation #5-0517 Products and Services Certification according to NF EN ISO/CEI 17065:2013 -
Scope available on www.cofrac.fr

COFRAC est signataire des accords MSA d'EA et MSA d'IAF.
COFRAC is signatory of EA MSA and IAF MSA.
List of EA members is available on www.regulation.ec.europa.eu/easr/members
www.iaf.org/2014/04/24/COFRAC-MEMBERS-SIGNATORIES/

1/2

EUROVENT CERTITA CERTIFICATION SAS au capital de 100 000 € - 48-50 rue de la Victoire 75009 Paris - FRANCE
Tel : 33 (0)1 75 44 71 71 - 513 133 637 RCS Paris - SIRET 513 133 637 000 35 - TVA FR 59513133637



CERTIFICATE

N° 13.05.001



Appendix / Annexe

Granted on May 14, 2013 - Date 1ere admission 14 mai 2013

This document is valid at the date of issue - Check the current validity on:
Document valable à la date d'émission - Vérifier la validité en cours sur :
www.eurovent-certification.com

List of certified products and characteristics is displayed on:
La liste des références et caractéristiques certifiées est disponible sur le site :
www.eurovent-certification.com

This product performance certificate is valid for the following trade names:
Ce certificat de performance produit est valide pour les marques commerciales suivantes:
[Trade Name / Marque Commerciale](#)

CLIVET

This product performance certificate is valid for the following manufacturing places:
Ce certificat de performance produit est valide pour les sites de production suivants:
[Manufacturing Place / Site de Production](#)

Isola della Scala (VR), Italy

This product performance certificate is valid for the following software:
Ce certificat de performance produit est valide pour les logiciels de sélection suivants:
[Software / Logiciel de sélection](#)

CTA PRO 1.0.7.6

EUROVENT CERTITA CERTIFICATION SAS au capital de 100 000 € - 48-50 rue de la Victoire 75009 Paris - FRANCE
Tel : 33 (0)1 75 44 71 71 - 513 133 637 RCS Paris - SIRET 513 133 637 000 35 - TVA FR 59513133637

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Clivet air handling units are designed and produced in compliance with the following standards:

- ✓ ECODSIGN Directive 1253/2014
- ✓ 1254/2014 Directive
- ✓ DIN 1946-4:2018
- ✓ DIN EN 13053:2020
- ✓ VDI 6022-1:2018
- ✓ VDI 3803-1:2020
- ✓ EN 1751:2014
- ✓ EN 1886:2009



Check ongoing validity of certificate: www.eurovent-certification.com



Clivet air handling units in hygienic configuration are TÜV SÜD certified, which means that they meet the requirements of accessibility and cleanability of the components and hygiene of the materials used.



Clivet participates in the EUROVENT Certification Programme for Air Handling Units which tests and certifies the performance of air conditioning and cooling products in accordance with European and international standards. The products concerned are listed in the EUROVENT guide of certified products and on the website www.eurovent-certification.com/en.



Clivet, aiming for the satisfaction of its customers, has integrated and certified its Quality, Environment and Safety Management Systems according to the international standards ISO 9001, ISO 14001 and ISO 45001.



Clivet products comply with the applicable product directives as required in all European Community countries to ensure an appropriate standard of safety.

