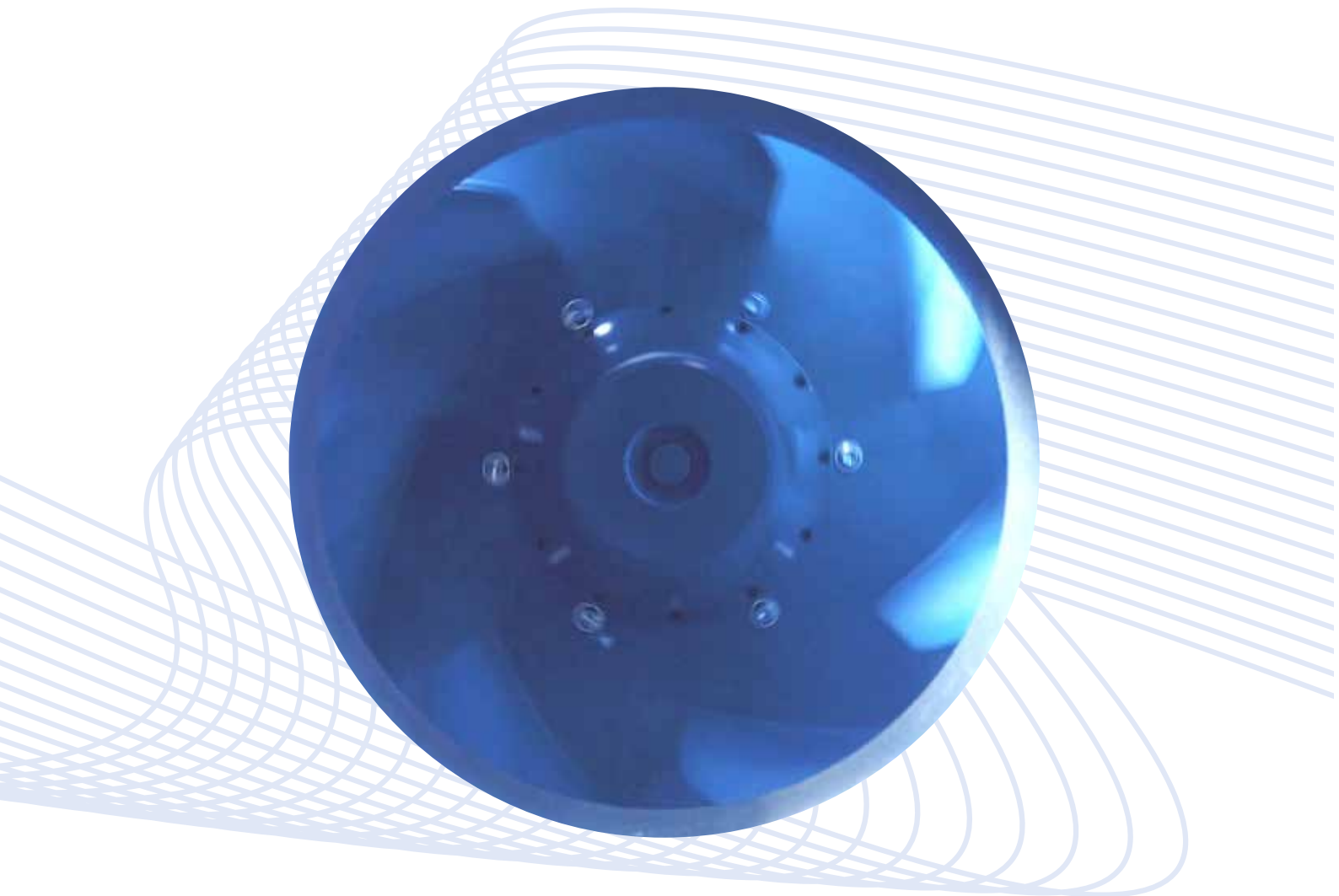




NIBE GROUP MEMBER

AIR HANDLING SYSTEMS

Product Catalogue 2021



| Air handling unit | Heat recovery units |
| Terminal units | Pool dehumidifiers | System solutions |



A global organisation
with companies
and a presence
worldwide

NIBE Group is a global organisation that contributes to a smaller carbon footprint and better utilisation of energy. In its three business areas – Climate Solutions, Element and Stoves – we develop, manufacture and market a wide range of eco-friendly, energy-efficient solutions for indoor climate comfort in all types of property, plus components and solutions for intelligent heating and control in industry and infrastructure.

From its beginning in Markaryd, in the province Småland ***more than 60 years ago, NIBE has grown into an international company with more than 15,000 employees and a presence worldwide.*** From the very start, the company was driven by a strong culture of entrepreneurship and a passion for responsible business operation. Its success factors are long-term investments in sustainable product development and strategic acquisitions. Combined, these factors have brought about strong, targeted growth, which generated sales of just over SEK 20 billion (EUR 2 billion).



Be the change
you want to see
in the world



Our focus on world-class solutions in sustainable energy contributes to the global goal to reduce emissions of greenhouse gases into the atmosphere.

Our entire value chain, from vision to end customers, must be based on the principles of sustainability in our business principles.

We are responsible not only for the financial results of our operations but also for their social and environmental impact.

NIBE's responsibility forms the Group's framework for sustainability efforts in four different areas:



IN
BUSINESS



FOR THE
ENVIRONMENT



RESPONSIBILITY
FOR EMPLOYEES



LOCAL SOCIAL
RESPONSIBILITY

Change
your perspective!
Solutions
that look
to the future.



COMFORT

Air handling terminal units
850÷16500 m³/h

PAGE 17



Terminal unit
UTNA Platinum
6,4÷70 kW
Web code: UTAP1
PAGE 20

Compact heat recovery units
100÷5300 m³/h

PAGE 25



Heat recovery unit
UTNR-A Platinum
Counterflow heat recovery
Air flow rate: 400-4,700 m³/h
Web code: UTNR3
PAGE 26



Heat recovery unit
UTNR-HE Platinum
Rotative heat recovery
Air flow rate: 310÷4,250 m³/h
Web code: UTHE3
PAGE 32



Heat recovery unit
UTNR-HP
Thermodynamic heat recovery
Air flow rate: 350÷4,500 m³/h
Web code: UTHP1
PAGE 40



Heat recovery unit
VMC-E
Counterflow heat recovery
Air flow rate: 250÷1.300 m³/h
Web code: VMC01
PAGE 42

FULL CONTROL CONTROLS

PAGE 36



INDOOR AIR QUALITY SOLUTIONS

PAGE 61



air'suite®

Modular air handling units
800÷41000 m³/h

PAGE 45



CTA ADV Next Air

Air flow rate: 800÷41,000 m³/h
Web code: NA001
PAGE 46

Customised air handling units
850÷104970 m³/h

PAGE 67



CTA ADV - Custom

Air flow rate: 850÷104,970 m³/h
Web code: CTCT
PAGE 68



Heat recovery unit
FLUXBLOCK

Air flow rate: 2000÷22000 m³/h
Web code: CTFB
PAGE 90



Heat recovery unit
ROTOBLOCK

Air flow rate: 2500÷22000 m³/h
Web code: CTRB
PAGE 92

Pool dehumidifiers
2200÷27000 m³/h

PAGE 95



Dry-Pool

8÷140 l/h
Web code Dry-Pool: DP001
PAGE 96

PAGE 103



Air'Suite® filters

air'suite®

Living in a clean environment is a concept closely linked to breathing "clean air". It has been established that the concept of clean air, i.e. free from any additional factors, such as odours or pathogens, which can directly or indirectly affect or alter a person's physical or mental state, must be related to high standards of Indoor Air Quality. It is no longer possible to believe that outdoor air is clean: the increase in production facilities, with varyingly controlled emissions in the atmosphere, and vehicular traffic make it actually impossible to use outdoor air to dilute indoor contaminants without proper handling.

Rhoss sets a new "indoor" environment comfort standard by improving the hedonistic nature of the air introduced into rooms by means of a broad spectrum "biocidal filtration" treatment.

A new way to treat the air in confined spaces that we breathe every day. It requires systems for olfactometric conditioning and the "filter" range, that is the line of filters applicable to the world of ventilation and air conditioning.

A new concept of biocidal filtration that allows for the removal of microbiological contamination without requiring additional solutions to be installed or modifying existing systems.



External sources of pollution



Internal sources of pollution

Air'Suite Indoor filtering systems

Download the complete document:
<http://www.rhoss.com/download>



IAQmatters
Get in a better Indoor Air Quality

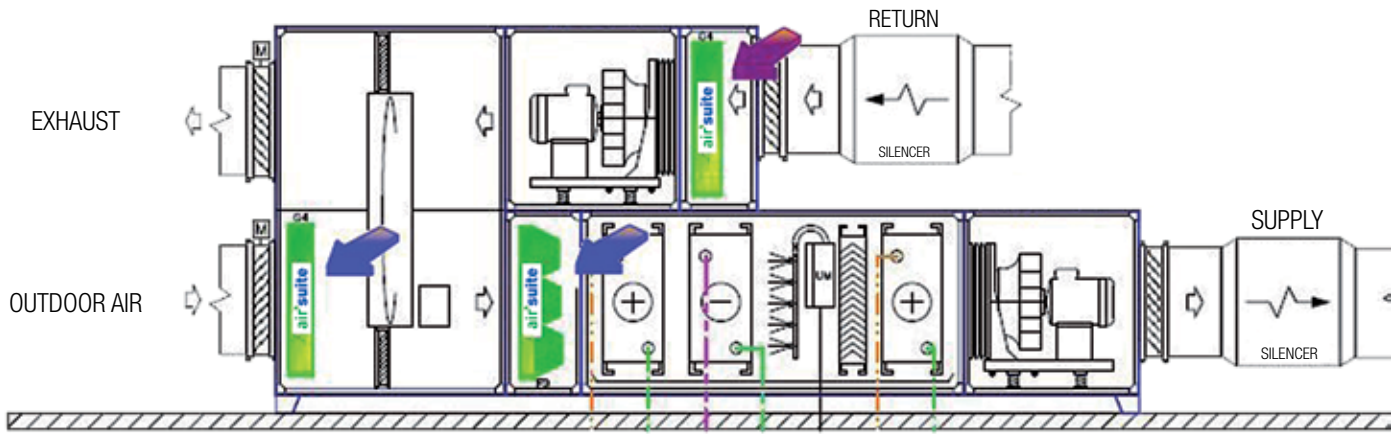
THE NEXT GENERATION OF ENERGY EFFICIENT BUILDINGS

THINK AHEAD, SHARE THIS MESSAGE. TELL YOUR BUILDING OWNER AND HVAC SUPPLIER THAT #IAQmatters TO YOU.



EUROVENT
EUROVENT

For more information, visit www.IAQmatters.org

Rhoss confirms its commitment and constant attention to the issues related to Indoor Air Quality by participating in the new awareness campaign #IAQmatters. A joint initiative of manufacturers of heating, ventilation and air conditioning (HVAC) systems in Europe and the Middle East, which provides solutions to guarantee a healthy indoor climate.



Example of Air'Suite application

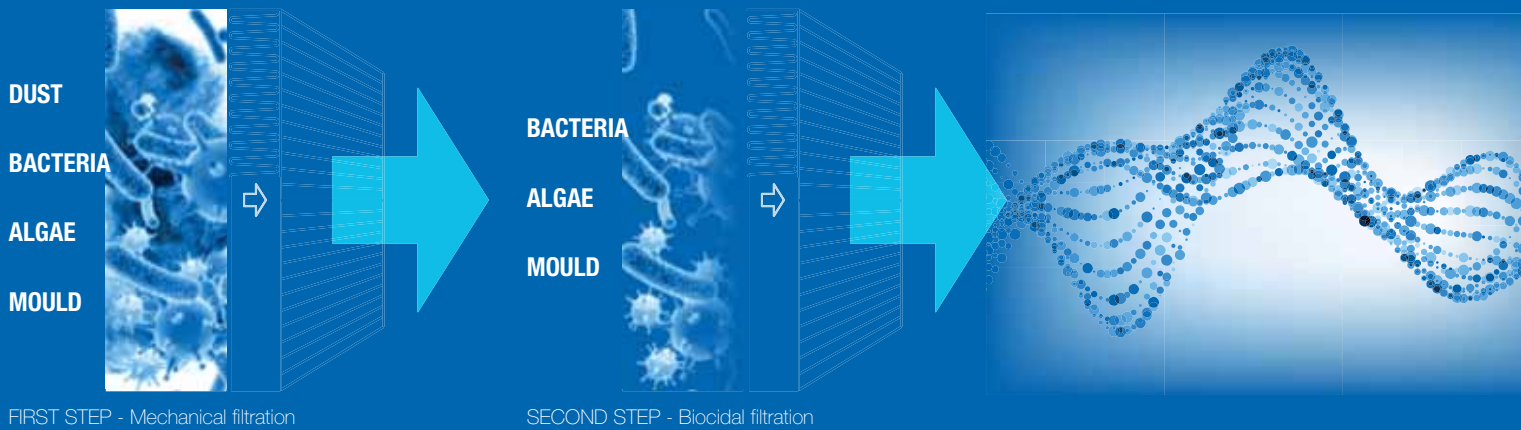
 **contamination from the indoor environment**
 **contamination from the outdoor environment**

The term biocidal filtration refers to the combination of granular filtration (classical) and deactivating the biological load (innovative) on the same amount of air going through the same filtering means. This process is achieved by using a new, specifically designed bio-polymer featuring: wide availability in nature, biocompatibility, non-toxicity and intrinsic infection prevention properties. The Air'Suite® filters were tested with new, state-of-the-art techniques that

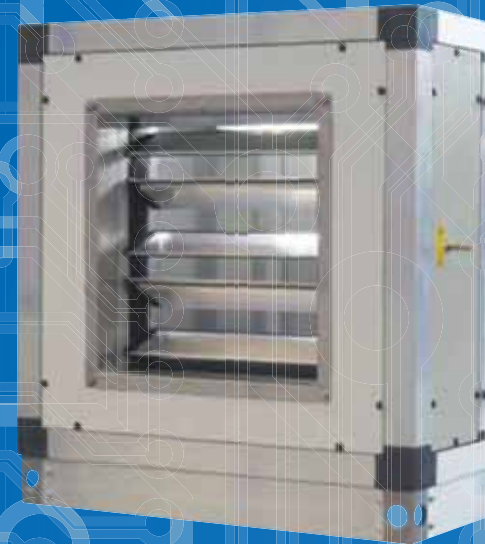
measure the actual biocidal ability on the filter surface and that do not make use of cultures but count each organism/cell and its integrity or ability to reproduce.

The bacteria removal efficiency was measured through a study protocol with IRSA-CNR certified flow cytometry techniques.

The resulting efficiency is more than 50% "instantaneous" reduction and 100% reduction within 30 hours after contamination.



CTA ADV Custom Hygienic



The range of ADV Custom Hygienic air handling units is designed according to high engineering standards and is ideal for applications where cleanliness and hygiene requirements are mandatory.

The units have been awarded the Hygiene compliance certificate for Air Handling Units by TUV NORD according to standards VDI 6022 Part 1 and DIN 1946 Part 4.

The air flow features and mechanical performance are certified by Eurovent according to standards EN1886 and EN13053.

The VDI 6022 Guideline contains the minimum hygiene requirements for HVAC systems, ventilation and air handling units for design, manufacture, operation, management and maintenance aspects. It therefore also defines the hygiene requirements of Air handling units regarding: usable materials, components, manufacturing, mechanical features, accessibility and serviceability, in accordance with the highest technical standards.

By complying with these requirements the CTA ADV Custom Hygienic units provide an excellent solution for designers, installers, maintenance technicians and end users.



Operating theatres

In order for these “critical” settings to work at their full potential, all systems must operate at top efficiency and be optimised. This concerns not only the work team or the hospital or laboratory equipment, but also the ventilation and air conditioning systems serving these types of settings. Any service outage due to failure or unplanned maintenance has very high potential risks.



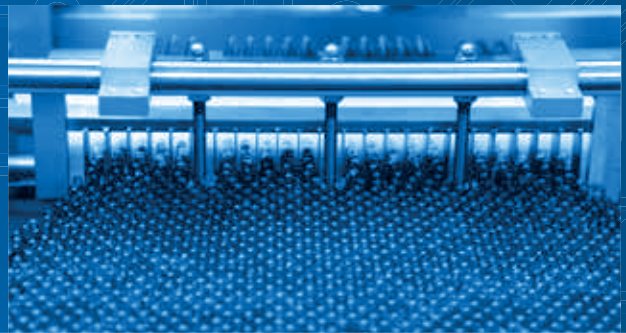
Laboratories and clean rooms

In the pharmaceutical or food sectors or in other specific areas, air handling directly affects the production process. The air handling unit – the core of the system – must meet the highest requirements.



Food industry

Pharmaceutical industry



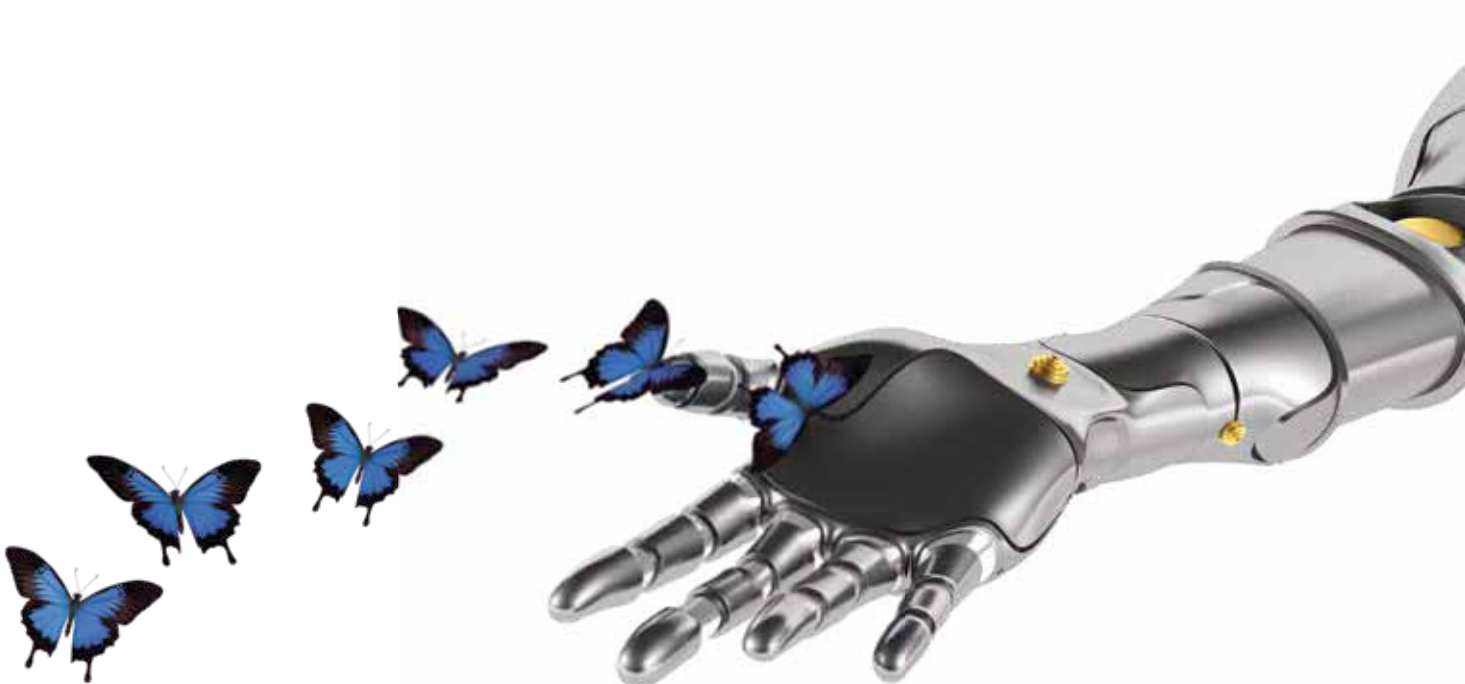


The perfect combination of industrial precision and artisanal love

ADV Next Air range air handling units are the perfect balance between industrial precision and craftsmanship, between love, care of the product and the ability to meet market demands, between innovation and tradition.

In fact, the particular type of material to be processed and the precision complexity of the required operations are what make handling these processes extremely delicate. The significant investment made in flexible automation has allowed Rhoss Spa to: ensure constant excellence in quality over time through extremely stable and precise production processes; significantly improve operating efficiency by reducing product run through times; make human labour more sustainable and safer; reduce material consumption, production waste and energy consumption, while better respecting the environment.

These are excellent results that make us proud.

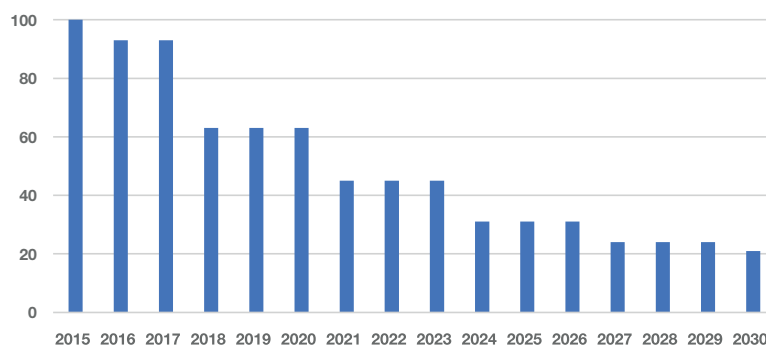


RHOSS: the conscious choice for an ecological future

EFFICIENCY, TECHNOLOGY and ECOLOGY: the three key words for a sustainable future.

Rhoss has always been careful to create comfort, and invests and researches new solutions to be applied to equipment dedicated to the HVAC world: efficiency and technology are firm points in the development of new products in order to make them more and more compatible with the environment which we live in.

The progressive elimination of fluorinated refrigerants (HFCs), established by the new EU regulation, provides for a gradual reduction of the quantities placed on the market, expressed as the equivalent in tons of CO₂. This should lead to a reduction of HFC consumption of 79% by 2030.



Volume di riferimento (100%) corrispondente alla media annuale della quantità totale di CO₂ equivalente immessa all'interno dell'UE nel periodo dal 2009 al 2012.

The application of this legislation will lead to the introduction and increasingly massive use of new low-GWP (Global Warming Potential) gases, consistent with the evolution of technology.

In fact, in the world market of refrigerants, depending on the technology used, there are many solutions that allow for a reduction in GWP, with respect to the gas traditionally used in the HVAC sector.



The following table indicates some examples of refrigerant gases and related GWP.

Refrigerant	GWP (UNI EN 378-1 2017)
R407C	1774
R134a	1450
R410A	2088
R513A	631
R1233zd	4,5
R1234ze	7
R32/R452 B	675
R454 B	466

Rhoss has long started this process of harmonisation with the new “green” gases, testing and experimenting with new solutions, without precluding any possibility.

Furthermore, all the ranges in the catalogue for which Rhoss provides solutions with low GWP refrigerant are distinguished by a specific mark.

The gradual phase-down of high GWP refrigerants is also accompanied by the demand for increasingly efficient and low-consumption products as required by the European Ecodesign Directive. This provides the specifications for an environmentally friendly design of all energy-using products and through Regulations 813/2013 and 2016/2281 imposed minimum seasonal winter (SCOP) and summer (SEER) efficiency requirements for the introduction of chillers and heat pumps in the European market.

The product performance tables, therefore, indicate the SEER and SCOP indexes, in line with the requirements of the directive.

Our certifications, in 360 degrees



ISO 9001:2015 Certification

RHOSS Spa provides quality goods designed for environmental comfort, making them available and accessible thanks to the advanced technological and organisational level achieved, and, above all, to the committed, reliable and dedicated approach that RHOSS personnel take to their job every day. The organisation and operations of the business are based on a Quality Management System. The Quality System currently implemented with the new ISO 9001-2015 version is based on rules and practices that are established and agreed on with the entire organisation.



ISO 14001:2015 Certification

RHOSS Spa supplies quality goods designed for environmental comfort. With the same commitment, it pays attention to environmental issues, considering correct management and efficient control of its environmental aspects of prime importance, engaging in Environmental Protection and in full compliance with the standards in force and with specific requirements. For this reason, Management has decided to implement an environmental certification system, based on the requirements of the international standard UNI EN ISO 14001, applying it to all the activities carried out within the company and especially to its production activities.



EUROVENT certification for CHILLERS, HEAT PUMPS (CCP-HP) AND FAN-COILS (FCU)

Rhoss participates in the Eurovent certification programmes for chillers, heat pumps and fan coils. The performance of Rhoss products is therefore guaranteed by tests performed by an accredited third party certification company.



EUROVENT certification for AIR HANDLING UNITS (AHU)

Rhoss participates in the Eurovent certification programme for the Air handling units with the ADV and NEXTAIR range according to the EN 13053 standard; certification of mechanical characteristics according to EN1886; and the energy classification of the machines.



LEED certification - Leadership in Energy & Environmental Design

Rhoss participates in the certification protocol of LEED buildings. The international system is based on the entire building life cycle from design and construction to management and maintenance.



COMFORT

.....

Air handling terminal units
850÷16500 m³/h

.....

Readily available Rhoss solutions

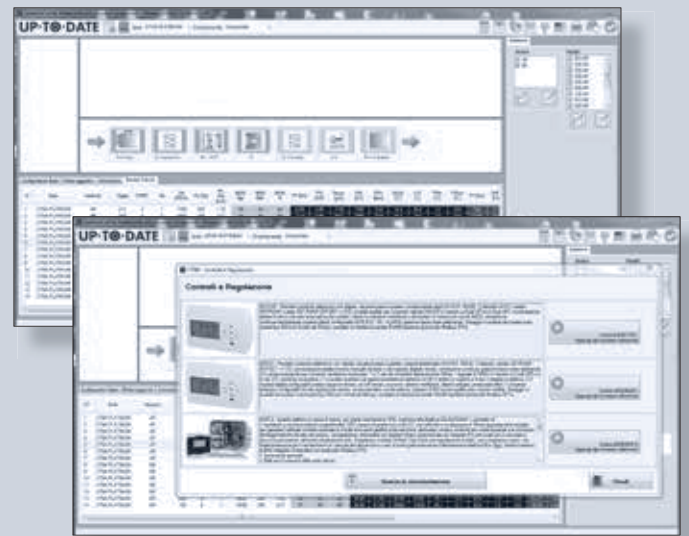
UpToDate is the ideal tool for selecting the Rhoss product range and verify the technical data of each model.

The integrated calculation engine requires the verification of feasibility of the proposed solution, the selection and technical dimensioning of the catalogue models.

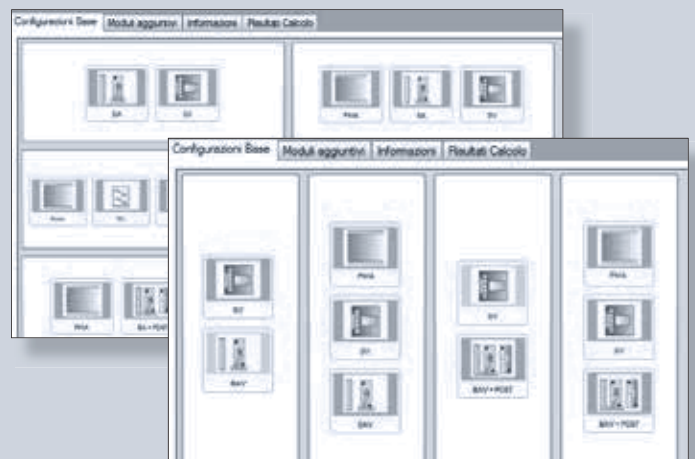
A unique and fast way to always find the ideal solution for any application together with the high technology proposed by Rhoss products.

- Complete tool to choose the configuration that best suits your needs.
- Rapid search of the most suitable size and treatment
- Rapid selection of all available accessory modules, which match your selection
- Always updated on the latest news.
- Detailed technical reports in 7 languages.

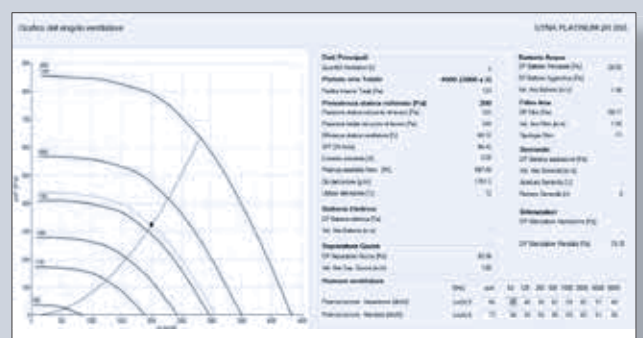
UTNA Platinum selection



Selection of the final configuration



Timely performance of the fans





Terminal unit

UTNA Platinum 013÷120

Cooling capacity: 6.4÷70 kW - Heating capacity: 4.9÷78 kW



INVERTER

- **Brushless EC fan IE5 efficiency**
- **ISO Coarse Filter 55% (G4) Airsuite Biocide**
- **ePM1 filter 50% (F7)**



Modular ductable air handling terminal units.

Construction features

- Terminal air handling unit: with modular units for horizontal or vertical installation (013-050) with ducting.
- Structure with double wall sandwich type freestanding panelling, 30mm-thick with closed cell expanded polyurethane insulation with high soundproofing and thermal insulation capacity.
- Routine machine maintenance from the bottom (for the horizontal version with installation in false ceiling or hanging from ceiling) or frontally (for the vertical version) with removable panels.
- Coil module BA (horizontal) / coil module BAV (vertical up to size 050) including: standard ISO Coarse Filter 55% (G4). All filters are supplied complete with differential pressure switch to signal filter clogging condition in compliance with European regulation no. 1253/2014. Finned coil heat exchanger, with copper pipes and 2 rows of aluminium fins for heating or reheating only and 4-6 rows for cooling and/or heating with right or left connections to be selected with order. Condensate drain pan in aluminium both for horizontal BA4R and BA6R versions and vertical BAV4R and BAV6R versions.
- SV fan module complete with EC Brushless centrifugal plenum fan with single intake directly coupled to electric motor efficiency class IE5. Static and dynamic balancing of the entire assembly, built in accordance with standard DIN ISO 1940. G6.3 balancing grade. Standard control of the rotation speed via special 0-10V analogue input. Electrical connection panel fitted as standard complete with disconnect switch, protection fuses and connecting terminal block.

Factory fitted accessories

- AIRSUITE G4- Iso Coarse Filter 55% (ISO 16890) G4 (EN 779) Airsuite with biocide capacity
- F7 - Fine dust filter Iso ePM1 50% (ISO 16890) F7 (EN 779)
- SG - Optional polypropylene drop separator at low load losses.
- TAG - Optional antifreeze thermostat.

Accessory modules

- PMA - Intake/outlet plenum with pre-cut side outlets.
- SIL - Plenum with absorbent cartridge silencer to be placed on inlet or outlet.
- MUV-PRV - Plenum with steam humidifier and external electric generator.
- BE - Additional electrical coil for connection to channel.

Separately supplied accessories

- KSG - Polypropylene drop separator at low load losses (only for BA).
- KTAG - Antifreeze thermostat (only for BA).
- KSER - Kit in combination with PMA consisting of: damper with aluminium blades and frame, fitted with seal gasket, certified class 2 according to En 1751 for fresh air (max 30%) or recirculated air and a fastening panel to PMA module. The damper is sized for treating up to 100% of the UTNA air capacity and may be positioned at the front, top or bottom of the PMA.
- KMS - Manual control for KSER damper.
- KB2R - Separately supplied additional reheat coil.



UTNAP MODEL			013	025	035	050	070	090	120	
2	Coil thermal power Only hot	BA 2R/BAV 2R	kW	4,9	8,4	11,7	16,8	25,1	32,8	39,1
1	Cooling capacity	BA/BAV 4R	kW	6,4	11,1	14,6	21,3	31,9	45,2	53,6
2	Heating capacity	BA/BAV 4R	kW	7,6	13,6	18,4	26,5	39,7	52,3	64,4
1	Cooling capacity	BA/BAV 6R	kW	8,1	14,9	20,2	27,5	41,2	56,8	68,9
2	Heating capacity	BA/BAV 6R	kW	9,1	16,6	22,8	32,2	48,3	62,1	78,2
3	Heater power	230V-1ph-50Hz	kW	3	-	-	-	-	-	-
	BE electric	400V-3ph-50Hz	kW	-	6	9	13	17	24	24
4	Air flow rate	NOM	m³/h	1300	2500	3500	5000	7500	9000	12000
		MIN	m³/h	800	1100	1500	2100	3100	5000	5000
		MAX	m³/h	2100	3700	4800	6700	10500	14400	15500
4	Useful static head.	NOM	Pa	300	300	300	300	300	300	300
5	Irradiated sound power		dB(A)	47	50	54	54	56	55	59
5	Intake sound power		dB(A)	64	65	69	68	71	70	74
5	Delivery sound power		dB(A)	70	71	75	75	78	77	80
4	SFP Int (Erp 2018<230)		W/m³/s	80	121	137	128	143	101	146
	Filtration grade EN779		G4/F7	G4/F7	G4/F7	G4/F7	G4/F7	G4/F7	G4/F7	G4/F7
	PRV Maximum steam production		Kg/h	3	5	5	8	10	15	18
	Electrical supply		V-ph-Hz	230-1-50	230-1-50	230-1-50	230-1-50	400-3-50	400-3-50	400-3-50
DIMENSIONS AND WEIGHTS			013	025	035	050	070	090	120	
	L - Width		mm	945	1245	1545	1645	1645	2045	2045
	H - Height		mm	387	387	387	504	687	837	837
	PMA - Depth		mm	480	480	480	596	780	931	931
	BA - Depth		mm	750	750	750	750	750	750	750
	BAV - Height		mm	812	812	862	962	-	-	-
6	UTNA Weight		kg	53	60	67	88	94	132	142

Data at the following conditions:

- 1 Air T in 26°C D.B.; 18.6°C W.B. (50% R.H.); water T in 7°C with Δt 5°C; nominal air flow.
- 2 Air T in 20°C D.B.; 13.7°C W.B. (50% R.H.); water T in 40°C with Δt 5°C; nominal air flow.
- 3 Air T in 20°C D.B.; 13.7°C W.B. (50% R.H.); nominal air flow.
- 4 Air T in 20°C D.B.; 13.7°C W.B. (50% R.H.); nominal air flow; 4-row coil BA/BAV 4R; clean type F7 filter.
- 5 Of SV only with work point at nominal air flow; and total head calculated in configuration: 4-row coil BA/BAV 4R; clean type F7 filter; available static 300 Pa. In accordance with EN ISO 11546-2.
- 6 SV Weight

Controls

- KPTZ - Rotating potentiometer for wall mounting installation, dedicated to manual fan speed control. The speed of delivery and return fans is calibrated with a single potentiometer.
- KTVDIM - Electronic control panel with display, for semi-recessed wall installation, including ON/OFF button, MODE, 3 Speeds+AUTO, SETPOINT change; auxiliary contacts to control ON/OFF valve in 2-pipe and 4-pipe systems; summer/winter switching; manual/automatic/ from contact; continuous/thermostat ventilation; configurable digital inputs (SCR, ECO, SIC, ALARM), weekly time bands management., complete with RS485 resident serial interface (Modbus RTU protocol).
- KRCA1 - Electronic control panel with display, for semi-recessed wall installation, including ON/OFF button, MODE, 2 Speeds, SETPOINT change; summer/winter switching with button or remote digital input; continuous ventilation, weekly time bands management room probe; 3 analogue outputs to control modulating fan,

1 or 2 modulating valves in 2-pipe or 4-pipe systems, modulating damper; 1 auxiliary contact to control on/off electrical resistance (1 stage) in 2-pipe systems + electrical resistance; 2 configurable digital inputs and 2 configurable analogue inputs. Complete with RS485 resident serial interface (Modbus RTU protocol).

