



Think far*

* AIR CONDITIONING SOLUTIONS FOR YOUR FUTURE



PRODUCT CATALOGUE

2013 - 2014

lennoxemeia.com



Product tested and rated in accordance with Eurovent certification program



Product complying with the European standard



Cooling only unit



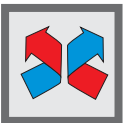
Heat pump unit



Heating only unit



Unit with gas burner only



Heat recovery



Water cooled condenser



Electrical heater



Hermetic scroll compressor
(with R407C or R410A)



R410A refrigerant



R407C refrigerant



Axial condenser fan



Centrifugal fan



Think far*

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LENNOX International

Through its subsidiaries, present on the five continents, LENNOX International (LII) is a leading provider of climate control solutions for the heating, air conditioning, and refrigeration markets around the world. We have built our business on a heritage of integrity and innovation dating back to 1895.

The 12,000 employees worldwide who make up our company are dedicated to providing trusted brands, innovative products, unsurpassed quality, and responsive service.

We share a mission

To conduct our business to the highest standards of integrity in what we say and do, the products we make, the services we provide, the way we act, and the way we treat others. Foremost to build a company in which people have a sense of pride and commitment.

We are proud of our values made of trust, discussion, exchanges and sustainability so, we work hard every day to enhance the vitality and success of each client with very clear commitments: customer satisfaction, expertise in our trades, intelligence, a global presence, sustainable performance, investment of our employees.



We have a vision

Building a leading HVACR EMEIA* company where people are proud and committed to providing sustainable quality solutions that satisfy customer needs giving an attractive return to our shareholders.



* :
HVAC = Heating ventilation airconditioning and refrigeration
EMEIA = Europe Middle-East India Africa zone

Loyalty is based around true partnership

Your right Partner

LENNOX brings added-value to major players on its targeted markets. Most of them have been our customers for 10 years and more.

- Understand **Customer perception** far beyond product or project
 - Key account organization
 - Specialized application sales force
- Provide the customer with **time and expertise**
 - Highly trained sales engineers
 - Wide network of engineers in Europe
- Make sure that the whole organization is built around **customer satisfaction**
 - Strong customer service
 - Quality based organization (ISO 9001, STEP+ program)
 - Long-term satisfied relationships rather than «one shot» orders
 - Best TCO (Total Cost of Ownership) offered to customers
- Provide **solutions which best fit** customers needs
 - “Listen to the customer” to develop products and anticipate its needs
 - Recognized «Research and Development Excellence»
- Be a **responsible organization**
 - LENNOX international is environmentally focused (ISO 14001 certified factory in Dijon)
 - LENNOX International is an equal opportunity employer.



Quality and Innovation

LENNOX is allocating 3% of **its turnover** on Research and Development in Europe. Together with the industry recognised R&D power of LENNOX USA, LENNOX wishes to be seen as the leading player in HVAC innovation.

Every year LENNOX applies for patents, we also work closely with our partner suppliers on common research programmes.

HVAC & R Laboratory facilities

MIONS laboratory facility has been designed to handle tests for both medium to high capacity HVAC products and Refrigeration equipment.

On HVAC air side, a 250 kW test chamber is testing air cooled and water cooled rooftops handling up to 40000 m³/h from -15°C to 50°C.

This is made of a large outdoor condition room receiving a rooftop unit connected with a wide indoor condition room, the link being made of an AMCA tunnel.

Those 2 chambers are since 2012 qualified for welcoming Eurovent engineers in order to achieve yearly rooftop program above 85 kW.

Beside those chambers, the team is also trained to run and test gas heating products used in rooftop.

On HVAC water side, a 450 kW test chamber is receiving cooling only and reversible chillers, whether it would be air cooled or water cooled.

In a second chamber, a ground source of 180 m³/h of constant temperature well water is allowing qualification and life test up to 1000 kW.

For refrigeration units, several tools are dedicated for evaporators & condenser products.

First, an AMCA tunnel is focusing on axial fan performance qualification.

Then a coil fin performance tunnel is a key tool to evaluate the coils behavior to cool or heat the air.

Life test equipment is also installed to simulate accelerated cycles on product.

Various new refrigerants are under test in dedicated compressorized racks including low GWP fluids like CO₂ or R407F.

BURGOS laboratory facility (Spain) is focusing on small to medium HVAC products tests.

2 set of 2 test chambers are receiving air cooled chiller and rooftop from 20 to 200 kW under condition from -10°C to 50°C.

An AMCA tunnel is allowing to test rooftop and package air side product up to 20000 m³/h.

Control platforms qualification and accelerated lifetest for components used in HVAC product are also key competence of this facility.



The European factories in the LENNOX Group are ISO 9001 certified. Our Longvic factory is also ISO 14001 certified since March 2007. The manufactured units comply with EEC regulations, and each year an approved organism carries out a specific audit to check conformity with pressure equipment directives.

As of today, the majority of our products have Eurovent certification. With this program, we remain resolutely committed to reinforcing integrity and transparency in our commercial relationship with our customers.



Protect the planet

Lennox is proactive in producing environment friendly machines in order to protect the planet. Our production tends to:

- **Limit toxic substances, use recyclable materials and reduce components :**

As for an example, our NEOSYS chiller uses HFC R410A cooling fluid which is an azeotropic mixture that does not damage the ozone layer. The micro channel and plate heat exchangers reduce the refrigerant charge by 40% thereby limiting the direct impact due to accidental loss of refrigerant (irregular loss associated with mechanical breakage or end of life cycle).

Made entirely from aluminium, micro channel heat exchangers can be easily recycled and lead to a reduction in material in the order of 30% compared with traditional heat exchangers.

- **Reduce energy consumption**

The impact of our machines on global warming is mainly due to the primary energy used for their operation. Our products are designed to achieve optimised energy performance throughout the year and limits the indirect release of CO₂ associated with the consumption of electricity. The use of variable speed fans, the eDrive™ variable speed pump, the high performance of our air/water heat pump have earned Certificates of Energy Reduction (BAT-TH-12, BAT-TH-14 – France only).

Lennox hardly works on reducing energy through innovative solutions such as eRecovery, a special module that transforms the calories extracted from the refrigeration systems in order to use them through an air conditioning system (like a rooftop packaged unit) that will warm up the whole building. Instead of losing the calories in the air they are used to warm up the buildings. 90% of the heat needs of a commercial surface can be provided by the use of eRecovery.

By reducing energy consumption, we also reduce the energy bill and limit emissions of CO₂. Refer to TEWI to measure the global warming impact (Total Equivalent Warming Impact = direct loss of refrigerant and indirect effect of CO₂ emissions from power consumption).

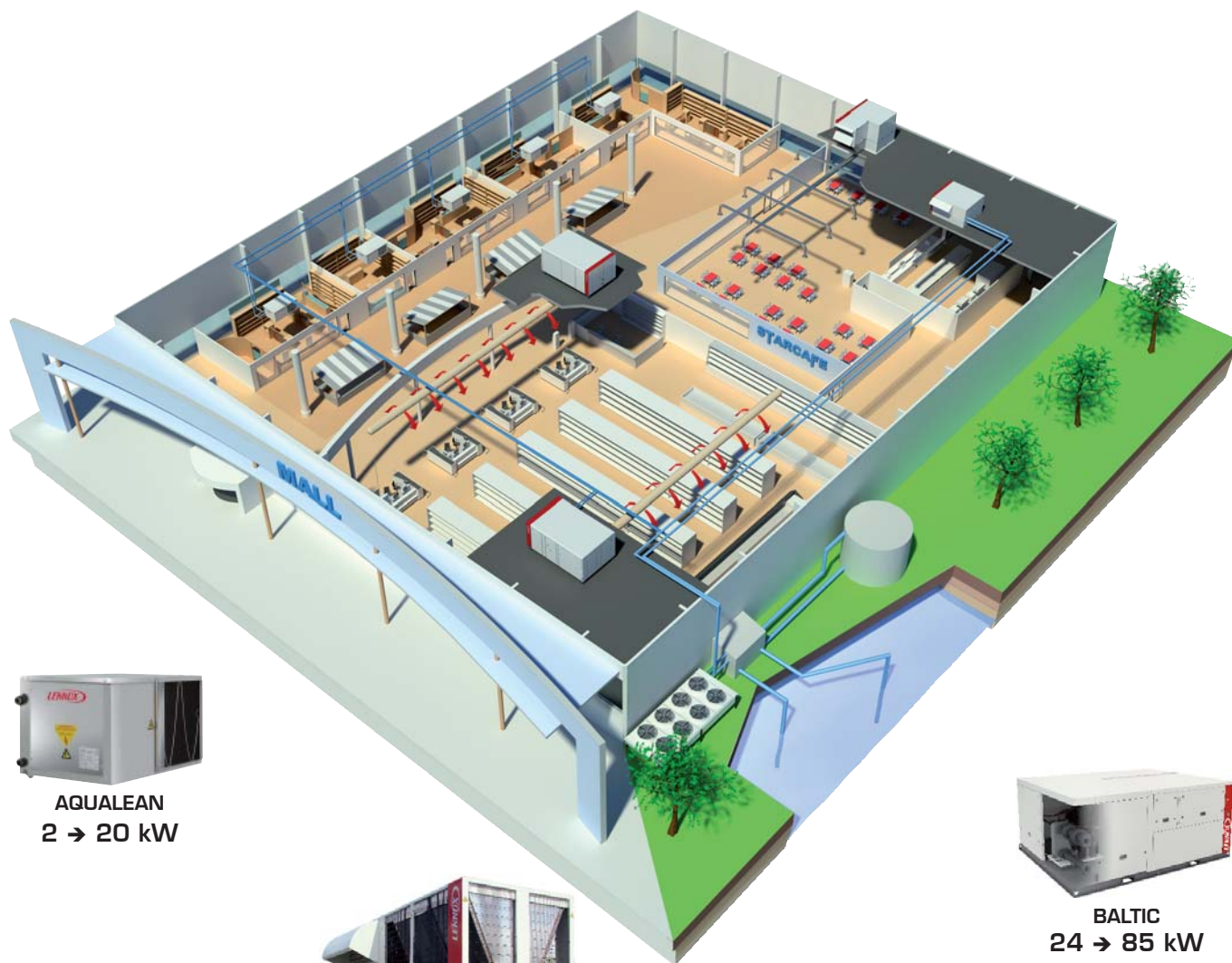
- **Extend the life cycle, ease repair and end of life recycling:**