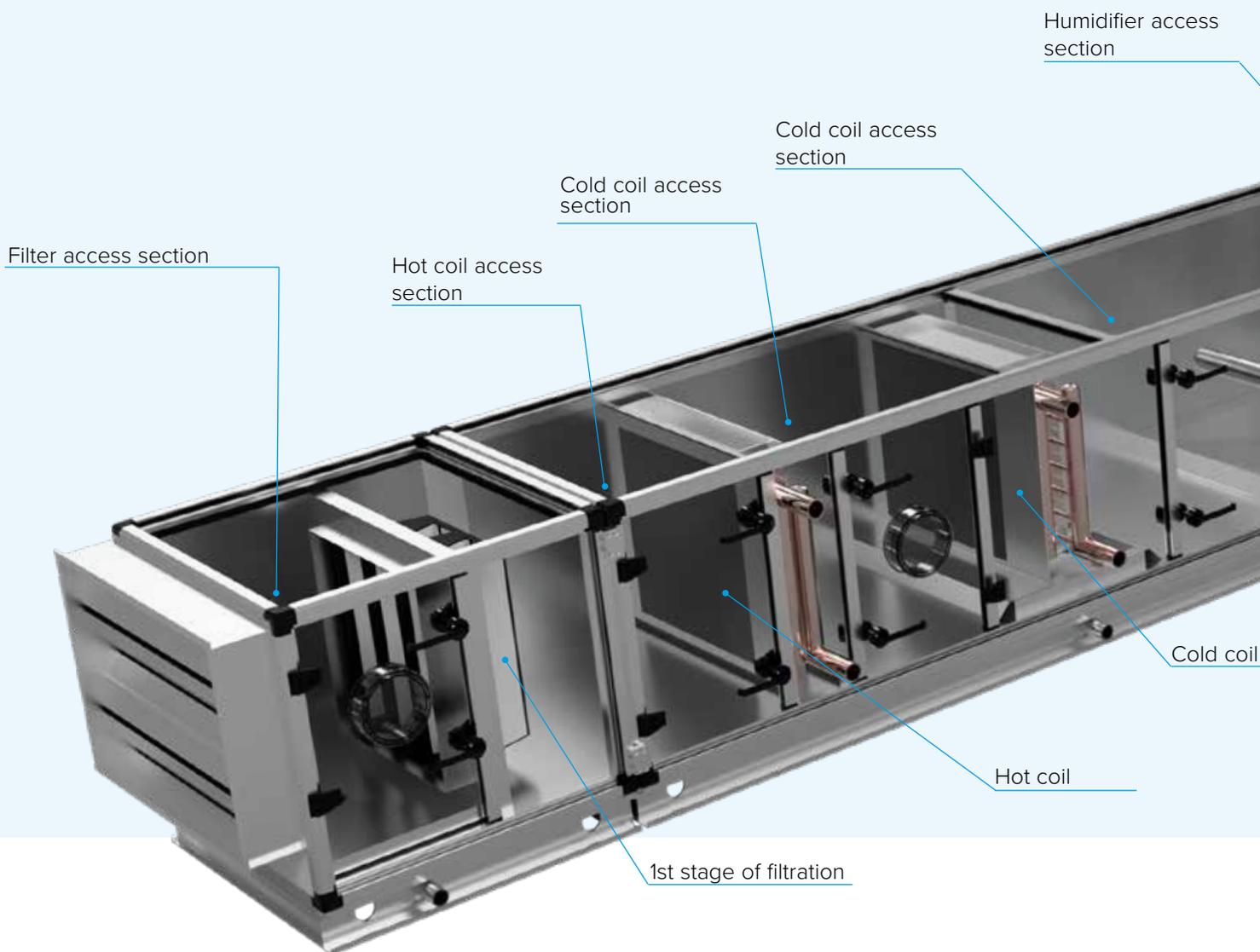
Main features

Components accessible through special doors or inspection panels:

- ✓ Filters
- ✓ Drain pans
- ✓ Hot coil
- ✓ Cold coil
- ✓ Droplet separator
- ✓ Humidifier
- ✓ Fans
- ✓ Sound attenuators

Components easily removable for cleaning and maintenance purposes:

- ✓ Filters
- ✓ Hot coil
- ✓ Cold coil
- ✓ Droplet separator
- ✓ Sound attenuators

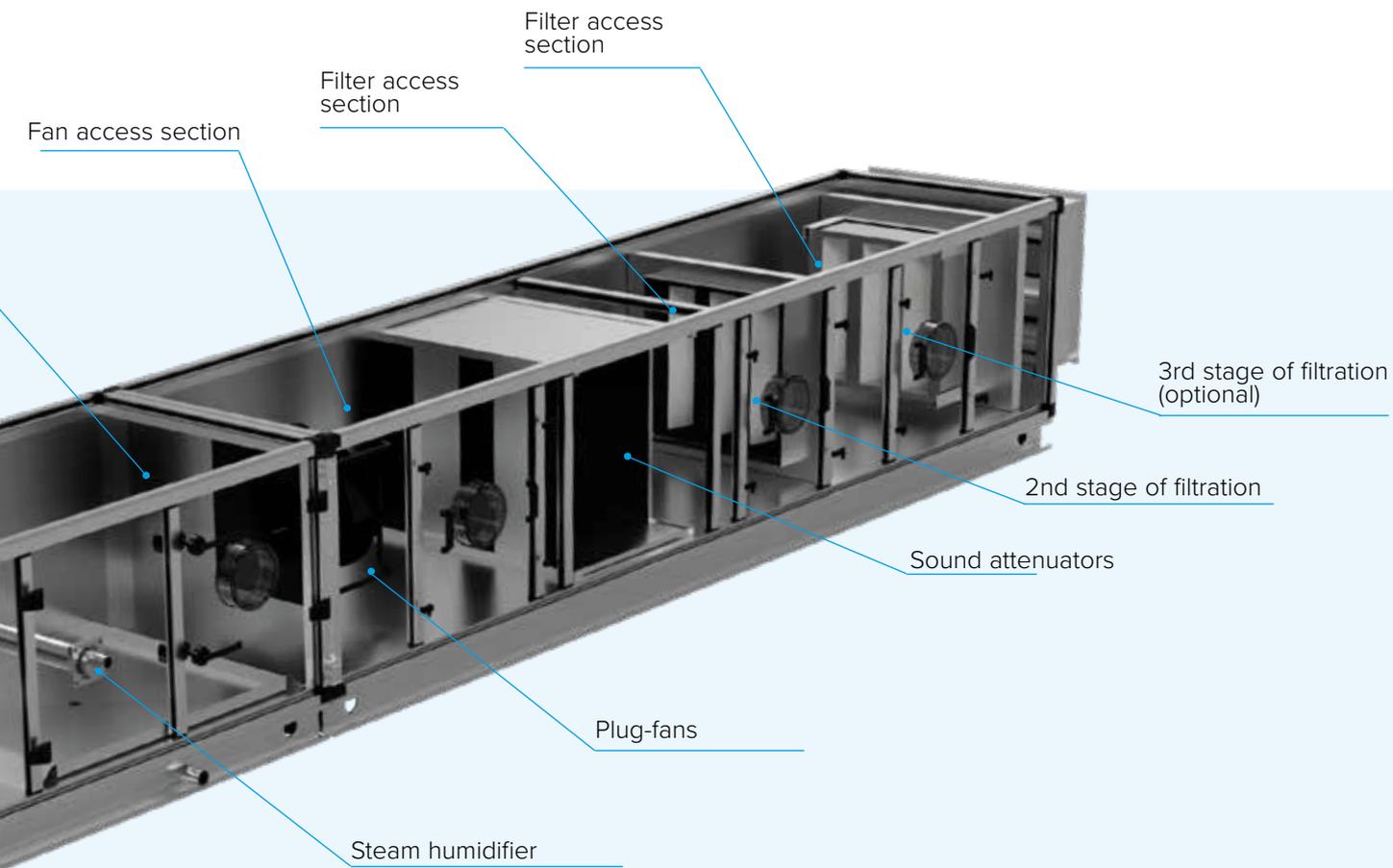


Smooth interior surfaces, without recesses and resistant to disinfectants for easy cleaning