- KPAU - Humidistat panel for PRV steam producer control.

Terminal unit

UTNA Platinum 013÷120

Cooling capacity: 6.4÷70 kW - Heating capacity: 4.9÷78 kW



Full Controls

- KRFCs - Electrical panel complete with: DDC programmable microprocessor regulator. BMS interfacing Integrated as standard with Modbus RTU protocol, main disconnecting switch, relay to control various users, terminal blocks for quick connection of all machine components, auxiliary circuit supply with suitable transformer 230/12-24V.

USER PANELS (for KRFCs)

- KHMIG - Interface terminal with black monochrome graphic display with LED backlighting.
- KHMIR - Interface terminal complete with integrated room temperature probe with black monochrome graphic display with LED backlighting.
- KCW - White decorative plate for control panel.
- KCB - Black decorative plate for control panel.
- KWMS - Wall mounting installation support for control panel.

Valves and actuators

- KV3V - PN40 Mixer/diverter 3-way regulation ball valves, female threaded hydraulic connections.
- KV2V - PN40 2-way regulation ball valves, female threaded hydraulic connections.
- KVMM - Actuator for ball regulation valves with modulating control 0/10 Vdc 24 Vac power supply.
- KVOM - Actuator for 230V On/Off valves.
- KDMA-S - Actuator for modulating damper 0-10V 24V with spring return.
- KDMA - Actuator for modulating damper 0-10V 24V without spring return.
- KDOA - Actuator for ON/OFF damper with spring return.

All the probes, actuators and valves on the Full Control section are also available.

Full Control regulation

The Full Control kit allows integrated management of all the functions in the UTNAP, guaranteeing total control of room comfort in a simple and complete manner:

- **Simple installation: all components are designed for on site maximum simplicity and flexibility of installation and supplied separately to not hinder handling and the installation of the units in a false ceiling and in confined spaces. The electrical panel can also be installed remotely. Pre-assembled and pre-wired at the factory on request.**
- **Easy to use: intuitive and user friendly functions and menus.**
- **Weekly time schedule.**
- **Easy start-up: pre-calibrated regulators, pre-set and tested at the factory, specifically developed to manage all functions of the chosen configuration, avoiding any complication.**
- **Easily and immediately interfaced: controller comes standard with a USB port, RS 485 for dialogue via Modbus RTU and Canbus port to develop local networks.**

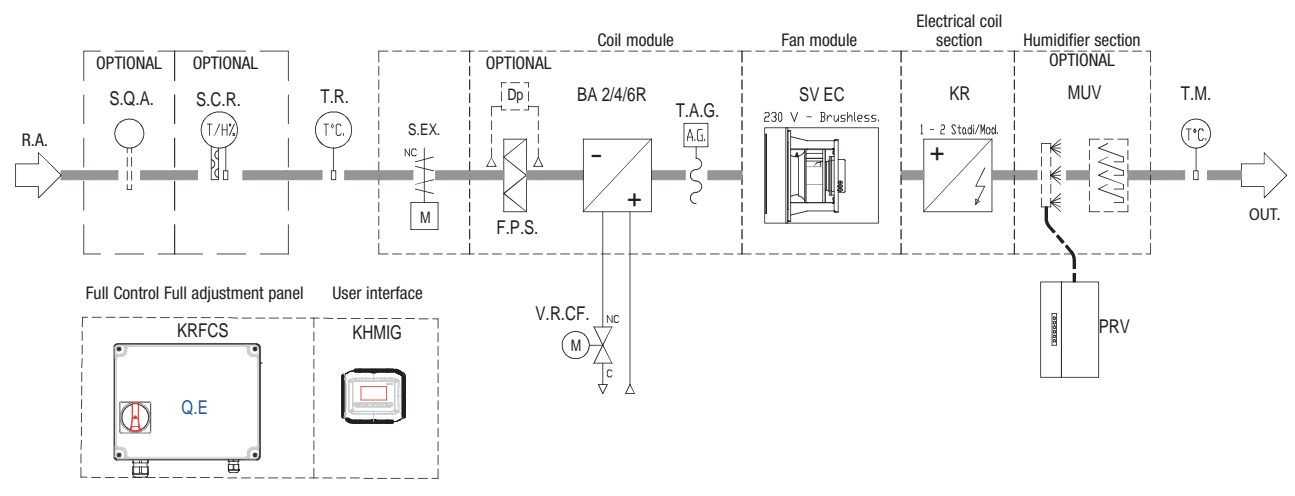
The following functions are present according to the selected machine composition:

- S.Q.R. - Duct or ambient air quality sensor to manage the fan speed or automatic modulation of the dampers.
- S.C.R. - Combined temperature and humidity return air or environment probe to manage air units with humidification and/or dehumidification functions.
- T.R. - Air return temperature probe.
- S.EX. - Shut-off damper.
- F.P.S. - Standard pleated filter.
- DP - Differential clogging filters pressure switch.
- BA - Hot/cold water coil.
- V.R.CF. - Hot-cold coil adjustment valve.
- T.A.G. - Antifreeze thermostat.
- SV EC - Brushless EC ventilated section.
- SV - 3-speed ventilated section.
- B.E. - Electrical coil.
- PV - Steam producer.
- T.M. - Supply temperature probe.
- KRFCs - Full Control power and regulation electrical panel.
- KHMIG - Control panel with graphic display.



UTNA SV EC

UTNA fan unit





COMFORT

Compact heat recovery units
100÷5300 m³/h

Heat recovery unit

UTNR-A Platinum 040÷500

Air flow rate: 400-4.700 m³/h



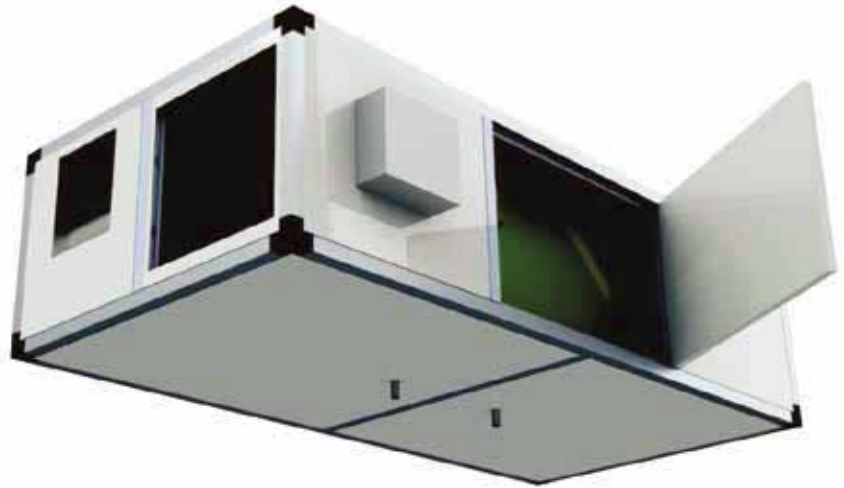
INVERTER

- Horizontal or Vertical Version
- Very high efficiency heat recovery Eurovent Certificate
- Multi-speed or Brushless EC fans
- F7 and M5 high efficiency filters
- Double sandwich wall with high insulation capacity

Fresh air terminal unit with counterflow opposing flow static heat recovery.

Construction features

- Recovery unit: very high yield static type with aluminium plates with back-current flows with close step. Extraction of side exchange pack from top or bottom depending on models and versions
- Fans: fresh air inlet and forward blade dual intake centrifugal exhaust type with a directly coupled electric motor; optionally, EC Brushless technology high efficiency electric motors. Fan unit installed on anti-vibration mountings to prevent the transmission of vibration to the structure. The EC fans can be factory set for operation with constant flow rate (specification to be provided in order)
- Structure: frame made with extruded aluminium profile with preloaded nylon joints. Sandwich buffer panels, 23 mm thick, made with galvanised sheet steel on the inside and pre-painted on the outside with thermal and acoustic insulation made of injected polyurethane, with a density of 45 kg/m³.
- Filtering section: filtration sections made of compact cell filters with low pressure drop polypropylene media, removable from the side, with ISO 16890 ePM1 55% efficiency class (F7 EN 779) in fresh flow and ISO 16890 ePM10 55% (M5 EN 779) in exhaust flow.
- Factory-installed dirty filter differential pressure switches
- Condensate drain pan made of galvanised sheet steel with condensate drain connection from the bottom.
- Integrated free cooling or thawing by-pass system. Thanks to the presence of a motorised damper next to the heat recovery, a bypass system can be created to manage freecooling or thawing depending on thermohyrometric needs or conventions



Versions

- UTNR-A/O PLATINUM - Recovery unit with opposing flow heat exchanger, horizontal installation and with standard multi-speed fans
- UTNRE-A/O PLATINUM - Recovery unit with opposing flow heat exchanger, horizontal installation and with Brushless EC fans that reduce power consumption for ventilation at equal performance.
- UTNR-A/V PLATINUM - Recovery unit with opposing flow heat exchanger, installed vertically and with standard multi-speed fans
- UTNRE-A/V PLATINUM - Recovery unit with opposing flow heat exchanger, installed vertically and with Brushless EC fans that reduce power consumption for ventilation at equal performance.

Available orientation

- 01 - Right-hand connections
 - 02 - Left-hand connections
- The selected orientation must be specified to process the job order.

Installation

- EXT- Outdoor installation including rain cover, 80 mm-high base and an outdoor electrical box (the kit does not include the roof for any additional accessory modules)



Factory fitted accessories

- BER - PRE-POST - Pre-heating electrical resistance (no frost function) installed inside, complete with filament-type safety thermostats and control relays to contain pressure drops.
For each size you may choose between 2 available power outputs
- BA - Internal hot water reheating coil.
- BAATG - Antifreeze thermostat installed downstream of the water reheating coil.
- ERF7-F7 efficiency return filter

Separately supplied accessories

- KSBFR - Section containing hot/cold water coil to reheat or recool, placed outside the machine in front of the intake vent. Includes stainless steel condensate drain pan with drain connection from the bottom.
- KSBFR + ATG - Hot/cold water coil section with mounted antifreeze thermostat.
- KSRE - Regulation damper set up for servo-control, consisting of a galvanised sheet steel frame with adjustable fins.
- KSSC - Duct silencer with a rectangular base made of glass wool covered with a protective film of glass fibre and micro-stretched sheet metal.
- KRMS - Section with three dampers for air mixing and recirculation (only for horizontal installation).
- KSPC - 4 circular connections

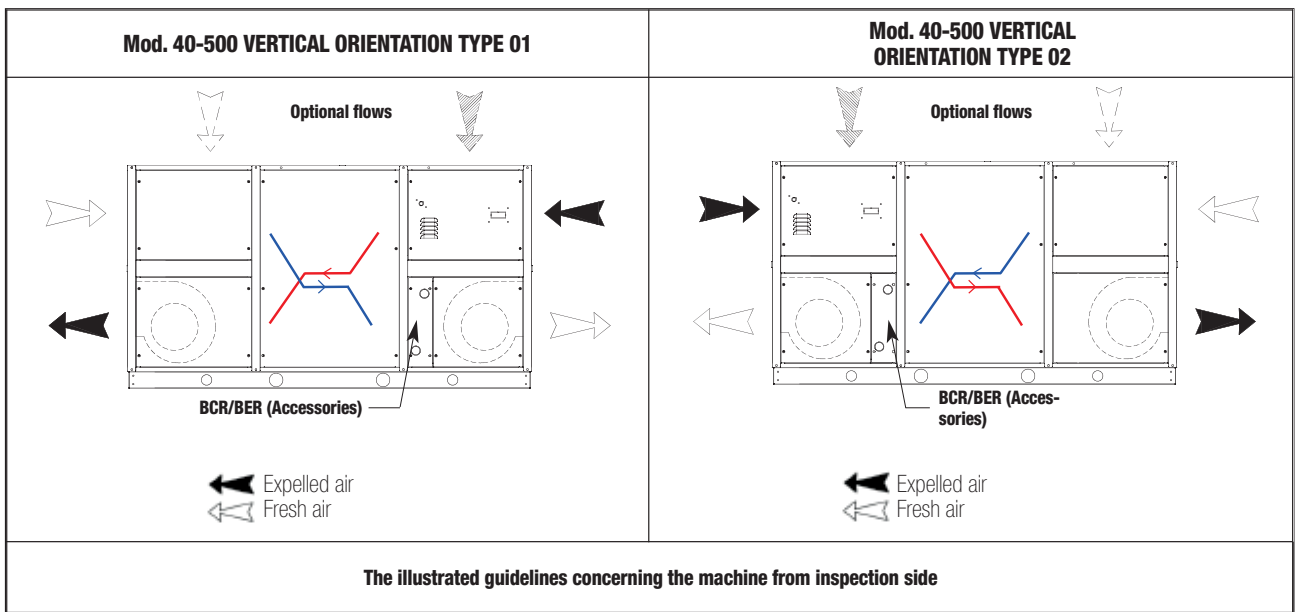
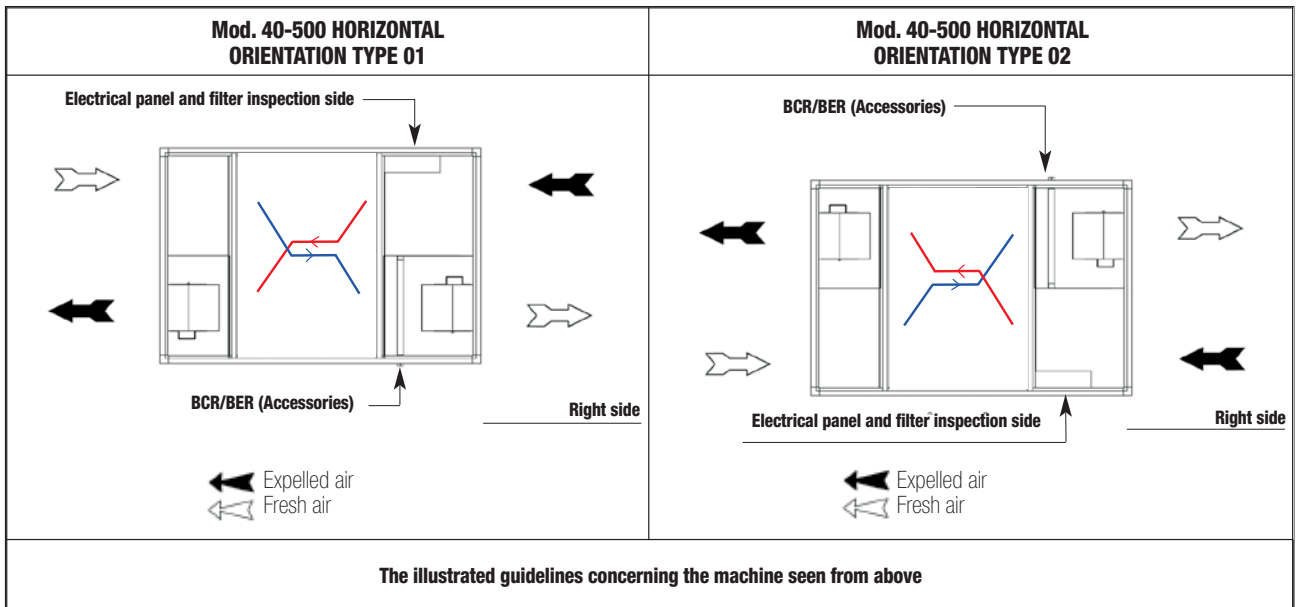
Heat recovery unit

UTNR-A Platinum 040÷500

UTNR-A PLATINUM MODEL		40	75	100	150	200	320	400	500
Type of Unit		Non-residential- Bidirectional							
Outdoor air filters		F7							
Return air filters		M5							
Bypass		Motorisable side bypass damper							
TECHNICAL SPECIFICATIONS									
Nominal air flow rate	m³/h	400	750	1000	1500	2050	3200	3800	4700
STANDARD FANS									
① Nominal available static pressure	Pa	160	120	180	160	120	180	n.d.	n.d.
① Max available static pressure	Pa	160	120	180	160	120	180	n.d.	n.d.
② Specific fan power (SFP)	W/(m³/s)	740	934	1105	1102	1078	1054	n.d.	n.d.
③ Sound power level	dB(A)	58	61	61	64	64	68	n.d.	n.d.
Speed N°/Regulation Type		3	3	3	3	3	3	n.d.	n.d.
Electrical supply	V-ph-Hz	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50	n.d.	n.d.
BRUSHLESS EC FANS									
① Nominal available static pressure	Pa	160	120	180	160	120	180	200	200
① Max available static pressure	Pa	340	160	520	500	540	375	330	200
② Specific fan power (SFP)	W/(m³/s)	705	742	1059	1048	898	1040	949	935
③ Sound power level	dB(A)	57	60	59	61	59	64	66	68
Speed N°/Regulation Type		0-10 V							
Electrical supply	V-ph-Hz	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50
COUNTERFLOW HEAT RECOVERY									
④ Winter Efficiency	%	83,6	82,9	81,6	83,3	83,7	86,8	84,1	84,2
⑤ Summer Efficiency	%	75,5	75,9	74,5	75,1	75,6	78	75	75,1
⑥ Efficiency Regulation EC 1253/2014	%	75,9	76,4	75	75,6	76	76,3	75,5	75,6
DIMENSIONS AND WEIGHTS									
Length/Height/Depth HORIZONTAL vers.	mm	1480/380/800	1940/480/990	1940/480/990	2200/550/1000	2200/550/1400	2500/680/1400	2500/680/1400	2500/680/1700
Weight HORIZONTAL vers.	kg	90	140	150	170	200	230	260	300
Length/Depth/Height VERTICAL vers.	mm	1480/3420/830	1940/520/1070	1940/520/1070	2200/520/1080	2200/720/1480	2500/720/1480	2500/720/1480	2500/680/1780
Weight VERTICAL vers.	kg	90	150	160	180	220	250	280	330

Data at the following conditions:

- ① Values referring to the nominal air flow rate considering the pressure drops of the heat recovery and the F7 filter.
- ② Values referring to the nominal air flow rate and Nominal available static pressure.
- ③ Radiated sound power level from casing.
- ④ Outdoor air T: -5°C, 80% RH; Ambient air T: 20°C, 50% RH.
- ⑤ Outdoor air T: 32°C, 50% RH; Amb. air T: 26°C, 50% RH.
- ⑥ Dry nominal conditions, measured according to En 308 in balanced flows. Outdoor air 5°C D.B.; Ambient air 25°C D.B.



Heat recovery unit

UTNR-A Platinum 040÷500

Air flow rate: 400-4.700 m³/h



Controls

- KCV2 - Speed selector for wall mounting installation, to select from 3 speeds: Off/heating/cooling switch; 3-speed switch; 230V power supply.
- PCU - Control panel for wall mounting installation, allows the winter/summer environment temperature to be controlled, gives consent to activate or exclude the water coil (ON/OFF Valves control) or the electrical resistance. Selects the operating speed of the fan between minimum, medium, maximum and controls the freecooling function.
- PCU - Control panel for wall mounting installation, allows the winter/summer environment temperature to be controlled, gives consent to activate or exclude the water coil (ON/OFF Valves control) or the electrical resistance. Selects the operating speed of the fan through 0/10 V adjustment and controls the freecooling function.
- KPCUEM - adds a board to interface Modbus with BMS to the KPCUE control functions.

Full Controls

- KRFCs - Electrical panel complete with: DDC programmable microprocessor regulator. BMS interfacing Integrated as standard with Modbus RTU protocol, main disconnecting switch, relay to control various users, terminal blocks for quick connection of all machine components, auxiliary circuit supply with suitable transformer 230/12-24V.

USER PANELS (for KRFCs)

- KHMIG - Interface terminal with black monochrome graphic display with LED backlighting.
- KHMIR - Interface terminal complete with integrated room temperature probe with black monochrome graphic display with LED backlighting.
- KCW - White decorative plate for control panel.
- KCB - Black decorative plate for control panel.
- KWMS - Wall mounting installation support for control panel.

Valves and actuators

- KV3V - PN40 Mixer/diverter 3-way regulation ball valves, female threaded hydraulic connections.
- KV2V - PN40 2-way regulation ball valves, female threaded hydraulic connections.
- KVM - Actuator for ball regulation valves with modulating control 0/10 Vdc 24 Vac power supply.
- KVOM - Actuator for 230V On/Off valves.
- KDMA-S - Actuator for modulating damper 0-10V 24V with spring return.
- KDMA - Actuator for modulating damper 0-10V 24V without spring return.
- KDOA - Actuator for ON/OFF damper with spring return.

All the probes, actuators and valves on the Full Control section are also available.



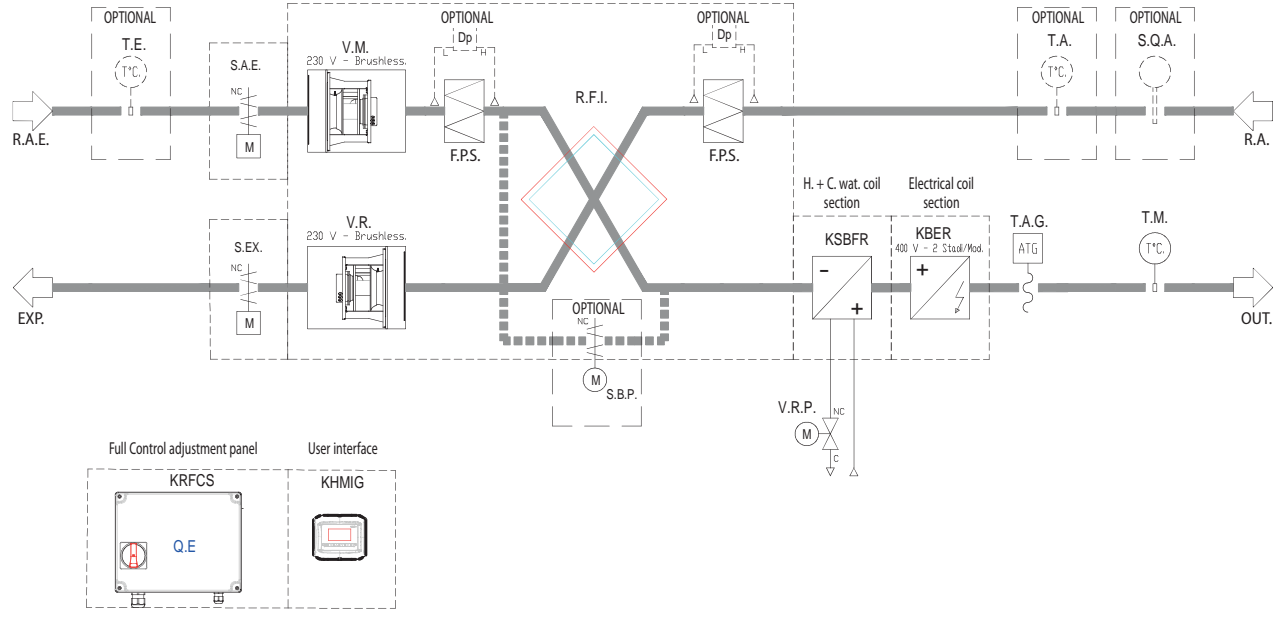
PCU Panel



KPCUE Panel



UTNRE-A Platinum



Full Control regulation

The Full Control kit allows integrated management of all the functions in the UTNRA-P, guaranteeing total control of room comfort in a simple and complete manner:

- **Simple installation: all components are designed for on site maximum simplicity and flexibility of installation and supplied separately to not hinder handling and the installation of the units in a false ceiling and in confined spaces. The electrical panel can also be installed remotely.**
Pre-assembled and pre-wired at the factory on request.
- **Easy to use: intuitive and user friendly functions and menus.**
- **Weekly time schedule.**
- **Easy start-up: pre-calibrated regulators, pre-set and tested at the factory, specifically developed to manage all functions of the chosen configuration, avoiding any complication.**
- **Easily and immediately interfaced: controller comes standard with a USB port, RS 485 for dialogue via Modbus RTU and Canbus port to develop local networks.**

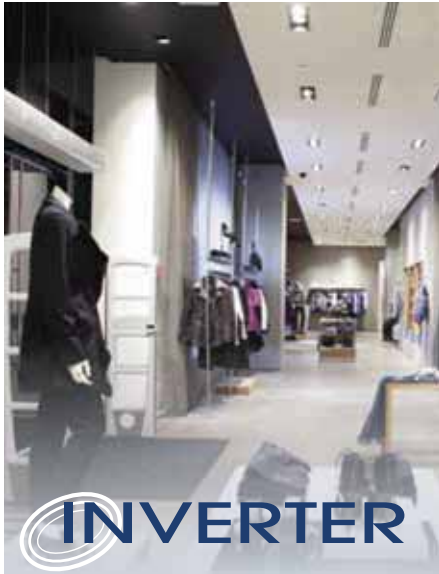
The following are present according to the composition of the selected machine and accessories:

- T.E. - Outdoor air temperature probe.
- S.A.E. - Outdoor air damper.
- V.M. - Supply fan.
- F.P.S. - Standard pleated filter.
- Dp - Differential clogging filters pressure switch.
- KSBFR - Hot-cold additional coil module.
- V.R.P. - Mixed coil adjustment valve.
- BCR - Integrated hot water coil.
- V.R.C - Hot coil adjustment valve.
- BER - Integrated electrical coil.
- T.A.G. - Antifreeze thermostat.
- T.M. - Supply temperature probe.
- S.Q.A. - Environmental air quality probe.
- T.A. - Environmental air temperature probe.
- V.R. - Return fan.
- S.EX. - Shut-off damper.
- KRFCS - Full Control power and regulation electrical panel.
- KHMIG - Control panel with graphic display.

Heat recovery unit

UTNR-HE Platinum 040÷400

Air flow rate: 310÷4,250 m³/h



- **Very high efficiency hygroscopic heat recovery Eurovent Certificate**
- **Multi-speed or Brushless EC fans**
- **F7 and M5 high efficiency filters**
- **Double sandwich wall with high insulation capacity**
- **Full control kit**

Fresh air terminal unit with enthalpy rotary heat recovery.

Construction features

- Recovery unit: high yield rotary type made of aluminium with hygroscopic surface. Electric induction motor with belt and pulley transmission. Recovery unit-motor assembly easily removed from the side for periodic maintenance.
- Fans: fresh air inlet and forward blade double intake centrifugal expulsion type with a continuously adjustable directly coupled electric motor; optionally, EC Brushless technology high efficiency electric motors. Fan unit installed on anti-vibration mountings to prevent the transmission of vibration to the structure. The EC fans can be factory set for operation with constant flow (specification to be provided in order)
- Structure: frame made with extruded aluminium profile with preloaded nylon joints. Sandwich buffer panels, 23 mm thick, with galvanised sheet steel on the inside and pre-painted on the outside with thermal and acoustic insulation made of injected polyurethane, with a density of 45 kg/m³. Integrated free cooling or thawing by-pass system. Thanks to the presence of a motorised damper on the heat recovery side, a bypass system can be created to manage the freecooling or thawing depending on requirements or mm thermohygroscopic conventions, with galvanised sheet steel on the inside and pre-painted on the outside with thermal-acoustic insulation made of injected polyurethane, with a density of 45 kg/m³ offering very high thermal and acoustic insulation.
- Filtering section: filtration sections made of compact cell filters with low pressure drop polypropylene media, removable from the side, with F7 efficiency class in fresh flow and M5 in expulsion flow.
- Factory-installed dirty filter differential pressure switches
- Terminal block: already part of the machine to facilitate the electrical connections, fan controls and rotary recovery.

Versions

- UTNR-HE/O PLATINUM - Recovery unit with rotary heat exchanger, installed horizontally and with standard multi-speed fans
- UTNRE-A/O PLATINUM - Recovery unit with rotary heat exchanger, installed horizontally and with Brushless EC fans that reduce the power consumption for ventilation at equal performance.

Available orientation

- 01 - Right-hand connections
 - 02 - Left-hand connections
- The selected orientation must be specified to process the job order.

Installation

- EXT- Outdoor installation

Factory fitted accessories

- ERF7-F7 efficiency return filter
- BP-Bypass control for free-cooling including: NC relay on board the panel (suitable for PCU and KPCUE) and 2 NTC probes on board the machine

Separately supplied accessories

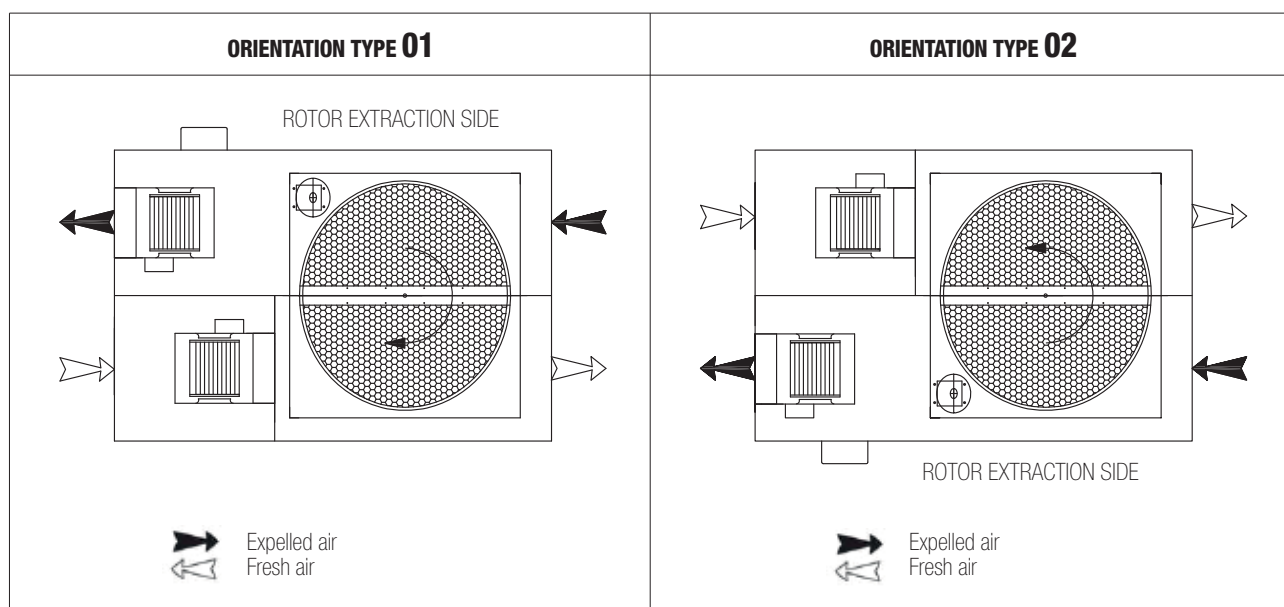
- KBER - Reheating electrical resistance installed outside in a duct dedicated module, complete with filament-type safety thermostats and control relays to contain pressure drops.
230/1/50 single-phase electrical supply for model 040 and 075. 400/3/50 three-phase for 100÷400 models.
- KSBFR - Section containing hot/cold water coil to reheat or recool, placed outside the machine in front of the intake vent. Includes stainless steel condensate drain pan with drain connection from the bottom.
- KSBFR + ATG - Hot/cold water coil section with mounted antifreeze thermostat
- KSRE - Regulation damper preset for servo-control, consisting of a galvanised sheet steel frame with adjustable fins.
- KSSC - Duct silencer with a rectangular base made of glass wool covered with a protective film of glass fibre and micro-stretched sheet metal.
- KRMS - Section with three dampers for air mixing and recirculation (only for horizontal installation).
- KSPC - 4 circular connections.



UTNR-HE PLATINUM MODEL		40	75	100	150	200	320	400
Type of Unit		Non-residential- Bidirectional						
Outdoor air filters		F7						
Return air filters		M5						
Bypass		Motorisable side bypass damper						
TECHNICAL SPECIFICATIONS								
Nominal air flow	m³/h	310	640	1000	1650	2400	3200	3800
STANDARD FANS								
1 Nominal available static pressure	Pa	230	130	190	160	300	180	n.d.
2 Specific fan power (SFP)	W/(m³/s)	1409	1443	1580	1036	806	1226	n.d.
3 Sound pressure level	dB(A)	59	60	62	62	63	66	n.d.
Speed N°/Regulation Type		4	3	3	3	3	3	n.d.
Electrical supply	V-ph-Hz	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50	
BRUSHLESS EC FANS								
1 Nominal available static pressure	Pa	230	130	190	160	300	180	100
1 Max available static pressure	Pa	430	280	560	600	480	460	230
2 Specific fan power (SFP)	W/(m³/s)	1045	1263	1102	842	617	869	1029
3 Sound pressure level	dB(A)	60	61	61	63	62	65	66
Speed N°/Regulation Type		0-10 V						
Electrical supply	V-ph-Hz	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50
COUNTERFLOW HEAT RECOVERY								
4 Winter efficiency temp/enthalpy	%	79/74	74/69	73/58	74/60	75/62	74/60	73,5/59
5 Summer efficiency temp/enthalpy	%	79/69	74/65	73/59	75/60	81/65	75/59,5	73/59
6 Efficiency Regulation EC 1253/2014	%	74,2	74	73	73	73,7	74,3	73
DIMENSIONS AND WEIGHTS		40	75	100	150	200	320	400
Length/Height/Depth UTNR-A PLATINUM	mm	1075/480/800	1075/480/800	1205/550/1000	1400/550/1000	1720/680/1290	2000/680/1400	2000/680/1400
Weight	kg	70	75	105	140	180	230	250

Data at the following conditions:

- 1 Values referred to the nominal air flow considering the pressure drops of the heat recovery and the F7 filter
- 2 Values referred to the nominal air flow and Nominal available static pressure
- 3 Sound pressure level referring to 1 m from the machine inlet in free field
- 4 Outdoor air T: -5°C, 80% RH ; Ambient air T: 20°C, 50% RH.
- 5 Outdoor air T: 32°C, 50% RH ; Amb. air T: 26°C, 50% RH.
- 6 Dry nominal conditions, measured according to En 308 in balanced flows. Outdoor air 5°C D.B.; Ambient air 25°C D.B.