The NEOSYS chiller for example is fitted with multiple scroll of very high reliability, “zero maintenance” compressors. In the event of a failure or the end of the life cycle of a compressor, partial replacement of one of the scroll compressors limits the impact of waste material. The micro- channel heat exchangers with very high corrosion resistance and fan motors fitted with ceramic bearings triple the life cycle of these components vs. traditional components.

All those technologies developed by our product development department are environmentally friendly and support a day to day work of each Lennox employee to respect the planet.



Leadership in Retail Solutions



AQUALEAN
2 → 20 kW



FLEXY
85 → 234 kW



BALTIC
24 → 85 kW



Ikea
(Portugal)



Weldom
(France)



Asda
(UK)



Géant Casino
(France)



Competences in Light Commercial Solutions



BALTIC
24 → 85 kW



ECOLEAN
9 → 200 kW



FAN COIL UNITS
1 → 61 kW



FLATAIR
10 → 28 kW



COMPACTAIR
20 → 100 kW



AIRCOOLAIR
19 → 134 kW



Zara
(Spain)



Esso
(Germany)

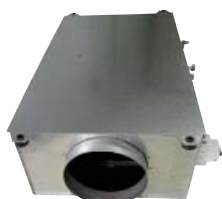


Quick
(France)



Maxi Dia
(Spain)

Innovations for applied solutions



ARIA
1,2 → 7,2 kW



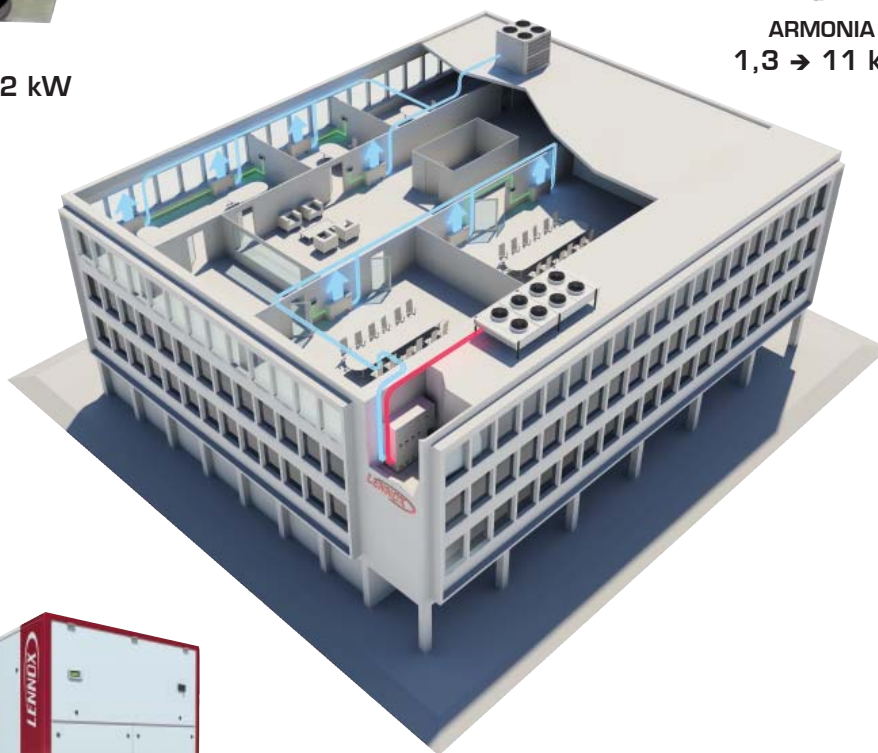
ARMONIA
1,3 → 11 kW



COANDAIR
0,8 → 5,1 kW



FAN COIL UNITS
1 → 61 kW



CHILLERS & HEAT PUMPS
9 → 1000 kW



MINIAIR & MINIAIR +
2 → 44 kW



CLEANAIR LX
1 000 → 100 000 m³/h



Torre Mutua
(Spain)



Holmes Place
(Portugal)



Tour de Lille
(France)



RBS
(UK)



Technopark
(Russia)



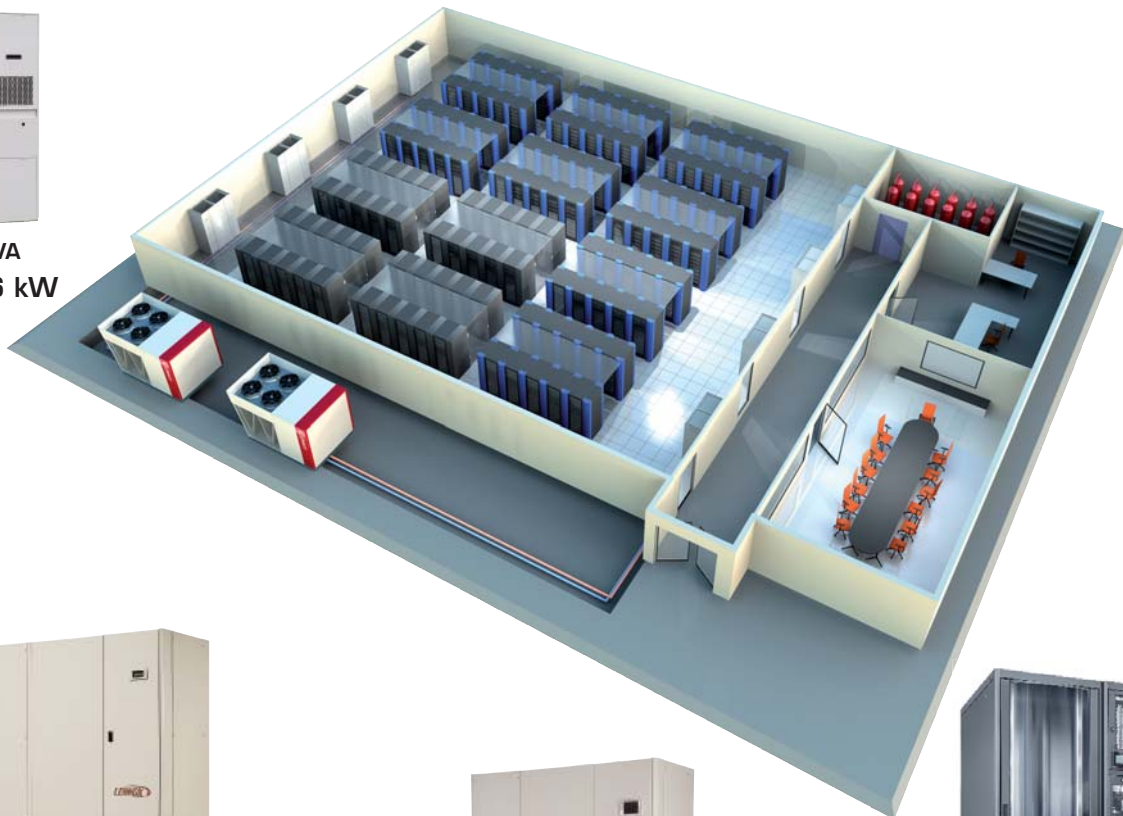
Monsanto
(Portugal)



Know-how in Tele/Data communication solutions



@DNOVA
2,5 → 26 kW



INNOVA
CHILLED WATER
8 → 128 kW



INNOVA
DIRECT EXPANSION
6 → 128 kW



R@CKCOOLAIR
3 → 51 kW



Training Center

To enhance your refrigeration and air conditioning skills, in an ever changing technological and regulatory environment



What we can offer

To increase your competitive advantage in an ever changing technological and regulatory environment, for refrigeration and air conditioning, LENNOX offers you a European training center:

To :

- improve your operational knowledge
- optimise your professional activities
- become more competitive.