60 mm panels for maximum mechanical and thermal performance

No risk of microbial contamination from internal components according to ISO 846 method A and C

Internal panels made of antibacterial material (stainless steel or aluminium)



Presence of viewing panels and lighting systems at:

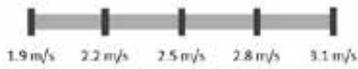
- ✓ Filters
- ✓ Cold coil
- ✓ Humidifier
- ✓ Fans

Drain pans under:

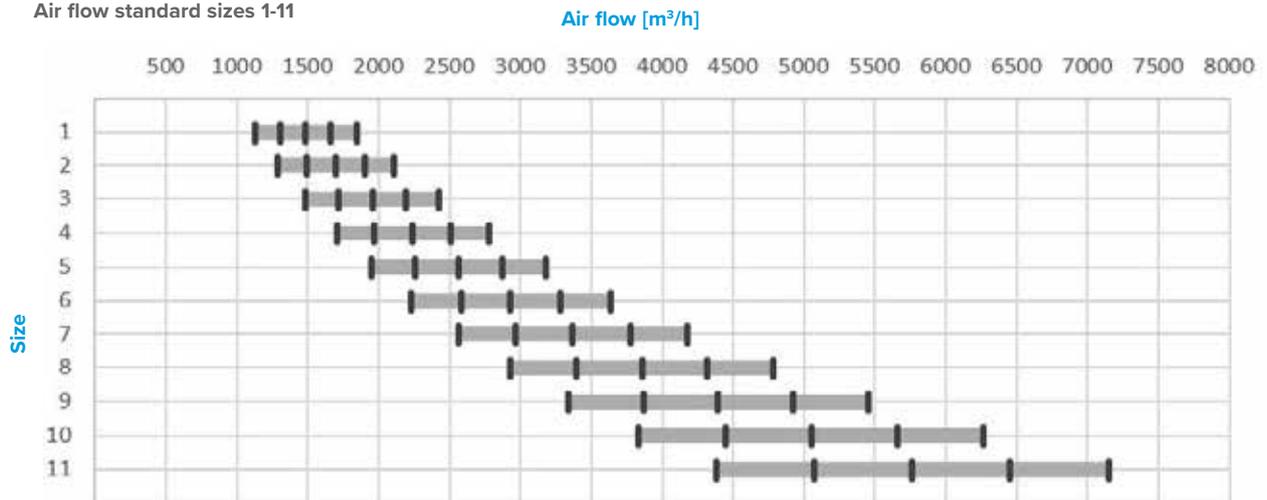
- ✓ Intake section
- ✓ Cold coil
- ✓ Humidifier
- ✓ Runaround coil

Available sizes and field of application

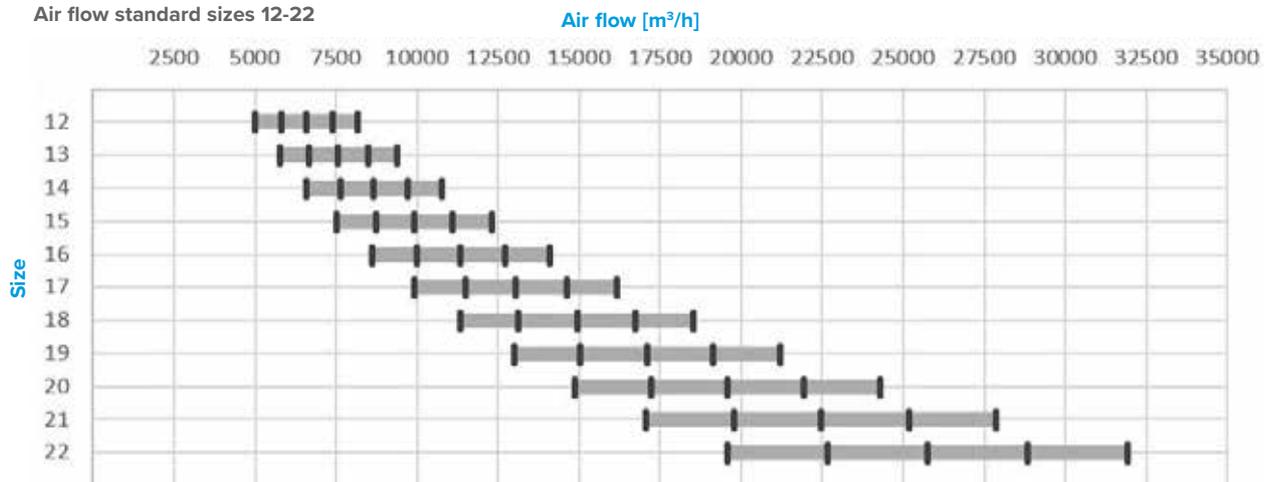
The Clivet AQX in hygienic configuration units are available in 32 standard sizes for flow rates from 1,500 to 100,000 m³/h (considering a speed of 2.5 m/s at the exchangers), but are also designed to be able to adapt to any architectural or design constraint. In this respect, the height and width can be varied as required in 50 mm increments, providing a number of combinations table to meet all requirements.