Heat recovery unit

UTNR-HE Platinum 040÷400

Air flow rate: 310÷4,250 m³/h



PCU Panel



KPCUE Panel

Controls

- KCV2-Speed selector for wall mounting installation, to select from 3 speeds (excluding model 40): Off/heating/cooling switch; 3-speed switch; 230V power supply.
- PCU - Control panel for wall mounting installation, allows the winter/summer environment temperature to be controlled, gives consent to activate or exclude the water coil (ON/OFF Valves control) or the electrical resistance. Selects the operating speed of the fan between minimum, medium, maximum and controls the freecooling function.
- PCU - Control panel for wall mounting installation, allows the winter/summer environment temperature to be controlled, gives consent to activate or exclude the water coil (ON/OFF Valves control) or the electrical resistance. Selects the operating speed of the fan through 0/10 V adjustment and controls the freecooling function.
- KPCUEM - Adds a board to interface Modbus with BMS to the KPCUE control functions.
- KPTZ - Rotating potentiometer for wall mounting installation, dedicated to manual fan speed control. The speed of delivery and return fans is calibrated with a single potentiometer (only for the EC Brushless fan version).

Full Controls

- KRFCFS - Electrical panel complete with: DDC programmable microprocessor regulator. BMS interfacing Integrated as standard with Modbus RTU protocol, main disconnecting switch, relay to control various users, terminal blocks for quick connection of all machine components, auxiliary circuit supply with suitable transformer 230/12-24V.

Optional first start-up

User panels (for KRFCFS)

- KHMIG - Interface terminal with black monochrome graphic display with LED backlighting.
- KHMIR - Interface terminal complete with integrated room temperature probe with black monochrome graphic display with LED backlighting.
- KCW - White decorative plate for control panel.
- KCB - Black decorative plate for control panel.
- KWMS - Wall mounting installation support for control panel.

Valves and actuators

- KV3V - PN40 Mixer/diverter 3-way regulation ball valves, female threaded hydraulic connections.
 - KV2V - PN40 2-way regulation ball valves, female threaded hydraulic connections.
 - KVMM - Actuator for ball regulation valves with modulating control 0/10 Vdc 24 Vac power supply.
 - KVOM - Actuator for 230V On/Off valves.
 - KDMA-S - Actuator for modulating damper 0-10V 24V with spring return.
 - KDMA - Actuator for modulating damper 0-10V 24V without spring return.
 - KDOA - Actuator for ON/OFF damper with spring return.
- All the probes, actuators and valves on the Full Control section are also available.

Full Control regulation

The Full Control kit allows integrated management of all the functions in the UTNRHE, guaranteeing total control of room comfort in a simple and complete manner:

- **Simple installation: all components are designed for on site maximum simplicity and flexibility of installation and supplied**

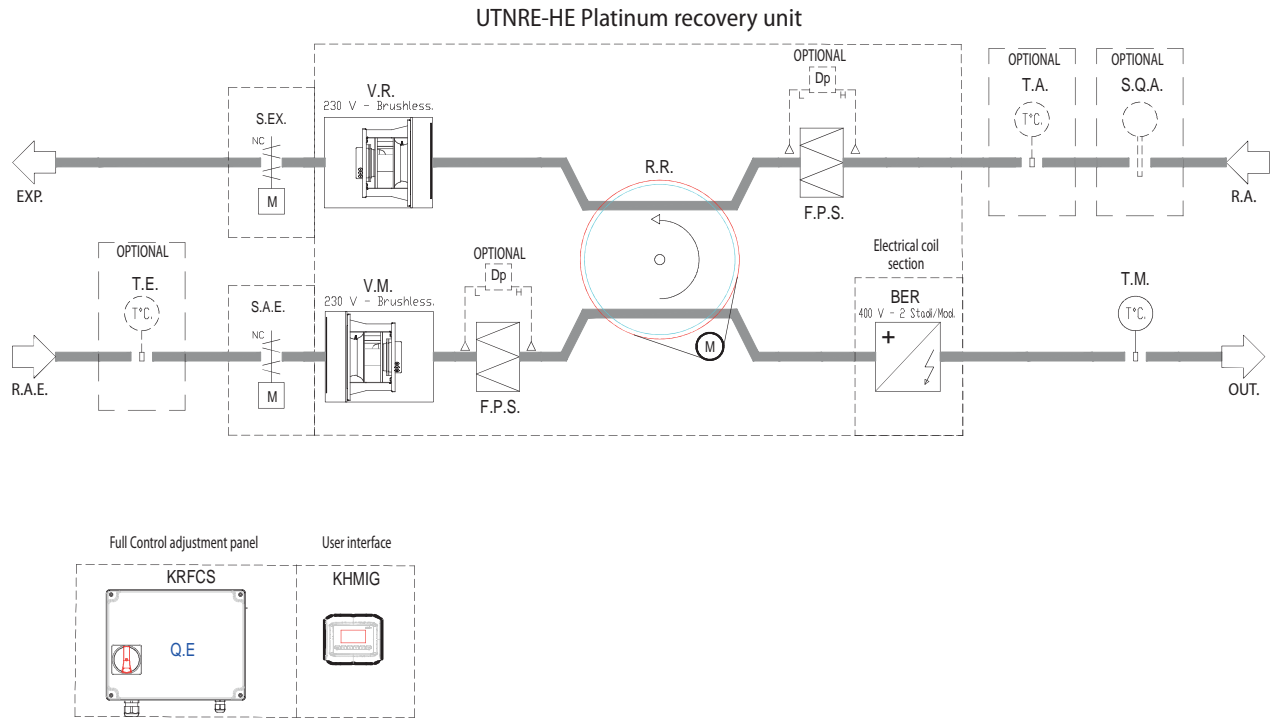
separately to not hinder handling and the installation of the units in a false ceiling and in confined spaces. The electrical panel can also be installed remotely. Pre-assembled and pre-wired at the factory on request.

- **Easy to use: intuitive and user friendly functions and menus.**
- **Weekly time schedule.**
- **Easy start-up: pre-calibrated regulators, pre-set and tested at the factory, specifically developed to manage all functions of the chosen configuration, avoiding any complication.**
- **Easily and immediately interfaced: controller comes standard with a USB port, RS 485 for dialogue via Modbus RTU and Canbus port to develop local networks.**

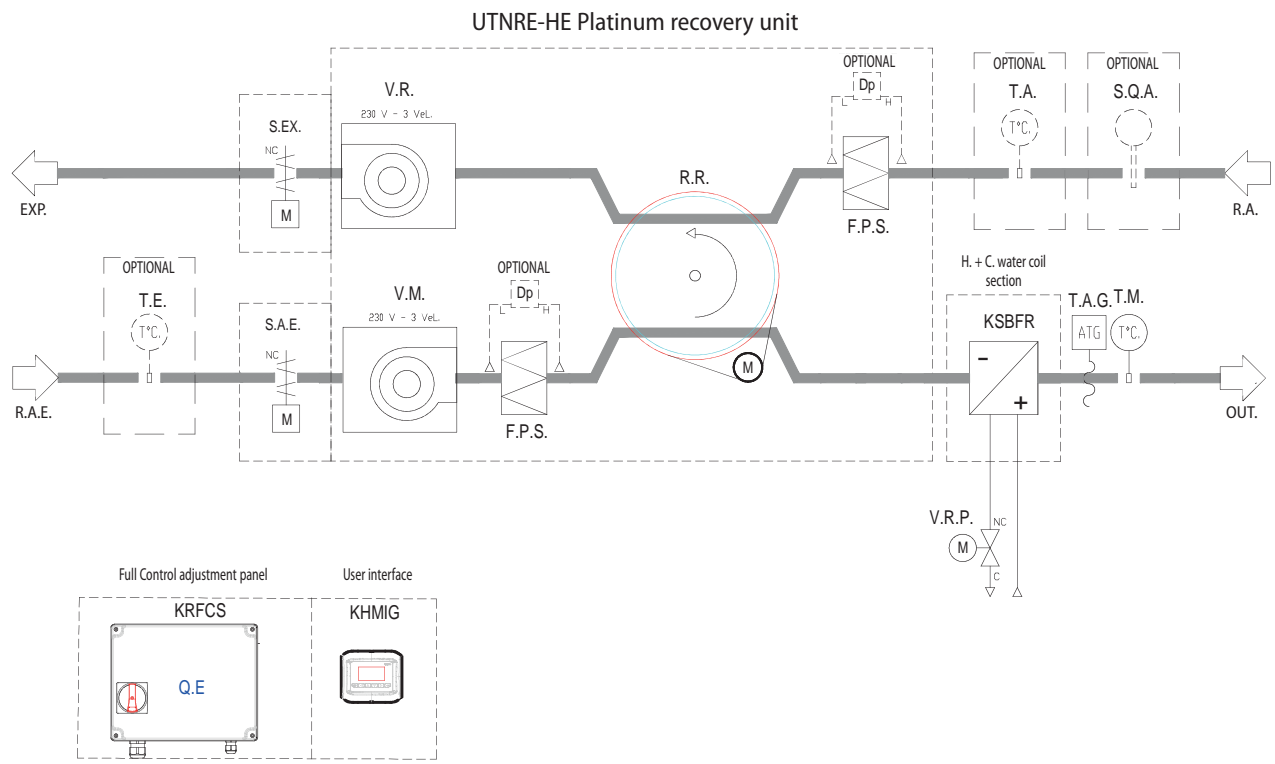
The following are present according to the composition of the selected machine and accessories:

- T.E. - Outdoor air temperature probe.
- S.A.E. - Outdoor air damper.
- V.M. - Supply fan.
- F.P.S. - Standard pleated filter.
- Dp - Differential clogging filters pressure switch.
- KSBFR - Hot-cold additional coil module.
- V.R.P - Mixed coil adjustment valve.
- BCR - Integrated hot water coil.
- V.R.C - Hot coil adjustment valve.
- BER - Integrated electrical coil.
- T.A.G. - Antifreeze thermostat.
- T.M. - Supply air thermostat.
- S.Q.A. - Environmental air quality probe.
- T.A. - Air return or ambient temperature probe.
- V.R. - Return fan.
- S.EX. - Shut-off damper.
- KRFCFS - Full Control power and regulation electrical panel.
- KHMIG - Control panel with graphic display.

UTNR-HE Platinum version E brushless



UTNR-HE Platinum



Controls

FULL CONTROL



The Full Control adjustment system aims to meet all the adjustment requirements of our units in the UTNA - UTNR A/P and HE comfort range starting from the most basic up to fully-equipped units.

MAIN CONTROL LOGIC SETTINGS

Temperature adjustment at a supply fixed point (primary air)

The Tm fixed point probe controls the supply temperature using the modulating actuator of the control valve.

“Sliding” adjustment of the supply temperature according to the ambient set-point (all air)

The supply set-point is calibrated according to the difference between the room temperature and set-point, with the authority set. This function allows the performance of a control loop with a high degree of difficulty to be improved, thereby reducing the delay with which the ambient/return probe indicates the interference that occurs in the supply and is used as a base when the ambient temperature is to be set.

Result

The supply air temperature varies according to the difference between the actual ambient temperature and that prescribed.

Benefits for the end user

The ambient temperature control is faster and more accurate, and the gap on the ambient set-point is smaller than that achieved with separate ambient/return temperature control.

Antifreeze protection function

The TAG antifreeze thermostat protects the coil from frost (in case of intervention) when the outdoor air damper closes and the unit stops

Filter clogging monitoring

The cleanliness and healthiness of the filters is constantly monitored by the differential pressure switch as required by the relevant EU regulation

2-pipe systems

In case of the mixed coil, the season must be selected from the control panel or the remote selector.

The E/I selector also lets you exclude antifreeze protection while the coil is powered by cold water.

4-pipe systems

The hot and cold valve control is in automatic sequence, with central dead band to prevent instability.

Supply summer temperature compensation in relation to the outdoor one

Adjusting the ambient/return humidity

The humidity probe on the return controls the humidity. During winter, it modulates the delivery of the steam humidifier. During the summer period it acts on the actuator of the control valve of the cold coil, thereby modulating the performance.

Temperature free-cooling

This type of function is ONLY possible if you have selected a unit with heat recovery and it is set to achieve maximum savings.

Energy will be saved in systems with internal foreign heat production in cooling mode since the typical outdoor temperatures of the winter or intermediate seasons (approx. 10 to 20°C), the ambient temperature controller controls the outdoor air dampers and expulsion on opening and recirculation on closing, thereby eliminating the added heat with a corresponding percentage of outdoor air.

The function must be activated on start-up.

UNIT		UTNA		UTNR A-HE	
FUNCTION		AP	TA	AP	TA
CONFIGURATIONS / FUNCTIONS	2-pipe single coil (Hot, Cold, Mixed)	•	•	•	•
	4-pipe second coil (Hot, Mixed)	•	•	•	•
	Fan control 1, 2 or 3V	•	•	•	•
	Fan control control (operated manually from the control panel or from the external input/potentiometer or according to the pressure/IAQ/Humidity probes)	•	•	•	•
	On/off damper control (operated electro-mechanically when the machine is switched on and the optional antifreeze thermostat, in case of alarm)	•	•	•	•
	Mixture chamber module damper control (potentiometer/from controller)	n/a	•	n/a	n/a
	Separate control for double vent.	n/a	n/a	•	•
	Recovery unit bypass command (for free-cooling control)	n/a	n/a	•	•
	Recovery unit antifreeze control	n/a	n/a	•	•
	On/off dehumidifier command	•	•	•	•
	Modulating dehumidifier command	•	•	•	•
	Coil on/off command Electric (ONLY 2-pipe versions alternative to the second hot coil for UTNA and UTNR)	•	•	•	•
	Coil modul. command Electric (ONLY 2-pipe versions alternative to the second hot coil for UTNA and UTNR)	OPT	OPT	OPT	OPT
	PROBES	Antifreeze Thermostat	•	•	•
Supply temperature probe		•	•	•	•
Ambient/Return temperature probe and combined return/ambient temperature + humidity probe		•	•	•	•
Ambient/Return Humidity Probe		•	•	•	•
I/O OPT.	IAQ input probe* (Modulating damper control or fan speed)	•	•	•	•
	Channel const. pressure probe input (Speed modulation of the fans on VAV systems with separate zone dampers or pressurised control)**	•	•	•	•
	Outdoor air temperature probe outlet (for supply set-point compensation, recovery/free-cooling bypass)	•	•	•	•
	Dp filter pressure switch input	n/a	•	n/a	•
	Remote temperature recalibration potentiometer input and remote damper positioning	•	•	•	•
	Input Remote E/I selection input (ONLY 2 pipes)	•	•	•	•
	Remote On/Off input	•	•	•	•
	Economy input (from external timer, micro window, badge reader, etc.)	•	•	•	•
	Ext. alarm input (general alarm, fire protection etc) for emergency stop	•	•	•	•
	Alarm repeat output (Relay)	n/a	n/a	n/a	n/a
	Thawing input from heat pump	•	•	n/a	n/a
	E/I switching output for heat pump	•	•	•	•
ADDITIONAL FUNCTIONS	Pump control 1 (auxiliary, not power, for the pump or generator to service the coil/circuit 1)	•	•	•	•
	Pump control 2 (auxiliary, not power, for the pump or generator to service the coil/circuit 2)	•	•	•	•
	Modbus serial communication	•	•	•	•
	Weekly time schedule	•	•	•	•
	Holiday schedule	•	•	•	•

** only with the Brushless EC fan
n/a: not available
OPT: option

Controls

FULL CONTROL

Separately supplied accessories

- KSEZM - Single-phase main disconnecting switch on the front of the electrical panel interrupts the power supply before allowing the door to be opened. It can be blocked with a padlock.
- KSEZT - Three-phase main disconnecting switch on the front of the electrical panel interrupts the power supply before allowing the door to be opened. It can be blocked with a padlock.
- KPD - Differential air pressure switch (20-300Pa) to indicate the alarm when the point of intervention set to detect a dirty filter or air flow is reached.
- KTAG - Antifreeze thermostat (with brackets).
- KPOTS - Remote potentiometer for damper calibration.
- KLS - Damper manual command lever

Probes

- KATS - Ambient air NTC temperature probe (in the diagrams: TA).
- KDTS - NTC temperature probe from the channel (in the diagrams: TM/TR/TX).
- KOTS - Outdoor air NTC temperature probe (in the diagrams: TE).
- KDHS - Active humidity probe from channel with 0/10Vdc signal (in the diagrams: TUR/TUM).
- KATHS - Ambient temperature/humidity probe (in the diagrams: TUA).
- KDTHS - Channel temperature/humidity probe (in the diagrams: UR/UM).
- KAVOCS - Ambient IAQ VOC probe (in the diagrams: IAQ).
- KDVOCS - Channel IAQ VOC probe (in the diagrams: IAQ).
- KAIAQS - Ambient IAQ VOC+CO2 probe.
- KDIAQS - Channel IAQ VOC/CO2 probe.
- KDAPS - Air pressure probe.

Mixing/diverter 3-way ball PN40 VALVE.

With body and shaft in brass and chrome plated brass ball. Sealed with an EPDM ring, female THREADED hydraulic connections

- KV3V15-x_x - 3-WAY threaded VALVE. DN15 kv from 1.6 to 6.3 depending on the sizes.
- KV3V20-6_3 - 3-WAY threaded VALVE DN20 kv 6.3.
- KV3V25-10 - 3-WAY threaded VALVE DN25 kv 10.
- KV3V20-6_3 - 3-WAY threaded VALVE DN32 kv 16.
- KV3V40-25 - 3-WAY threaded VALVE DN40 kv 25.
- KV3V50-xx - 3-WAY threaded VALVE DN50 kv 40 or 63 depending on the sizes.

Adjustment 2-way ball PN40 VALVES.

With body and shaft in brass and chrome plated brass ball. Sealed with an EPDM ring, female THREADED hydraulic connections.

- KV2V15-x_x - 2-WAY threaded VALVE. DN15 kv from 1.6 to 6.3 depending on the sizes.
- KV2V20-6_3 - 2-WAY threaded VALVE DN20 kv 6.3.
- KV2V25-10 - 2-WAY threaded VALVE DN25 kv 10.
- KV2V32-16 - 2-WAY threaded VALVE DN32 kv 16.
- KV2V40-25 - 2-WAY threaded VALVE DN40 kv 25.
- KV2V50-40 - 2-WAY threaded VALVE DN50 kv 40.

Actuators for regulation BALL valves with 0/10Vdc 24Vac power supply modulating control

- KVMM25 - ACTUATOR V.DN MAX25 24V 0-10Vdc.
- KVMM50 - ACTUATOR V.DN MAX50 24V 0-10Vdc.

On/Off valve actuators, 230V TO OPERATE WITH 2-position control FAN-COIL THERMOSTATS

- KVOM25 - ACTUATOR V. DN MAX 25 230V On/Off SPDT.
- KVOM25 - ACTUATOR V. DN MAX 25 230V On/Off SPRING RET. SPST.
- KVOM50 - ACTUATOR V. DN MAX 50 230V On/Off SPRING RET. SPST.

ACTUATORS FOR MODULATING DAMPERS 0-10V 24V

- KDMAxS - ROT. DAMP. ACTUATOR 2/7/18Nm modulating with 24V spring return
- KDMAx b - ROT. DAMP. ACTUATOR 5/10/15Nm modulating without 24V spring return

ACTUATORS FOR ON-OFF 24V DAMPERS

- KDOAxS - ROT. DAMP. ACTUATOR 2/7/18 Nm on/off with 24V spring return

BASIC CONTROLS

User panels

With these accessories you can easily manage all active control functions by means of symbols and clear icons and intuitive including: change the set-point, manage summer/winter seasonal switching, manage the ON/OFF power, manage the ventilation mode, display the temperature, humidity and all the values measured by the connected probes, set a weekly program schedule or a timer for prolonged absences (holiday mode), view alarms, reset alarms and manually position any motorised dampers in modulating control.

The features described above are common to all the following control panels. All Panel controls are used for box recessed installation (BTicino 506 type). You can customise the terminal to integrate it aesthetically in environments with the KCW or KCB plates according to the price list or the several Bticino series "Living" and "Light" plaques.

- KHMIG - Vgraph control panel. Interface terminal with black monochrome graphic display with LED backlighting.
- KHMIR - Control panel with ambient temperature probe (Vroom). In addition to the functions of the previous control panel implemented a temperature probe in the panel.
- KTOUCH - Black and white monochrome touch screen control panel 320x240 pixels.
- KCOLOR - Colour touch screen control panel 320x240 pixels.
- KCW - White decorative plate for control panel.
- KCB - Black decorative plate for control panel.
- KWMS - Wall mounting installation support for control panel.



KHMIG and KHMIR



KCW

Electrical panel in a resin case, with IP55 protection, compliant with IEC EN 60204-1, complete with:

- DDC programmable microprocessor controller that can manage up to 40 I/O with Rhoss software and configuration specifically designed to make sure the optimal automatic control of all functions can be managed on the machine, via continuous comparisons made between the set values and the temperature and humidity conditions detected by the sensors. The adjustment, optimised with proportional-type algorithms plus integral (PI), assures accurate and safe operation of the air handling unit. The controller is equipped with a Real Time Clock to set the date, time and time program, with a backup battery to keep the saved data even in case of a prolonged power cut (up to 2 days). Interfaced with BMS Integrated as standard with Modbus RTU protocol.
- Main disconnecting switch.
- Fuse holder to protect single phase fan motors with power up to 1.6 kW with isolating function for phase and neutral on opening (*).
- Motor protection fuses for the motor of a rotary recovery, the 230/12V transformer and the 24V auxiliary circuit.
- Relay to control various utilities.
- Spring terminal blocks with removable connectors for quick connection of all components on the machine.
- Electrical supply 1F+N 230V 50Hz.
- Auxiliary power supply with a converter transformer 230/12-24V.
(* An external panel with specific protection and drive devices must be added required for higher power and three-phase loads .
- KRFCs - Full Control power and regulation electrical panel for UTNB-UTNA-UTNR-UTNV Single-phase Max Pow. 2x1.6 kW.



- KDTR - Usable with all UTNA-V-R with 1 coil. Simple and reliable controller to be installed in the supply duct, in the same case which already holds the temperature probe and is designed to handle simple air handling units operating at a supply fixed point. Operating range 0-50°C:
- KPOTR - Remote potentiometer for damper recalibration (in combination with KDTR).

AMBIENT regulators for wall mounting with software application, display, ambient sensor, RS485 serial board and clock with control of up to 9 I/O.

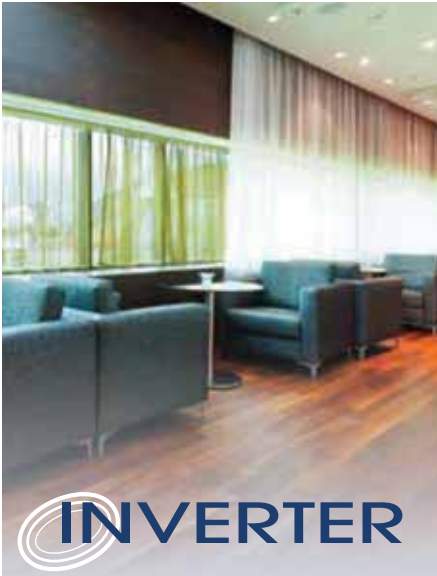
- KRCA1 - Ambient regulator with integrated temperature probe to control the following functions:
 - 2 modulating coils, antifreeze, 1 modulating damper, 1 on/off resistance
 - modulating coils, antifreeze, 1 modulating fan, 1 on/off resistance
 - 2 modulating coils, antifreeze, 1 modulating resistance, 1 on/off fan
 - 2 modulating coils, antifreeze, 1 modulating fan, recovery bypass
- KRCA2 - Ambient regulator with integrated temperature probe to control the following functions:
 - 2 modulating coils, antifreeze, 1 on/off fan, 1 aux. on/off control
 - 2 modulating coils, antifreeze, 1 on/off fan, recovery bypass, 1 aux. on/off control
 - 2 modulating coils, antifreeze, 1 on/off resistance, recovery bypass, 1 aux. on/off control



Heat recovery unit

UTNR-HP 035÷450

Air flow rate: 350÷4,500 m³/h



INVERTER

- Combined crossed flow and active thermodynamic heat recovery
- Standard air filter with G4 efficiency
- Integrated electronics



Fresh air terminal units with two-stage heat recovery unit.

Construction features

- Recovery unit:
 - First stage of the crossed flow air-air static heat recovery with aluminium heat exchanger plates; lower condensate drain pan along the entire heat treatment area.
 - Second stage of the active thermodynamic heat recovery unit with heat pump cooling circuit (with R410A gas) consisting of hermetic compressor (rotary or scroll type depending on the size of the machine), evaporating and condensing coils with copper pipes and continuous aluminium fins, electronic expansion valve, liquid separator and receiver, 4-way valve for cycle inversion, high and low pressure switches, Freon filter and liquid indicator.
- Fans: fresh air inlet and dual intake centrifugal exhaust type with a directly coupled electric motor. Fan unit installed on anti-vibration mountings to prevent the transmission of vibration.
- Structure and panels: frame made with extruded aluminium profile, Anticorodal 63 alloy, with preloaded nylon angular joints. Sandwich buffer panels, 23 mm thick, made internally with galvanised sheet steel and externally with galvanised pre-painted sheet steel (RAL 9002), with thermal and acoustic insulation made of injected polyurethane, with a density of 45 kg/m³.
- Filtering section: consisting of two class G4 filters (one on the fresh air intake and one on the ambient inlet), both can be removed from the bottom and side.
- Electrical panel: with integrated regulation and power; NTC temperature probes on both the delivery and return air circuits; micro-processor electronic control for automatic room temperature management, winter/summer switch and thawing cycles; remote control of panel up to 20 m from the unit,

Versions

Available orientation:

- UTNR-HP 01, 02 – Heat recovery unit with crossed flow and active thermodynamic double heat exchanger with 01 or 02 orientation (right connection side) or 01s or 02s (left connection side).
The selected orientation must be specified to process the job order.

Installation

- EXT - Protective roof for outdoor installation.

Factory fitted accessories

- BER - Internally installed filament type reheating electrical resistance, complete with safety thermostats and control relays. 230/1/50 single-phase for models 035÷150. 400/3/50 three-phase for models 230÷450.
- BEP - Internally installed filament type reheating electrical coil, complete with safety thermostats and control relays. 230/1/50 single-phase for models 035÷150. 400/3/50 three-phase for models 230÷450.
- PF - Differential pressure switch installed on the inlet filter to indicate a dirty filter.
- ATG - Antifreeze thermostat installed downstream of the water coil.
- EG4PF - G4 outdoor air filter with differential pressure switch.
- ERG4PF - G4 outdoor air filter and G4 return air with differential pressure switch.
- EF7 - F7 outdoor air filter.
- ERF7 - F7 outdoor and return air filter.
- EG7PF - F7 outdoor air filter with differential pressure switch.
- ERF7PF - F7 outdoor and return air filter with differential pressure switch.

Separately supplied accessories

- KSBFR - Section containing hot/cold water coil for reheat or recool, placed outside the machine in front of the inlet. Includes a stainless steel condensate drain pan with drain connection from the bottom.
- KSBFR + ATG - Hot/cold water coil section with mounted antifreeze thermostat.
- KV2V ON/OFF - 2 way valve kit with On/Off servo-control.
- KV3V ON/OFF - 3 way valve kit with On/Off servo-control.
- KSRE230 - Regulation damper consisting of a galvanised sheet steel frame with adjustable fins, equipped with 230V ON/OFF servo-control.
- KSME230R - Regulation damper consisting of a galvanised sheet steel frame with adjustable fins, equipped with 230V ON/OFF servo-control with spring return.
- KSSC - Duct silencer with wool baffles covered with glass fibre and micro-stretched sheet steel.
- KRMS - 3-damper section for operation with outdoor air at low temperature up to -20°C, with modulating servo-controls.

Controls supplied separately

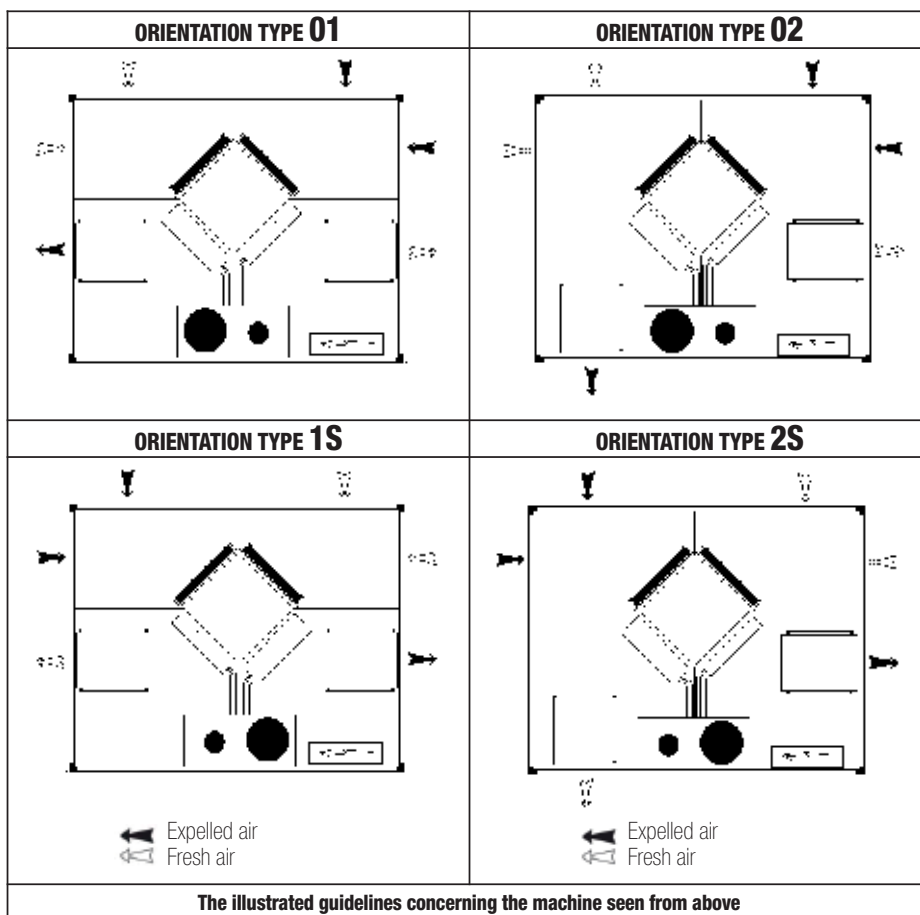
- KTUP - Additional user terminal, with remote control up to 50 m, for wall mounting.
- KSCMB - Modbus serial board.



UTNR-HP MODEL		35	60	100	150	230	320	450
Nominal air flow	m³/h	350	600	1000	1500	2300	3200	4500
Available delivery static pressure	Pa	165	170	195	155	155	185	175
Available return static pressure	Pa	140	100	140	95	95	115	110
① Sound pressure level	db (A)	59/47/52	64/50/55	62/49/54	67/54/57	65/51/59	68/54/59	70/56/59
Max available delivery static pressure - Version E Brushless	Pa	270	285	295	290	365	265	270
Max available return static pressure - Version E Brushless	Pa	245	215	240	230	305	195	205
FUNCTIONAL LIMITS		35	60	100	150	230	320	450
② Standard configuration winter limit operating conditions	°C / %	MIN -10°C OUT & MIN 19°C 50% IN						
② Winter limit operating conditions with KRMS accessory	°C / %	MIN -20°C OUT & MIN 19°C 50% IN						
Summer limit operating conditions	°C / %	MAX 38°C 50% OUT & MAX 27°C IN						
Flow rate variation field	%	-10 ÷ +10						
ELECTRICAL SPECIFICATIONS		35	60	100	150	230	320	450
Electrical supply	V/ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	400/3/50	400/3/50	400/3/50
Max. absorption	A	5,3	9	13,2	20,2	10	15,4	16,4
③ PERFORMANCE IN HEATING MODE		35	60	100	150	230	320	450
Static recovery efficiency	%	62	51	50	50	50	50	50
Active recovery	W	1740	2960	5010	7690	11090	16300	17300
Total power	W	3580	5790	9410	14390	21190	30260	36010
Treated air temperature	°C	24	23	22	22	22	22	18
④ Overall COP	W/W	10,9	9,6	9,22	8,64	8,9	9,9	12,6
⑤ PERFORMANCE IN COOLING MODE		35	60	100	150	230	320	450
Static recovery efficiency	%	56	50	50	50	50	50	49
Active recovery	W	1810	2860	4890	7270	10580	15310	16990
Total power	W	2210	3450	5840	8720	12830	18390	21440
Treated air temperature	°C	19	20	20	20	20	20	21
④ Overall EER	W/W	4,2	3,9	4,2	3,9	3,9	4,1	5,01
DIMENSIONS AND WEIGHTS								
Length/Height/Depth	mm	1540/370/1240	1540/370/1240	1840/410/1440	1840/500/1440	2040/550/1690	2040/650/1690	2240/710/1890
Weight	Kg	122	125	185	228	267	281	329

Data at the following conditions:

- ① Sound pressure level assessed at 1 m from: permanent ducted socket/intake socket/compressor compartment. Generally, the operating noise level differs from the indicated values depending on the operating conditions, reflected noise and peripheral noise.
- ② Referred to the nominal flow rate.
- ③ Outdoor air -5°C RH 80%; ambient air 20°C RH 50%.
- ④ Excluding power consumption for ventilation.
- ⑤ Outdoor air 32°C RH 50%; ambient air 26°C RH 50%.