Modern and innovative, situated at the heart of one of our European manufacturing site in France, this complex benefits from all the experience and technological resources you would expect of an international manufacturer.

The courses

LENNOX University adapts itself to your requirements and trains you in the operation of **our cooling and air conditioning systems to optimise energy management with greater respect for the environment:**

- Regulation and control of air conditioning equipment
- Commissioning, management and maintenance of machinery
- Initiation and improvement in cooling technologies
- Initiation and improvement in air conditioning
- Building Management System
- Specification and rating of air conditioning plant
- Handling, retrofit of refrigerants



LENNOX University offers practical experience on a complete range of air conditioning equipment, permanently installed at the disposition of students in test stations, exclusively dedicated to training.

LENNOX University also offers specially **tailored courses**; we will find a solution suited to your specific requirements : content, date or place at your course.

The courses combine alternate theoretical and practical modules and are sanctioned by a LENNOX certificate, the mark of quality for your customer and enable you to work on our equipment under the best conditions.

The equipments

- 500 m² dedicated to training
- An audiovisual room to follow the theory courses in comfort
- Roof top and chiller test stations
- Real life test benches for unit products (Split, ducted, cabinet, etc.)
- "System" workshops combining several types of unit.
- Simulator for the programmed controllers in our range
- A changing room
- A relaxation room for refreshments and meals



The instructors

- Experienced
- In permanent contact with real situations on the ground

E-learning

- E-learning is an ideal solution if your busy lifestyle does not allow you to attend our LENNOX University trainings.
- Our student-centred and flexible online subjects offer the same rigorous learning requirements as our traditional courses.



Partner companies who followed the courses:

- | | | |
|-------------|-------------------|-------------------|
| • Alcatel | • City Facilities | • Johnson Control |
| • Auchan | • Cofely | • Jtek |
| • Axima | • Dalkia | • Mc Donald's |
| • Carrefour | • Elyo Suez | • Veolia |
| • Cegelec | • Ikea | • and more ... |



Packaged Air units





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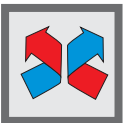
Heat pump unit



Heating only unit



Unit with gas burner only



Heat recovery



Water cooled condenser



Electrical heater



Hermetic scroll compressor
(with R407C or R410A)



R410A refrigerant



R407C refrigerant



Axial condenser fan



Centrifugal fan



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Due to Lennox's ongoing commitment to quality, the specifications, ratings and dimensions are subject to change without notice and without incurring liability. Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury. Installation and service must be performed by a qualified installer and servicing agency



PCA-GL-0613-E
lennoxemeia.com

- Horizontal water cooled packaged air conditioners

AQUALEAN

2 - 20 kW	14
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- Horizontal packaged air conditioners

FLATAIR

10 - 28 kW	16
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- Vertical packaged air conditioners

COMPACTAIR

20 - 100 kW	20
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- Large ducted split / dual split units

AIRCOOLAIR

19 - 134 kW	26
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AQUALEAN

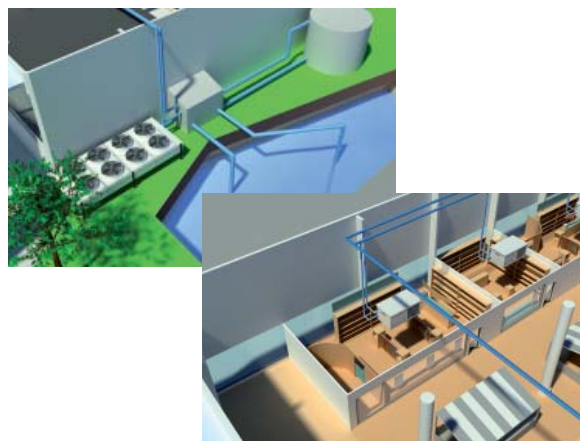
Horizontal water cooled packaged air conditioners

Main applications

- Open-plan and cellular office buildings
- Hotel rooms
- Shopping areas
- Buildings with water loop

Why this choice?

- High efficiency system
- Compact solution and reduced height
- Ceiling installation : floor space optimization
- Quiet operation: variable speed fan motor
- Zoning requirements in cellular office buildings
- Low energy consumption : airflow rate variation
- Independent consumption and maintenance in buildings
- Wide choice of communication interfaces (ModBus®, LonWORKS® and BACnet®)



General description

AQUALEAN is a water source heat pump packaged unit designed to provide high efficiency comfort air conditioning and ventilation for shopping areas and open-plan or cellular offices of large buildings. Each unit answers to the heating or cooling load of the individual zone it serves to ensure an excellent comfort level for occupants, better control of energy use for buildings owners and lower seasonal operating cost.

It is generally connected to a closed water loop (boiler/cooling tower or geothermal application) or to an open ground water loop.

This water source heat pump is one of the most efficient, environmentally friendly system available for cooling and heating :

- High efficiency system thanks to scroll compressor operating with chlorine free and zero Ozone Depletion Potential R410A refrigerant
- Compact self-supporting casing with very short height to lower dropped ceilings dimension
- eDrive variable speed direct transmission ventilation system to save energy on ventilation-driven costs
- Lennox's advance **CLIMATIC** controller designed to improve energy efficiency and reliability. Accurate operation is managed by electronic expansion valve, pressure transducers and temperature sensors. This controller integrates master slave capability and a wide choice of communication interfaces
- Horizontal air configuration

AQUALEAN units are available in the following versions:

- Cooling only
- Heat pump (cooling and heating)
- Horizontal air configuration

Main components

- R410A compressor
- Advanced microprocessor control
- Electronic expansion valve
- Coaxial water/refrigerant heat exchanger (sizes O2/O3)
- Brazed water/refrigerant heat exchanger
- Copper-Aluminium air/refrigerant heat exchanger
- MO fire-class insulation
- G2 filter
- Galvanized steel casing

Options

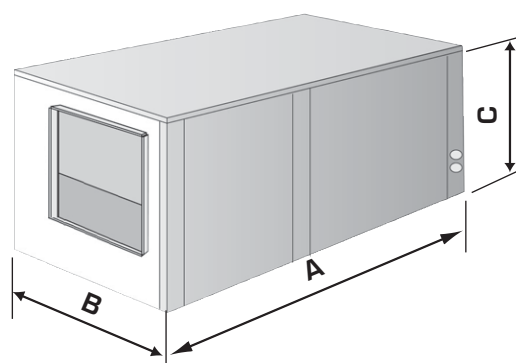
- BMS possibility : Master/slave, Modbus, BACnet, LonWorks
- Auxiliary electric heater: 2 to 13 kW
- Flow switch
- Water filter
- Pressostatic valve (AWC only)
- Low noise compressor jacket
- Main switch
- Phase inversion protection
- Return sensor
- Airflow configuration

General data

AWC/AWH		02	03	07	08	10	12	15	18	20
Cooling mode - AWC										
Gross cooling capacity ⁽¹⁾	kW	2,2	2,75	7,0	8,3	10,6	11,6	14,9	17,5	19,5
Net cooling capacity ⁽¹⁾		2,2	2,7	6,8	8,0	10,2	11,2	14,5	17,0	19,0
Absorbed power		0,5	0,6	1,7	2,1	2,6	2,8	3,4	4,2	4,8
Gross EER		4,6	5,0	4,8	4,7	4,8	4,7	5,0	4,8	4,6
Net EER		4,2	4,2	4,0	3,9	4,0	4,0	4,3	4,1	4,0
Heating mode - AWH										
Net heating capacity ⁽²⁾	kW	2,9	3,3	8	9,5	12,3	13,5	17	19,5	22
Absorbed power		0,63	0,72	2,1	2,5	3,2	3,6	4,6	5,1	6,0
Gross COP		4,9	5,4	4,1	4,1	4,3	4,1	3,9	4,1	3,9
Net COP		4,5	4,6	3,8	3,8	3,9	3,8	3,7	3,8	3,6
Auxiliary heating										
Electric heater capacity S/M/H ⁽³⁾	kW	N/A	N/A	2/3/5	2/3/5	3/6/9	3/6/10	3/6/11	5/9/12	5/9/13
Refrigerant circuit										
Number of compressors/Number of circuits		1/1								
Refrigerant charge per circuit	Kg	0,575	0,65	1,25	1,35	2,2	2,3	2,5	2,8	3
Maxi. outdoor temperature Indoor temperature 27°C DB/19°C WB		40 °C								
Water cooled condenser										
Nominal water flow	l/h	495	560	1390	1650	2100	2320	2980	3480	3960
Water pressure drop Cooling mode	kPa	30	29	25	30	40	48	35	45	55
Water pressure drop Heating mode		29	26	23	28	38	46	33	43	53
Ventilation										
Nominal airflow rate	m³/h	430	575	1200	1500	1900	2100	2350	2800	3100
Minimum airflow		275	350	960	1250	1520	1680	1750	2240	2500
Maximum airflow		440	650	1400	1600	2300	2400	2600	3400	3500
Nominal available static pressure	Pa	50	50	50	50	50	50	50	70	70
Available static pressure Minimum/Maximum		25/90	25/110	25/130	25/130	25/140	25/140	25/140	50/140	50/140
Acoustic data										
Supply ductwork sound power ⁽⁴⁾ Standard unit	dB(A)	46/48	52/54	62/64	66/69	65/68	67/70	69/72	66/70	69/73