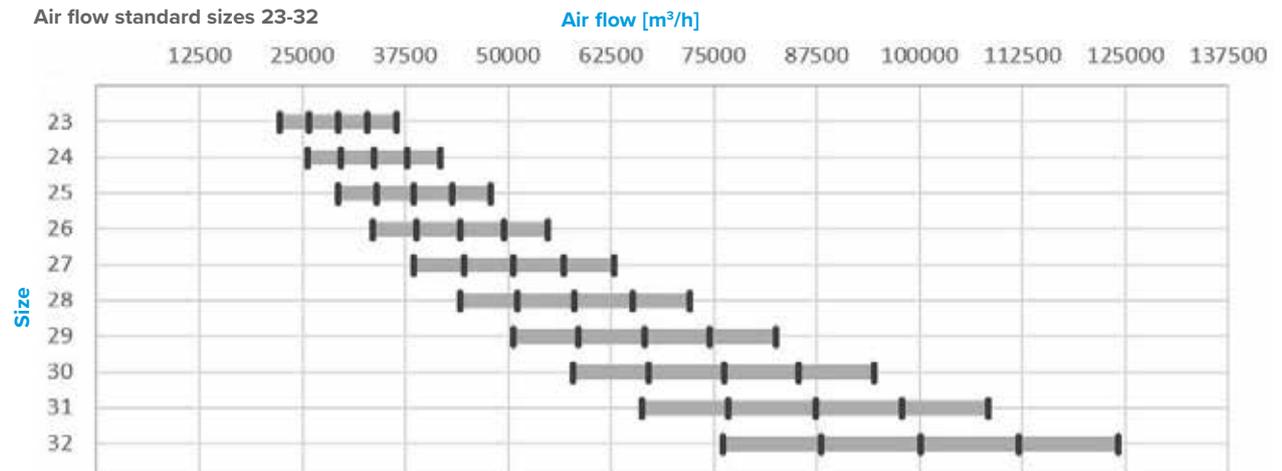
Air flow standard sizes 1-11

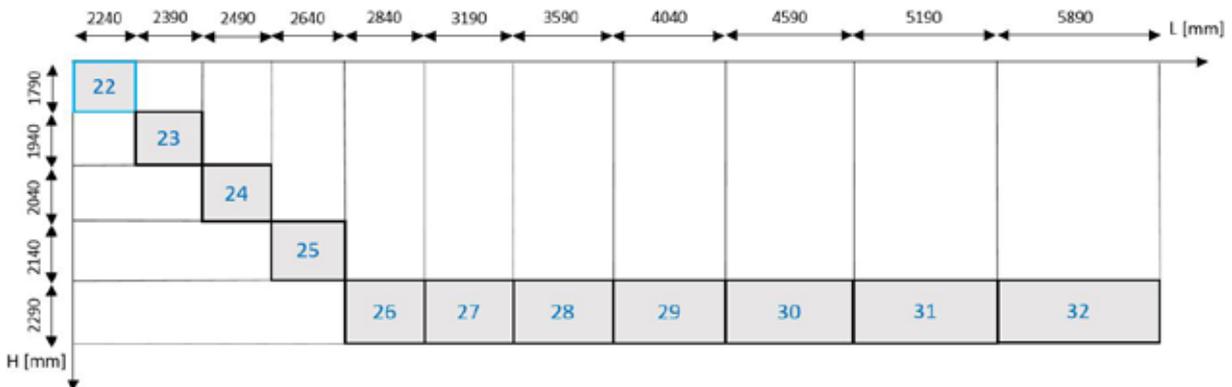
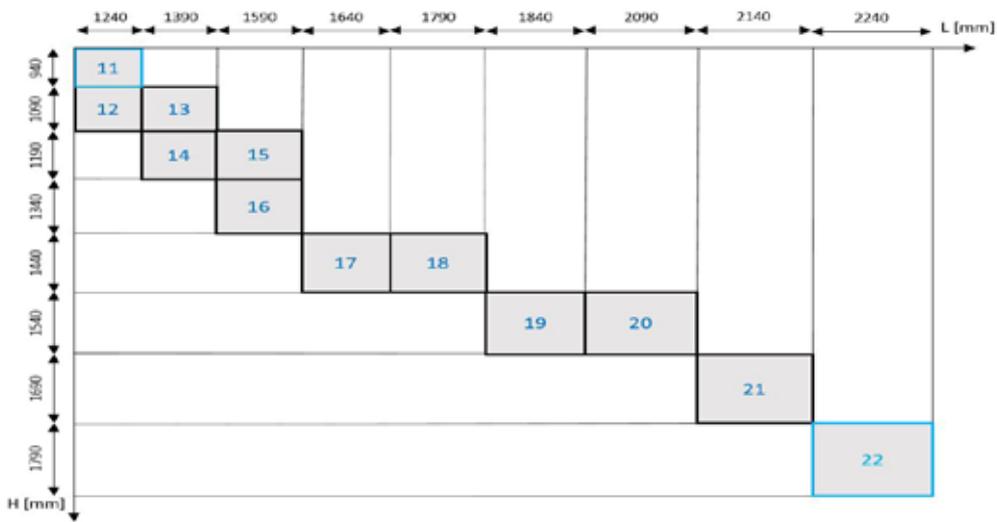
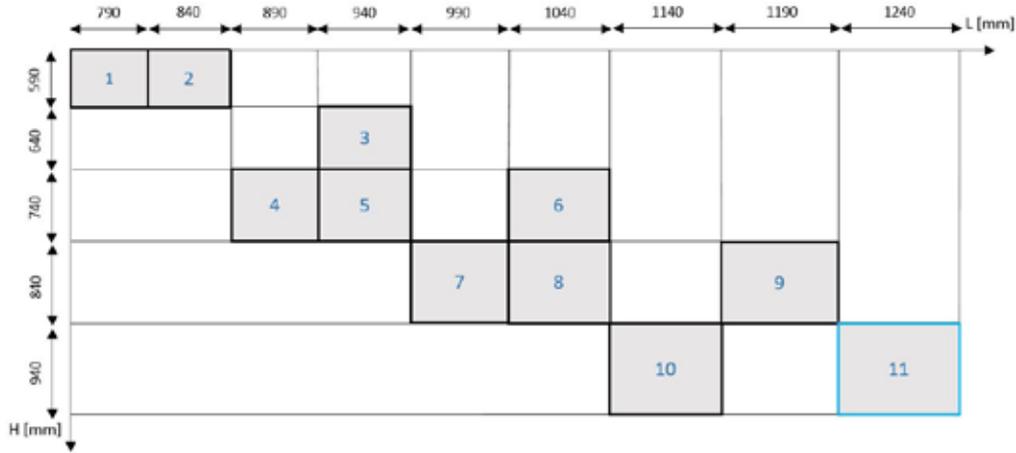
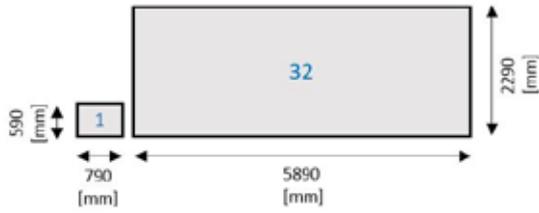