Heat recovery unit

VMC-E 025÷130

Air flow rate: 250÷1.300 m³/h



- Extremely compact
- High efficiency recovery
- Very silent
- Brushless DC fans

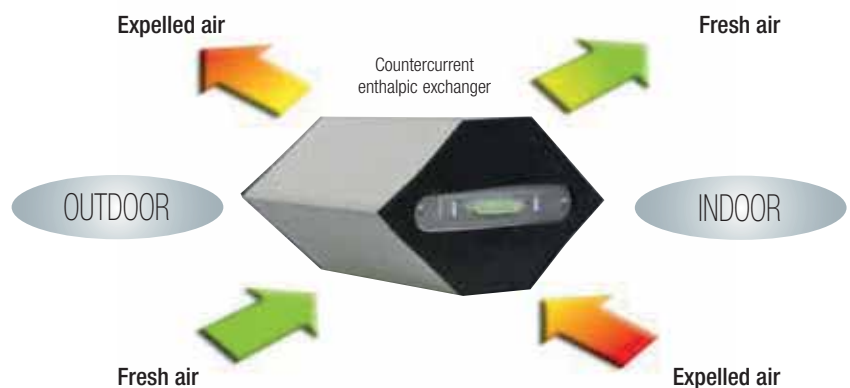
Fresh air terminal unit with counterflow static heat recovery.

Construction features

- Galvanised sheet steel self-bearing structure, insulated internally and externally.
- Recovery unit: thanks to a high yield static type heat exchanger with counterflows consisting of flat layers of special paper that allow total heat exchange, thereby recovering both sensitive and latent heat. The air flows are kept separate by relevant sealing. Maintenance is easily performed on the heat exchanger and filters thanks to side extraction.
- By-pass motorised system of the recovery unit actuated automatically by the electronic control
- Air filtration in F9 efficiency class (with G3 pre-filter) on the fresh air and G3 filter on return air.
- Integrated dirty filter signal pressure switches.
- Fans: fresh air inlet and centrifugal expulsion with BRUSHLESS EC motors that allow higher efficiency to be achieved in comparison to traditional motors with energy savings of up to 60%. 10-speed management option.
- Ducting connections with plastic round fittings.
- Incorporated electrical panel with electronic board to control the free-cooling and fan functions.

Controls

- KPST- Touch screen remote control panel
- KQSW- CO2 wall sensor for fan regulation
- KUSW- Wall humidity sensor for fan regulation

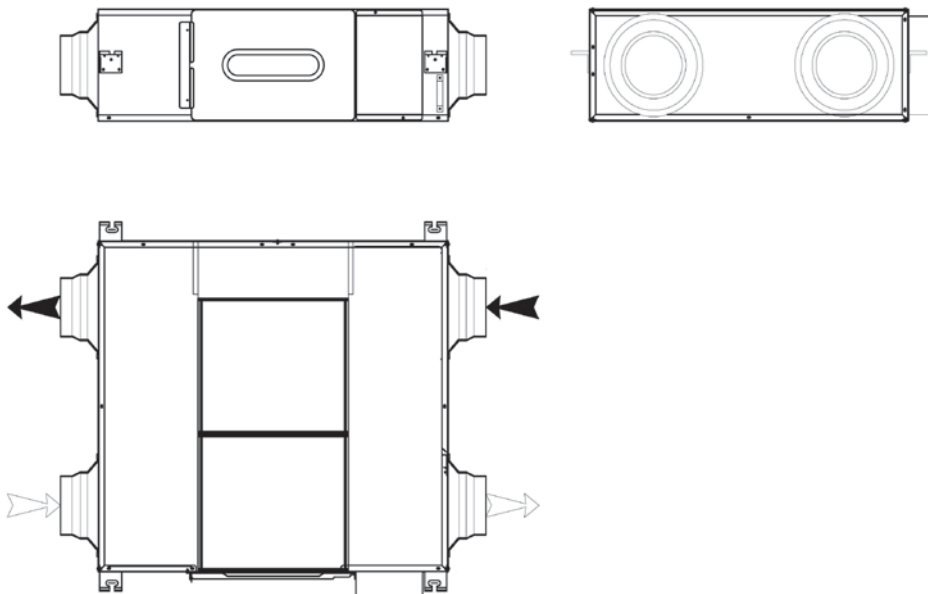




VMC MODEL		025	035	050	080	100	130
Nominal air flow	m³/h	250	350	500	750	1000	1300
Nominal available static pressure	Pa	90	140	110	140	140	140
Total nominal absorbed power	W	80	130	150	320	390	500
Total maximum absorbed current	A	0,5	0,6	0,6	1,4	2,1	2,7
Int S.F.P.	W/m³/s	812	670	547	865	881	873
① Sound pressure	dB(A)	34	37	39	42	43	44
Electrical supply	V-ph-Hz	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50
Speed number		10	10	10	10	10	10
HEAT RECOVERY		025	035	050	080	100	130
② Winter efficiency (temp/enthalpy)	%	73/65	74/65	76/67	76/65	76/62	74/59
③ Summer efficiency (temp/enthalpy)	%	73/62	74/62	76/63	76/63	76/60	74/58
④ Dry thermal efficiency	%	73	74	76	76	76	74
DIMENSIONS AND WEIGHTS		025	035	050	080	100	130
Length/Depth/Height	mm	815/650/270	815/855/270	895/955/270	1185/1200/390	1200/1290/390	1200/1290/390
Weight	Kg	30	37	43	71	83	83

Data at the following conditions:

- ① Sound pressure level assessed at 1 m, with all 4 air nozzles ducted, on the machine inspection side and under nominal operating conditions
- ② Nominal winter conditions: outdoor air: -5°C; 80% TH. Ambient air: 20°C; 50% RH.
- ③ Nominal summer conditions: outdoor air: 32°C; 50% TH. Ambient air: 26°C; 50% RH.
- ④ According to EU Regulation 1253/2014





PROFESSIONAL

Modular air handling units
800÷41000 m³/h



Advance

ADV Next Air 01÷16

Air flow rate: 800÷41,000 m³/h



INVERTER

- **Highly performing new generation structure**
- **Energy efficiency of excellence**
- **Range ErP 2018 Ready**
- **Plug and play integrated intelligence**
- **Exclusive solutions exclusive for Indoor Air Quality**



Modular air handling units.

- The ADV Next Air range is developed from the new Rhoss air handling vision. Innovative ideas and cutting-edge technology are the winning combination that characterise it. This, together with our thirty years of experience in the sector, leads to the new innovative line of air handling units that looks to the future of air conditioning. The strength of the product lies in the use of latest generation creative engineering solutions, preserving the qualitative excellence and the reliability traits that have made Rhoss a well-known name. The fully modular nature and the wide range of configurations come together in the Next Air range to create perfect balance between customisation and standardisation, flexibility and industrialisation.

STRUCTURE

- Sturdy and self-bearing structure made from one 50 mm thick single-piece sandwich panel, internally and externally hot galvanised sheet steel painted with oil-free polyester paint, highly resistant to corrosion. The internal surfaces are completely smooth to inhibit microbial proliferation and prevent the accumulation of dust.
- Insulation of self-extinguishing polyurethane base resins with a density of 48 kg/m³. Fire reaction Euroclass Cs3d0.
- The step-type full-face front inspection sandwich panels are housed in the profile seat, with thermal

cut interruption, a soft PVC double gasket that simultaneously ensures tightness and prevents humidity, water or any other unwanted element from entering the machine.

- The fixing profiles are made of latest generation plastic material (PVC-RAU). Specifically made on Rhoss design, their geometry ensures perfect thermal insulation of the structure and complete interruption of thermal bridge, optimally resistance to exposure to sunlight (UV rays) and atmospheric agents, ensuring outstanding resistance to ageing.
- The condensate drain pans are made of magnesium and aluminium alloy sheet steel, ensuring excellent resistance to corrosion. They are installed inside the machine structure and are fully insulated. Thanks to the double inclination, full drainage of fluid is guaranteed thus avoiding any kind of unwanted stagnation.
- All units are suitable for both indoor and outdoor installation.

Mechanical features EN 1886 achieved by the ADV Next-Air Range

Mechanical Resistance D1
Leakage (-400Pa) L1
Leakage (+700Pa) L1
Bypass Factor Filters F9
Thermal Transmittance T2
Thermal bridge factor TB1



STANDARD SET-UP

- The standard supply for each section is:
- Pressure fitting that allows and facilitates the assembly of any sensors and the measurements of aerologic performance required by the commissioning activities, as specified in the reference LEED guide.
 - Holes for the passage of signal or power cables protected internally and externally by a multi-hole cable gland with IP 65D in order to prevent altering the mechanical performance of the machine and facilitate on site operations.

MAIN COMPONENTS

Heat recovery units

- Sensitive or enthalpic rotary recovery unit
- Crossed flow recovery unit with integrated bypass

Fans

- Highly efficient backward blade fans
- EC Brushless free impeller fans
- Plenum fan free impeller fans

Filters

- Standard or Airsuite Biocide G4 pleated synthetic filters
- G1 flat metal mesh filters
- Airsuite Biocide or Standard M6 F7 F8 F9 rigid bag filters
- M6 F7 F8 F9 Soft bag filters

Heat exchangers

- Water fed coils
- Electric coils

Humidifiers

- Disposable water evaporating pack humidifiers
- Recirculation water evaporating pack humidifiers
- Autonomous immersed electrode steam humidifiers with producer
- Set-up for the installation of other types of humidifiers

Various sections

- Outdoor/mixture/expulsion air intake dampers with
 - Servo-controllable dampers
 - Manual dampers
- Empty inspection sections
- Silencers

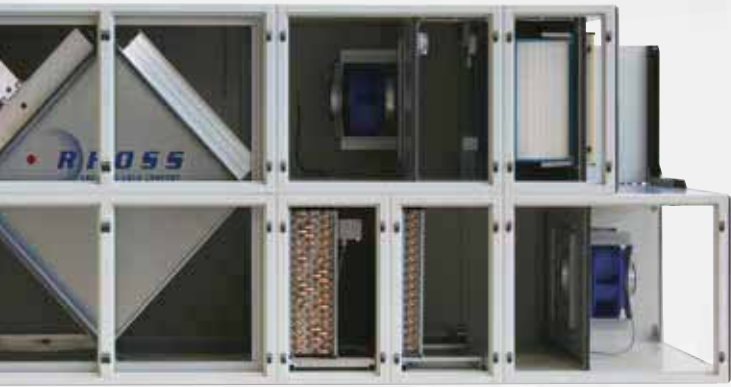
Available versions:

- Type A Unidirectional machine
- Type B Machines with mixing chamber
- Type C Crossed flow heat recovery for primary air
- Type D Crossed flow heat recovery for all air systems
- Type E Rotary heat recovery for primary air
- Type F Rotary heat recovery for all air systems

Factory fitted accessories

- Dirty filters monitoring system
- Fan motors inverter and rotary recovery
- Indoor lighting system
- Anti-vibration fittings for ducting connection
- Rain and anti-intrusion grilles.





A new comfort level

Air'suite® filters the room air, making it healthy and clean, and breaks down microbiological agents, such as bacteria, mould and viruses, reaching a new IAQ standard (Indoor Air Quality) for indoor comfort.



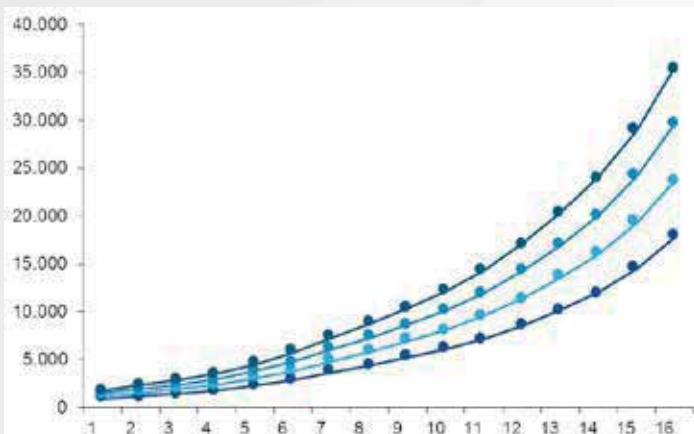
ADV Next Air

Air Handling Units

In 2016 comes to life Next Air, take place the new idea of Rhoss air treatment.

When ideas meet technology, innovation is born. From here, and from our thirty years of experience in the AHU business, is born a new innovative line of air handling units looking to the future of the air conditioning.

The strength of this product is the use of creative and innovative engineering solutions, while preserving the qualitative excellence and the characteristics of reliability for which Rhoss is known.



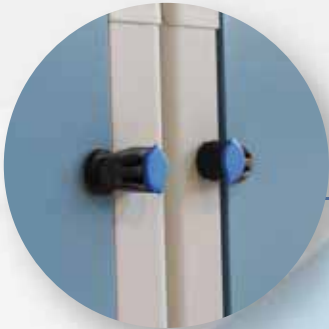
The complete modularity and the wide configurability create, in the Next Air range, the perfect balance between customization and standardization, flexibility and industrialization.

Perfect in any weather conditions

Thanks to the careful study of materials and the extreme attention payed to the thermal decoupling of the structure we can guarantee the absence of condensation in a very wide area of operating temperature and humidity both in summer and winter season.

Thermal bridge factor Class TB1.

Our units installed outdoors excellently resist both to the rain that UV guaranteeing performance unchanged over time.



No Waste

The perfect fit of the panels, the valuable seals and the Rhoss monocoque structure are the best guarantee against air leakage and the related energy waste.

Air Leakage class L1.

The new generation plastic profiles with very low thermal conductivity and the highly insulating panels of are the unique solutions that we give to our customers in order to eliminate energy waste.

Thermal transmittance Class T2.

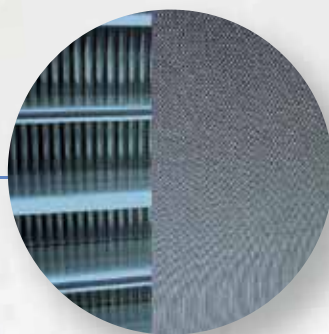


Built-in intelligence

The integrated Rhoss control system ensures the best energy performance, fast connectivity, ease of use and management, full integration to supervisory systems of buildings.

Best efficiency in minimum space

The entire range meets the **2018 step of Erp Directive** for NRvU ensuring a sustainable energy savings. The energy efficiency is guaranteed with low operating costs.



ADV Next Air

3 new heat recovery systems

Diversified recovery solutions

- Vast choice of Erp 2018 recovery systems to meet various plant and climate needs

Guaranteed performance

- Eurovent Certification
- Thorough Rhoss R&D laboratory testing

Plug and Play Version

- All heat recovery systems are available in the plug&play version with integrated Rhoss heat regulation

Indirect adiabatic recovery

Applying the ErP Directive to UNVR (Non-Residential Ventilation Units) has introduced minimum efficiency heat recovery levels, solely considering the winter season. Unfortunately, this regulation does not offer high energy savings for the Mediterranean region, where the main problem is heat recovery during the summer. Rhoss offers a combination with an indirect adiabatic cooling system (IAC), specifically to improve heat recovery energy performance in summer mode. Through this system, the exhaust air can be cooled by means of adiabatic humidification by obtaining a lower delivery air temperature than the ambient temperature without using cold coils, thereby continuing to recover heat even if the outdoor air temperature is lower than the ambient temperature.



Office building Energy efficiency guide

Download the complete document:
<http://www.rhoss.com/download>

Monodirectional regenerative recovery

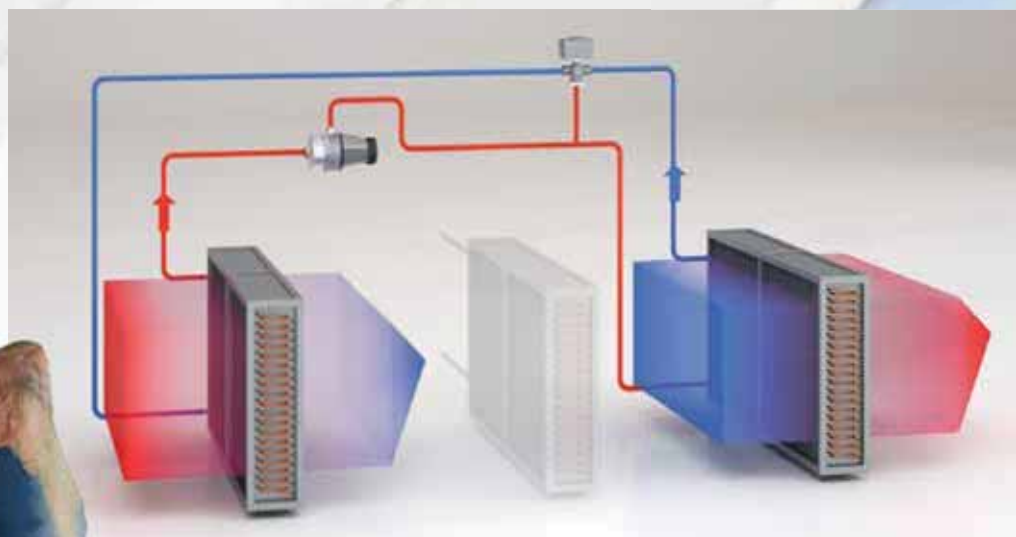
Total comfort has become a must even in the summer, both for new and renovated systems. Air must be dehumidified to properly control humidity, by bringing it to between 14 and 12°C, then reheating it. This requires a heat source (boiler, electric coils) even in the summer, which is not always possible and is always energetically disadvantageous.

MONODIRECTIONAL REGENERATIVE RECOVERY resolves this problem by supplying post-reheating heat at no cost, returning the heat drawn from the outdoor air by the pre-cooling coil.

This ensures summer comfort even in existing systems supplied by heat pumps in conventional 2-pipe systems.

Twin coil recovery

Rhoss introduces ErP 2018-compliant twin coil recovery systems, using extremely high-efficiency heat exchangers and optimising the hydraulic circuits and fluid dynamics of the machine. This solution proves to be an effective solution for installations where there must be no contamination between the two air flows and when retrofitting existing systems where the installation space is limited to up to 30% of the refrigerant gas content used.



As is clearly evident in the Rhoss Guide to energy efficiency, there is no single ideal system which is applicable to all situations. Each type of building, set in a different climate, gives priority to a specific system which behaves better than the others by far. Precisely for this reason, Rhoss expands the heat recovery solutions available in the ADV - Next range, integrating them in the selection software. Alongside the rotary and crossed flow heat recovery units, we also provide our customers with series of twin coil, regenerative monodirectional and indirect adiabatic recovery units to efficiently meet various plant requirements.

Heat recovery unit

Monodirectional regenerative (RR)

Air flow rate: 2800:30.000 m³/h



- Summer modulating and free reheating without requiring hot fluids
- Can be combined with every configuration and to all exhaust air recovery systems from sizes 06 to 16 included

Regenerative heat recovery.

Principle of operation

Total comfort has become a must even in the summer, both for new and renovated systems.

Workplaces, shopping centres, systems with public access cannot omit this type of treatment.

To control humidity correctly (essential parameter for summer comfort), set the air at a temperature between 14 and 12°C in order to cope with the latent load. This however requires reheating the air in order to obtain a delivery temperature between 18 and 23°C depending on the type of system.

This way, a hot source is also required in the summer (boilers, electric coils). This is not always possible and unfavourable in terms of energy.

The RIGENERA range solves this problem by providing the reheating heat free of charge, exploiting the temperature difference available to the expulsion flow. This guarantees summer comfort also in existing systems supplied by heat pumps in traditional 2-pipe systems.

Immediate benefits:

- Summer energy savings (intended as total power saved) ranging from 15% for primary air systems to 35% for full air systems.
- Modulating and free control of summer reheating for accurate control of the air intake temperature, using the regeneration of the delivery and expulsion flows without requiring hot springs.
- Twice the winter efficiency thanks to the crossed flow recover unit (standard), which guarantees up to 70% efficiency.
- The Full Control option allows you to obtain maximum energy savings compatible with the desired heat and hygrometric comfort: no waste at all.
- Integrated regulation of the required hygrometric thermal comfort: no waste, ever.
- The energy performance can be calculated through the selection software that provides the following outputs:
 - summer mode in recovery only
 - complete performance of the pre-cooling and post-heating recovery batteries at the design summer conditions
 - summer mode with integration
 - performance of the post-heating recovery battery with partial or total integration from external hot fluid
 - winter mode
 - performance of the pre-heating and post-heating batteries

Sizes available

General information		06	07	08	09	10	11	12	13	14	15	16
Flow rate at 1,5 m/s	m ³ /h	2860	3610	4360	5180	6070	7160	8520	10160	12000	14450	17730
Flow rate at 2 m/s	m ³ /h	3820	4820	5820	6910	8090	9550	11360	13550	16000	19270	23640
Flow rate at 2,5 m/s	m ³ /h	4770	6020	7270	8640	10110	11930	14200	16930	20000	24090	29550
Flow rate at 3 m/s	m ³ /h	5730	7230	8730	10360	12140	14320	17050	20320	24000	28910	35450



Regenerative recovery				
Monodirectional recovery system for free pre-cooling and post-heating of the delivery air				
Incoming Air		Sum Pre Rec	Cold	Sum Post Rec
Air flow rate	m³/h	8000	8000	8000
Temperature	°C	32	24	14
Relative humidity	%	50	79	100
Absolute humidity	g/kg	15	15	10
Outgoing Air				
Temperature	°C	24,5	12	21,7
Relative humidity	%	77	100	62
Absolute humidity	g/kg	15	9	10
Pressure drops	Pa	52,4	102,7	50,4
Fluid				
Inlet temperature	°C	19,8	7,0	25,6
Outlet temperature	°C	25,6	12,0	19,8
Flow rate	L/h	3100	12831	3100
Effective speed	m/s	0,45	0,93	0,45
Pressure drops	kPa	7,8	13,1	7,8
Fluid type		Water	Water	Acqua
Internal volume	dm³	26,2	41,8	26,2
Energy performance				
No. of rows	N°	4	6	4
η Temp./ERP	%	41,7/40,2		
Total recovered heat	kW	20,8	74,8	20,8
Sum Pre Rec P40 4R 20T(800) 1400A p.a.2.5 10C 1" Cu 0.40 / AIPr 0.11 SX Cold P40 6R 20T(800) 1400A p.a.2.5 20C 2" Cu 0.40 / AI 0.11 SX Sum Post Rec P40 4R 20T(800) 1400A p.a.2.5 10C 1" Cu 0.40 / AI 0.11 SX				
Sum Pre Rec: performance of the pre-cooling recovery battery at the specified summer conditions Sum Post Rec: performance of the post-heating recovery battery at the specified summer conditions				
Regenerative recovery system complete with: - Inverter-operated circulation pump - Complete hydraulic connection piping - Shut-off valves and safety devices - Regulating valves with modulating actuators for: summer management of recovery in closed circuit or with integration of external fluid, both partial and total, winter management of the 2 hot batteries if part of the system				

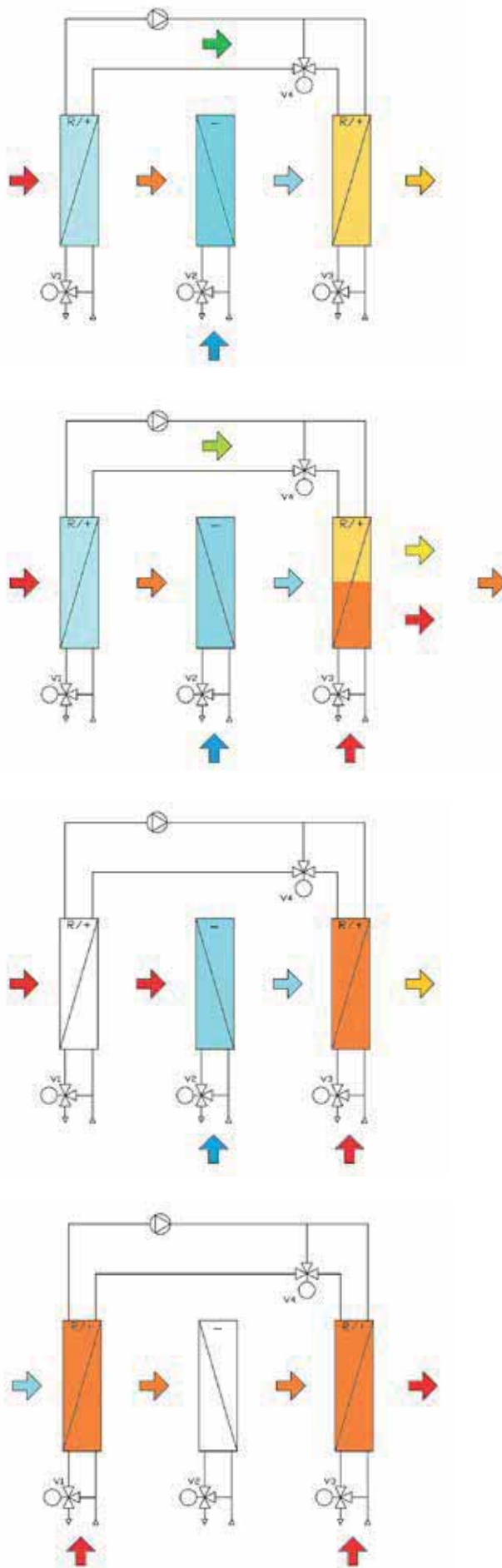
Three-way valve complete with wired modulating actuator and with complete hydraulic assembly

Check					
		Winter		Summer	
Incoming Air		Pre heat	Post heat	Sum 30% post	Sum 100% post
Air flow rate	m³/h	8000	8000	8000	8000
Temperature	°C	-5	21	20	12
Relative humidity	%	80	58	80	100
Absolute humidity	g/kg	2	9	12	9
Outgoing Air					
Temperature	°C	30,4	37,2	27,6	40,6
Relative humidity	%	8	23	45	18
Absolute humidity	g/kg	2	9	11	9
Pressure drops	Pa	48,6	51,5	50,8	51,0
Fluid					
Inlet temperature	°C	45	45	50	50
Outlet temperature	°C	35	35	40	40
Flow rate	L/h	8319	3860	1555	6830
Effective speed	m/s	1,20	0,56	0,75	0,99
Pressure drops	kPa	21,4	9,9	9,6	14,7
Fluid type		Acqua	Acqua	Acqua	Acqua
Internal volume	dm³	27,6	26,2	7,8	27,6
Energy performance					
No. of rows	N°	4	4	4	4
Power	kW	95,7	44,4	17,8	78,4
Pre-heat: maximum performance of the preheating battery in winter mode Post-heat: maximum performance of the post-heating battery in winter mode Partial sum 30% post: performance of the summer post-heating regenerative recovery battery with partial (30%) integration of external hot fluid Total sum 100% post: performance of the summer post-heating regenerative recovery battery with 100% supply of external hot fluid					

Heat recovery unit

Monodirectional regenerative (RR)

Air flow rate: 2800:30.000 m³/h





Seasonal operating logic

Summer operation in recovery only

If the hot power recovered with the pre-cooling coil is sufficient to post-heat the air coming out of the cold battery, the reheating is carried out using the heat of the air entering the machine.

The temperature adjustment at the machine outlet is carried out through a three-way valve on the post-heating coil.

Summer operation with integration

In the event that the hot power recovered with the precooling coil is not sufficient to post-heat the air coming out of the cold coil up to the desired set, it is possible to integrate the re-heating using boiler water or heat pump.

The integration of the post heating occurs by the fractionation of the post-heating battery. A part of the post battery continues to work with the recovery circuit together with the pre-cooling coil, while the other part of the post battery is used for heating the air by heat from an external source. In this phase of operation, the temperature control is obtained by acting on the post-heating valve.

Summer operation with external source only

In the event that the partitioned post-heating coil is not able to perform air heating up to the set set, the entire post battery can be used with an external source, with consequent deactivation of the recovery circuit.

Winter mode

During winter operation, the recovery circuit is deactivated. The preheating and post-heating batteries can be used for heating using water from any heat generator (boiler or heat pump).

Heat recovery unit with indirect adiabatic cooling



- Heat recovery system with maximised summer efficiency
- Can be used in combination with every handling module in the range

Heat recovery with indirect adiabatic cooling.

Principle of operation

To improve the performance of sensitive heat exchangers in summer mode, combine them to an indirect adiabatic cooling system (IAC). Rhoss has developed a state of the art recovery system that integrates indirect adiabatic cooling with high efficiency static heat recovery. Through this system, the exhaust air can be cooled in a sensitive way in one or more stages of humidification by obtaining a lower delivery air temperature than the ambient temperature without using any cold coils, thereby continuing to recover heat also if the outdoor air temperature is lower than the room temperature. This cooling method is extremely cheap and sustainable. It also allows you to reduce the size of the cooling unit or even remove it.

Summer mode and intermediate warm season

During the hot season, the system activates the indirect adiabatic humidifier automatically, which cools the expulsion air down before entering the heat recovery unit. This way, the temperature difference between expulsion air and outdoor air is maximised as is system efficiency. If intervention is required, the regulator activates the cooling coil and possibly the reheating one to obtain the exact temperature and humidity conditions required.

Winter mode and intermediate cold seasons

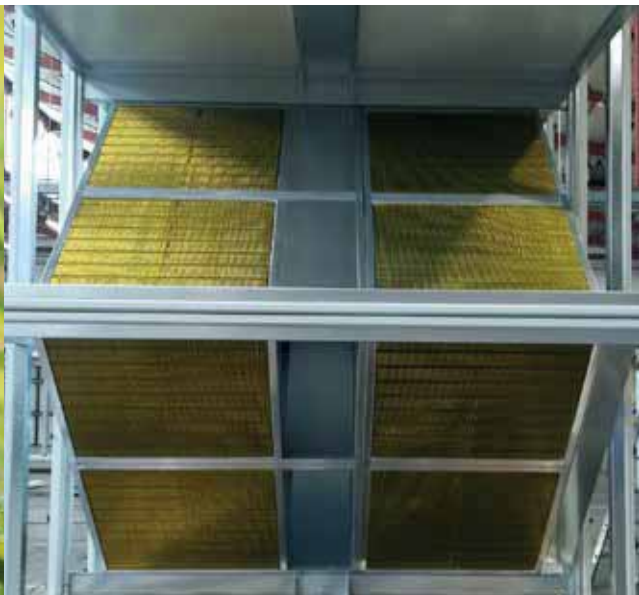
In winter the system maintains all the energy benefits arising from free-cooling and/or recovery of sensitive heat, thereby guaranteeing maximum energy savings in any environmental condition. According to an enthalpic comparison between outdoor air and room air, and according to the required percentage of fresh air, the system regulation selects the most economic operating mode between total free-cooling, partial free-cooling, and partial and total heat recovery.

Parameters that influence system operation

The parameters that most affect the process are room temperature and humidity and heat recovery efficiency. Outdoor air is also important, because the lower it is, the more the room can be maintained at a lower relative humidity, thereby increasing system efficiency. It is important for energy saving assessments to be made considering the real values of system operation.

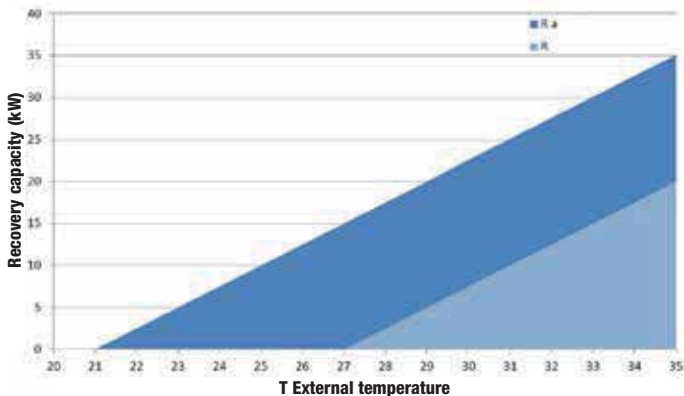
Energy saving data referred to kW supplied by the recovery unit compared to the total cooling capacity required (ambient conditions 26°C, 50% RH).

CTA ADV Next Air	Temperature	Relative humidity	Energy savings %
Outdoor project conditions MI	32°C	48%	33%
Outdoor project conditions RM	33°C	45%	35%
Outdoor project conditions NA	32°C	45%	36%



Graph of the Power recovered by the standard recovery unit and one with RAI (Indirect Adiabatic Recovery) based on the external temperature. Air flow rate of 10,000 m³/h. Return air T 26°C

Summer Energy Savings (10.000 m³/h)



Ra Adiabatic recovery
R Recovery

This recovery can be selected through the RHOSS - CTA NEXT AIR software

Main features

The crossed flow recovery unit features aluminium fins protected against corrosion by a special non-toxic hydrophilic epoxy paint, which guarantees on the one hand a high resistance to corrosion of the different types of water used to supply the humidification system and on the other allows the formation of a wet micro-layer on the exchange fins increasing the useful effect of the system.

The water is micro-sprayed by an atomiser with a high-pressure pump that creates an ultra-fine mist by cooling the air both by direct evaporative effect and by water retention on the surface of the heat recovery unit, thus providing a greater cooling capacity and reducing water consumption. The ramps of nozzles with head and baffle made of stainless steel come complete with anti-spill valve and are completely removable.