- (1) Air inlet temperature : 27°C DB/19°C WB - Water inlet temperature : 30°C at nominal water flow. (3) Available as an option at nominal water flow rate.
S = Standard heat - M = Medium heat - H = High heat
- (2) Air inlet temperature : 20°C DB - Water inlet temperature : 20°C at nominal water flow. (4) At nominal water flow

Dimensions and weights



AWC/AWH		02	03	07	08	10	12	15	18	20
A	mm	1000	1000	792	792	1083	1083	1083	1503	1503
B		500	500	492	492	623	623	623	703	703
C		230	230	440	440	490	490	490	530	530
Weight - Standard unit	kg	50	55	77	80	105	110	120	160	165

10 → 28 kW

Horizontal packaged air conditioners



Main applications

- Stores in urban area
- Small offices
- Bank offices
- Restaurant & Bars

Why this choice?

- Preserve architecture: 100% indoor unit
- Compact & monobloc: all components centralized
- Freecooling operations in mid seasons
- Fresh air management

General description

FLATAIR is packaged HVAC unit: it can manage the cooling, heating and ventilation of small to medium premise. The design of the unit is made to be installed 100% indoor and particularly **fits in city centers, where architecture protection is required**. Overall, it doesn't require any floor space, being a ceiling hanged installation. It exists in the following version:

- Cooling only
- Heat pump
- Monobloc
- Split

Main components

- R410a scroll compressor
- Ductable supply and condenser
- Centrifugal fans at condenser up to 160 Pa
- Centrifugal supply fan
- Remote thermostat with ambient sensor
- Galvanized steel sheet casing
- Voltage 230V/1 phase/50 Hz or 400V/3 phases/50 Hz



Options

Auxiliary heating

- Electrical heater (1 stage): add an auxiliary heating stage to heat pump or cooling units : Standard, Medium, High.

Indoor air quality

- Freecooling equipment: energy saving solution that uses outdoor air for cooling when outdoor air temperature is low. The freecooling equipment also allows the amount of fresh air to be set manually.

Security & extended lifecycle

- Three phase protection: electrical circuit protection to avoid wrong wiring of 400 volts power supply. This protects the compressor on 1st start.
- Main switch: the main switch is a safety option: : it prevents service operations from being performed on the **FLATAIR** electrical panel when it is operating.

Comfort and energy efficiency accessories

- Remote ambient sensors / remote duct sensor: this option can be chosen when the the control display is installed in a room with no air conditioning.
- Winter cooling operation down to 0°C: this option makes cooling operations available with outdoor temperature down to 0°C.

General data

FMC/FMH		10	10	12	15	20	25	30
Cooling mode								
Gross cooling capacity ⁽¹⁾	kW	10,1	12,5	15,8	20,5	24,8	28,3	
Absorbed power	kW	3,31	4,81	5,49	7,56	9,22	11,3	
Gross eer		3,05	2,60	2,88	2,71	2,69	2,50	
Heating mode								
Net heating capacity ⁽²⁾	kW	10,0	12,5	15,5	20,5	25,0	27,9	
Absorbed power	kW	3,21	4,46	5,44	6,83	8,68	9,96	
Net cop		3,12	2,80	2,85	3,00	2,88	2,80	
Electrical data								
Voltage	V/Ph/Hz	230/1/50	400/3/50					
Refrigerant circuit								
Number of circuits		1						
Number of compressors		1						
Refrigerant charge Cooling only	kg	2,14	2,57	3,55	4,46	5,38	6,15	
Refrigerant charge Heat pump		2,5	2,93	4,0	4,9	6,3	7,0	

AIR TREATMENT SECTION FIX/FIC/FIH		10	10	12	15	20	25	30
Capacity								
Absorbed power	kW	0,4			0,8	1	1,3	
Electrical data								
Voltage	V/Ph/Hz	230/1/50			400/3/50			
Ventilation								
Minimum airflow	m³/h	1500	1650	2410	3090	3455	3695	
Maximum airflow		2350	2300	3575	4850	5750	5500	
Maximum available static pressure	Pa	120	110	160	200	240	180	
Acoustic data								
Sound power level ⁽³⁾	dB(A)	72			76	80	84	83

(1) Indoor air: 27°C DB, 19°C WB - Outdoor air: 35°C DB, 24°C WB

(2) Indoor air: 20°C DB, 12°C WB - Outdoor air: 7°C DB, 6°C WB

(3) EUROVENT conditions data

General data

CONDENSING UNIT FSC/FSH		10	10	12	15	20	25	30
Absorbed power								
Absorbed power ⁽¹⁾	kW	5,1	4,9	6,1	7,0	9,4	11,3	13
Electrical data								
Voltage	V/Ph/Hz	230/1/50	400/3/50					
Ventilation								
Minimum airflow	m³/h	2350	2400	3740	4095	4760	5000	
Maximum airflow		3500	3400	4500	5650	6000	5850	
Available static pressure	Pa	100	90	120	150	160	100	
Acoustic data								
Sound power level ⁽³⁾	dB(A)	77	82	86	81	81		
Operating limits								
Maximum indoor temperature Cooling only/Heat pump	°C	32/27						
Minimum indoor temperature Cooling only/Heat pump		21/15						
Maximum outdoor temperature Cooling only/Heat pump		45/25	45/25	43/23	45/25	44/25	44/23	41/25
Minimum outdoor temperature Cooling only/Heat pump		Standard unit : 15°C [-15°C with low ambient kit] / -12°C						

(1) Indoor air: 27°C DB, 19°C WB - Outdoor air: 35°C DB, 24°C WB

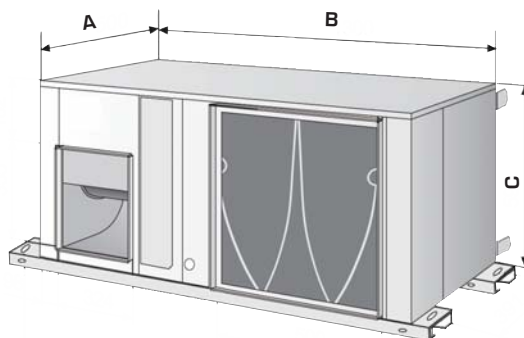
(2) Indoor air: 20°C DB, 12°C WB - Outdoor air: 7°C DB, 6°C WB

(3) EUROVENT conditions data

Dimensions and weights

FIX/FIC/FIH

Air treatment section

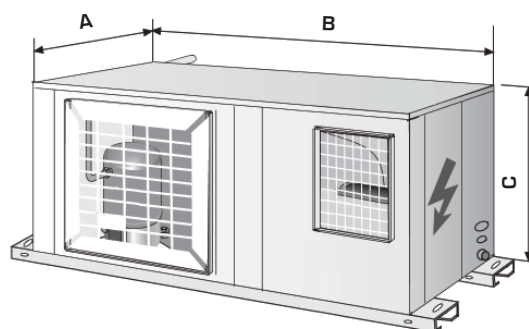


FIX/FIC/FIH		10	12	15	20	25	30
A	mm	430	430	500	620	775	775
B		1250	1250	1300	1450	1500	1500
C		500	500	595	595	645	645
Weight	kg	58	58	85	109	121	131