Air flow standard sizes 12-22



Air flow standard sizes 23-32





Reported values refer to external dimensions and do not take into account the height of the base frame.

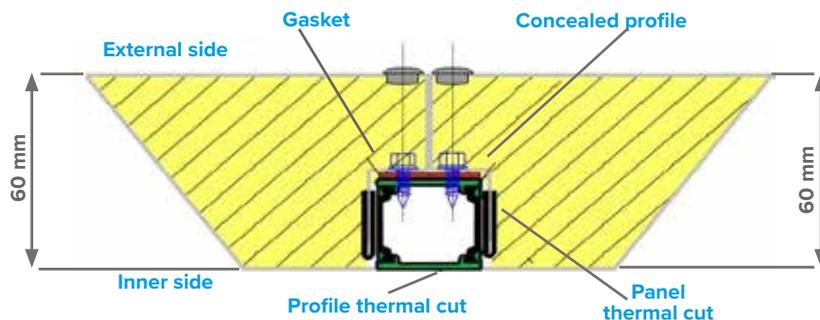
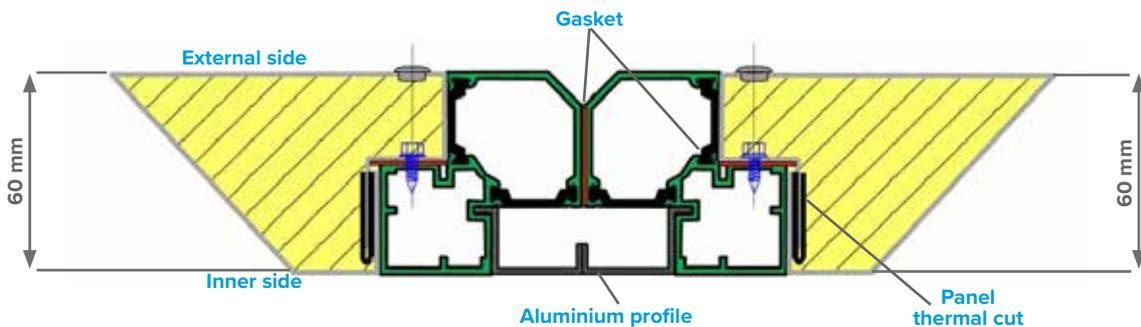
Structure and execution

The load-bearing structure of the AQX in hygienic configuration units is made of cold extruded aluminium profiles and sandwich panels to ensure maximum rigidity and lightness. The casing is designed to ensure excellent sound insulation and minimal deformation under pression or depression operation.

In the case of single-flow units it is possible to have fully linear execution or linear execution with partial vertical section; in the case of dual-flow units, in-line, overlapped or side-by-side executions are available. The great versatility of the profiles also makes it possible to create products that can be fully customised according to specific requirements. All models are available for indoor and outdoor installation.

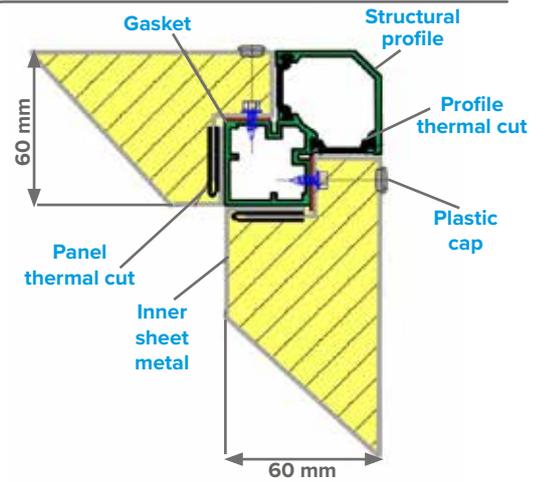
The structure is modular: the base, where present, is made of aluminium sheet metal or steel and is independent for each module. The intermediate aluminium profiles, on the other hand, are concealed for better thermal cut and reduced length of the machine.

All sections are linked together by an external coupling system that guarantees maximum precision and speed of assembly, and internal filling profiles whose purpose is to maintain the surface continuity.



Profiles

The aluminium corner profiles of 60 mm are available in accident-prevention moulding. The closed double chamber construction allows the fixing screws to be concealed and avoids thermal bridges.



Corners

The structure is assembled with three-way corners made of fibreglass-reinforced nylon and with thermal cut. The corners are certified as microbially inert according to ISO 846 Method A/C.



Panels

The panels are of the sandwich type with thermal cut, consisting of a double sheet metal wall with polyurethane foam or mineral wool fibre insulation in between. The special design of the panels, featuring coupling with the profiles, ensures an internal surface free of protrusions. The possible variants and main features are as follows:

	Insulating material	Density	Fire reaction class (UNI 9177)
60 mm	Polyurethane foam (PU)	45 kg/m ³	1
	Rockwool (RW)	90 kg/m ³	1

The panels are fastened using self-tapping screws and covered externally with a cap that completely conceals them, guarantees their water-tightness over time and improves their thermal performance.