Advantages

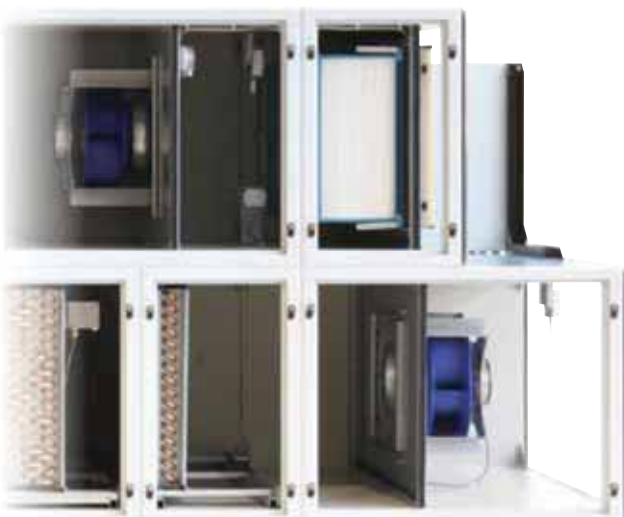
- Greater evaporation efficiency and speed
- Greater exchange efficiency thanks to the damp micro-layer on the heat recovery unit
- Unvaried pressure drops on the air side
- Lower air consumption
- No contamination

Indirect adiabatic recovery unit					
Characteristics and accessories					
Crossed flow aluminium recovery unit protected from corrosion by a special non-toxic epoxy paint, ensuring high resistance to the aggression of different types of water used for feeding the humidification system.					
The integrated indirect adiabatic cooling system uses water micro-sprayed by a high-pressure pump (70 bar) that creates an ultra-fine mist by cooling the air both by evaporative effect and by water retention on the surface of the heat recovery unit, thus providing a greater cooling capacity and reducing water consumption. The ramps of nozzles for high pressure with head and baffle made of stainless steel come complete with anti-spill valve and 25 micron filter and are completely removable.					
Humidifier efficiency: 70%					
With aluminium tray					
With by-pass damper for free-cooling					
Delta P recovery calculated with design values 376 Pa; Maximum admissible Delta P 2000 Pa					
		Winter		Summer	
Incoming Air		Fresh	Exhaust	Fresh	Exhaust
Air flow rate	m ³ /h	7000	7000	7000	7000
Temperature	°C	-5	20	32	26
Relative humidity	%	80	50	50	50
Absolute humidity	g/kg	2,1	7,3	15,0	10,5
Outgoing Air					
Temperature	°C	15,03	4,83	23,7	29,17
Relative humidity	%	18	96	81	49
Absolute humidity	g/kg	1,9	5,1	15,0	12,5
Technical specifications					
Condensate	L/h	0	15,86	0	0
Pressure drop	Pa	144	148	159	157
Eurovent pressure drop	Pa	153	153	153	153
Air speed	m/s	1,61	1,61	1,61	1,61
Energy performance					
Efficiency at temperature (EN 308 std))	%	80,11		74,56	
Yield at temperature (ASHRAE method)	%	80,11		74,56	
Total recovered heat	kW	80,11		19,51	
Efficiency at balanced flow rates / ERP	%	80,11		-	
Recirculation percentage	%	0		-	

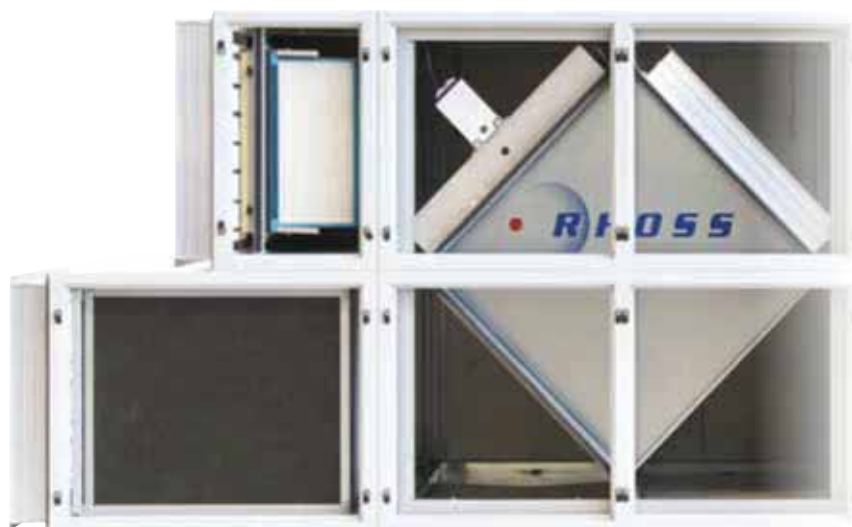
Advance

ADV Next Air 01÷16

ADV Next Air MODEL		01	02	03	04	05	06	07	08
Air flow rates									
Air flow rate at 1.5 m/s	m ³ /h	890	1160	1430	1770	2250	2860	3610	4360
Air flow rate at 2 m/s	m ³ /h	1180	1550	1910	2360	3000	3820	4820	5820
Air flow rate at 2.5 m/s	m ³ /h	1480	1930	2390	2950	3750	4770	6020	7270
Air flow rate at 3 m/s	m ³ /h	1770	2320	2860	3550	4500	5730	7230	8730
Air flow rate at 3.5 m/s	m ³ /h	2070	2700	3340	4140	5250	6680	8430	10180
External front dimensions									
Base	mm	790	875	975	1075	1175	1275	1375	1480
Height	mm	520	640	720	720	760	840	840	950
Crossed flow heat recovery units									
Recovery at total air flow rate									
Nominal recovery air flow rate	m ³ /h	1300	1700	2100	2600	3300	4200	5300	6400
Minimum air flow rate	m ³ /h	600	800	1000	1300	1600	2100	2600	3200
Maximum air flow rate	m ³ /h	1700	2200	3000	3700	4900	5500	6900	8800
Balanced flow rate dry efficiency	%	73,5	73,2	73,7	69,8	73,4	75,1	75,1	74,9
Efficiency EN 308	%	80,5	80,4	79,3	77,3	79	80,8	80,8	80,6
Recovery at partial air flow rate									
Nominal recovery air flow rate	m ³ /h	650	850	1050	1300	1650	2100	2600	3200
Minimum air flow rate	m ³ /h	300	400	500	600	800	1000	1300	1600
Maximum air flow rate	m ³ /h	850	1100	1350	1700	2200	3000	3700	4900
Balanced flow rate dry efficiency	%	73,5	73,5	73,5	73,5	73,6	73,7	69,8	73,3
Efficiency EN 308	%	80,6	80,5	80,5	80,5	80,5	79,3	77,3	78,9
Rotary heat recovery									
Recovery at total air flow rate									
Sensitive recovery									
Nominal recovery air flow rate	m ³ /h	1150	1650	2100	2600	3300	4200	5250	6300
Balanced flow rate dry efficiency	%	73,0	73,1	74,4	74,9	74,9	74,5	73,0	73,1
Hygroscopic recovery									
Nominal recovery air flow rate	m ³ /h	1200	1700	2100	2600	3300	4200	5300	6400
Balanced flow rate dry efficiency	%	73,3	73,7	75,1	75,4	75,5	75,2	73,9	73,8
Recovery at partial air flow rate									
Sensitive recovery									
Nominal recovery air flow rate	m ³ /h	1150	1150	1150	1650	1650	2250	2900	3700
Balanced flow rate dry efficiency	%	73,0	73,0	73,0	73,1	73,1	73,2	73,0	73,0
Hygroscopic recovery									
Nominal recovery air flow rate	m ³ /h	1200	1200	1200	1750	1750	2400	3100	3950
Balanced flow rate dry efficiency	%	73,3	73,3	73,3	73,2	73,2	73,2	73,0	73,0



ADV Next Air MODEL		09	10	11	12	13	14	15	16
Air flow rates									
Air flow rate at 1.5 m/s	m³/h	5180	6070	7160	8520	10160	12000	14450	17730
Air flow rate at 2 m/s	m³/h	6910	8090	9550	11360	13550	16000	19270	23640
Air flow rate at 2.5 m/s	m³/h	8640	10110	11930	14200	16930	20000	24090	29550
Air flow rate at 3 m/s	m³/h	10360	12140	14320	17050	20320	24000	28910	35450
Air flow rate at 3.5 m/s	m³/h	12090	14160	16700	19890	23700	28000	33730	41360
External front dimensions									
Base	mm	1575	1775	1925	1980	2085	2275	2535	2665
Height	mm	1000	1100	1100	1200	1320	1500	1500	1680
Crossed flow heat recovery units									
Recovery at total air flow rate									
Nominal recovery air flow rate	m³/h	7600	8900	10500	12500	14900	17600	21200	24700
Minimum air flow rate	m³/h	3800	4400	5200	5800	6900	8300	10000	11300
Maximum air flow rate	m³/h	10500	12300	14500	17600	21000	24800	29600	32000
Balanced flow rate dry efficiency	%	74,9	74,9	74,9	73,4	73,4	73,4	73,4	73,0
Efficiency EN 308	%	80,6	80,6	80,6	79,0	79,0	79,0	79,0	78,6
Recovery at partial air flow rate									
Nominal recovery air flow rate	m³/h	3800	4200	5300	6400	7600	8900	10500	12800
Minimum air flow rate	m³/h	1900	2100	2500	2700	3000	3600	4200	5100
Maximum air flow rate	m³/h	5500	5500	6900	8800	10500	12300	14500	17600
Balanced flow rate dry efficiency	%	73,3	75,1	75,1	74,9	74,9	74,9	74,9	74,9
Efficiency EN 308	%	78,9	80,8	80,8	80,6	80,6	80,6	80,6	80,6
Rotary heat recovery									
Recovery at total air flow rate									
Sensitive recovery									
Nominal recovery air flow rate	m³/h	7500	8900	10500	12500	14800	17600	21200	25900
Balanced flow rate dry efficiency	%	73,0	75,2	74,7	73,9	73,0	73,0	73,3	73,0
Hygroscopic recovery									
Nominal recovery air flow rate	m³/h	7600	8900	10500	12500	14900	17600	21200	26000
Balanced flow rate dry efficiency	%	73,8	75,7	75,3	74,7	73,9	74,0	74,2	73,8
Recovery at partial air flow rate									
Sensitive recovery									
Nominal recovery air flow rate	m³/h	4600	5250	5250	6300	7500	10150	11600	14800
Balanced flow rate dry efficiency	%	73,0	73,0	73,0	73,1	73,0	73,0	73,0	73,0
Hygroscopic recovery									
Nominal recovery air flow rate	m³/h	4900	5500	5500	6750	8050	10850	12400	15800
Balanced flow rate dry efficiency	%	73,0	73,3	73,3	73,1	73,0	73,0	73,0	73,0



air'suite

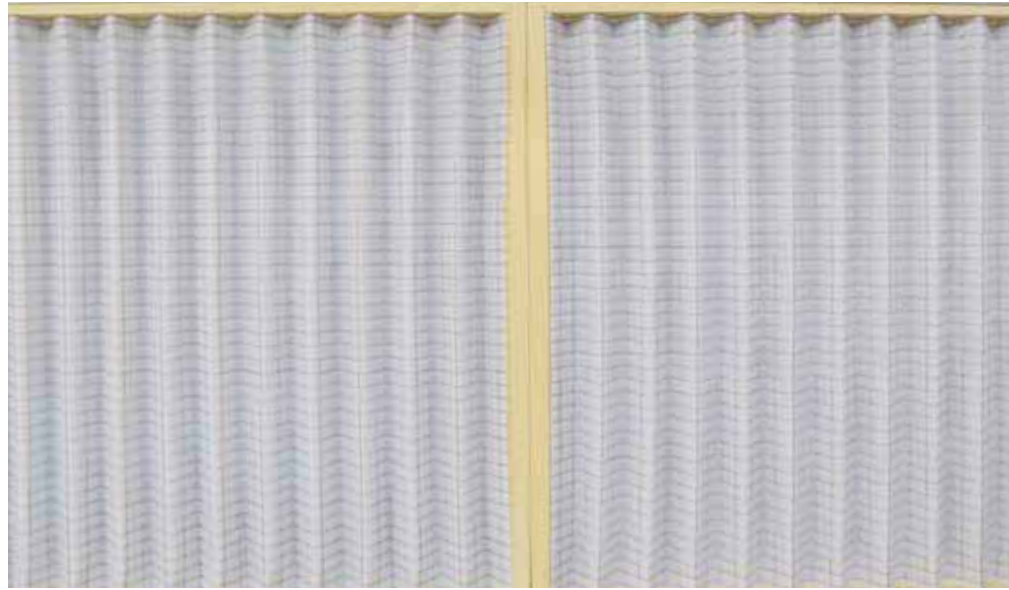


**INDOOR AIR QUALITY
SOLUTIONS**





- **Inactivation of bioburden**
- **Zero energy impact**
- **No additional maintenance**
- **Immediate retrofitting on existing systems**



Rhoss sets a new standard for "indoor" comfort by improving the hedonistic nature of the air delivered into the room by means of broad spectrum "biocidal filtration" treatment.

Air'Suite®

A new way to treat the air in the confined spaces that we breathe every day. It requires systems for olfactometric conditioning and the "filter" range, that is the line of filters applicable to the world of ventilation and air conditioning.

A new concept of biocidal filtration that allows for the removal of microbiological contamination without requiring the installation of additional solutions or the modification of existing systems.

Healthy environment

Living in a "clean" environment is a concept closely linked to breathing clean air.

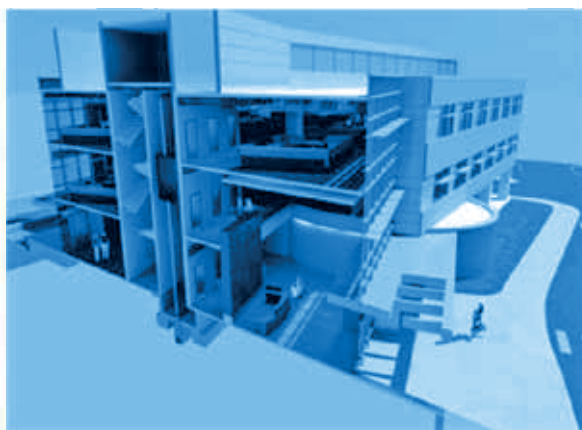
On average, each person inhales air 16,000 times a day, so breathing in a healthy environment allows for

healthy living. But what does clean air mean? Healthy? It means guaranteeing adequate thermo-hygrometric conditions, but mainly the absence of conditions that directly or indirectly affect out mental and physical state, such as odours and pathogens. In other words, a high standard of IAQ (Indoor Air Quality).

Today this need indoors is threatened by the intensification of external pollution (promiscuity of production areas, road traffic, etc..) and increased air recirculation in environments where energy saving is strategic and/or where there is no easy availability of primary air.

General regulatory issues

Through the "2004-2010 European Environmental and Health Action Plan", the European Union has set the improvement of air quality as a priority objective together with the development of new countermeasures against the increase in diseases and syndromes associated with extended periods spent in confined, high density environments (SBS: sick building syndrome). This same objective has inspired our staff during the design and creation of Air'Suite®.



← TRAFFIC

← PRODUCTIVE SETTLEMENT

← BIOLOGICAL CONTAMINANTS

← UNPLEASANT ODOURS

Air'Suite filter®

Breathe clean air, save your health & improve your productivity

BACKGROUND

DID YOU KNOW?

- 90% TIME SPENT IN INDOOR ENVIRONMENTS
- 24% DISEASES CAUSED BY ENVIRONMENTAL FACTORS
- 40% TOTAL ENERGY CONSUMED BY BUILDINGS
- 50% OUTDOOR POLLUTANTS ENTERED INTO INDOORS

INDOOR & OUTDOOR HARMFUL POLLUTANTS

INDOOR CONTAMINANTS: TOBACCO (Building occupants), DUST MITES (Fixed and mobile furniture), GASES, VAPOURS (Pesticides, disinfectants, solvents), BACTERIA (Air conditioning system), RADON (Building materials), OZONE (Photocopiers, electric motors).

OUTDOOR POLLUTANTS: CARBON DIOXIDE, SULFUR DIOXIDE, NITROGEN DIOXIDE, PARTICULATE MATTER, OZONE.

▲ Outdoor pollutants considered to evaluate productivity benefits ■ Indoor contaminant considered to evaluate health benefits

RESEARCH TOPIC

WHO IS AT RISK: OFFICE WORKER, SENIOR, PEOPLE WITH DISEASES, CHILDREN, PREGNANT WOMAN.

WHICH BUILDINGS?: OFFICE, HOTEL, HOSPITAL, SCHOOL.

HEALTH IMPACTS

SHORT TERM EFFECTS: HEADACHE, NOSE, THROAT, EYES INFLAMMATION, COUGHING, PNEUMONIA, BRONCHITIS, SKIN IRRITATION.

LONG TERM EFFECTS: CENTRAL NERVOUS SYSTEM DISEASES, CARDIOVASCULAR DISEASES, RESPIRATORY DISEASES (asthma, cancer), IMPACTS ON LIVER, IMPACTS ON REPRODUCTIVE SYSTEM.

PRODUCTIVITY IMPACTS: ABSTENTEEISM FROM WORK OR SCHOOL, REDUCTION OF WORK PERFORMANCE, REDUCTION OF SCHOOL LEARNING.

WHY CHOOSE THE AIR'SUITE FILTER IN HVAC SYSTEM?



HEALTH	Abatement Capacity		Costs		Benefits	Benefits
	S. Aureus	E. Coli	Investment	Energy	Energy Savings	Health
REFERENCE FILTER NOT TREATED	0%	0%	65€ (*)	244€/y	-	-
AIR'SUITE FILTER	98%	53%	150€(*)	156€/y	88€/y	83,33€/y

(*) Medium size filter

Cost-Benefit Analysis

$\frac{B}{C} = 17,85$ ✓

$\frac{B_s - B_r}{C_s - C_r} > 1 \quad \beta > \alpha$

β: Air'Suite filter α: Reference filter

PRODUCTIVITY	Abatement Capacity				Costs		Benefits	Benefits
	CO ₂	SO ₂	NO ₂	PM _{2.5}	Investment	Energy	Energy Savings	Productivity
REFERENCE FILTER NOT TREATED	0%	0%	0%	0%	913€ (*)	244-292,8€/y	-	-
AIR'SUITE FILTER	1%	20%	5%	5%	150€	156€/y	88 - 136€/y	1842,5 - 7370€/y

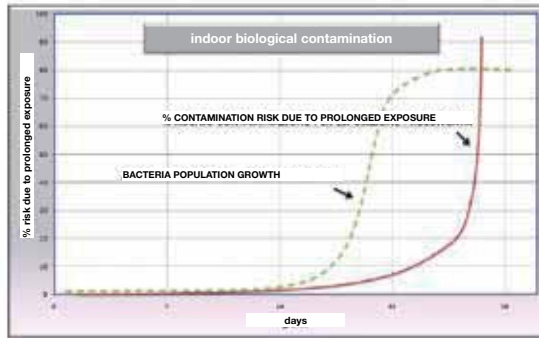
(*) 80€ (big size filter) + 833€ (air handling unit)

Cost-Benefit Analysis

$\frac{B}{C} = 0,06 < 1$ ✗

$\frac{B}{C} = 22 > 1$ ✓

Microbiological contamination of a confined environment.



Air'Suite® filter

Applying the Air'Suite® filter to a Rhoss air handling system of the ADV Custom or Next Air Ranges assures traditional de-dusting, additional decontamination from microbiological agents (bacteria, moulds, viruses, algae, etc.) of the air and filtration device as well. An effect that requires no change to the existing or new air conditioning equipment and that does not require any additional cost for the installation of additional equipment. The conventional filtration unit simply needs to be replaced with the Air'Suite® filter line.

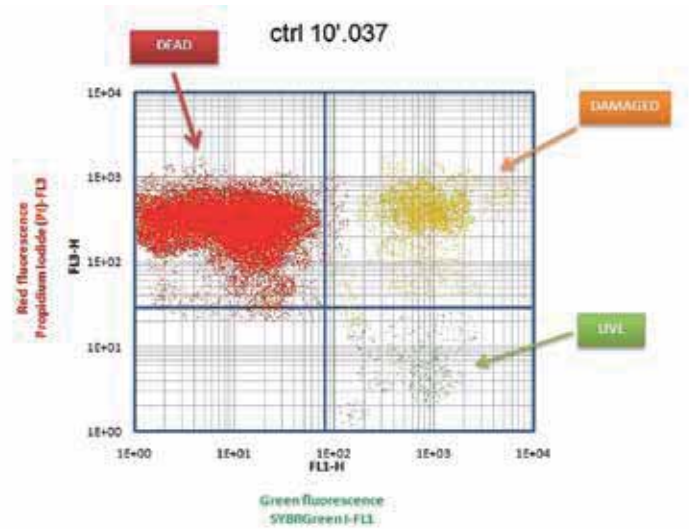
Obviously, its development has met the following essential requirements, in order to assure immediate use and no short or long-term contraindications:

- The electrical loads of the system are not altered;
- The pre-existing levels of filtration are not changed;
- No formats or multi-cell compositions other than the existing ones are required;
- No special frames or specific filter integration systems are required
- No additional maintenance is required;

The replacement times are determined by the pressure drops due to dust contamination (as for classic filters) and not by the biocide power. In addition, the Air'Suite® filter offers the following advantages:

- Contamination through the "proliferation" of algae, moulds, fungi or bacteria on the filter surface is completely inhibited;
- The filter is self-decontaminating. If left in the environment it does not become a source of contamination;
- The possible release of biological material into air ducts, unlike conventional filters, is not active, therefore, it cannot proliferate again in other parts of the air conditioning system.

Noise reduction efficiency of Air'Suite Filter.



Biocidal filtration

Biocidal filtration refers to a combination of granular filtration (conventional) and inactivation of the bioburden (innovative) on the same amount of air which passes through the same filtration medium.

This process has been achieved by using a new, appropriately functionalised bio-polymer, characterised by:

- wide availability in nature;
- biocompatibility;
- non-toxicity;
- intrinsic infection preventing properties.

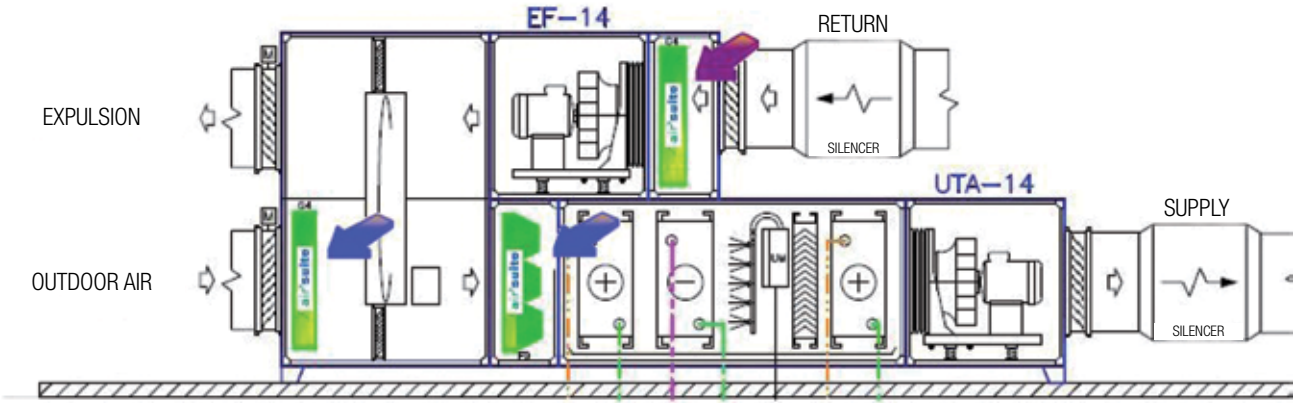
Fields of application



There are no limits of application, however, fields and contexts that are particularly sensitive to indoor air quality in which the new line of Air'Suite® filters finds its natural application are:

- Boats, planes, trains, coaches and subways;
- Hospitals, clinics and nursing homes;
- Offices, meeting rooms and conference rooms;
- Waiting rooms, outpatient clinics;
- Restaurants, cafés, bars;
- Hot baths, spas;
- Swimming pools, gyms;
- Schools and kindergartens, etc.



Example of Air'Suite application



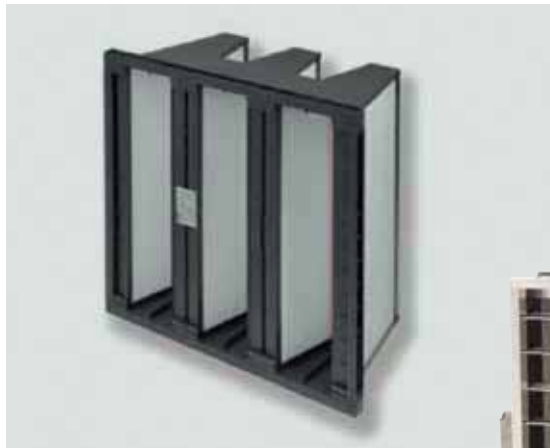
 **contamination of indoor environment**
 **contamination of outdoor environment**

Available types of filters

The Air'Suite® biocide filters are available in the following filtration grades:

Cell filters: ISO COARSE 55% ISO 16890

Rigid or floppy bag filters: ISO ePM1 50%, 70%, 85% ISO 16890



Research, development and certificates

The action mechanism of the biocide media has been the subject of study and development of important Italian research institutes.

The decontamination power of the media was also the subject of studies and testing. The classic sampling on plate that is usually indicated as sole reference to measure removal efficiency, e.g. of bacteria, in fact is nothing more than a system for a semi-quantitative measurement of a possible contamination that passes through the filter.

Whereas, the Air'Suite® filters were tested with new, state-of-the-art techniques that measure the actual biocide capacity on the filter surface and that do not make use of cultures but count each organism/cell and its integrity or capacity to reproduce.

The bacteria removal efficiency was, therefore, measured through a study protocol with IRSA-CNR certified flow cytometry techniques on a sample of the contaminated filter.

The resulting efficiencies are higher than 50% of "instant" reduction and 100% within 30 hours of contamination.



PROFESSIONAL

Customised air handling units
850÷104970 m³/h

Custom ADV

CTA ADV 240÷22920

Air flow rate: 850÷104,970 m³/h



- **Wide and versatile range**
- **Integrated heat regulation**
- **Energy Saving Solutions**
- **Self-sanitising units**
- **Custom solutions**

Modular air handling units.

- The CTA ADV range is based on decades of Rhoss experience in the field of air handling and is continuously developed to meet the new requirements of the market and our customers.
- The possibility of conducting functional and performance tests of the units thanks to the R&D Lab allows us to test the reliability of our machines, the energy efficiency of the proposed systems and test new components and innovative solutions.
- The available range of air flows, the possibility of selecting a comprehensive range of functional modules and options, and the total flexibility of configurations available makes this range the ideal solution for applications in the service sector as well as those in the industrial sector.

The CTA ADV range guarantees:

- **High quality of the selected components;**
- **Completeness of the offer of available sections and accessories;**
- **A wide range of flow rates and versatility of the available configurations;**
- **Optimal energy efficiency, air quality and comfort;**
- **Unlimited modularity to facilitate portability and on site positioning;**
- **Easy maintenance thanks to easy access to the sections that can be inspected and the set-ups available for service readings.**

VERSIONS

- **STANDARD Series** with a single fan with a rectangular section.
- **NARROW Series** with a single fan with a square section: useful to minimise the footprint taken up by the CTA.
- **LOWERED Series** with a combined fan: useful to minimise the total height of the CTA.
- **VERTICAL Series.**

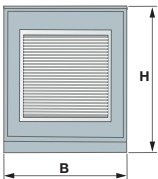
SIZES

- A total of 77 sizes are available, divided into standard, narrow and combined ranges.



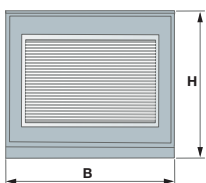
NARROW ADV SERIES

MODEL		371	471	541	661	741	881	1071	1241
Air flow rate at 2.5 m/s	m³/h	1.300	1.700	1.950	2.400	2.700	3.200	3.850	4.500
Front dimension B	mm	730	730	770	810	870	880	880	1.030
Front dimension H	mm	680	740	740	800	800	900	940	980
MODEL		1461	1751	2021	2361	2831	3371	3941	4571
Air flow rate at 2.5 m/s	m³/h	5.300	6.300	7.300	8.500	10.200	12.200	14.000	16.500
Front dimension B	mm	1.030	1.030	1.050	1.220	1.410	1.610	1.610	1.630
Front dimension H	mm	1.120	1.280	1.310	1.340	1.350	1.350	1.520	1.700
MODEL		5441	6561	7611	9131	10711	12751	15041	18361
Air flow rate at 2.5 m/s	m³/h	19.500	23.500	27.500	33.000	38.500	46.000	55.000	66.000
Front dimension B	mm	1.740	2.020	2.150	2.500	2.780	2.900	3.350	3.800
Front dimension H	mm	1.880	1.880	2.000	2.000	2.060	2.300	2.300	2.420



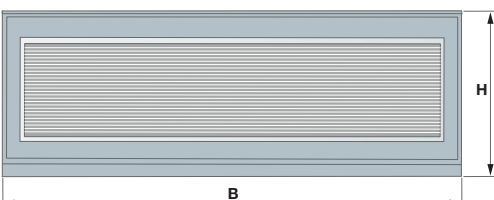
STANDARD ADV SERIES

MODEL		240	300	380	440	570	710	800	920
Air flow rate at 2.5 m/s	m³/h	850	1.080	1.360	1.700	2.050	2.450	2.850	3.300
Front dimension B	mm	730	820	950	950	970	1.080	1.080	1.080
Front dimension H	mm	630	630	660	720	720	750	820	880
MODEL		1070	1220	1380	1530	1720	2080	2300	2500
Air flow rate at 2.5 m/s	m³/h	3.850	4.400	4.950	5.500	6.200	7.500	8.300	9.000
Front dimension B	mm	1.230	1.360	1.360	1.430	1.480	1.550	1.630	1.630
Front dimension H	mm	880	880	920	920	990	1.070	1.070	1.170
MODEL		2920	3270	3600	4300	5250	6060	7500	8480
Air flow rate at 2.5 m/s	m³/h	10.500	12.000	13.000	15.500	19.000	21.800	27.000	30.500
Front dimension B	mm	1.630	1.650	1.650	1.930	2.130	2.310	2.700	2.850
Front dimension H	mm	1.300	1.300	1.400	1.560	1.560	1.700	1.700	1.700
MODEL		9750	11400	12600	13900	16580	19860	22920	
Air flow rate at 2.5 m/s	m³/h	35.000	41.000	45.500	50.000	59.500	71.500	82.500	
Front dimension B	mm	3.000	3.000	3.200	3.600	3.850	4.040	4.540	
Front dimension H	mm	1.870	2.050	2.210	2.210	2.210	2.420	2.490	



LOWERED ADV SERIES

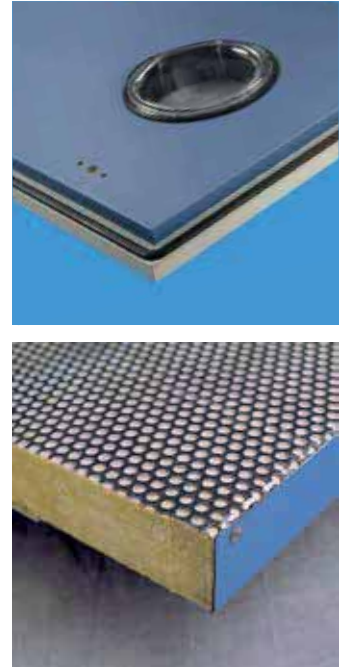
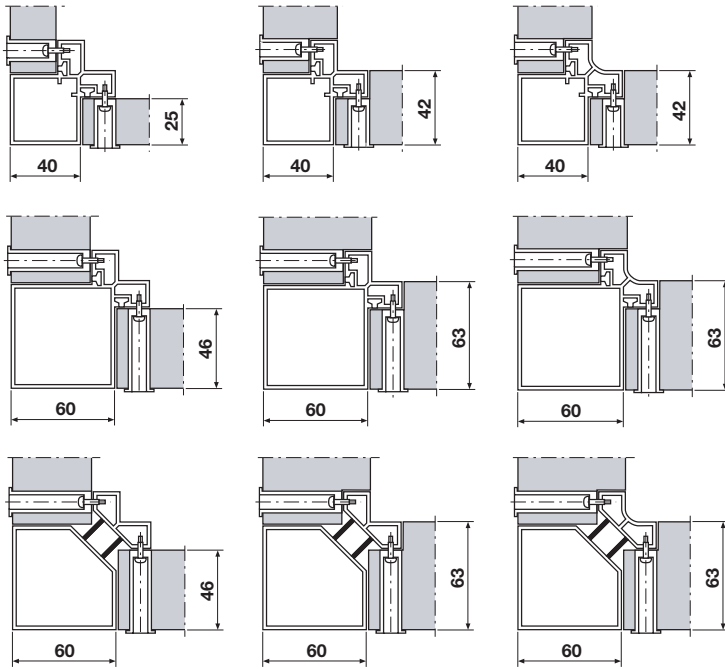
MODEL		420	630	830	990	1180	1400	1580	1850
Air flow rate at 2.5 m/s	m³/h	3.780	5.620	7.420	8.910	10.690	12.630	14.250	16.630
Front dimension B	mm	1.400	1.550	1.800	1.950	2.100	2.250	2.500	2.600
Front dimension H	mm	750	800	900	950	1.000	1.100	1.200	1.250
MODEL		2210	2550	2860	3190	3650	4220	4830	5550
Air flow rate at 2.5 m/s	m³/h	19.870	22.950	25.750	28.720	32.880	38.010	43.470	49.950
Front dimension B	mm	2.700	2.800	2.950	3.100	3.250	3.550	3.850	4.105
Front dimension H	mm	1.350	1.400	1.500	1.550	2.650	1.700	1.800	1.900
MODEL		6240	7060	8100	9220	10400	11660		
Air flow rate at 2.5 m/s	m³/h	56.160	63.500	72.900	82.940	93.630	104.970		
Front dimension B	mm	4.405	4.610	4.910	5.210	5.510	5.810		
Front dimension H	mm	1.950	2.100	2.200	2.350	2.500	2.600		



Custom ADV

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Construction details



STRUCTURE

- 1 Panels made of double sandwich sheet metal with interposed polyurethane insulation foam with a density of 40 kg/m³ and class 1 fire resistance, or rock wool with oriented and glued fibres with a density of 90 kg/m³ and class 0 fire resistance.
- 2 There are several material combinations available for the internal and external parts of the panel, such as galvanised steel, pre-painted and pre-plasticised, AISI 304 stainless steel and aluminium. If the acoustic aspect is a decisive factor, together with a careful selection of the silencers, high sound absorption capacity panels are suggested.
- Load-bearing structure in anti-corodal extruded aluminium sections for concealed screws with double fins and a chamber to guarantee no interruptions in the sections. Thicknesses available: 40x40 (can be combined with 25 and 42 mm thick panels) and 60x60 mm (can be combined with 46 and 63 mm thick panels) in versions with or without an interruption in the thermal bridge and with the inner corner rounded; corner nodes in fibreglass reinforced nylon and profile interlocking balloon gaskets.
- Continuous base beneath each aluminium section.
- Framework inside the unit is made of galvanised sheet steel/aluminium or AISI 304 stainless steel, in accordance with the requirements.
- Inspection doors in line with the various sections are equipped with anti-panic handles that open from both the inside as well as the outside. On request, the doors can be equipped with a double-glazed polycarbonate UV-resistant porthole and the relative sections can have spotlights.
- Outdoor versions: they are equipped with a roof with the same finish as the outer panels of the machine. This guarantees a perfect watertight seal even at the joints.
- On request, lateral technical compartments are available in line with the coils and humidification sections for the valve units to be covered. The depth of the technical compartment depends on the diameter of the collectors of the larger coils installed, in order to guarantee the space required inside the valve unit.
The technical compartments are the same type of construction as the air handling units.

DAMPERS AND MIXING CHAMBERS

- Opposing fin type calibrating dampers made of galvanised steel or opposing fins with a wing profile made of aluminium with a longitudinal seal applied on all fins.
The dampers are available in the version with manual fixed calibration or preset for a servo-control to be mounted.
- Mixing chambers with two dampers (outdoor and recirculation air) or three dampers (outdoor, recirculation and expulsion air).