Dimensions and weights

FSC/FSH

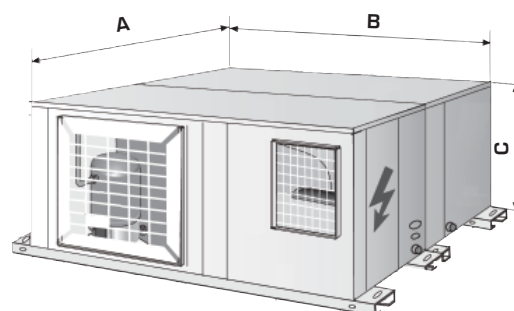
Condensing unit



FSC/FSH		10	12	15	20	25	30
A	mm	820	820	830	900	1025	1025
B		1250	1250	1300	1450	1500	1500
C		500	500	595	595	645	645
Weight	kg	117	121	170	164	207	213

FMC/FMH

Monobloc unit



FMC/FMH		10	12	15	20	25	30
A	mm	1250	1250	1330	1520	1800	1800
B		1250	1250	1300	1450	1500	1500
C		500	500	595	595	645	645
Weight	kg	175	179	255	273	327	343

20 → 100 kW

Vertical packaged air conditioner

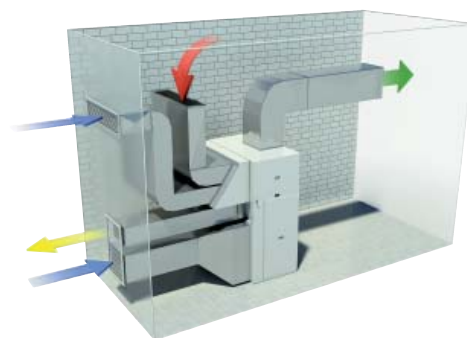


Main applications

- Retail premises in urban area
- Shopping mall
- Industry comfort

Why this choice?

- Preserve architecture: 100% indoor unit
- Very compact unit
- Free cooling/heating operation & fresh air management
- Low noise
- Flexibility
- Best efficiency on the market
- eDrive direct transmission variable speed fan



General description

COMPACTAIR can be used for medium to large commercial cooling and heating applications in urban building, where architectural protection is mandatory and roof access difficult. Made for indoor installation.

It exists in the following versions:

- Monobloc
- Split
- Cooling only & heat pump
- Economizer with multiple airflow configuration

Main components

- Vertical construction with small footprint
- Centrifugal fans in supply section with external static pressure up to 830 Pa (with optional eDrive supply fan)
- Centrifugal fans in outdoor section
- Scroll compressors
- Galvanized sheet steel casing
- Filtration G4 and G4/F7
- Voltage 400 V/3 Ph + N/50 Hz
- RAL 9002 white colour



COMPACTAIR with free-cooling option

CLIMATIC Controller

- Full text fault display and history.
- Many settings and readings available for customization and diagnostic.
- Advanced control features: advanced compressor management, dynamic defrost, intelligent fresh air management, automatic summer/winter change-over, variable speed drive fan management.
- Extended communication capability: master/slave, ModBus, BACnet, LonWorks, in RS485 or TCP-IP.
- Compatible with Lennox monitoring and supervision solutions.

CLIMATIC general description

This new generation of microprocessor based control, **CLIMATIC** equips the **COMPACTAIR** range. It is designed to provide best energy efficiency throughout the unit life cycle while ensuring reliable and consistent operation.

CLIMATIC integrates innovative PID control that will guaranty better temperature accuracy, while saving energy. It also ensures compressor running time optimisation.

It manages security algorithms and displays fault signals. It has extended scheduling capability with the possibility to adjust many set points over the various time zones. Up to 7 time zones per day and up to 4 different working mode for these time zones.

It is user friendly through a wide choice of displays and communication interfaces while providing flexibility with the ability to control multiple units on a single job site.

CLIMATIC standard features

- **Step of heating priorities:** Allows the user to choose which heating element should come first.
- **Automatic summer winter change:** **CLIMATIC** integrates an automatic time switch from winter to summer time.
- **Noise reduction feature:** The control will reduce the capacity of the unit during unoccupied zone to limit outdoor noise at night when capacity needed is lower and when noise matters more.
- **Staged start feature:** If there is a power shortage, units will not restart at the same.
- **Morning anticipation and dynamic set point:** The unit can be programmed to anticipate the morning cooling or heating needs depending on the outdoor temperature.
- **Dynamic set point** can be used in summer to offset the ambient temperature set point according to the outdoor temperature.
- **Dynamic defrost:** : it is a standard feature of all Lennox heat pumps. It limits the number and the duration of the defrost cycles on winter to maximize COP.

CLIMATIC main options

- **Advanced control pack:** Thanks to specific algorithm and sensors, this pack provides two advanced control features: enthalpy control on economiser and humidity control.
- **Service display:** This plug and play service display and controller allows service personal to set up to read and modify all unit parameters: Unit settings, operating time and number of compressor starts, low and high pressure reading, airflow rate of supply fan, and read the history of last 32 faults....
- **Comfort display:** This is a remote controller for non-technical customer. It was designed to aesthetically fit in the room and be very easy to use. With this display the customer can modify temperature set points.
- **Dry control board:** This option was developed for any customer who wants to take over the control of the unit using Digital or analogue input signal. It provides various logical dry contact inputs to be able to take over the control of the unit.

Communication interfaces and supervision

- **Standard master / slave link:** Master/slave or cascade control is a standard feature. It can be used to connect up to 8 **COMPACTAIR**. The units can then be programmed to optimize efficiency and improve reliability.
- **Communication Interface / ModBus Interface:** ModBus interface is required to connect the unit to a BMS using «ModBus protocol». No other hardware than this board is required to have ModBus communication. One board required per unit. The ModBus interface is available in two versions to be connected with RS485 or TCP/IP depending on site requirements
- **LonWorks® interface:** This board is a LonWorks® interface, needed for any BMS with "Lon protocol" and RS485 connection to communicate with the **COMPACTAIR** units. No other hardware than this board is required to have LonWorks® dialog. One board required per unit.
- **BACnet® interface:** The BACnet® interface is required to connect the unit to a BMS using BACnet® protocol. One board required per unit. The BACnet® interface is available in two versions to be connected with RS485 or TCP/IP depending on site requirements.
- **ADALINK II:** It is Lennox's simplest solution for HVAC installation supervision to better control the system and improve reliability and energy efficiency. One ADALINK II can control up to 16 Lennox units on the same site (liquid chillers, rooftop or any other unit using **CLIMATIC** controller). It displays a site picture with the status of each unit and allows the user to change set points, access alarm history and plot charts. It is the ideal tool to save time and money on maintenance with an expert mode giving access to all the parameters and set point of the unit.

General data

COMPACTAIR		20S	25S	30S	35S	40S	45D	55D	70D	85D	100D
Monobloc	CMC/CMH	A									NA
Split	CSC/CSH - CIC/CIH	A									

A : Available / NA : Non available

COMPACTAIR				20S	25S	30S	35S	40S	45D	55D	70D	85D	100D
Cooling mode - CMC/ CSC + CIC - CMH / CSH + CIH													
Gross cooling capacity ⁽¹⁾		kW	19,6	23,7	27,9	36,0	41,9	45,7	57,8	72,4	87,0	105,0	
Net cooling capacity ⁽¹⁾			19,2	23,0	27,0	35,0	40,5	43,5	56,0	69,5	83,0	101,0	
Net absorbed power ⁽¹⁾			7,3	9,4	11,0	13,7	15,9	18,1	21,5	27,8	32,5	40,4	
Gross EER ⁽¹⁾			2,85	2,72	2,74	2,83	2,90	2,86	2,92	2,90	3,05	2,87	
Net EER ⁽¹⁾			2,65	2,45	2,45	2,55	2,55	2,40	2,60	2,5	2,55	2,50	
Heating mode - CMH / CSH + CIH													
Net heating capacity ⁽¹⁾		kW	19,3	25	29,5	36	42	49,5	59	69,5	81	101	
Net absorbed power ⁽¹⁾			6,66	8,62	10,7	12,4	14	17,4	20,3	24,8	28,4	35,4	
Net COP ⁽¹⁾			2,9	2,9	2,75	2,9	3	2,85	2,9	2,8	2,85	2,85	
Electrical heater capacity	S ⁽³⁾	kW	10	10	10	15	15	15	20	20	20	27	
	M ⁽³⁾		15	15	15	20	20	20	27	27	27	40	
	H ⁽³⁾		20	20	20	27	27	27	40	40	40	50	
Hot water coil capacity ⁽²⁾			31	38	40	56	61	66	91	105	113	171	
Refrigerant circuit													
Number of compressors/Number of circuits			1/1	1/1	1/1	1/1	1/1	2/2	2/2	2/2	2/2	3/2	
Refrigerant charge per circuit (approximate)		kg	5,8	6,12	6,89	8,93	9,20	5,76 + 5,76	7,14 + 7,14	8,86 + 8,86	10,33 + 10,33	15,2 + 10,56	
Air treatment ventilation													
Minimum airflow rate		m³/h	3150	4250	4650	6200	6950	7950	9950	12450	14000	17350	
Maximum airflow rate			4100	5500	6000	8050	9050	9750	12850	15090	16725	22450	
Maximum available static pressure		Pa	685	672	650	729	833	812	747	711	680	812	
Condensing unit ventilation													
Nominal airflow rate		m³/h	7600	8500	10000	12000	11700	14000	10000	10500	11000	15500 + 11700	
Maximum available static pressure		Pa	178	223	272	209	205	237	299	272	277	239 + 201	
Acoustic data													
Outdoor blower outlet sound power ⁽¹⁾ Standard unit (Lw)		dB(A)	82	85	86	85	85	88	87	88	89	92	
Outdoor blower outlet sound power ⁽¹⁾ Low Noise unit (Lw)			75	76	77	76	76	78	78	79	80	83	
Radiated sound power level in room ⁽¹⁾ Standard monobloc unit (Lw)			77	79	80	79	81	82	82	82	83	-	
Radiated sound power level in room ⁽¹⁾ Low Noise unit (Lw)			76	76	77	77	78	80	78	80	81	-	
Indoor blower outlet sound power level (Lw) ⁽¹⁾			75	82	82	82	85	86	80	85	87	85	
Operating limits													
Maximum outdoor temperature Cooling mode		°C	45	45	45	47	47	45	45	47	47	47	
Minimum outdoor temperature Cooling mode			+15°C / down to -15°C with winter cooling operation options										
Minimum outdoor temperature Heating mode			-12°C with in 20°C indoor temperature										