The highest level of customisation is guaranteed with a choice of panel sheets in different types of materials and in different thicknesses:

Thickness of the sheet metal [mm]	0.5	0.6	0.8	1	1.2	1.5	2
Aluminium	-	-	✓	✓	✓	✓	✓
AISI 304 stainless steel	✓	✓	✓	✓	✓	✓	-
AISI 316 stainless steel	✓	✓	✓	✓	✓	✓	-
Pre-plasticised galvanised*	✓	✓	-	-	-	-	-
Pre-painted galvanised*	-	✓	✓	✓	✓	✓	-

*Only available for outer sheet metal in accordance with DIN 1946-4

Construction certification

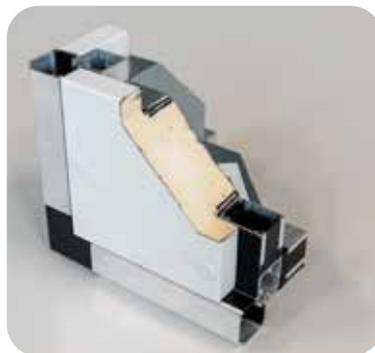
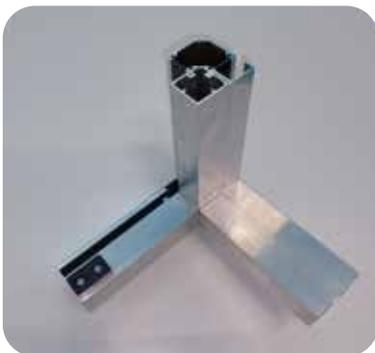
EN 1886 mechanical properties

	DIN 1946-4 Min. requirement	Polyurethane 60 mm	Rockwool 60 mm
Mechanical strength	D2	D1	D1
Maximum relative deflection mm/m	$4,0 < d \leq 10,0$	0.6	1.0
Casing air leakage at -400Pa	L2	L1	L1
Maximum leakage (f400) l/s/m ²	$0,15 < f400 \leq 0,44$	0.02	0.06
Casing air leakage at 700Pa	L2	L1	L1
Maximum leakage (f700) l/s/m ²	$0,22 < f700 \leq 0,63$	0.03	0.10
Filter bypass leakage	F9	F9	F9
Maximum filter bypass leakage: k in % of air flow rate	$\leq 0,5\%$	0,3%	0,3%
Thermal transmittance of the casing	T2	T2	T2
Thermal transmittance (U) W/m ² /k	$0,5 < U \leq 1$	0.78	0.94
Thermal bridge factor of the casing	TB3	TB2	TB2
Thermal bridge factor (kb) W/m ² /k	$0,45 \leq kb < 0,60$	0.68	0.64

Sound insulation [dB]

Frequency [Hz]	125	250	500	1000	2000	4000	8000
Polyurethane 60 mm	11	13	16	14	22	31	39
Rockwool 60 mm	15	17	19	18	23	29	38

The values shown in the tables refer to the results of tests carried out by Eurovent on Model Boxes PU60 and RW60.



Dampers

The dampers are positioned in correspondance of outdoor, supply, extract and exhaust air openings or duct connections:

1. They are made of aluminium alloy and certified to ISO 846 method A and C.
2. Minimum certified class 2 according to DIN EN 1751 with gaskets on the seals. They can be certified up to class 4 on request.
3. Gears are not in contact with air.



Filters

The filter sections are designed to be easily accessible for cleaning and replacement. An upstream space at least equal to the depth of the component and accessible through a door or inspection opening is made available for this operation. The first stage of filtration is positioned immediately after the external air intake section to protect the components, while the second/third stage of filtration, as the last component, ensures the supply of air to the environment with the highest level of purification.

1. There are at least two stages of filtration. The first performs at or above ISO 16890 ePM1 50% (F7) and the second ISO 16890 ePM1 85% (F9). If a higher degree of filtration is required, an additional absolute class H13 filter bank can be provided downstream of all components.
2. The first and second stages of filtration, the counterframes of which can be made of AISI 304/316 stainless steel or aluminium and secured with springs, are equipped with a differential pressure gauge (without sealing liquid) that allows the visualization of the clogging level directly on site.
3. The pre-filters, filters and frame are certified according to ISO 846 method A and C.



Components

Coils

The heat exchangers are available in different types: water, superheated water, steam and direct expansion. The standard materials are copper tubes, aluminium fins, copper collector and aluminium frame. Other material combinations in accordance with DIN 1946-4 are also available to meet all constructional requirements. The hygiene and cleanability of heat exchangers is facilitated by various measures:

1. The condensate connections are all located on the same side.
2. The fins spacing is at least 2 mm (2.5 for cold water coils) to facilitate cleaning from upstream to downstream.
3. The inspection of the air cooler is possible both from upstream and downstream side.
4. All wet surfaces are designed to be easily cleaned.
5. The drain pan under the cooler is fully accessible and can be cleaned from both sides.



Recovery systems

The use of heat recovery systems saves heating and cooling energy by exchanging heat between the fresh air and the exhaust air. To meet hygiene requirements, coil recovery units are available in which leakage between the supply and return flows is impossible.

1. They have the same specifications as those applicable to the heat exchangers.
2. They are equipped with a drain pan.

Fans

In order to ensure maximum cleanliness of the flow of air into the room, only plug fans or brushless fans are used between the first and second stage of filtration.