FILTERS

- Filters produced by major national companies are used, selected according to the filter class adequate for the specific application for which the unit is designed. The solutions adopted are aimed at obtaining maximum performance in terms of:
 - Filter efficiency;
 - Minimum filter pressure drop;
 - Maximum capacity of accumulation and retention of dust, and therefore useful life of the filter;
 - Recyclable materials that can be incinerated are used.
- An overview of the filters that can be installed in our machines and their classification according to the Standards currently in force is provided below.

The International Organisation for Standardisation (ISO) has created a new global standard, ISO16890, which defines the classification and testing procedures of air filters used in general ventilation systems. Specifically, ISO16890 refers to air filtering elements taking into account particle sizes between 0.3 µm and 10 µm.

The new standard, which came into force definitively in August 2018, replaces the previous European standard EN 779 and ASHRAE 52.2, predominant in the US, with the aim of creating a single global legislation divided into 4 classes related to filter performance in relation to three different particulate fractions with a more targeted percentage, which indicates the filter efficiency.

The major differences between the ISO16890 standard and the previous ones mainly concern stricter testing, with a consequent increase in the IAQ, and the fact that the finer dust subject to classification, PM1, is also the most dangerous to human health. Filters with high efficiencies that are able to retain this dust, will therefore contribute to improving the quality of the air we breathe.



The following table shows the comparison between the two standards

EN 779:2012	EN ISO 16890:2016								
Particles with a diameter of 0.4 µm for the classification of fine filters	particle efficiency (ePM) ePM _x – mass concentration of particles with an optical diameter between 0.3 µm and x µm								
	<table border="1"> <thead> <tr> <th>Efficiency</th> <th>range, µm</th> </tr> </thead> <tbody> <tr> <td>ePM₁₀</td> <td>0,3 ≤ x ≤ 10</td> </tr> <tr> <td>ePM_{2,5}</td> <td>0,3 ≤ x ≤ 2.5</td> </tr> <tr> <td>ePM₁</td> <td>0,3 ≤ x ≤ 1</td> </tr> </tbody> </table>	Efficiency	range, µm	ePM ₁₀	0,3 ≤ x ≤ 10	ePM _{2,5}	0,3 ≤ x ≤ 2.5	ePM ₁	0,3 ≤ x ≤ 1
	Efficiency	range, µm							
	ePM ₁₀	0,3 ≤ x ≤ 10							
ePM _{2,5}	0,3 ≤ x ≤ 2.5								
ePM ₁	0,3 ≤ x ≤ 1								
Dust accumulation is calculated up to the final pressure of 450 Pa	average eff = average value between initial and discharged eff Final pressure drops: 200 Pa (Coarse) 300 Pa (PM _x)								

New efficiency classes

PM1	PM2,5	PM10	coarse
ePM1[95%] ePM1[90%] ePM1[85%] ePM1[80%] ePM1[75%] ePM1[70%] ePM1[65%] ePM1[60%] ePM1[55%] ePM1[50%]	ePM2.5[95%] ePM2.5[90%] ePM2.5[85%] ePM2.5[80%] ePM2.5[75%] ePM2.5[70%] ePM2.5[65%] ePM2.5[60%] ePM2.5[55%] ePM2.5[50%]	ePM10[95%] ePM10[90%] ePM10[85%] ePM10[80%] ePM10[75%] ePM10[70%] ePM10[65%] ePM10[60%] ePM10[55%] ePM10[50%]	Efficiency with 5% step
Requisiti > 50% initial eff > 50% discharged eff	Requirements > 50% initial eff > 50% discharged eff	Requirements > 50% initial eff No minimum	no requirement

New efficiency classes

Group	Class			Reference value
	ePM _{1,min}	ePM _{2,5,min}	ePM ₁₀	
ISO Coarse	-	-	50%	initial gravimetric effieincycy
ISO ePM10	-	-	50%	ePM ₁₀
ISO ePM2,5	-	50%	-	ePM _{2,5}
ISO ePM1	50%	-	-	ePM ₁

- The filter section can be accessorised with pressure sockets, differential pressure switches and/or gauges to constantly monitor the cleanliness of the filters.
- Activated carbon filters are also available for chemical and physical deodorisation and absorption of gaseous and organic vapours.

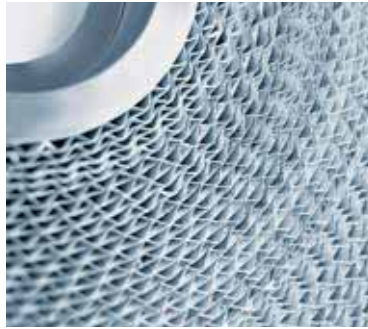
COILS

- Carrier fluids: water; glycol water; steam; superheated steam; direct expansion (refrigerants R22, R407c, R404A, R410a, R134a); electrical (with a double safety thermostat installed on board).
- The heat exchange coils, in standard operation, use the water as a carrier fluid and are package-type with copper pipes and aluminium fins and can be removed on guides. The collectors are in copper with terminals in brass or stainless steel.
Available options
Coils with the materials of the pipes and fins made of:
 - pre-painted copper/aluminium,
 - copper/copper,
 - copper/tinned copper,
 - metal/aluminium,
 - entirely made of stainless steel.

Custom ADV

CTA ADV 240÷22920

Construction details



- Drop separators: polypropylene, galvanised steel, aluminium and stainless steel droplet separators can be selected according to your needs.
- Condensation drain pans: in galvanised steel with an inclined base to guarantee excellent drainage through the drain. They are also available in Peraluman or AISI 304 stainless steel with a diamond-shaped base.

FANS

- The wide range of fans used allows an optimal selection to always be made to meet the flow rate and head pressure aerodynamic performances required, maximum efficiency and the minimum noise level possible. Double inlet fans are used coupled with electric motors via belt and pulley transmission (adjustable and non) with forward blades (for low pressures), with backward blades (for medium-high pressures), with backward wing profile blades (for medium-high pressures and high efficiency). The motors are installed as standard on fixed belt tensioning slides with the fan on a sturdy structure with interposed high efficiency anti-vibration mounts.
- Free impeller PLENUM FANS are also available with inverter controlled directly coupled electric motors.

Special implementations:

- Fans with easily washable screws;
- Epoxy paint finish for aggressive atmospheres;
- Constructions made entirely of stainless steel;
- Motors compliant with the ATEX Standard;
- Explosion-proof motors equipped with spark-proof nozzle.

SILENCERS

Consisting of highly soundproofing rock-wool partitions covered in glass fibre to protect against flaking.

Various lengths are available to meet all noise reduction requirements.

Available options

Implementation with Melinex coatings and micro-stretched mesh, suitable for specific installations such as pharmaceutical companies, research laboratories, the microelectronics industry and hospitals.

HUMIDIFIERS

Adiabatic humidifiers

- Evaporating pack implemented with disposable water or with pump recirculated water. The evaporating pack in cellulose paper is available in 100 (for efficiencies up to 70%) and 200 mm (for efficiencies up to 90%) thicknesses.
- Nozzles implemented with disposable water (for efficiencies up to 60%) or with pump recirculated water (for efficiencies up to 80%).

Special implementations

- High pressure atomising humidifiers: system with high efficiency and hygienically safe;
- Atomised water humidifiers: system that used compressed air and water from the mains (or demineralised) and produces water finely atomised.

Isothermal humidifiers

Steam humidifiers are intended for the following supplies:

- Only if the humidification section is set-up, including: the condensation drain pan along the entire section and a drop separator downstream.
- With just a dispensing pipe that is to be coupled with a regulation valve by the installer for centralised steam to be produced.
- With a dispensing pipe and autonomous steam producer with immersed electrodes.

Special implementations

- Autonomous steam producers with electric heaters.
 - Gas-powered autonomous steam producers.
 - Channel steam dispenser with nozzles supplied complete with a regulation valve and the relative electrical servo-command.
- Suitable for supply steam pressure from 0.2 to 4 bar.



HEAT RECOVERY UNITS

All heat recovery units used are designed and selected to maximise the sensitive and/or latent efficiency and minimise the pressure drops on the air side so as not to burden the electric power absorbed by the fans.

Plate recovery units, crossed-flows with or without side bypass for free-cooling in the following types:

- Straight expulsion and flow;
- Overlapping expulsion and flow;
- Side by side expulsion and flow.

Available options

- Acrylic protection: the aluminium is protected against corrosion by a polyurethane-based layer of non-toxic paint, in environments with an aggressive atmosphere.
- Extra sealing: to guarantee enhanced sealing between the two air flows.

Rotary recovery units with an enthalpic wheel in the following types:

- Straight expulsion and flow;
- Overlapping expulsion and flow.

Available options

Hygroscopic treatment

The aluminium matrix can be chemically treated with an alkaline solution of potassium carbonate in order to make the rotor hygroscopic.

High efficiency hygroscopic treatment

The rotor can be produced in special hygroscopic aluminium that guarantees even better performance.

Twin coil and single-directional regenerative recovery units

The finned recovery coils can be customised by selecting the number of rows according to the required recovery efficiency, and the materials used according to the type of application required.

Single and twin stage indirect adiabatic recovery units

For further details regarding the heat recovery unit consult the Energy Saving section in this document.

Special implementations

- Heat pipes recovery
- Integrated thermodynamic recovery

HANDLING, PACKAGING AND SHIPPING

- The CTA ADV are available in the packaged version as well as in sections, according to the requirements and type of unit selected, in order to easily resolve handling, transport and positioning the air handling units on site.
- The extreme modularity of this range also allows the sections to be easily passed through narrow spaces such as doors or lifts, resulting in the ideal solution for retrofitting existing systems.
- The single modules are designed to facilitate assembling the machine on site.
- The CTA ADV are packaged with a heat-shrinkable plastic film that protects the machine from dust or other dirt. It is also possible to request the air handling units to be supplied on Europallets (generally, when shipped via container) with standard wooden pallets as well as fumigated pallets.

CTA VERSION CKD

- In order to meet particular transport or on site requirements, Rhoss can supply the air handling units completely disassembled.
- The CTA ADV are compliant with the essential safety requirements set out in Machinery Directive 2006/42/EC. The machine also complies with the following directives: - 2006/95/EC, which annuls and replaces Directive 73/23/EEC as amended by 93/68/EEC. - 2004/108/CE (Electromagnetic Compatibility) as amended by 93/68/EEC.
- The ADV units comply with the Standards UNI EN 292, UNI EN 294, IEC EN 60204-1, UNI EN 563, UNI EN 1050, UNI 10893, UNI EN ISO 3744, ISO 3864 and ISO 5801 relative to the aerualic tests of the fans, EN 1886 relative to the mechanical performance of the ventilation in the building, EN 13053 relative to the classification and efficiency of the ventilation units in the buildings, EN 13779 relative to the efficiency requirements of the ventilation systems in non-residential buildings, EN 779 and 1822 relative to the ventilation air filters, EN 1216 relative to the efficiency of the exchange coils, EN 60204 relative to the safety of the electrical equipment of the machines and EN ISO 7730 relative to the thermal comfort of the rooms.

Custom ADV

CTA ADV 240÷22920

Adjustment

- **Plug&Play Unit**
- **360° service**
- **Performance reliability**

When the regulation and power components of an air handling unit are normally installed on site the following occur simultaneously:

- increased in installation costs (due to the on site restrictions, inconvenient work conditions and variable atmospheric conditions);
- decreased reliability and efficiency of the machine.

ADVR: the strength of a winning proposal

The CTA ADVR range eliminates all these issues:

- **No access related problems to install the components in the best position for the unit to work.**
- **Simplified installation and minimised time related factors.**
- **Rhoss becomes the only partner, responsible also for CE certification of the machine.**
- **Performance optimisation of the machine.**
- **A clear and competitive economic offer.**





All-round support

Rhoss offers all the support the customer may require putting all the skills, experience and professionalism at the customer's disposal.

Making the offer and defining the order: for the best choice

Our technical sales team can accurately define the most suitable regulation system for your requirements and help in the selection of customised solutions. The verification of the system and application specifications becomes the fundamental step to offer the right solution whilst not forgetting the economic and energy aspects that may affect the final selection.

Production phase: certainty of the result

- The CTA ADVR range is produced in compliance with all the directives set by ISO 9001:2008. This is a guarantee of selection and careful and constant monitoring of quality levels of the suppliers, processes and productive methods and tests of the units.
- The machines are produced in highly industrialised lines by trained and expert personnel.
- All the components are factory tested, programmed, wired and installed.
- Only a highly specialised company can guarantee this.

Delivery and installation phase: problem-free

The first start-up of the machine will be carried out by a Rhoss assistance centre that will:

- restore the electrical wiring between the sections of the machine;
- activate and check the overall functionality;
- set the pulley, inverter calibration and humidifiers, check electrical absorption and perform hydraulic tests;
- adjust the regulation parameters;
- train the personnel;
- issue the start-up report.

System operation phase: peace of mind

As with all Rhoss units, the customer has a vast selection of additional services at his disposal, such as:

- Possibility of extending the warranty from 12 months to 36 months: enhanced management tranquillity.
- Scheduled maintenance contracts including annual inspection visits, special interventions or faults seen to within 48 hours.
- Each contract can be customised with extra services such as emergency intervention within 4 hours.



Custom ADV

CTA ADV 240÷22920

Adjustment



Main technical features

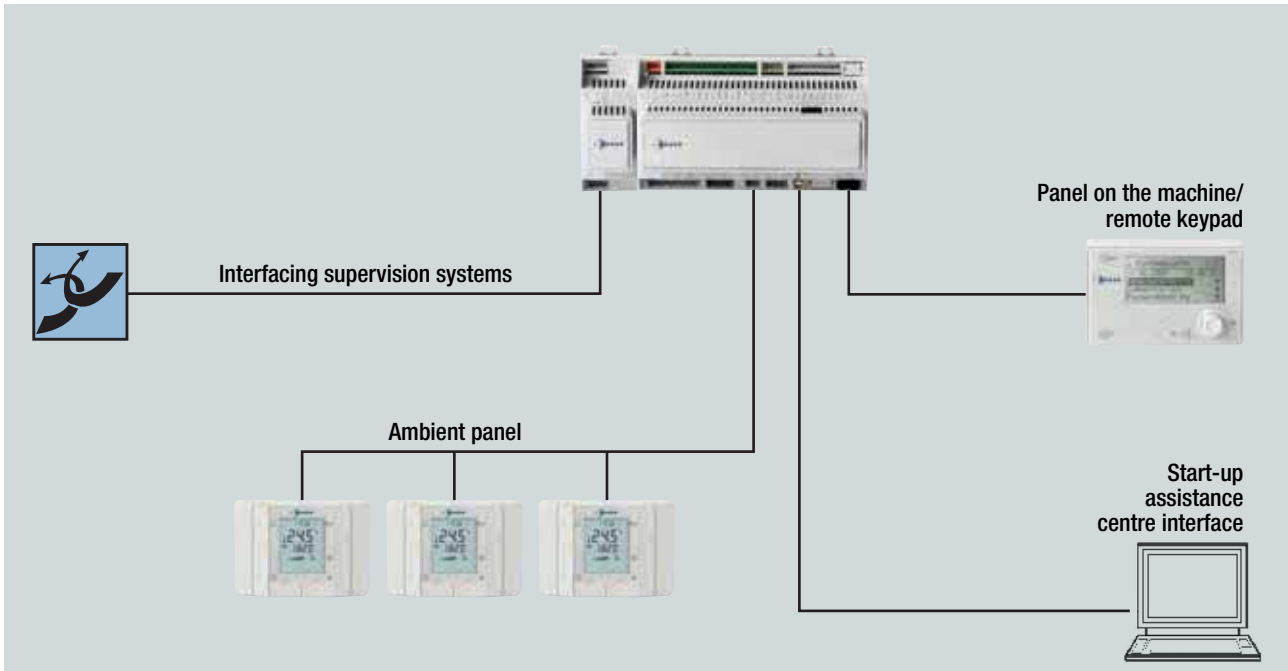
- ELECTRICAL PANEL installed on the machine and compliant with Directive IEC-EN 60204-1, complete with the programmed microprocessor regulator, transformers, drives for power control of the various utilities, safety devices and signal lights.
- CONTROL PANEL with LCD display and keypad, messaging and custom settings for the specific application.
- HYDRAULIC ASSEMBLIES for each coil, including 2 and 3 way, high quality, shut-off motorised valves and 2-way balancing valves on the bypass.
- ACTUATORS FOR AIR DAMPERS.
- Temperature, humidity and air quality SENSORS selected according to the specific requirements of the system.
- Dirty filter or no air flow signal PRESSURE SWITCHES.
- AIR ANTIFREEZE THERMOSTAT.
- Modulating or On/Off adiabatic or isothermic CONTROL OF THE HUMIDIFIERS, as required.
- AUTOMATIC AIR FREE-COOLING, RECIRCULATION/MIXING CONTROL.
- Plate, rotary, twin, single-directional regenerative, direct and indirect adiabatic single and twin stage HEAT RECOVERY UNIT MANAGEMENT.
- MANAGEMENT OF FANS with monopolar-bipolar motors or via an inverter. Management of fans with a double motor or twin fan units, one in stand by for the other.

- The INVERTERS can be configured for panel, potentiometer, constant pressure or flow rate control. They have been specifically selected to obtain low harmonic distortion in compliance with the European Directive IEC/EN 61000-3-12.
- Water and air OZONE SANITIZATION CYCLE MANAGEMENT.

Available functions and options

- Remote re-calibration potentiometers to control the ambient temperature, the opening of the dampers and fan inverter control.
- Unit management according to a freely set weekly program.
- Remote keyboard.
- Ambient panel for simplified use.
- General alarm.
- Remote On/Off.
- Remote summer/winter control in the presence of mixed coils.
- Possibility of customising the alarm functions.





Interface

- The CTA ADVR Rhoss can be interfaced with Modbus and Lonwork protocols via special additional modules.
- RHOSS SUPERVISION: it is also possible to monitor all out CTA via web through the Rhoss Supervisor.

Main functions:

- collection of the "historical" data, updated as often as desired;
- sending e-mails, SMS messages, faxes and voice calls if alarms are triggered or a desired threshold of a given parameter is exceeded;
- possibility for authorised operators to act remotely to resolve the problem without having to intervene on site.

INTERFACING SUPERVISION SYSTEMS



Modbus and Lonwork protocols



RHOSS supervision



Custom ADV

CTA ADV 240÷22920

Hospitals



The Rhoss suggestion for the hospital sector

The ADV health care range is designed according to the requirements of the European Standards EN 1886 and EN 13053 and certified by EUROVENT. All the components are selected and designed to obtain minimal energy consumption (with particular attention to pressure drops) and maximise the overall energy efficiency of the system.

STRUCTURE

- The entire machine can be inspected through large access doors. Each section that is subject to frequent maintenance can be supplied with lighting and a large double-walled porthole to facilitate a visual inspection.
- The internal structure is completely free of sharp edges or protrusions and the profiles used are completely rounded. Thereby, air friction on the surfaces is reduced together with the accumulation of dirt or washing liquid inside the unit.
- The materials available for the panelling and framework guarantee levels of chemical resistance and bacterial cleanliness required for the monitoring of contamination.
- The condensation drain pans are included along the entire length of the machine for all the components involved in the flow to be cleaned.

FILTERS

We can provide all degrees of filtration required by the specific application to guarantee adequate air quality in supply and return.

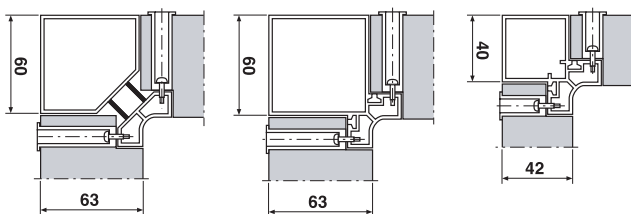
The Rhoss control constantly monitors the cleanliness of the filters, allowing preventive and/or special maintenance to be performed, thereby preventing unexpected idle times.

HUMIDIFIERS

- Steam humidification with autonomous producer with immersed electrodes/ electric heaters/gas.
- Dispensing mains steam nozzles suitable for hospital environments.
- High pressure adiabatic humidifiers are available for certain applications that allow an accurate control to be performed on the ambient humidity without compromising the cleanliness of the air.
- Adequate distances between the components are calculated for all the humidification sections in order to guarantee correct absorption of the steam itself.

INTERFACE AND SUPERVISION

- Guaranteed interface with the most common standard communication protocols such as Modbus and LON.
- Supervision via Web-Ethernet port on TCP/IP technology.
- GSM modem kit for remote monitoring via SMS with alarm control.





FAN AND PUMP CONTROL

External inverter controlled Plenum Fans or EC Brushless-type with control integrated directly in the electronics of the fan.

- Integrated management of any redundant fans for totally guaranteed comfort and performance, even in the event of a fault.
- Ventilating sections designed to guarantee the maximum aerodynamic efficiency possible.
- Constant PRESSURE control together with VAV systems with speed optimisation of the fans according to the reading of the position of the dampers, thereby optimising the energy efficiency of the system.
- Control with a constant supply FLOW, according to the dirt of the filters.
- Modulation of the return fans to control the pressurisation of the environments.
- Automatic reserve fan or pump activation management if a fault is detected in the active devices.
- Automatic rotation if the unit with reserve fan/pump reaches 100%.

“INTELLIGENT” FUNCTIONS

- Serial management of intelligent devices.
- Optimal use of the intelligent devices installed on the CTA ADV/R, such as inverters, autonomous humidifiers and EC Brushless fans.
- Collection of all the information transmitted to the supervision system makes the Rhoss ADV/R regulation a fundamental element to obtain maximum energy efficiency.
- A CTA ADV/R Rhoss can implement local interconnection with other Rhoss units such as chillers, hydronic terminals or subordinate reheating sections.

FUNCTIONS DEDICATED TO MAXIMUM ENERGY SAVINGS

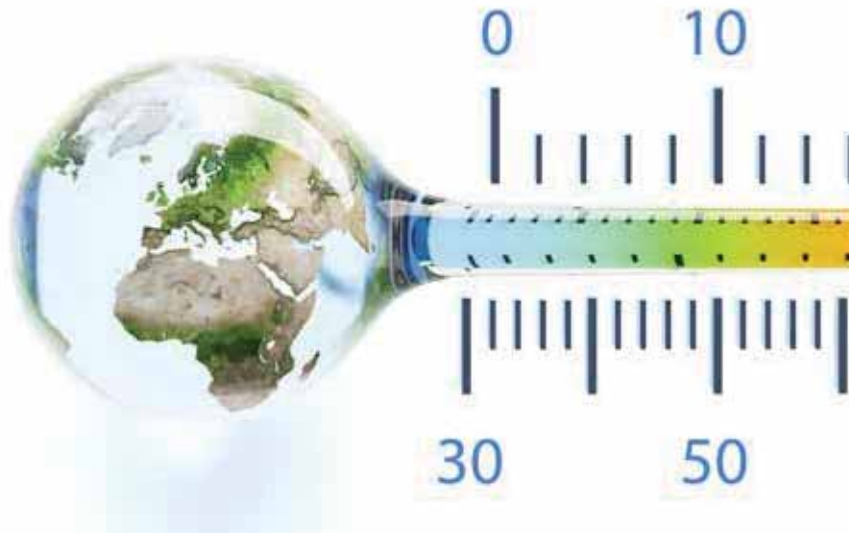
Wide selection of heat recovery systems according to the applications and project restrictions:

- Crossed flows and simple twin recovery units or with integrated indirect adiabatic cooling.
- Integrated free-cooling control (sensitive or enthalpy) and any recirculation dampers.
- Management of the heat transfer fluids according to the time schedule.
- Regulation at a constant water flow with 2-way valves.
- Supply temperature compensation in relation to the outdoor temperature.
- Innovative smooth management of the dehumidification and humidification without the use of the Saturation Probe.



CTA ADV Custom and Next Air

Eurovent Certification



In 2020 Eurovent finally introduced, in addition to the winter energy classification criteria of air handling units (introduced in 2010), also the new summer energy labels highlighting that the solutions applied to cold climates are not always valid for the Mediterranean climate or for even hotter or more humid climates and vice versa, thus introducing the concept of diversification of the energy class of a product based on its installation climatic area.

From now on winter energy labels will be identified by the symbol of a snowflake to tell the apart from summer labels symbolised by the sun.

Immediately identifiable energy efficiency

The 6 energy classes from A+ (for highest energy efficiency) to E (for lowest energy efficiency) offer the best answer on the required energy efficiency, making it a simple concept, immediately recognizable by all. Based on a global standard (EN 13053), the Eurovent energy classification for air handling units considers parameters such as air speed, absorbed electric power of the fan motor and the heat recovery efficiency.



WINTER ENERGY EFFICIENCY CLASS

In this method, the impacts of the following factors are weighted together to establish the final energy class.

- Maximum air speed through the filtering section
- Heat recovery efficiency.
- Heat recovery pressure drops.
- Absorbed power factor.

Three types of winter air handling units.

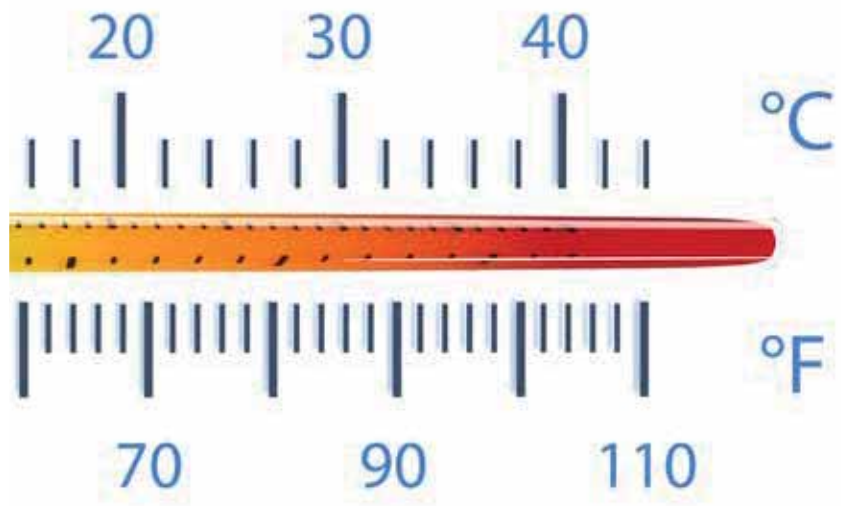
Three subcategories are defined with three different energy label symbols:

1) From A+ to E for units with total or partial outdoor air and design winter temperature $\leq 9^{\circ}\text{C}$.

2) From A+ \curvearrowright to E \curvearrowright for full recirculation units or again with design winter temperature $> 9^{\circ}\text{C}$.

3) From A+ \uparrow to E \uparrow for stand alone extractors.

CLASS	For all units	Total or partial fresh air units and design T		Fan efficiency degree
	Speed	Speed	Heat recovery	
	v_{class} [m/s]	η_{class} [%]	Δp_{class} [Pa]	
A+ / A+ \curvearrowright / A+ \uparrow	1.4	83	250	64
A / A \curvearrowright / A \uparrow	1.6	78	230	62
B / B \curvearrowright / B \uparrow	1.8	73	210	60
C / C \curvearrowright / C \uparrow	2.0	68	190	57
D / D \curvearrowright / D \uparrow	2.2	63	170	52
E / E \curvearrowright / E \uparrow	Calculation not necessary			No requirement



SUMMER ENERGY EFFICIENCY CLASS

The initial idea came from several tests carried out on hourly energy consumption, calculated in Europe, the Mideast, North Africa and some extreme meteorological locations for total of 58 locations. It helped to identify a mathematical model balancing the advantage of 3 different technical solutions which could result in energy saving of the AHU:

- 1) Recovery of summer humidity
- 2) Indirect adiabatic cooling (IAC)
- 3) Reduction of the pressure drop in the bypass of the heat recovery system

Points 2 and 3 will only be considered at a further stage while in this initial integration calculation stage they will be disregarded.

In order to calculate summer energy classes, it is mandatory to indicate the place of installation of the AHU so as to identify the correct dry bulb temperature and dewpoint temperature values in the place where the machine will operate. The list of cities of reference contains all of the cities registered in the Climatic Design Conditions ASHRAE 2017 database.

Three types of summer air handling units

For summer as well three subcategories with different energy label symbols are defined:

1. From A+ to E: for units that meet the following parameters:
 - Winter design conditions (actual selection) $\geq -3\text{ }^{\circ}\text{C}$ and design dry bulb temperature (from ASHRAE 2017 design climatic conditions) $\geq 30\text{ }^{\circ}\text{C}$
 - Or
 - Winter design conditions (actual selection) $\geq -3\text{ }^{\circ}\text{C}$ and design dewpoint temperature (ASHRAE 2017 design climatic conditions) $\geq 17\text{ }^{\circ}\text{C}$
 - Or
 - Dry bulb design conditions (from ASHRAE 2017 design climatic conditions) $\geq 30\text{ }^{\circ}\text{C}$ and design dewpoint temperature (ASHRAE 2017 design climatic conditions) $\geq 17\text{ }^{\circ}\text{C}$
2. From A+↺ to E↺: if the outdoor conditions where the unit will be installed are different than those defined above, the unit belongs to subgroup 2 and the class will be displayed with an arrow. The class will therefore be the same as that for winter application (subgroup 2 when the winter design temperature $T_{oda} \geq 9\text{ }^{\circ}\text{C}$).
3. From A+↑ to E↑ for stand alone extractors: this subgroup will only consider the speed of the cross-section of the filter and the network energy consumption for the fans.



CLASS	Total or partial fresh air units and: Win dbt $\geq -3^{\circ}\text{C}$ and Sum dbt $\geq 30^{\circ}\text{C}$ or Win dbt $\geq -3^{\circ}\text{C}$ and Sum Tdew-point $\geq 17^{\circ}\text{C}$ or Win dbt $\geq -30^{\circ}\text{C}$ and Sum Tdew-point $\geq 17^{\circ}\text{C}$					
	For all units	Heat recovery				Fan efficiency degree
	Speed					
	$V_{\text{class-T}}$ [m/s]	$\eta_{\text{class-T}}$ [%]	$\Delta p_{\text{class-T}}$ [Pa]	$\eta_{\text{class-H}}$ [%]	$\Delta p_{\text{class-H}}$ [Pa]	$NG_{\text{ref-class}}$ [-]
A+ / A+↺ / A+↑	1.4	83	167	81	222	64
A / A↺ / A↑	1.6	78	160	73	213	62
B / B↺ / B↑	1.8	73	155	65	207	60
C / C↺ / C↑	2.0	68	151	58	202	57
D / D↺ / D↑	2.2	63	147	50	197	52
E / E↺ / E↑	Calculation not necessary					No requirement

CTA ADV Custom and Next Air

Eurovent Certification



- **Guaranteed performance**
- **Certainty of the results**

Eurovent certification is synonymous with absolute guarantee, according to standard parameters and protocols of the actual performance of the air handling units.

The air handling units of the ADV range have successfully passed the mechanical and performance tests, thereby confirming the excellence of our product and the seriousness of our business proposal.

Mechanical features

Verified according to EN1886: Ventilation in the Building - air handling units - Mechanical characteristics

More specifically, the following mechanical characteristics are guaranteed:

- **Mechanical strength of the structure**

Deflection: the maximum deflection of the sides of the unit subjected to positive or negative pressure, expressed as the difference in the distance between a reference plane outside the unit itself is not subjected to pressure and the external surface of the unit in question, subjected or not to the test pressure. This value is an indication of the robustness of the unit.

Classification criteria:

EN 1886:1998	EN 1886:2006	Maximum relative deflection mmxm-1	Resistance to the max pressure generated by the fan
1B	D3	>10	NO
1A	D2	10	SI
2A	D1	4	SI

- **Air leakage through the casing with a depression of 400 Pa**

Air leakage of the casing subjected to a negative pressure test of 400 Pa compared to the total casing surface.

Classification criteria:

EN 1886:1998	EN 1886:2006	Leakage at -400Pa in l/sXm2
3 A	-	3,96
A	L3	1,32
B	L2	0,44
-	L1	0,15

- **Air leakage through the casing with an over-pressure of 700 Pa**

Air leakage of the casing subjected to a positive pressure test of 700 Pa compared to the total casing surface.

Classification criteria:

EN 1886:1998	EN 1886:2006	Leakage at 700Pa in l/sXm2
3 A	-	5,7
A	L3	1,9
B	L2	0,63
-	L1	0,22

- **Leaks due to bypassed filter sections**

Air leakage around the frame of the filters subjected to a negative pressure test of 400 Pa and a positive pressure test of 400 Pa.

Classification criteria:

EN 1886:1998	EN 1886:2006	Leakage % at -400Pa
6	< F6	G1-F5
4	F6	F6
2	F7	F7
1	F8	F8
0,5	F9	F9



• **Casing heat transmission**

The overall heat exchange coefficient is equal to the amount of heat transmitted by the unit surface due to the difference between the internal and external temperature of the unit itself.

Classification criteria:

Class	Thermal transmittance K in W/m²K
T5	No requirement
T4	1,4 < U ≤ 2
T3	1 < U ≤ 1,4
T2	0,5 < U ≤ 1
T1	U ≤ 0,5

• **Thermal bridge factor of the casing.**

Differential ratio between the minimum temperature at any point on the outer surface of the unit and the average temperature of the internal air and the difference of the average air temperature.

Classification criteria:

Class	Kb
TB5	No requirement
TB4	0,3 < Kb ≤ 0,45
TB3	0,45 < Kb ≤ 0,6
TB2	0,6 < Kb ≤ 0,75
TB1	0,75 < Kb < 1,00

• **Casing acoustic isolation**

Classification criteria:

Frequency in Hz	125	250	500	1000	2000	4000	8000
Reduction value	dB	dB	dB	dB	dB	dB	dB

Sound pressure readings are taken around the casing of the CTA by placing a source of sound inside and repeating the readings after having removed the panels. Thereby obtaining the noise reduction of the casing.

EN 13053: a European Standard to evaluate the energy efficiency of the air handling units.