(1) EUROVENT conditions data

Cooling :
Outdoor temperature = 35°C DB
Entering coil temperature 27°C DB / 19°C WB

Heating :

Outdoor temperature = 7°C DB / 6°C WB
Indoor temperature = 20°C DB

(2) Air inlet temperature = 20°C
Water temperature = 90-70°C

(3) S = Standard heat
M = Medium heat
H = High heat

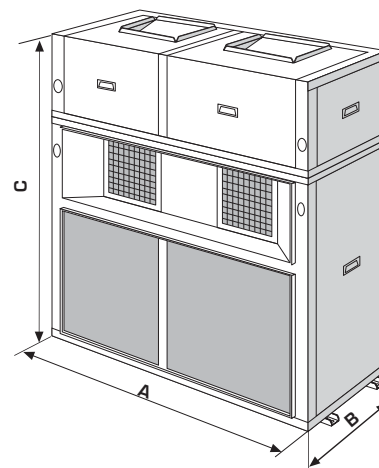
Check ongoing validity of certificate :
eurovent-certification.com
certiflash.com



Dimensions and weights

CMC/CMH

Monobloc unit



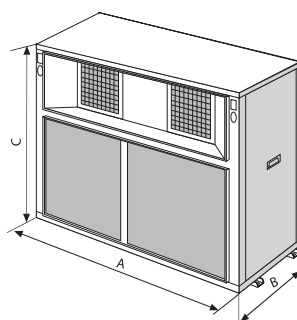
CMC/CMH		20S	25S	30S	35S	40S	45D	55D	70D	85D
A	mm	1194			1445			2251		
B		840			960			960		
C		2055			2145			2145		
Operating weight (standard unit) ⁽¹⁾	kg	376	412	424	516	539	630	785	831	883

⁽¹⁾ Heat pump

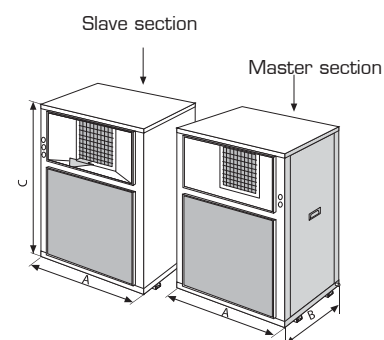
CSC/CSH/CDC/CDH

Condensing unit

Sizes 20S to 85D



Sizes 100D

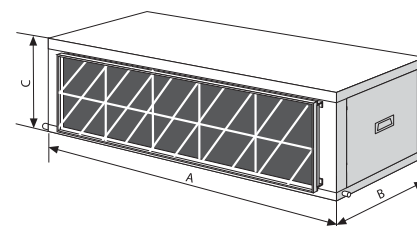


CSC/CSH/CDC/CDH		20S	25S	30S	35S	40S	45D	55D	70D	85D	100D
A	mm	1194			1445			2251			2900
B		745			870			870			870
C		1410			1410			1410			1410
Approximate operating weight ⁽¹⁾	kg	262	295	302	357	370	448	529	554	586	870

⁽¹⁾ Heat pump

CIC/CIH

Air treatment section

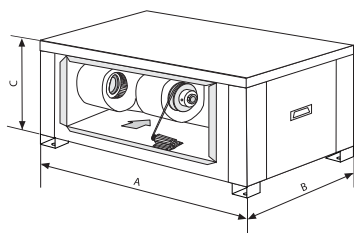


CIC/CIH		20S	25S	30S	35S	40S	45D	55D	70D	85D	100D
A	mm	1194			1445			2251			2900
B		840			960			960			1140
C		645			735			735			1140
Approximate operating weight ⁽¹⁾	kg	108	111	115	150	160	170	242	259	276	470

⁽¹⁾ Heat pump

Dimensions and weights (cont'd)

CIC/CIH Return fan

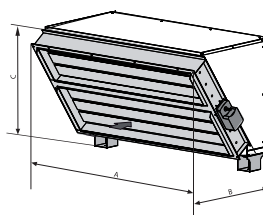


CMC/CMH		55D	70D	85D	100D	
CIC/CIH		55D	70D	85D	100D	
A	mm	2250			2900	
B		650			700	
C		735			1140	
Approximate operating weight ⁽¹⁾		kg	310	310	310	420

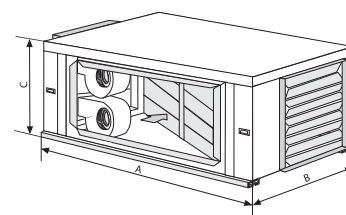
CIC/CIH

Free cooling module

Sizes 20S to 45D



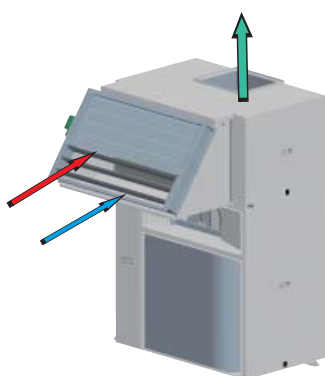
Sizes 55D to 100D



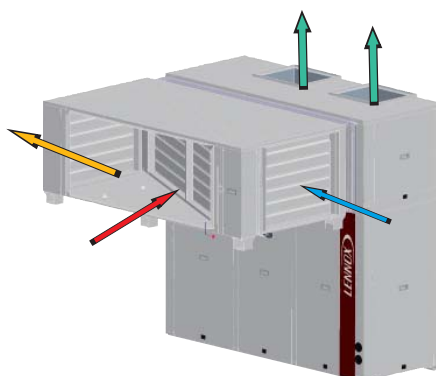
CMC/CMH		20S	25S	30S	35S	40S	45D	55D	70D	85D	100D	
CIC/CIH		20S	25S	30S	35S	40S	45D	55D	70D	85D	100D	
A	mm	1195			1445			2250			2900	
B		674			697			1150			1150	
C		645			740			740			1140	
Approximate operating weight ⁽¹⁾		kg	50	50	50	75	75	75	165	165	165	190