1. They are easy to inspect.
2. The fan sections, including the impellers, frame and separating bulkheads, are made at least of galvanised sheet metal and painted to protect against corrosion.
3. Certified according to ISO 846 method A and C.
4. Flow rate meter with built-in display.



Sound attenuators

The sound-absorbing section is designed to reduce sound pressure according to the design requirements. The baffles have aluminium or stainless steel frames and rockwool-lined mineral wool fillings. They are designed so that their surfaces facing the air flow are smooth, abrasion-proof, water-repellent and non-decaying.

1. The fabric coating is VDI 6022 certified.
2. Each sound attenuator and spacer is completely removable



Humidification

The humidifier is positioned before the second stage of filtration. For hygienic reasons, only standalone steam humidifiers (with immersed electrodes or heating elements) or live steam humidifier are used.

1. The distribution system, designed to distribute the steam evenly, consists of one or more AISI 316L nozzles the length of which varies according to the width of the unit.
2. The position of the fixing bracket allows the correct gradient for draining the condensate.
3. The humidification chamber varies in length according to the treatment required and a drain pan covers its entire length.
4. The components of the humidifier are easy to access, inspect and clean.
5. A removable droplet separator can be installed downstream.



Accessories

Outdoor installation

All the air handling units are also available in outdoor versions. There are various construction measures to prevent weathering:

1. The outer sheet metal of the panels has a protective scratch-resistant plastic coating. It is also available in Aluzinc, AISI 304 and AISI 316.
2. The units have an aluminium walkable roof.
3. An anti-fingerprint coating is provided as standard, for additional protection against corrosion.
4. A technical compartment is provided for the valves and regulating components and is available in various depths and lengths.

Droplet separators

If there is a risk of a flow of water after dehumidification, a droplet separator is fitted downstream of the cooling coil. Versions with aluminium or stainless steel 304/316 frames and single-fold fins in PVC, aluminium and 304/316 stainless steel are available. The section results:

1. Corrosion resistant
2. Easy to clean
3. Extractable via service door

Direct irradiation UV-C lamps

UV-C lamps with germicidal properties sanitise the air and radiant batteries to prevent the formation and growth of microorganisms potentially harmful to people's health (bacteria, mould, fungal spores and viruses). They are an economical and reliable solution for preventing microbial contamination of the environment. Since it is installed inside the AHU, the system is safe for staff and ensures significantly lower running costs and protection against diseases such as:

1. Sick Building Syndrome
2. Legionellosis
3. Tuberculosis

Photocatalytic oxidation modules

Photocatalytic oxidation modules sanitise both the flow of air and the surfaces of ventilation ducts by decomposing pathogens such as germs, bacteria, viruses and odours. The devices consist of a special UV lamp and a catalyst structure consisting of a metal alloy with a titanium dioxide honeycomb matrix, which produce hydroxyl radicals and hydrogen peroxide as a result of their action.

Maintenance and construction concept

One of the main features of hygienic air handling units is the possibility to access and clean most of its components. Doors or removable panels to sanitize the internal components are available in two configurations:

1. with double single-latch handles and sturdy hinges for vacuum sections
2. with screw locks on both sides for pressurised sections

Monitoring is possible thanks to the double-walled polycarbonate observation ports with sealing gasket and internal lighting systems on the fan, filters, cooling coil and humidifier.



The components that are easy to access and remove are:

- ✓ Filters (removal from front)



- ✓ Handling coils and droplet separator, if applicable (removal from side)



- ✓ Sound attenuators (removal from side)



Maintenance and construction concept

Drain pans

Drain pans are located in correspondence of the outdoor air intake chamber, cold coil, humidifier/dehumidifier and heat recovery units:

1. Available in stainless steel or aluminium alloy (AlMg).
2. They can be reached from the outside via removable panels or access doors.
3. Designed to drain water in accordance with DIN 1946-4 with certified performance.
4. Pans with double slope and 1-1/2" central drain.



Built-in monitoring systems

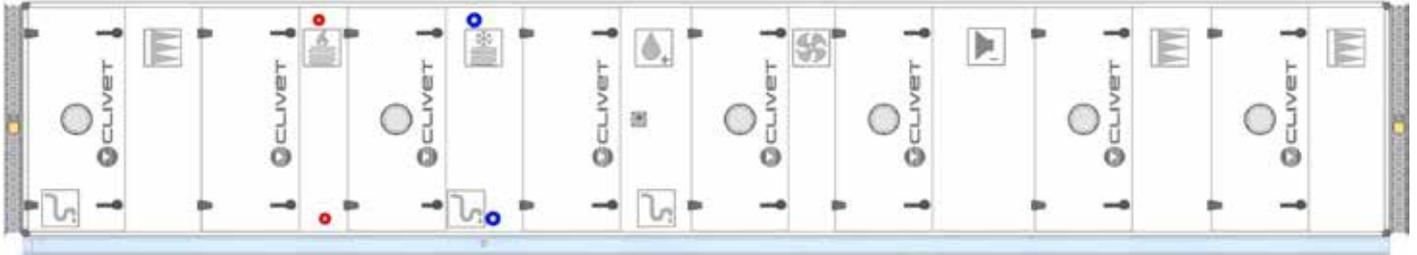
1. Differential pressure gauge with display and pressure transmitters for both stages of filtration
2. Display of effective air flow rate in the fan section



Maintenance and construction concept

Easy identification of the components

Each section of the unit is accompanied by a sticker defining its function (in accordance with DIN 1946-4). A label with the main technical characteristics of the component is also found on the filters and fans.