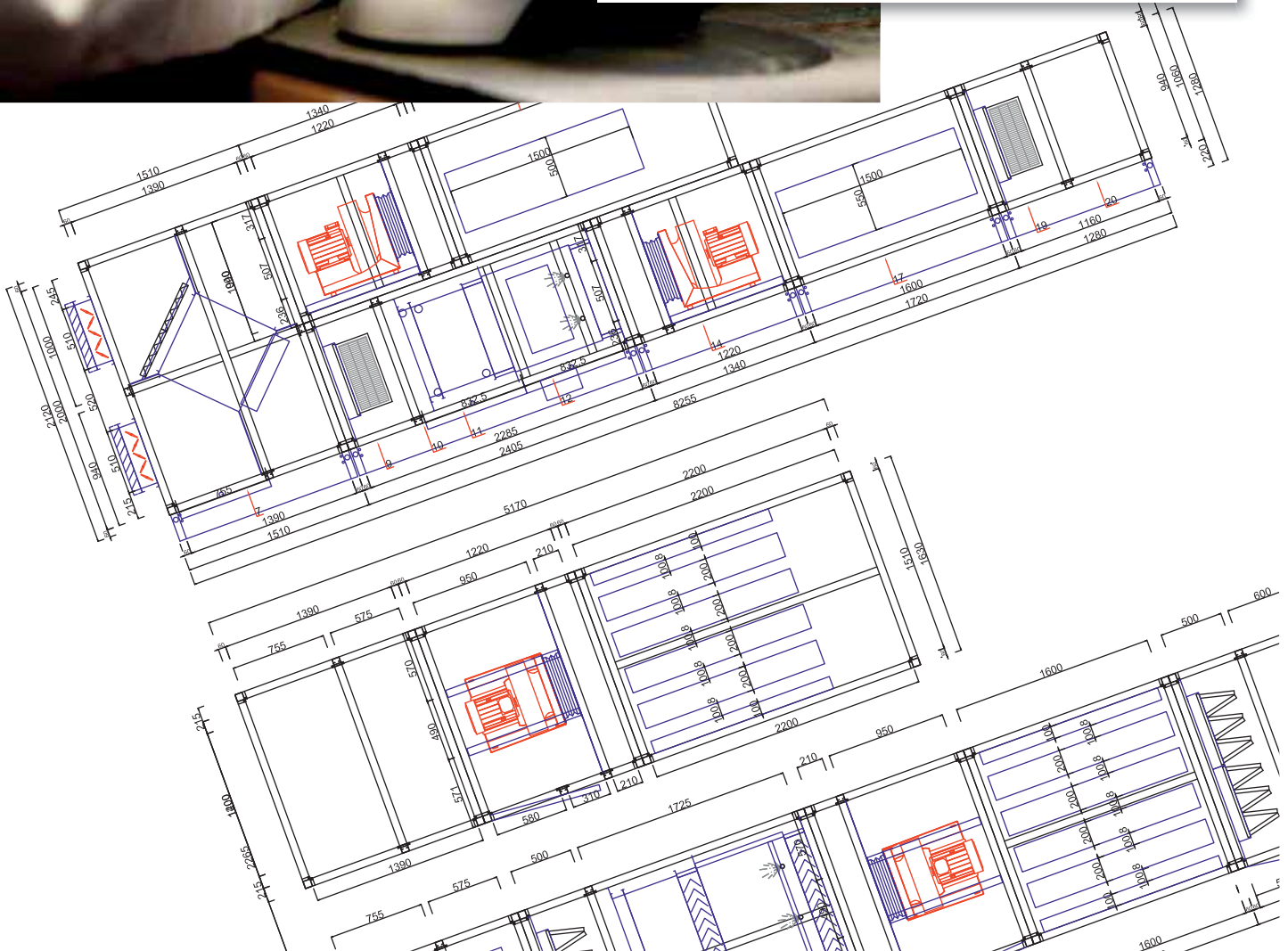
Performance characteristics measured according to EN13053: Ventilation in the Building - air handling units - performance characteristics per units, components and sections.

More specifically, the following performance characteristics of the air handling unit are measured and certified (by independent laboratories):

- Air flow rate
- Static pressure available
- Absorbed power
- Hot water coil heating power
- Cold water coil cooling power
- Coil hydraulic side pressure drops
- Heat recovery efficiency
- Sound power level measured in octave band in the inlet and outlet duct
- Sound power level measured in octave band detected in the ambient



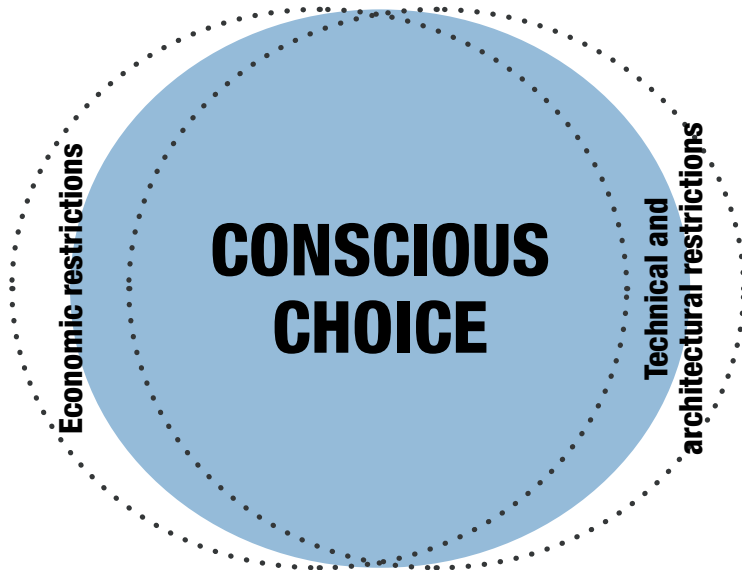
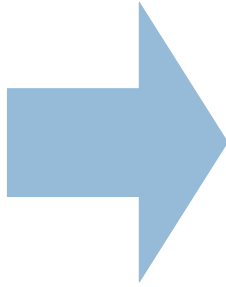
GIUNZIONE	
Giunzione di due sezioni, al fine di agevolare la movimentazione ed il trasporto.	
Batteria di riscaldamento	
DATI TERMOIGROMETRICI ARIA	
Portata aria	2500 m ³ /h
Temperatura ingresso	-5 °C
Temperatura uscita	20 °C
Potenzialità	21 kW
Perdita di carico	37 Pa
Velocità di attraversamento	2.54 m/s
FLUIDO	
Acqua	
Temperatura ingresso	45 °C
Temperatura uscita	40 °C
Portata	3643 L/h
Perdita di carico	18.3 kPa
Volume interno	4.2 L
P60 3R 6T(360) 760A p.a.2.5 3C 1° Cu/Al SX	
Filtro a tasche rigide	
Filtro a tasche efficienza F8 - 95% N°1 592 x 490 x 292 mm	
Controtelai in lamiera zincata N°1 610x506x100 mm	
Dp iniziale / media / finale [Pa] 113 / 176 / 240	
Batteria di raffreddamento	
DATI TERMOIGROMETRICI ARIA	
Portata aria	2500 m ³ /h
Temperatura ingresso	35 °C
Umidità relativa	50 %
Temperatura uscita	14 °C
Umidità relativa	98 %
Potenzialità	35.3 kW
Perdita di carico	237 Pa
Velocità di attraversamento	2.54 m/s
Rapporto S/T	0.51
FLUIDO	
Acqua	
Temperatura ingresso	7 °C
Temperatura uscita	12 °C
Portata	6071 L/h
Perdita di carico	20.5 kPa
Volume interno	11.2 L
Condensa	24.0 L/h
P3012 8R 12T(360) 760A p.a.2.5 12C 1 1/4° Cu/Al SX	
Bacinella in lamiera zincata	
Designed for dry conditions	
Umidificazione a pacco evaporante	
Umidificazione adiabatica a pacco dello spessore 100 mm a perdere	
Separatore di gocce a 1 piega in polipropilene	
Bacinella in lamiera zincata	
Con punto luce completo per portello di ispezione	
Con oblo per portello di ispezione	
GIUNZIONE	
Giunzione di due sezioni, al fine di agevolare la movimentazione ed il trasporto.	



CTA ADV Custom and Next Air

ENERGY SAVING

Software for the energy assessment and the comparison of the heat recovery units



1. Exclusive energy analysis tools

An air handling unit must not only be selected according to its initial price but also considering the costs generated by its use.

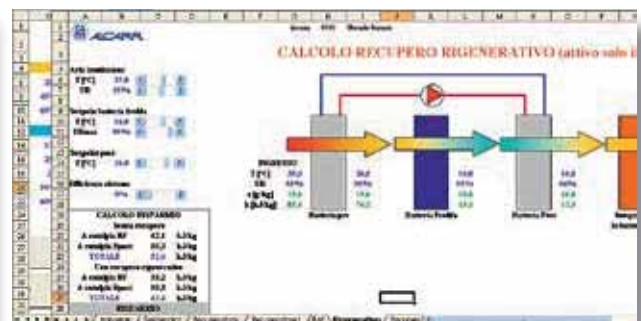
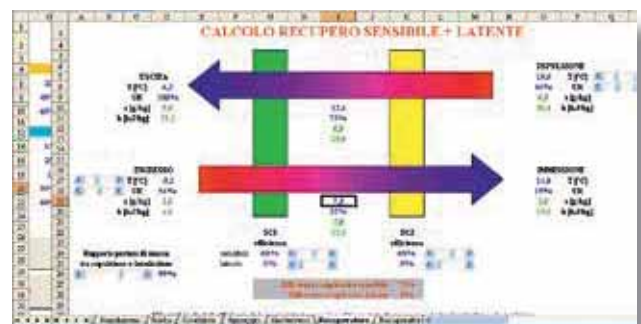
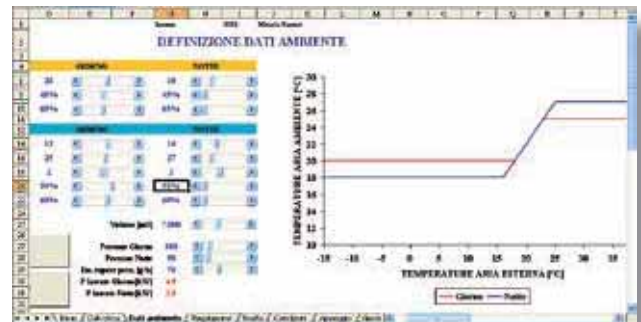
To help you choose the type of heat recovery that is the most economic and energy convenient for your specific application, Rhoss provides exclusive software that allows the following calculations, either as a regular calculation or bin-method monthly:

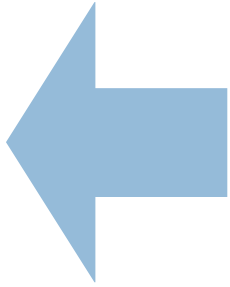
- the overall efficiencies of the heat recovery units used;
- the annual energy savings of the system;
- the annual energy consumption of the various recovery systems compared, immediately verifying the relative amortisation times.

All this considering:

- the thermal load of the system in question;
- the temperature and humidity conditions of the environment that is to be air conditioned;
- the temperature and humidity conditions of the external environment;

Thanks to this tool, Rhoss can provide support to select the best type of recovery unit.

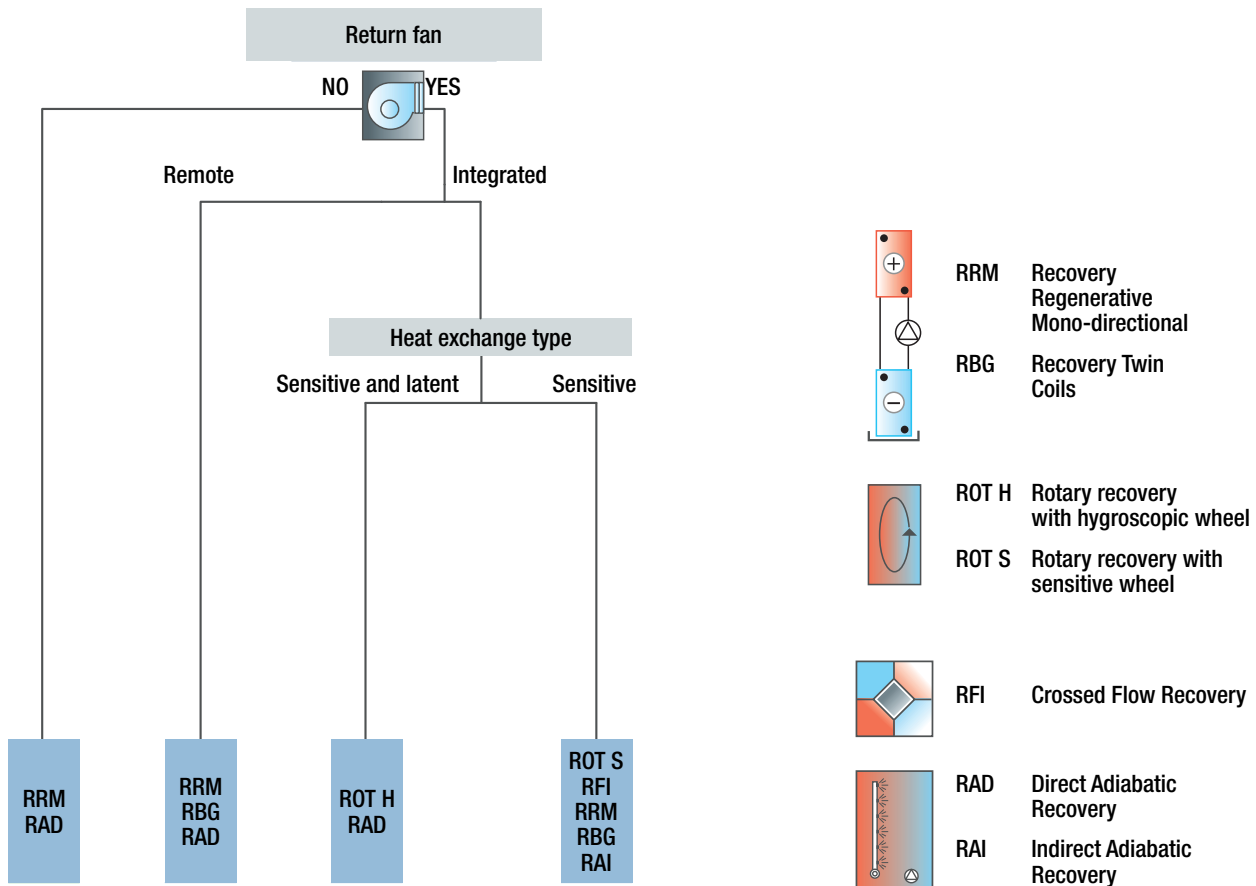




Selecting the layout and type of heat recovery to be used

2. Selecting the layout and type of heat recovery to be used

- Besides being based on a purely energy and economic level, the type of heat recovery selected is also based on project and application restrictions.
- Below is a quick reference for the selection of heat recovery systems that Rhoss provides and that will certainly meet your application requirements.



CTA ADV Custom and Next Air

ENERGY SAVING



1

1 TWIN RECOVERY

Principle of operation

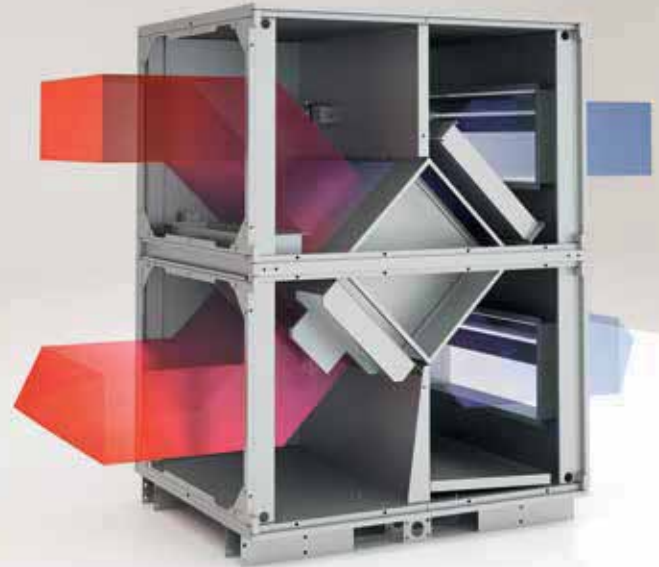
- Recovery with twin coils consists of hydraulically connecting a finned coil in a closed circuit placed on the supply flow and on the exhaust flow.
- Thereby, allowing for free pre-heating of the external air when in winter mode, bringing the inlet air to the hot coil to a higher enthalpic level and free pre-cooling when in summer mode, bringing the inlet air to the cooling coil to a lower enthalpic level. This allows the winter heating coil and the summer cooling coil to be undersized.
- Average efficiencies: 45-55%.

Main features

- Easy installation.
- Possibility of installing the system even when the air supply and return are far apart.
- Low cost of investment.
- Low energy consumption (circulation pump).
- Average maintenance costs.
- No risk of cross contamination in the air flows.
Excellent solution for applications in hospitals/operating theatres, cleanrooms, etc.
- Low/medium air side pressure drops.

Available options

- Customisations of the exchange coils according to the efficiencies required (efficiency and/or pressure drops).
- Customisation of the materials according to the applications: copper/pre-painted aluminium; copper/copper; copper/tin-plated copper; stainless steel coils.
- The twin recovery unit in the ADV range is supplied complete with the hydraulic circuits and automatic regulation of the system that always guarantees maximum energy savings possible.



2

MONODIRECTIONAL REGENERATIVE RECOVERY

Principle of operation

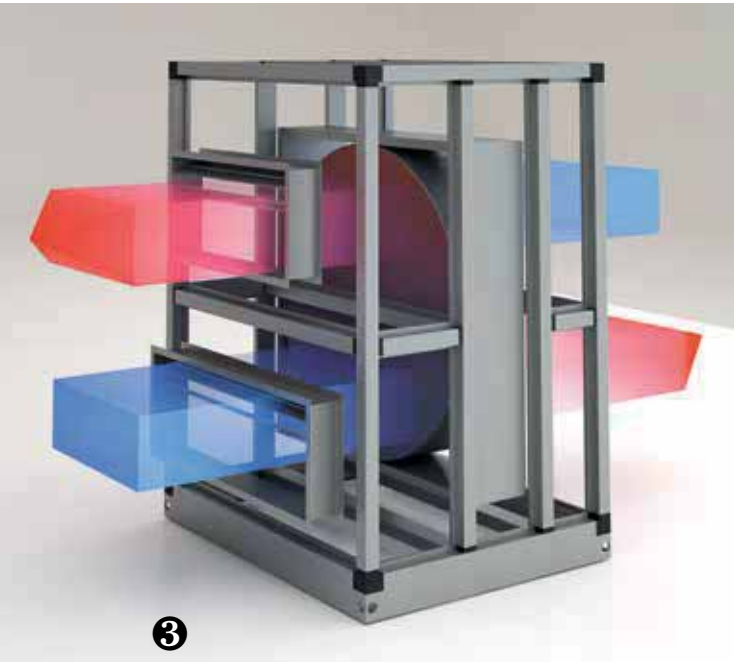
- The one-way renewable recovery consists in hydraulically connecting a finned coil in a closed circuit placed downstream of the summer cooling coil and upstream of the coil itself. The two recovery coils are connected by a hydraulic circuit with a pump and regulation valve. This is used to adjust the power of the coil downstream of the cold one in order to modulate the reheating request. In this way we can save cooling and summer reheating energy until completely excluding the need for external heat input.
- Average efficiencies: 45-55%.

Main features

- Easy installation.
- Possibility of installing the system even when there is no return fan.
- Low cost of investment.
- Low energy consumption (circulation pump).
- Average maintenance costs.
- No risk of cross contamination in the air flows.
Excellent solution for applications in hospitals/operating theatres, cleanrooms, etc.
- Low/medium air side pressure drops.

Available options

- Customisations of the exchange coils according to the efficiencies required (efficiency and/or pressure drops).
- Customisation of the materials according to the applications: copper/pre-painted aluminium; copper/copper; copper/tin-plated copper; stainless steel coils.
- The twin recovery unit in the ADV range is supplied complete with the hydraulic circuits and automatic regulation of the system that always guarantees maximum energy savings possible.



② CROSS FLOW STATIC RECOVERY

Principle of operation

- The plate recovery units are static-type and therefore, do not have moving parts. This guarantees excellent reliability and operating safety.
- Upon entry into the recovery unit, the two air flows, renewal and expulsion, are divided into passages between two plates that alternatively bring hot and cold air.
- These passages are sealed with appropriate solutions for each application, in order to hinder any contamination between the two air flows. The exchange occurs through the plates that form the passage walls.
- In order to enhance the efficiency, Rhoss uses particular heat exchangers. The surface of the plates have shapes with particular patented baffle plates that allow a maximum efficiency of 75%.

Fundamental features

- Low operating and installation costs.
- High flow separation guarantees.
- No moving parts.
- Easily adapted to each use.
- Products with materials adequate for the characteristics in different environments.
- Low air side pressure drops.
- Medium/high efficiencies.
- Easily cleaned and minimum maintenance required.
- Effective action to dampen the noise.
- Value for money even for small air flows.

Available options

- Extra sealing.
An additional seal can be applied to the heat exchanger in order to guarantee enhanced sealing between the two air flows. This option is recommended especially in particular applications such as hospitals, cleanrooms, etc.

③ ROTARY RECOVERY

Principle of operation

- The air-air rotary heat recovery units used by Rhoss consist of a cylindrical rotor containing thousands of channels and distinguished by a very high surface development and are driven by an electric motor equipped with a speed regulator, as necessary.
- The heat exchange in the rotary heat recovery units occurs by means of heat storage in the rotor. In fact, as the cylinder rotates slowly, the expulsion air passes through half of the casing and releases heat to the matrix of the rotor that stores it.
- The renewal air that passes through the other half absorbs the stored heat. As rotation continues, the parts that absorb and release heat invert continuously.
- The rotation speed of the rotor can be constant or made to vary by a speed regulator.
- The exchange surface, very high in comparison to the volume, allows for very high performance with respect to other types of recovery units, reaching even efficiencies up to 85%.

Fundamental features

- The high efficiency and the possibility of recovering the humidity besides the heat (hygroscopic wheel) allows the capacity installed in a system to be reduced significantly.
- Possibility of transferring the latent heat.
- Possible reduction of humidification devices.
- Average pressure drops.
- Medium-high cost of investment.
- Medium-high maintenance costs.
- High risk of cross contamination: there is no separation of the air flows. Not recommended for application in hospitals or at high risk of contamination flows.

Available options

- Hygroscopic treatment.
The standard aluminium matrix, which constitutes the rotor, can be chemically treated with an alkaline solution of potassium carbonate in order to create an oxidised surface that makes the rotor hygroscopic. The oxidation makes the surface porous at microscopic level, thereby allowing the humidity to be transferred between the two air flows.
- High efficiency hygroscopic treatment.
The rotor can be supplied in special hygroscopic aluminium that guarantees high performance.
- Speed regulator.
The speed regulator allows recovery partialisation and just like the motor is installed on the inspection side of the rotary recovery unit.

Heat recovery unit

FLUXBLOCK

Air flow rate: 2000÷22000 m³/h



- **Maximised energy saving without admixture of the flows**
- **EC high efficiency fan use**
- **Extremely silent**
- **Full Control Option**
- **Can be integrated into existing traditional-type systems**



Crossed flow heat recovery.

Principle of operation

What makes the air treatment system unique is the possibility of reaching optimal temperature and humidity conditions for total comfort and minimising energy expenditure without any compromise: the result is total comfort.

Humidity and air temperature, air quality, and silence are all interconnected parameters and must always be controlled and guaranteed.

Thanks to crossed flow heat recovery, which guarantees the separation of the delivery and return flows without any admixture of the two, you can achieve up to 65% efficiency resulting in significantly reduced heating and cooling loads.

The state of the art EC Brushless fans allow you to minimise and monitor electric power consumption. Air quality is always guaranteed by high efficiency filters.

Construction features

- Anticorodal aluminium profile load-bearing structure.
- Continuous anticorodal aluminium base under the entire machine.
- Panels made with double sandwich sheet steel with galvanised steel plate on the inside and galvanised steel plate with scratch-resistant and corrosion-resistant paint on the outside.
- Interposed 46 mm polyurethane foam or oriented cell mineral wool insulation.
- Dampers with opposed wing profile aluminium fins.
- Delivery and return filters in class F6 of rigid bag-type (En 779:2011).
- Crossed flow recovery unit installed vertically and sized so to maximise summer and winter efficiency and reduce air side pressure drops. The recovery unit integrates the bypass dampers for automatic management of free-cooling/free-heating.
- Recovery wheel activation motor with belt and pulley transmission equipped with variable revs regulator.

- Centrifugal fans with EC Brushless directly coupled motor. Ultra-efficient motors with electronic switch equipped with permanent magnets, where the rev number is adjusted by the integrated controller.
- Large inspection doors in the same execution as the panel and equipped with safety closures with closing handles.
- Version for indoor and outdoor installation.
- Packaged version or with separate sections.

ACCESSORIES

- Additional cold water coil.
- Additional hot water coil.
- Steam humidifier or with evaporating pack.
- Silencers.
- G4 pre-filters.

Control and regulation functions

- Heat recovery management in Maximum Economy mode with automatic management of free-cooling in temperature or enthalpy and integrated antifreeze management.
- Delivery temperature compensation in relation to the outdoor temperature.
- Fan operation with constant delivery flow, based on how dirty the filters are.
- Fan operation with variable flow:
 - 0-10V signal control (CO2 probe or potentiometer) for single-zone applications;
 - constant pressure control for multi-zone application.
- Management of the heat transfer fluids according to time schedule with 3- or 2-way valves depending on the system.
- Weekly time bands control.
- BMS interface with Modbus or Lon protocol.
- Supervision via Web-Ethernet port on TCP/IP technology.
- GSM modem kit for remote monitoring via SMS with alarm control.



FLUXBLOCK MODEL		570	920	1280	2080	2920	3600	4300	5250	6060	
Nominal air flow (SFP $v_{c} \leq 2$ at 200Pa)		m ³ /h	2.000	3.500	5.000	7.000	10.000	12.500	15.500	18.500	22.000
Air flow speed	MAX	m ³ /h	3.500	4.800	5.700	8.200	11.000	15.000	17.500	21.000	22.500
	MIN	m ³ /h	500	1.000	1.000	2.000	2.000	4.000	4.000	5.000	5.000
Available delivery/return static pressure		Pa	150/200	150/200	150/200	150/200	150/200	150/200	150/200	150/200	150/200
①	Additional hot water coil heating capacity	kW	14	21	30	42	60	75	94	112	
②	Additional cold water coil cooling capacity	kW	25	35	57	73	100	125	158	190	
③	Winter recovery eff. at the nominal capacity	%	76	76	75	75	74	74	74	75	
③	Summer recovery eff. at the nominal capacity	%	71	71	70	70	69	69	69	70	
DIMENSIONS		570	920	1280	2080	2920	3600	4300	5250	6060	
④	Width	mm	2.400	2.600	2.800	3.200	3.500	3.600	3.900	4.200	4.400
④	Height	mm	1.250	1.500	1.650	1.800	1.950	2.000	2.100	2.300	2.300
④	Depth	mm	950	1.100	1.300	1.450	1.650	1.750	1.900	2.100	2.200

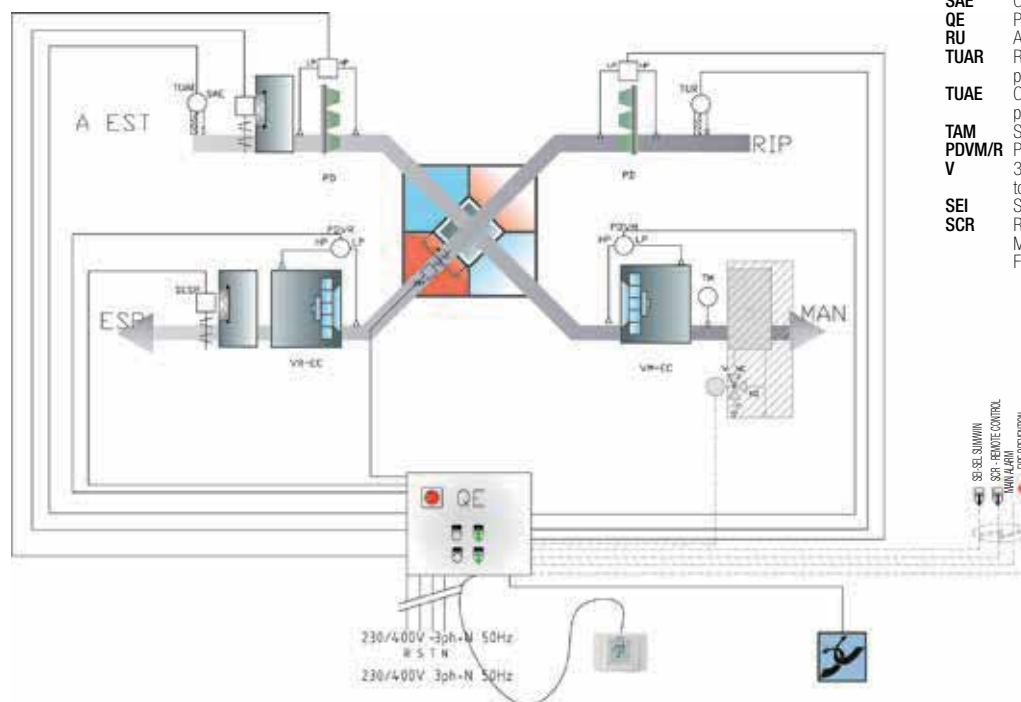
Data at the following conditions:

- ① In out water T 50/40°C; coil outlet air T 32°C.
- ② In out water T 7/12°C; coil outlet air T 13.5°C.
- ③ With equal delivery and return air flow rate.
- ④ Dimensions (without additional elements) in the horizontal air flow configuration.

Winter conditions: outdoor air -5°C 80% RH; return air 20°C 50% RH.

Summer conditions: outdoor air 32°C 50% RH; return air 26°C 50% RH.

Full Control Option



- Key**
- VM-EC** Brushless EC supply fan
 - VR-EC** Brushless EC return fan
 - RR-OT** Heat recovery motor at a variable rpm
 - PD** Dirty filter differential pressure switch
 - SE-SP** Expulsion damper actuator
 - SAE** Outdoor air inlet damper actuator
 - QE** Power and regulation electrical panel
 - RU** Ambient panel
 - TUAR** Return air humidity/temperature combined probe
 - TUAE** Outdoor air humidity/temperature combined probe
 - TAM** Supply air limit probe
 - PDMV/R** Pressure sensor to measure the flow rate
 - V** 3-way adjustment valves with a clogging rod to control hot and cold liquids
 - SEI** Summer/winter selector
 - SCR** Remote control selector switch
 - Fire prevention alarm contact

Heat recovery unit

ROTOBLOCK

Air flow rate: 2500÷22000 m³/h



- **Maximised energy savings**
- **EC high efficiency fan use**
- **Extremely silent**
- **Full Control Option**
- **Can be integrated into existing traditional-type systems**

Rotary heat recovery.

Principle of operation

What makes the air treatment system unique is the possibility of reaching optimal temperature and humidity conditions for total comfort and minimising energy expenditure without any compromise: the result is total comfort.

Humidity and air temperature, air quality, and silence are all interconnected parameters and must always be controlled and guaranteed.

The rotary heat recovery unit allows you to obtain efficiency up to 80%, thus reducing cooling, dehumidification and humidification loads considerably. The state of the art EC Brushless fans allow you to minimise and monitor electric power consumption. Air quality is always guaranteed by high efficiency filters.

Construction features

- Anticorrosive aluminium profile load-bearing structure.
- Continuous anticorrosive aluminium base under the entire machine.
- Panels made with double sandwich sheet steel with galvanised steel plate on the inside and galvanised steel plate with scratch-resistant and corrosion-resistant paint on the outside.
- Interposed 46 mm polyurethane foam or oriented cell mineral wool insulation.
- Dampers with opposed wing profile aluminium fins.
- Class F6 rigid bag-type delivery and return filters (En 779:2011).
- Rotary recovery unit installed vertically and sized to obtain maximum efficiency.
Available in aluminium version (for temperature exchange only) or Sorbtion version (with high efficiency hygroscopic treatment of the wheel, which allows heat exchange in temperature and humidity).
- Recovery wheel activation motor with belt and pulley transmission equipped with variable revs regulator.
- Centrifugal fans with EC Brushless directly coupled

motor. Ultra-efficient motors with electronic switch equipped with permanent magnets, where the rev number is adjusted by the integrated controller.

- Large inspection doors in the same execution as the panel and equipped with safety closures with closing handles.
- Version for indoor and outdoor installation.
- Packaged version or with separate sections.

ACCESSORIES

- Additional cold water coil.
- Additional hot water coil.
- Steam humidifier or with evaporating pack.
- Silencers.
- G4 pre-filters.

Control and regulation functions

- Heat recovery management in Maximum Economy mode with rotation rev number variation, automatic management of free-cooling in temperature or enthalpy mode and integrated management of the antifreeze.
- Delivery temperature compensation in relation to the outdoor temperature.
- Fan operation with constant delivery flow, based on how dirty the filters are.
- Fan operation with variable flow:
 - 0-10V signal control (CO₂ probe or potentiometer) for single-zone applications;
 - constant pressure control for multi-zone application.
- Management of the heat transfer fluids according to time schedule with 3- or 2-way valves depending on the system.
- Weekly time bands control.
- BMS interface with Modbus or Lon protocol.
- Supervision via Web-Ethernet port on TCP/IP technology.
- GSM modem kit for remote monitoring via SMS with alarm control.