Principle sketches

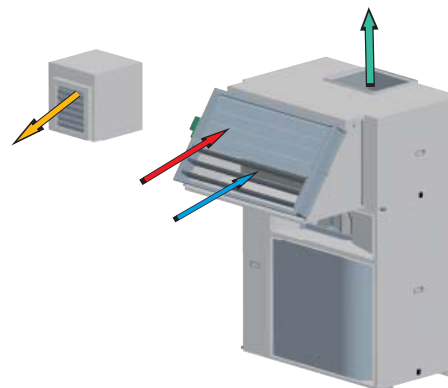
With economizer
Sizes 20S to 45D



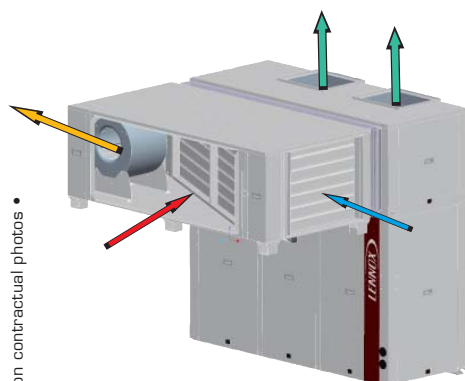
With economizer
Sizes 55D to 100D



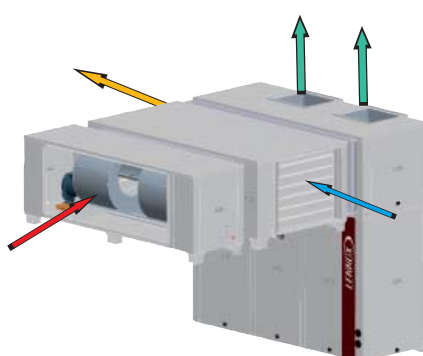
With exhaust fan
Sizes 20S to 45D



With exhaust fan
Sizes 55D to 100D



With return fan
Sizes 55D to 100D



	Fresh air
	Return air
	Exhaust air
	Supply air

Options

Energy efficiency and comfort

- **eDrive:** eDrive is an optional feature of Lennox **COMPACTAIR** units. It is a variable speed, direct transmission ventilation system that saves energy and reduces maintenance costs. **CLIMATIC** controls eDrive and automatically adjusts the airflow rate to the exact building needs, saving up to 30% annual **COMPACTAIR** energy consumption. eDrive is a direct transmission system without pulleys nor belts. It eliminates friction losses improving energy efficiency even at full speed.
- **Free cooling/heating:** Thermodynamic cooling or heating can be replaced by free-cooling/heating when outdoor temperature are favorable (below/above the building set point), saving up to 30% on annual energy consumption.
- **Accurate percentage of fresh air:** Managing fresh air is mandatory in a building to control CO₂ level and comfort. Introducing just the required amount of fresh air in a building can reduce energy consumption. This feature ensures a better CO₂ management while saving energy by reducing the amount of cooling or heating to treat the extra fresh air.
- **Dynamic defrost control:** dynamic defrost is Lennox' answers to unnecessary defrost cycles. Dynamic defrost detects icing of the coil by monitoring the difference between refrigerant and outside temperature and starts the defrost cycle only when required. This feature allows significant energy savings by reducing the numbers of defrost cycles when they are not necessary.
- **Exhaust fan module:** this ensures overpressure extraction in case of high level of fresh air inlet.
- **Return module:** the return fan enables to overcome the return duct pressure drop, particularly during freecooling operation.

Indoor air quality

- **Fresh air management:** The Economiser is able to ensure that fresh air is provided to the building to meet the Indoor Air Quality requirement (Patent 03 50616).
- **EU4 / F7 panel filters:** Set of G4 prefilter and F7 filter at return, operating on return air and fresh air. Adding a G4 pre-filter before the F7 filter reduces excessive replacement of F7 filters.
- **Analog dirty filter sensor:** A differential pressure sensor measures the pressure drop across the filters and coil to allow preventive filter change, thus reducing energy consumption and improving air quality.
- **Indoor air quality sensor:** This feature gives the possibility to match minimum fresh air requirements with occupancy. It measures CO₂ levels and adjusts fresh airflow rate accordingly.

Auxiliary heating

- **Electrical heater:** Standard, medium and high capacity heaters. Available with steps or modulating control.
- **Hot water coil heater:** includes the valves and has a proportional potential with **CLIMATIC** advanced control.

Safety

- **MO fire-proof insulation :** **COMPACTAIR** features MO rock or glass wool insulation as standard.
- **Smoke detector:** The optical head of the smoke detector can detect any type of smoke. When this occurs the unit will stop operating, the return air damper will close fully and the fresh air damper will open fully

Refrigeration options

- **Long refrigerant piping:** allows up to 65m piping between the internal and external units.
- **Shut off service valve:** facilitates installation & service operations. Includes a valve on the gas loop side and a valve on the liquid loop side of split units.
- **Refrigerant pre-charged:** split condenser supplied with factory filled refrigerant pre-charge. Includes shut off service valves, on liquid and gas loop sides.

Electrical and safety

- **Main switch:** situated on the electrical panel of the condensing unit. The unit is shut off when the board panel is opened.
- **Phase sequencer:** this prevents the compressor from starting if the phases are reversed.

Other options

- **Low noise & winter operation with inverter control:** reduce radiated noise and noise in duct at condenser are reduced down to 9dBa. Cooling operations are also possible down -15°C.
- **Precoated coil:** outdoor or indoor coils anticorrosion treatment. Particularly recommended in saline or polluted environment.

19 → 134 kW

Large ducted split / Air cooled condensing units



Main applications

- Retail premises in urban area
- Shopping mall
- Industry comfort
- Building air conditioning combined with air handling unit

Why this choice?

- Can be installed when the roof access is complicated
- Freecooling operation & fresh air management
- Unit integrating air conditioning equipment and control
- High quality
- Low noise
- eDrive direct transmission variable speed fan



General description

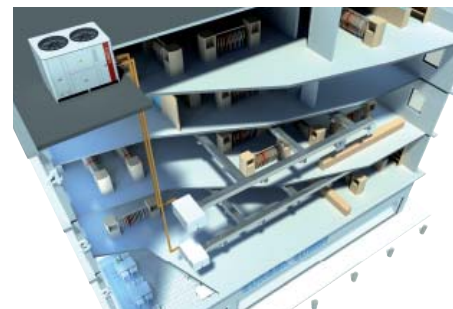
AIRCOOLAIR range is developed from **ECOLEAN** liquid chiller range and exists in two versions :

AIRCOOLAIR SPLIT UNIT can be used for **medium to large commercial cooling and heating applications** when the premises are not directly accessible from the roof.

It exists in the following versions :

- Cooling only & heat pump
- Freecooling

AIRCOOLAIR CONDENSING UNIT is the outdoor unit without the supply section. This unit is available as cooling only or as heat pump and can be combined with air handling units. It provides you with a low noise level, high efficiency and almost customized units.



Main components

- R410A refrigerant
- Sealed scroll compressor
- Centrifugal fans in supply section
- Axial condenser fan in outdoor section
- Galvanized sheet steel framework with fork lift pockets for ease of maintenance
- Control and protection panel according to EN 60 204-1
- 1 or 2 independent cooling circuit according to size
- Filter dryer, solenoid valve, thermostatic expansion valve, HP pressure switch, HP/LP pressure transducers, liquid accumulator and 4-way valve (heat pump only)
- Filtration G4 and G4/F7 in supply section
- **CLIMATIC** electronic controller
- Voltage 400V/3 phases/50 Hz
- Colour RAL 9002

Control

All units are equipped with:

- Dynamic defrost control
- Dynamic set point
- Time schedule programmer
- **CLIMATIC** control for advanced comfort & communication devices: master-slave, multi-unit display, BMS communication or Lennox ADALINK II supervision
- Advanced default analyse, enthalpy and humidity control (optional), CO₂ level control (optional), stepped and modulating auxiliary heaters

General data

AIRCOOLAIR		20S > 140D	200D & 230D
Split	ASC/ASH - CIC/CIH	A	NA
Condensing unit	ASC/ASH	A	

A : Available / NA : Non available

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



SPLIT UNIT				20S	25S	30S	35S	40S	45D	
Cooling mode - ASC + CIC - ASH + CIH										
Gross cooling capacity ⁽¹⁾				kW	19,9	24,2	27,9	36,5	41,9	48,7
Net cooling capacity ⁽¹⁾					19,5	23,5	27,0	35,5	40,5	46,5
Absorbed power ⁽¹⁾					6,72	8,45	9,82	12,4	14,7	17
Gross EER ⁽¹⁾					3,13	3,12	3,11	3,19	3,15	3,28
Net EER ⁽¹⁾					2,90	2,78	2,75	2,86	2,75	2,73
Heating mode - ASH + CIH										
Net heating capacity ⁽¹⁾				kW	19,5	25	28,5	36	40	49,5
Net COP ⁽¹⁾					3	3	2,95	3,03	3	2,9
Net absorbed power ⁽¹⁾				kW	6,5	8,33	9,66	11,9	13,3	17,1
Electrical heater capacity		S ⁽³⁾	10		10	10	15	15	15	
		M ⁽³⁾	15		15	15	20	20	20	
		H ⁽³⁾	20		20	20	27	27	27	
Hot water coil capacity ⁽²⁾					31	38	40	56	61	66
Refrigerant circuit										
Number of compressors/Number of circuits					1/1	1/1	1/1	1/1	1/1	2/2
Refrigerant charge per circuit (approximate)				kg	4,9	5,9	6,33	8,84	10,83	6,94 + 6,94
Air treatment ventilation										
Minimum airflow				m³/h	3150	4250	4650	6200	6950	7950
Maximum airflow					4100	5500	6000	8050	9050	9750
Maximum available static pressure				Pa	685	672	650	729	833	812
Condensing unit ventilation										
Nominal airflow				m³/h	6800	9750	11500	11300	11000	2x9750
Acoustic data										
Outdoor blower outlet sound power - Standard unit (Lw) ⁽¹⁾				dB(A)	72	76	76	77	78	79
Outdoor blower outlet sound power - Low noise unit (Lw) ⁽¹⁾					70	71	70	71	72	74
Indoor blower outlet sound power level (Lw)					75	82	82	82	85	86