Control

AQX in hygienic configuration units are available with built-in control package that can include:

- Electric power panel
- Microprocessor controller
- Control algorithm
- Probes to measure temperature, humidity, air quality, pressure, air flow and clogging of the filters
- Control of two or three way, on/off or modulating valves
- On/off or modulating actuators
- Air flow control
- Safety devices

The controls include a serial port used to connect the AQX in hygienic configuration unit to a supervisory system or Building Management System (BMS) via the Modbus, LonWorks or BACnet communication protocols. All the control components are installed and tested directly at the factory, ensuring high reliability and fast installation.



Herewith it is confirmed to the company

Clivet S.p.A.

in

IT-32032 Z.I. Villapaiera

for the factory in

IT-37063 Isola della Scala (VR)

based on the positive results of the completed tests on the

**Air handling unit in hygienic design
Range: "AQX...H"**

according to the standards
VDI 6022 part 1:2018-01
VDI 3803 part 1:2020-05
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DIN EN 13053:2020-05

that the requirements of the Certification Program of the
TÜV SÜD Industrie Service GmbH are fulfilled.

The company is allowed to use the following Certification Mark:



This certificate is valid up to and including 2024-03-31

Certificate registration number: 22/21/87



Certification Body for Products
Refrigeration and Air-Conditioning
Munich, 2022-03-30



Certification mark license
No.
22/21/87



The company in Clivet S.p.A.
IT-32032 Z.I. Villapaiera

is authorized to identify the product mentioned below with the approval mark of the TÜV SÜD Industrie Service GmbH



Manufacturing plant	Clivet Air IT-37063 Isola della Scala (VR)
Tested in accordance with	DIN 1946 part 4 VDI 6022 part 1 VDI 3803 part 2 DIN EN 13053
Annual units	20
Description of the product	Air handling unit in hygienic design
Model	AQX...H

Munich/ 30 March 2022

Andreas Klotz
Certification Body for products
Refrigeration and air-conditioning

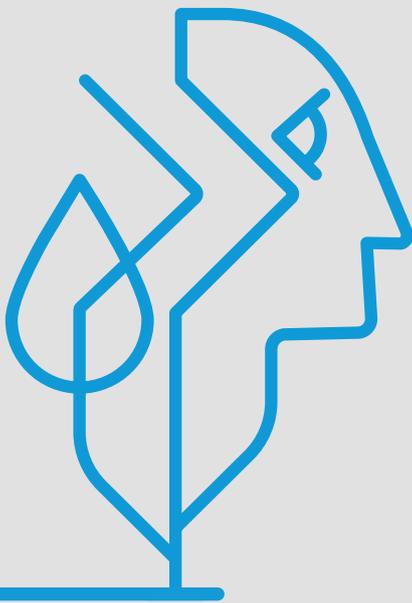


**ALWAYS READY FOR
THE FUTURE**

INSPIRING SOLUTIONS

For over 30 years of working on the design, manufacturing and distribution of air conditioning and handling systems, combining high efficiency with minimal environmental impact, Clivet has developed solutions to ensure sustainable comfort and the well-being of people and the environment.

Designing and developing year-round air conditioning solutions with innovative technologies are part of Clivet's DNA, which means the company has always been ready for the future.

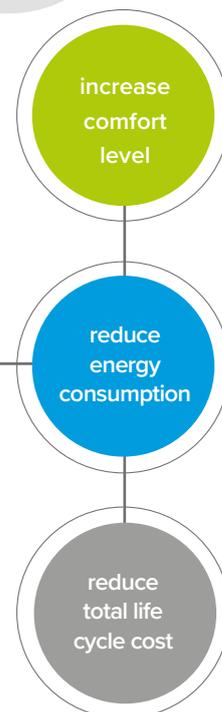


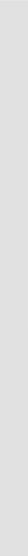
COMFORT FOR THE PLANET & PEOPLE

OUR VALUES

**IN THE RESIDENTIAL,
COMMERCIAL AND INDUSTRIAL SECTORS**

Increasing comfort, saving energy and providing customers with the best value for the entire life cycle of the system: these are the values that inspire our systems for the residential, services and industrial sectors.





FOR OVER 30 YEARS WE HAVE BEEN OFFERING SOLUTIONS TO ENSURE SUSTAINABLE COMFORT AND THE WELL-BEING OF PEOPLE AND THE ENVIRONMENT

www.clivet.com

MideaGroup
humanizing technology



Valid from: April 2023
DF22D014GB-01



CLIVET S.p.A.

Via Camp Lonc 25, Z.I. Villapaiera 32032 - Feltre (BL) - Italy
Tel. +39 0439 3131 - info@clivet.it

CLIVET GMBH

Hummelsbütteler Steindamm 84,
22851 Norderstedt, Germany
Tel. +49 40 325957-0 - info.de@clivet.com

Clivet Group UK LTD

Units F5 & F6 Railway Triangle,
Portsmouth, Hampshire PO6 1TG
Tel. +44 02392 381235 -
Enquiries@Clivetgroup.co.uk

CLIVET LLC

Office 508-511, Elektrozavodskaya st. 24,
Moscow, Russian Federation, 107023
Tel. +7495 6462009 - info.ru@clivet.com

CLIVET MIDEAST FZCO

Dubai Silicon Oasis (DSO), Headquarter, E Wing,
EG04-05 Dubai, UAE
Tel. +971 45015840 info@clivet.ae

Clivet South East Europe

Jarušćica 9b
10000, Zagreb, Croatia
Tel. +3851 222 8784 - info.see@clivet.com

CLIVET France

10, rue du Fort de Saint Cyr - 78180 Montigny le
Bretonneux, France
info.fr@clivet.com

Clivet Airconditioning Systems Pvt Ltd

Office No.501 & 502,5th Floor, Commercial –I,
Kohinoor City, Old Premier Compound, Off LBS
Marg, Kiroil Road, Kuria West, Mumbai
Maharashtra 400070, India
Tel. +91 22 30930200 - sales.india@clivet.com