ROTOBLOCK MODEL		710	1070	1530	2080	2500	2920	3270	4300	5250	6060	
Nominal air flow (SFP v<=2 at 200Pa)		m³/h	2.500	4.000	5.500	7.000	9.000	11.500	15.000	18.000	20.000	22.000
Air flow speed	MAX	m³/h	3.600	5.000	6.000	8.000	9.500	10.500	12.500	15.500	18.000	21.500
	MIN	m³/h	750	800	1.200	2.000	2.500	2.500	3.000	4.000	4.000	5.000
Available delivery/return fan static pressure		Pa	150/200	150/200	150/200	150/200	150/200	150/200	150/200	150/200	150/200	150/200
① Additional hot water coil heating capacity		kW	16	25	33	43	55	64	76	94	110	130
② Additional cold water coil cooling capacity		kW	27	50	68	86	110	130	154	190	220	265
③ Eff. recovery in temperature at min/nom/max air flow rates		%	81/73/67	82/70/66	81/70/66	81/70/67	81/70/67	81/70/67	82/70/66	82/70/66	82/70/67	82/70/67
③ Eff. recovery in humidity at min/nom/max flow rates		%	76/65/59	77/62/57	76/60/58	76/62/59	76/60/59	76/60/58	76/60/58	77/60/57	77/62/57	77/60/58
DIMENSIONS			710	1070	1530	2080	2500	2920	3270	4300	5250	6060
④ Width		mm	1.750	2.000	2.200	2.400	2.400	2.500	2.700	2.800	2.900	3.100
④ Height		mm	1.200	1.500	1.600	1.700	1.800	1.900	2.200	2.300	2.400	2.500
④ Depth		mm	1.050	1.200	1.400	1.500	1.600	1.700	1.800	2.000	2.200	2.400

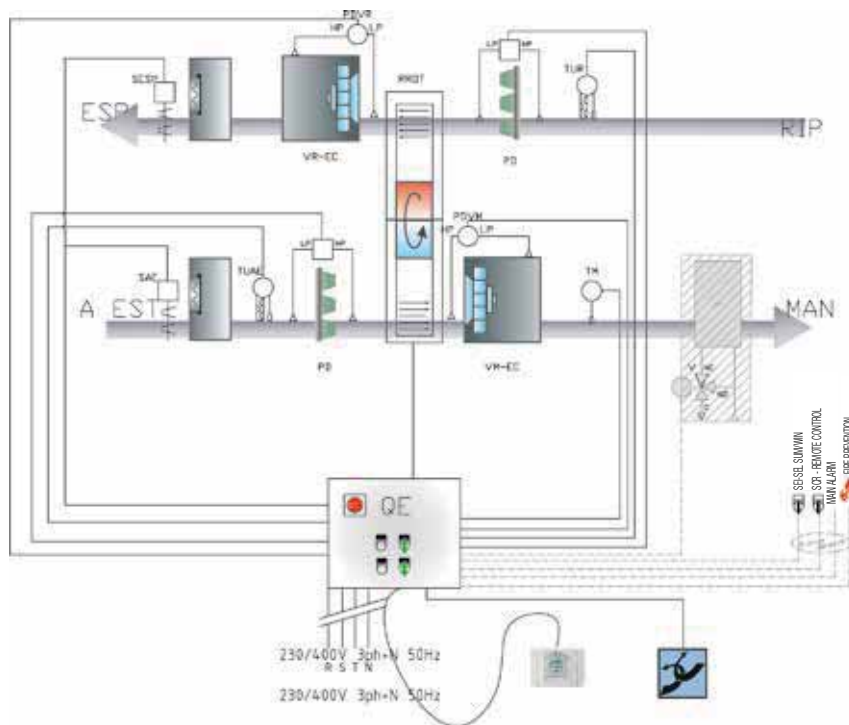
Data at the following conditions:

- ① In out water T 50/40°C; coil outlet air T 32°C.
- ② In out water T 7/12°C; coil outlet air T 13.5°C.
- ③ With equal delivery and return air flow rate.
- ④ Dimensions (without additional elements) in the horizontal air flow configuration.

Winter conditions: outdoor air -5°C 80% RH; return air 20°C 50% RH.

Summer conditions: outdoor air 32°C 50% RH; return air 26°C 50% RH.

Full Control Option



- Key**
- VM EC** Brushless EC supply fan
 - VR EC** Brushless EC return fan
 - RRROT** Heat recovery motor at a variable rpm
 - PD** Dirty filter differential pressure switch
 - SESP** Expulsion damper actuator
 - SAE** Outdoor air inlet damper actuator
 - QE** Power and regulation electrical panel
 - RU** Ambient panel
 - TUAR** Return air humidity/temperature combined probe
 - TUAE** Outdoor air humidity/temperature combined probe
 - TAM** Supply air limit probe
 - PDVM/R** Pressure sensor to measure the flow rate
 - V** 3-way adjustment valves with a clogging rod to control hot and cold liquids
 - SEI** Summer/winter selector
 - SCR** Remote control selector switch
- Main alarm
Fire prevention alarm contact

Control and regulation functions

- Heat recovery management in Maximum Economy mode with rotation rev number variation, automatic management of free-cooling in temperature or enthalpy mode and integrated management of the antifreeze.
- Delivery temperature compensation in relation to the outdoor temperature.
- Fan operation with constant delivery flow, based on how dirty the filters are.

- Fan operation with variable flow:
 - 0-10V signal control (CO₂ probe or potentiometer) for single-zone applications;
 - constant pressure control for multi-zone application.
- Management of the heat transfer fluids according to time schedule with 3- or 2-way valves depending on the system.
- Weekly time bands control.
- BMS interface with Modbus or Lon protocol.

- Supervision via Web-Ethernet port on TCP/IP technology.
- GSM modem kit for remote monitoring via SMS with alarm control.



PROFESSIONAL

Pool dehumidifiers
2200÷27000 m³/h

Dry-Pool

DAESY-DRESY-DTESY-DEESY 108÷2140

Dehumidification capacity: 8÷140 l/h



INVERTER

- R410A
- Integrated regulation
- Double panels
- Thermal cut profiles
- Version with brushless EC fans



Air and/or water cooled centrifugal fan POOL DEHUMIDIFIERS. Range with scroll hermetic compressors and R410A refrigerant gas.

Construction features

- Frame and load-bearing structure: extruded profiles aluminium alloy with a cross section of 40 x 40 mm, thermal cut-type with concealed screws. Balloon sealing gaskets fitted onto the profile. • Aluminium base.
- Panelling: 25 mm double sheet steel (galvanised steel plate on the inside and pre-painted with RAL 9002 on the outside). Hot-injected polyurethane insulation (average density 40 kg/m³).
- Compressor: scroll type, rotary, hermetic complete with thermal protection and casing heater.
- Evaporating coil: made with copper pipes and fins with a condensate drain pan.
- Condensing coil: made with copper pipes and aluminium fins.
- Water side heat exchanger (DRESY-DTESY-DEESY): braze-welded plates in special stainless steel for chlorinated water or tube and shell in Cu/Ni for water treated with saline chlorination. The heat exchanger in the DEESY models features stainless steel braze-welded plates that are not suitable for chlorinated water. Water flow differential pressure switch.
- Fan: double intake centrifugal fan with external motor and belt transmission with variable-pitch pulleys. Standard set up with vertical air delivery. Available static pressure of 100 Pa.
- Filters: class G3 fitted inside the intake.
- Cooling circuit: separate from the aeraulic circuit and complete with a dryer filter, humidity indicator, high and low gas pressure gauges, load connections, high and low pressure side safety pressure switch, thermostatic expansion valve, liquid receiver (DRESY-DTESY-DEESY version), high pressure safety valve and R410A refrigerant load.
- Electrical panel: set up for 230V-1ph+N-50Hz power supply (mod. 108 single-phase) and 400V-3ph+N-50Hz (mod. 108÷2140 three-phase). It is complete with master switch with door-lock device, circuit breaker switches, power contactors, auxiliary circuit protection fuses, microprocessor electronic control board.

Versions

- DAESY: dehumidifier with 100% pool air side heat exchange.
- DRESY: dehumidifier with 45% pool water side recovery unit.
- DTESY: dehumidifier with 100% pool water side recovery unit.
- DEESY: dehumidifier with 100% pool water side recovery unit and possibility of 100% heat exchange on an external dry-cooler.

Options

- Pre-painted steel roof for outdoor installation.
- Intake opposite side horizontal air delivery.
- Intake side horizontal air delivery.

Factory fitted accessories

- FM M6 - Highly efficient compact delivery air pre-filters. Class (EN 779:2012) M6, glass fibre filtration medium, to replace the standard G3 (only available with VM EC accessory).
- BRA (*) - Integral hot water coil complete with 3-way valve fully managed by micro-processor and 2-way balancing valve on the bypass.
- BA EXT - Technical compartment to house the BA accessory in machines installed outdoors.
- BA RAP (***) - Additional copper/pre-painted aluminium hot water coil.
- BA BRR (***) - Additional copper/copper hot water coil.
- RAP (***) - Copper/pre-painted aluminium condensing coil.
- BRR (***) - Copper/copper condensing coil.
- BE (***) - Supplementary electrical coil managed by micro-processor with step input logic.
- VM100 - Delivery fan with available static pressure of 100 Pa. The accessory differs depending on the composition of the selected machine (D~ESY+BA; D~ESY+DAHR; D~ESY+BA+DAHR). The presence of the DAFC module and/or BE accessory does not modify the available static pressure.
- VM150 - Delivery fan with available static pressure of 150 Pa. The accessory differs depending on the composition of the selected machine (D~ESY; D~ESY+BA; D~ESY+DAHR; D~ESY+BA+DAHR). The presence of the DAFC module and/or BE accessory does not modify the available static pressure.
- VM200 - Delivery fan with available static pressure of 200 Pa. The accessory differs depending on the composition of the selected machine



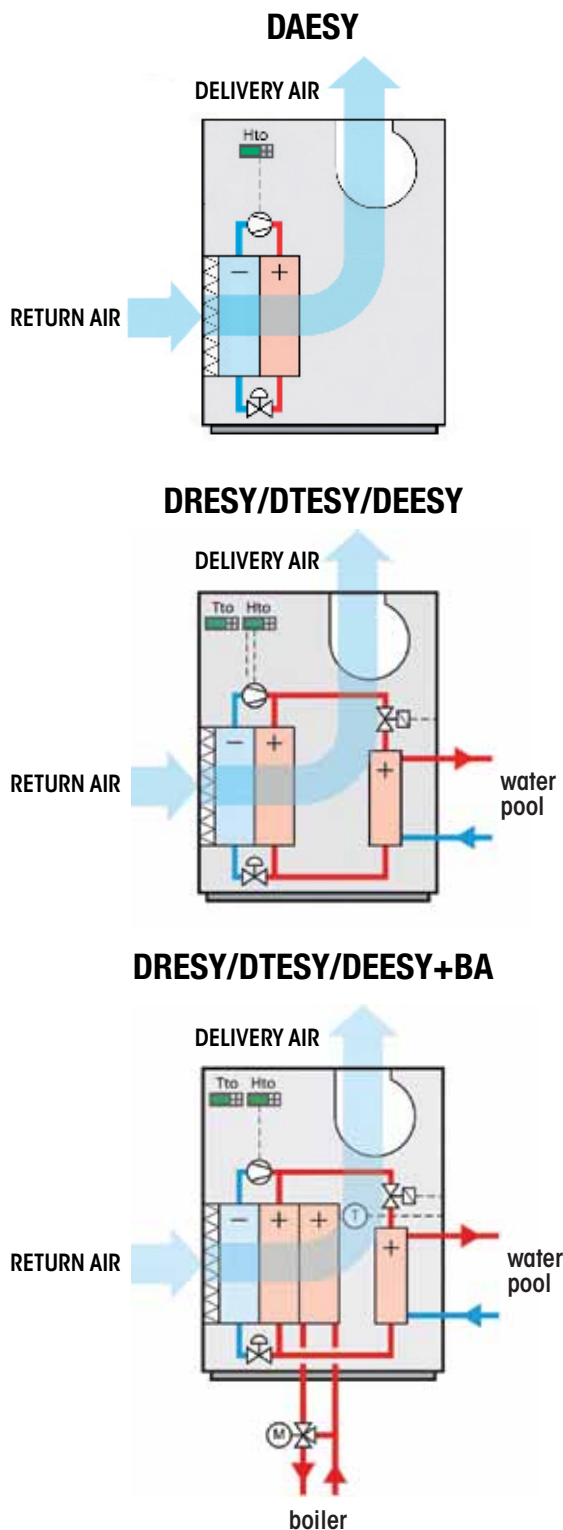
(D~ESY; D~ESY+BA; D~ESY+DAHR; D~ESY+BA+DAHR). The presence of the DAFC module and/or BE accessory does not modify the available static pressure.

- VM EC - Brushless EC type of delivery fan with impeller made of corrosion resistant composite plastic with backward curved wing profile blades.
- Static and dynamic balancing of the entire assembly (motor/impeller), built in accordance with standard DIN ISO 1940. G6.3 balancing grade.
- External rotor motor with electronic commutation (EC), with integrated electronics and protected against overload through active temperature management.
- Programmable relay for reporting faults. Integrated motor protection and motor heating operation.
- Motor with IP54 protection rating, thermal class 155.
- Energy efficiencies higher than the second phase objectives (year 2015) of EU Regulation 327/2011, on the methods of application of European Directive 2009/125/EC.
- Complies with product EMC and EC Standards.
- Motor and fan are fixed to a sturdy and compact structure in galvanised sheet steel including galvanised steel intake bell mouth and integrated pressure probe to measure the air flow.
- The fan is equipped with constant flow control and work point display. Maximum available static pressure (referred to D~ESY + BA+ DAHR configuration)=500Pa.
- VMEPOX - Delivery fan treatment with epoxy paint (not available for VM EC version).
- DSP Base (****) - Double humidity setpoint by digital input.
- DSP Ev (****) - Double humidity setpoint by digital input.

Separately supplied accessories

- KFM F8 - Additional module with highly efficient compact delivery air pre-filters, Class (EN 779:2012) F8, glass fibre filtration medium, (only available with VM EC accessory).
- KUSB Ev - RS485/USB serial converter for Advanced control.
- KRS485 Ev - RTU Modbus protocol RS485 serial interface for Advanced control.
- FTT10 Ev - Lon serial interface (standard electric FTT10) for Advanced control.
- KBE - Serial interface for Bacnet ip protocol.
- KBM - RS485 interface for Bacnet ms/tp protocol.
- KTR Ev - Remote keyboard for Advanced control. The remote keyboard is not available for machines fitted with basic control.
- KRJ1220 - 20 m-long connection cable for KTR.
- KRJ1230 - 30 m-long connection cable for KTR.
- KRJ200 - KTR remote control kit for distances between 50 and 200 m.

(*) Not available together with the BE accessory.
 (**) Not available together with the BA accessory.
 (***) Accessory that requires longer delivery time, please check when ordering.
 (~) Extended to all A, R, T, E versions.



Dry-Pool

DAESY-DRESY-DTESY-DEESY 108÷2140

ADDITIONAL FRESH AIR HANDLING UNIT MODULES

DAFC: FREE-COOLING MODULE.

Construction features

- Fan: dual intake centrifuge with backward impeller blades that are statically and dynamically balanced, taper fitted onto the steel shaft and supported by moveable ball bearings. External motor with IE2 efficiency class, equipped with internal thermal protection, actuated by pulley transmission, which is made of cast iron and has a variable pitch. The motor is installed on a belt-tensioner slide fixed to the fan on a robust double profile galvanised steel structure with high efficiency rubber anti-vibration mountings positioned in between. Air return with horizontal flow. Available static pressure of 100 Pa.
- Structure and frame: thermal cut extruded aluminium alloy profiles with a 40x40mm section 25mm thick double plate panelling (galvanised internally and pre-painted externally) with interposed highly effective and soundproofing injected polyurethane insulation. Interlocking seals in the balloon type profile.
- Motorised dampers: in the aluminium wing profile. The 3 dampers (external air intake, recirculation, expulsion) are sized for 100% capacity and fitted with factory-mounted modulating actuators.

DAFC - Factory fitted accessories

- VR150: return fan with available static pressure of 150 Pa.
- VR200: return fan with available static pressure of 200 Pa.
- VR EC: Brushless EC type of RETURN fan with impeller made of composite corrosion resistant plastic with backward wing profile blades.
- Static and dynamic balancing of the entire assembly (motor-impeller), constructed in accordance with standard DIN ISO 1940. Degree of balancing G6.3.
- External electronic commutation rotor motor (EC) with integrated electronics and protection against overloads due to active temperature management.
- Programmable relay to signal faults. Motor protection and integrated heating motor operation.
- IP54 motor protection rating, thermal class 155.
- Greater energy efficiencies than the target values of the second tier (2015) of Commission Regulation (EU) 327/2011, regarding the application methods of the European Directive 2009/125/EC.
- In compliance with product EMC and EC regulations.
- Motor and fan are mounted on a robust and compact galvanised steel sheet structure with a galvanised steel suction nozzle and integrated pressure probe for measuring the air flow
- The fan is fitted with constant flow control and a display of the working point.
- Maximum available static pressure (referred to the DAHR configuration)=500 Pa
- VREPOX: return fan treatment with epoxy paint (not available for VR EC version).
- EXT: steel pre-painted roof covering for outdoor installation.

DAHR: HEAT RECOVERY MODULE.

Construction features

- Fan: dual intake centrifuge with backward impeller blades that are statically and dynamically balanced, taper fitted onto the steel shaft and supported by moveable ball bearings. External motor equipped with internal thermal protection, actuated by pulley transmission, which is made of cast iron and has a variable pitch. The motor is installed on a belt-tensioner slide fixed to the fan on a robust double profile galvanised steel structure with high efficiency rubber anti-vibration mountings positioned in between. Air return with horizontal flow. Available static pressure of 100 Pa.
- Structure and frame: thermal cut extruded aluminium alloy profiles with a 40x40mm section 25mm thick double plate panelling (galvanised internally and pre-painted externally) with interposed highly effective and soundproofing injected polyurethane insulation. Interlocking seals in the balloon type profile.
- Heat recovery: static horizontal crossed flow with pre-painted aluminium exchanger pack complete with a condensate drain pan and support frame. Nominal performance not less than 55%. 48 thick filter (mounted on the outdoor air inlet) of class G3 corrugated synthetic cell type (UNI EN 779) with 87% average weight arrestance.
- Motorised dampers: in the aluminium wing profile. The 4 dampers (external air intake, recirculation, expulsion, by-pass) are sized for 100% capacity and fitted with factory-mounted modulating actuators.

DAHR - Factory fitted accessories

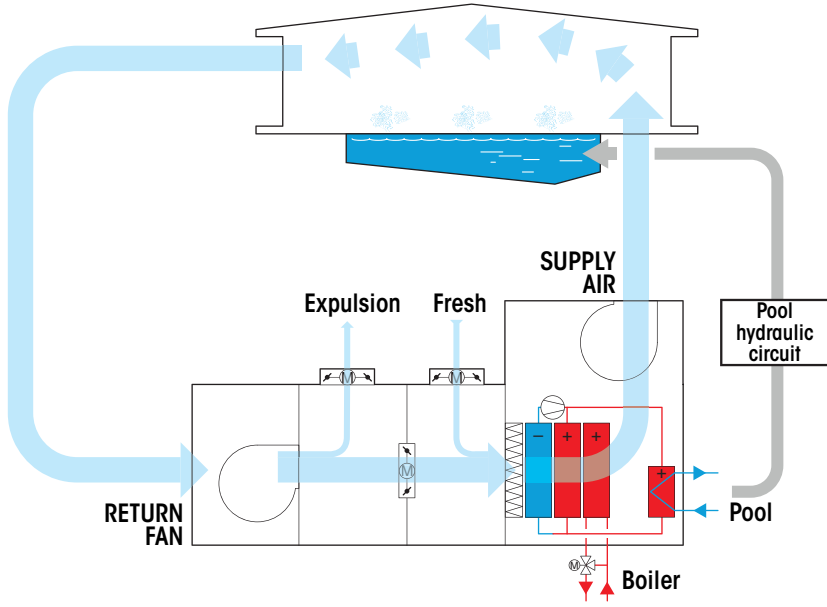
- FAE M6: compact high efficiency outdoor air pre-filters, Class M6 (EN 779:2012), filtering means made of fibreglass, which replaces the standard G3 (only available with VM-R EC accessory).
- VR150: return fan with available static pressure of 150 Pa.
- VR200: return fan with available static pressure of 200 Pa.
- VR EC: Brushless EC type of RETURN fan with impeller made of composite corrosion resistant plastic with backward wing profile blades.
- Static and dynamic balancing of the entire assembly (motor-impeller), constructed in accordance with standard DIN ISO 1940. Degree of balancing G6.3.
- External electronic commutation rotor motor (EC) with integrated electronics and protection against overloads due to active temperature management.
- Programmable relay to signal faults. Motor protection and integrated heating motor operation.
- IP54 motor protection rating, thermal class 155.
- Greater energy efficiencies than the target values of the second tier (2015) of Commission Regulation (EU) 327/2011, regarding the application methods of the European Directive 2009/125/EC.
- In compliance with product EMC and EC regulations.
- Motor and fan are mounted on a robust and compact galvanised steel sheet structure with a galvanised steel suction nozzle and integrated pressure probe for measuring the air flow.

- The fan is fitted with constant flow control and a display of the working point.
- Maximum available static pressure (referred to the DAHR configuration)=500 Pa.
- VREPOX: return fan treatment with epoxy paint (not available for VR EC version).
- EXT: steel pre-painted roof covering for outdoor installation.
- KFR M6: additional module with compact high efficiency return air filters, Class M6 (EN 779:2012), filtering means made of fibreglass (only available with VM-R EC accessory).

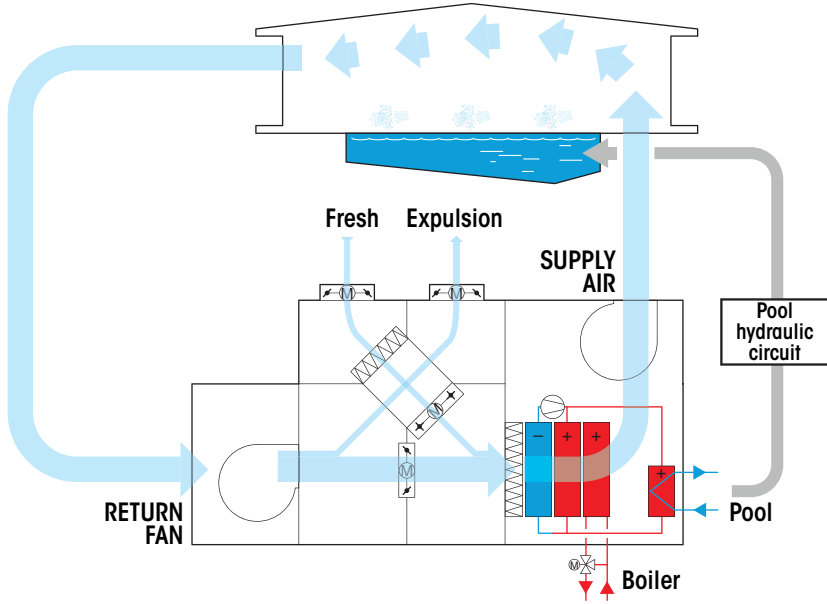
ATTENTION: the additional outdoor air handling modules must be ordered with the dehumidifier as they effect the electronic control. You cannot order the two modules separately.

Examples of combinations between the dehumidifier and the additional module

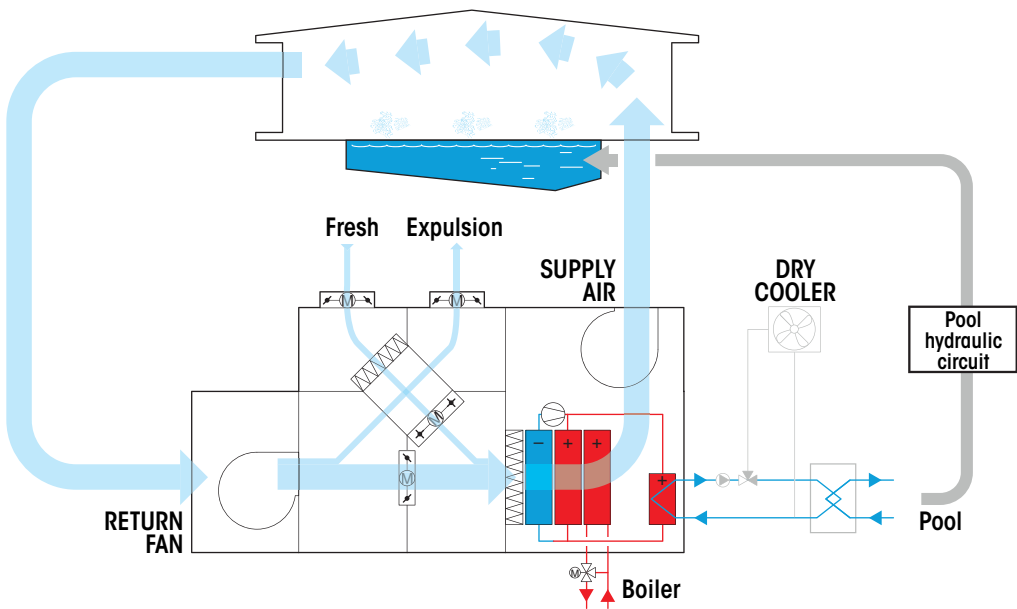
DRESY/DTESY + BA + DAFC



DRESY/DTESY + BA + DAHR



DEESY + BA + DAHR



Dry-Pool

DAESY-DRESY-DTESY-DEESY 108÷2140

DAESY-DRESY-DTESY-DEESY MODEL		108	112	115	118	122	128	131	136
② Dehumidification capacity	l/h	7,7	11,3	13,1	16,5	19,5	25,2	28,0	33,0
② 100% heating capacity transferred to the air	kW	12,6	18,8	23,0	30,1	33,9	43,7	49,6	57,6
② Total absorbed power	kW	3,2	4,9	5,4	7,0	7,4	10,0	11,3	13,1
Scroll/step compressor	no.	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
Fans/Motors	no.	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
⑤ Available static	Pa	100	100	100	100	100	100	100	100
⑤ Max available static EC Version	Pa	500	500	500	500	500	500	500	500
Nominal air flow rate	m³/h	2.200	3.000	3.500	4.500	4.700	6.200	7.200	8.200
DIMENSIONS		108	112	115	118	122	128	131	136
L - Width	mm	790	790	850	850	850	850	850	850
H - Height	mm	1.380	1.380	1.580	1.580	1.890	1.890	1.890	1.890
P - Depth	mm	1.300	1.300	1.600	1.600	1.600	1.600	1.600	2.100
DRESY MODEL		108	112	115	118	122	128	131	136
① Dehumidification capacity	l/h	7,8	11,3	14,5	18,1	21,6	27,4	30,5	36,2
① 45% heating capacity transferred to the water	kW	6,9	10,1	11,4	13,8	15,9	19,6	23,4	27,3
① Total absorbed power	kW	2,6	4,1	4,4	5,6	5,8	8,3	9,4	10,5
DTESY MODEL		108	112	115	118	122	128	131	136
③ Dehumidification capacity	l/h	8,5	12,3	14,5	18,2	21,3	27,4	-	-
③ 100% heating capacity transferred to the water	kW	14,7	20,8	24,8	31,9	35,6	45,4	-	-
③ Total absorbed power	kW	2,7	4,3	4,5	5,8	6,0	8,5	-	-
DEESY MODEL		108	112	115	118	122	128	131	136
④ Dehumidification capacity	l/h	8,3	11,9	14,2	18,2	21,3	26,6	30,1	35,9
④ 100% heating capacity transferred to the water	kW	14,7	19,7	23,7	30,7	35,6	45,4	50,2	58,6
④ Total absorbed power	kW	2,8	4,5	4,8	5,9	6,4	8,9	10,0	11,3

DAESY-DRESY-DTESY-DEESY MODEL		237	242	250	254	262	271	281	294	2111	2126	2140
② Dehumidification capacity	l/h	34,0	38,3	43,6	49,3	56,0	64,8	72,4	83,4	96,4	110,7	126,0
② 100% heating capacity transferred to the air	kW	59,8	67,8	78,1	88,0	100,5	116,4	121,7	143,2	183,3	204,8	231,7
② Total absorbed power	kW	9,0	15,1	18,5	20,1	22,1	27,0	32,1	35,9	44,9	53,7	60,0
Scroll/step compressor	no.	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Fans/Motors	no.	1/1	1/1	1/1	1/1	1/1	1/1	1/1	3/3	3/3	3/3	3/3
⑤ Available static	Pa	100	100	100	100	100	100	100	100	100	100	100
⑤ Max available static EC Version	Pa	500	500	500	500	500	500	500	500	500	500	500
Nominal air flow rate	m³/h	9.000	9.300	11.000	12.400	14.400	16.500	18.000	21.000	22.000	25.000	27.000
DIMENSIONS		237	242	250	254	262	271	281	294	2111	2126	2140
L - Width	mm	850	850	850	1.230	1.230	1.230	1.230	1.230	1.230	1.230	1.230
H - Height	mm	1.890	1.890	1.890	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.300
P - Depth	mm	2.270	2.270	2.270	2.870	2.870	2.870	2.870	3.370	3.870	3.870	3.870
DRESY MODEL		237	242	250	254	262	271	281	294	2111	2126	2140
① Dehumidification capacity	l/h	37,3	42,0	48,7	53,9	61,2	71,0	80,7	93,7	111,1	127,1	144,6
① 45% heating capacity transferred to the water	kW	27,4	31,8	39,0	41,4	46,8	56,1	61,0	69,7	84,2	96,7	109,6
① Total absorbed power	kW	10,8	11,9	14,2	16,0	18,1	21,8	25,2	28,5	34,6	40,9	45,4
DTESY MODEL		237	242	250	254	262	271	281	294	2111	2126	2140
③ Dehumidification capacity	l/h	37,3	41,7	48,3	53,5	-	-	-	-	-	-	-
③ 100% heating capacity transferred to the water	kW	61,5	69,5	81,0	89,6	-	-	-	-	-	-	-
③ Total absorbed power	kW	11,1	12,2	14,6	16,5	-	-	-	-	-	-	-
DEESY MODEL		237	242	250	254	262	271	281	294	2111	2126	2140
④ Dehumidification capacity	l/h	37,3	41,0	48,1	52,4	60,2	70,3	78,8	91,6	109,8	124,8	142,4
④ 100% heating capacity transferred to the water	kW	60,8	68,2	79,8	89,6	101,5	118,0	126,3	147,5	184,7	206,8	232,3
④ Total absorbed power	kW	11,3	12,8	15,3	17,3	19,1	23,1	26,7	30,1	35,8	43,1	48,5

Data at the following conditions:

- ① Transferring heat to the air and the water. Ambient air temperature: 27°C, 65% RH in/out pool water temperature: 26/32°C.
- ② Transferring heat only to the air. Ambient temperature: 27°C, 65% RH
- ③ Transferring heat only to the water. Ambient air temperature: 27°C, 65% RH 26/32°C in/out pool water temperature.
- ④ Transferring heat only to the water of the Dry-Cooler. Ambient air temperature: 27°C, 65% RH 31/37°C in/out water temperature.
- ⑤ Without the BA accessory and/or the DAHR additional module.

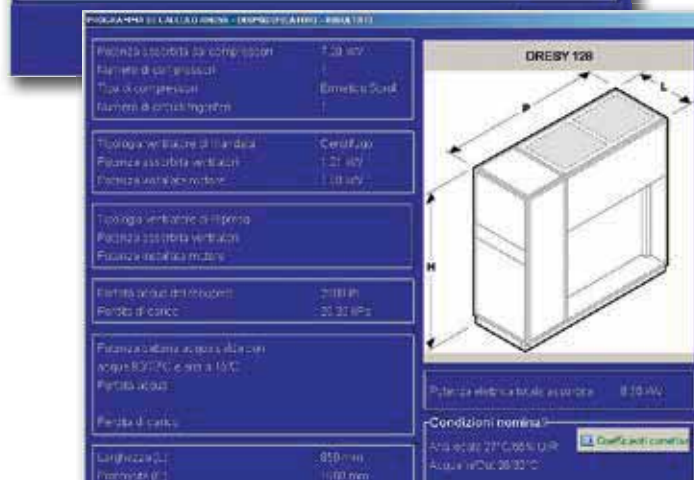
Dry-Pool SELECTION SOFTWARE



FROM THE SYSTEM TO THE DEHUMIDIFIER.

- The air conditioning of a closed pool has very different requirements from those of a typical system for residential or commercial utilities.
- To facilitate the sizing aspect of these systems, Rhoss has designed a selection programme with which the rate of evaporation, generated within these particular environments, can be calculated precisely.
- The calculation tool allows all the basic parameters required to determine the dehumidifier work load to be entered: temperature and relative humidity of the air in the room, surface area of the pool, water temperature and occupancy rate.

- Other elements such as the number of pools and their water volume, the cubic volume of the room, the number of spectators and the presence of special water games are also taken into consideration for a more accurate selection.
- The results of the calculation are necessary references to select the most suitable size of dehumidifier to guarantee comfort and safety for the entire system.
- The user is guided up to pages of the machine configuration where all the DRY-POOL versions (DAESY, DRESY, DTESY, DEESY) can be selected compete with all the options and accessories available in the full range.





INDUSTRY

INDUSTRY



RHOSS INDUSTRY: a team of professionals at the service of the industry.

RHOSS INDUSTRY can develop solutions, products and services for the industrial sectors in which the processing or transformation of a product require precise control of the temperature and humidity parameters with the maximum overall efficiency of the suggested systems. Dimensional aspects, the aspect of logistics, temporary renting services, working alongside RHOSS INDUSTRY technicians during installation and assembly of the products; verification and testing teams and scheduled maintenance packages.

Food industry

Wine industry

Meat processing

Canning industry

Confectionery industry

Poultry industry

Electronics industry

Chemical industry

Pharmaceutical industry

Cleanrooms

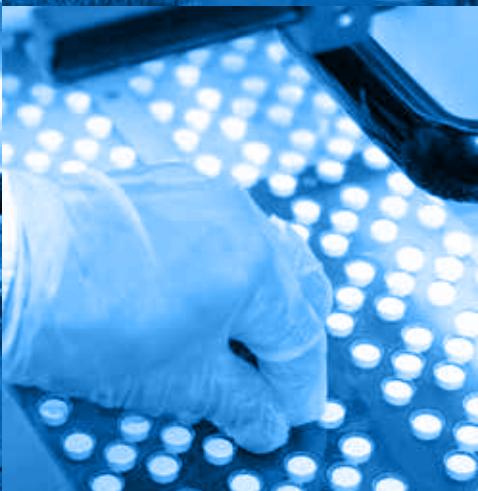
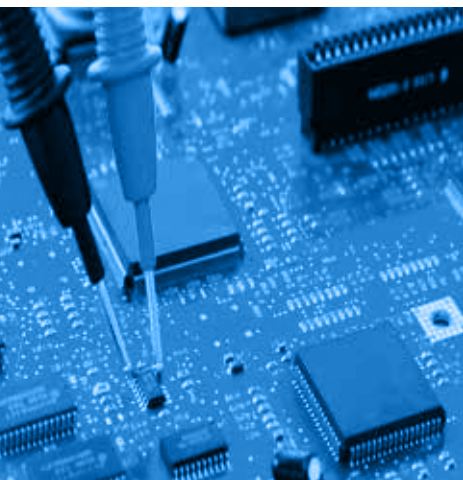
Metrological rooms

Furniture and paints sector

Shipping industry

Hereunder are a few examples of the solutions that Rhoss can propose:

- **Support and assistance when re-assembling the machines on site**
- **Shipment of semi or completely disassembled machines**
- **System tab services via specialised and trained partners**
- **Ad hoc solution design and implementation for industrial applications, such as:**
 - **centralised ozone water treatment systems**
 - **ozone sanitisation systems implemented in industrial processes**
- **Development of air handling units for thermodynamic and chemical industry dehumidification processes**
- **Support in the energy assessments of heat recovery units for industrial applications and their implementation**





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