SPLIT UNIT			55D	70D	85D	100D	120D	140D
Cooling mode - ASC + CIC - ASH + CIH								
Gross cooling capacity ⁽¹⁾		kW	57,3	72,4	86,0	103,9	116,2	140,6
Net cooling capacity ⁽¹⁾			55,5	69,5	82,0	100,0	111,0	135,0
Absorbed power ⁽¹⁾			19,8	24,8	29,8	35,7	38,9	48,2
Gross EER ⁽¹⁾			3,17	3,3	3,33	3,26	3,44	3,3
Net EER ⁽¹⁾			2,8	2,8	2,75	2,8	2,85	2,80
Heating mode - ASH + CIH								
Net heating capacity ⁽¹⁾		kW	56,5	72,5	80	108	118	137
Net COP ⁽¹⁾			3	3	3	3,13	3,05	2,82
Net absorbed power ⁽¹⁾		kW	18,8	24,2	26,7	34,5	38,7	48,6
Electrical heater capacity	S ⁽³⁾		20	20	20	27	27	27
	M ⁽³⁾		27	27	27	40	40	40
	H ⁽³⁾		40	40	40	50	50	50
Hot water coil capacity ⁽¹⁾			91	105	113	171	183	192
Refrigerant circuit								
Number of compressors/Number of circuits			2/2	2/2	2/2	3/2	3/2	3/2
Refrigerant charge per circuit (approximate)		kg	6,42 + 6,42	8,74+ 8,74	10,9 + 10,9	13,98 + 11,6	17,32 + 11,16	17,23 + 17,1
Air treatment ventilation								
Minimum airflow		m³/h	9950	12450	14000	17350	19300	21000
Maximum airflow			12850	15090	16725	22450	24950	24750
Maximum available static pressure		Pa	747	711	680	812	784	828
Condensing unit ventilation								
Nominal airflow		m³/h	2 x 11500	2 x 11300	2 x 11000	22700 + 18100	22700 +18100	2 x 22700
Acoustic data								
Outdoor blower outlet sound power - Standard unit (Lw) ⁽¹⁾		dB(A)	79	80	81	82	83	87
Outdoor blower outlet sound power - Low noise unit (Lw) ⁽¹⁾			73	74	75	76	76	81
Indoor blower outlet sound power level (Lw)			80	85	87	85	87	89

(1) EUROVENT conditions data

Cooling :

Outdoor temperature = 35°C DB

Entering coil temperature 27°C DB / 19°C WB

Heating :

Outdoor temperature = 7°C DB / 6°C WB

Indoor temperature = 20°C DB

(2) Air inlet temperature = 20°C
Water temperature = 90-70°C

(3) S = Standard heat
M = Medium heat
H = High heat

General data

CONDENSING UNIT		020S	025S	030S	035S	040S	045D	055D
Cooling mode - ASC								
Cooling capacity ⁽¹⁾	kW	19,7	24,7	28,4	36,1	42	49,4	56,7
EER ⁽¹⁾		3,06	3,05	2,95	3,03	2,98	3,05	2,94
Heating mode - ASH								
Heating capacity ⁽²⁾	kW	19,8	25,0	28,6	36,0	40,2	50,1	57,1
COP ⁽²⁾		3,20	3,21	3,12	3,24	2,98	3,21	3,1
Refrigerant circuit								
Number of compressors/Number of circuits		1/1	1/1	1/1	1/1	1/1	2/2	2/2
Capacity steps		1	1	1	1	1	2	2
Electrical data								
Voltage		400V/3 Ph/50Hz						
Maximum absorbed power	kW	8,55	10,8	12,5	16,4	17,7	21,6	25
Acoustic data								
Sound power level ⁽³⁾	dB(A)	76	78	81	80	81	81	84

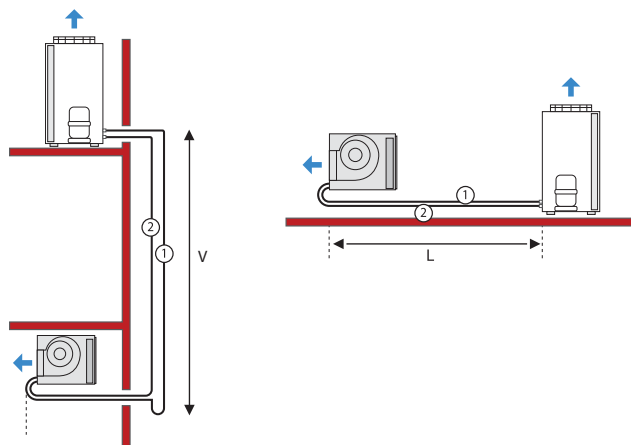
CONDENSING UNIT		070D	085D	100D	120D	140D	200D	230D
Cooling mode - ASC								
Cooling capacity ⁽¹⁾	kW	72,1	83,9	104	115	141	197	228
EER ⁽¹⁾		3,04	2,96	3,03	3,1	3,05	3,11	3,06
Heating mode - ASH								
Heating capacity ⁽²⁾	kW	71,9	80,3	105	114	137	191	218
COP ⁽²⁾		3,24	3,1	3,24	3,2	3,13	3,19	3,06
Refrigerant circuit								
Number of compressors/Number of circuits		2/2	2/2	3/2	3/2	3/2	4/2	4/2
Capacity steps		2	2	2	2	2	2	2
Electrical data								
Voltage		400V/3 Ph/50Hz						
Maximum absorbed power	kW	32,8	35,5	45,6	48,7	59,9	83,0	96,2
Acoustic data								
Sound power level ⁽³⁾	dB(A)	83	84	87	87	90	89	82

(1) Evaporating temperature = 7°C / Ambient temperature = 35°C

(2) Condensing temperature = 50°C / Ambient temperature = 7°C DB/6°C WB

(3) EUROVENT conditions data

Refrigerant connections



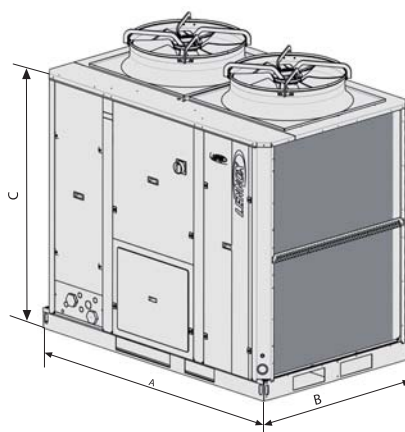
AIRCOOLAIR		20 S	25 S	30 S	35 S	40 S	45 D	55 D	70 D	85 D	100 D	120 D	140 D	200 D	230 D	
Total length 0 to 30m																
Pipe sizes	Liquid	1/2"	5/8"						3/4"			7/8"				
Circuit 1	Gas	7/8"	1" 1/8		1" 3/8		1" 1/8		1" 3/8		1" 5/8					
Pipe sizes	Liquid	-					5/8"					3/4"		7/8"		
Circuit 2	Gas	-					1 1/8"		1 3/8"			1" 5/8			2" 5/8	
Maximum vertical length																
Vertical length	m	16														
Maximum total length																
Total length	m	65														
Maximum number of bends		12														

Dimensions and weights

ASC/ASH/ADC/ADH

Outdoor section

Split outdoor unit
Condensing unit



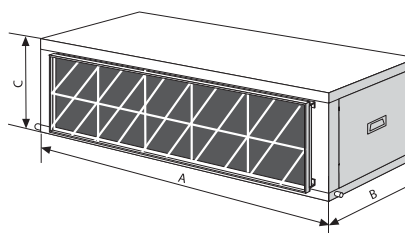
ASC/ASH		20 S	25 S	30 S	35 S	40 S	45 D	55 D	70 D	85 D	100 D	120 D	140 D	200 D	230 D
A	mm	1195	1195				1960				2250				2250
B	mm	660	980				1195				1420				2300
C	mm	1375	1635				1635				2155				2250
Approximate operating weight ⁽¹⁾	kg	168	219	221	239	258	452	463	499	537	748	828	932	1684	1704

[1] Heat pump

CIC/CIH

Air treatment section

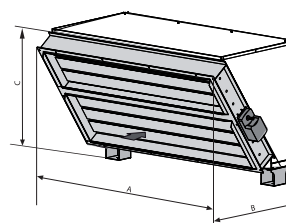
Split indoor unit



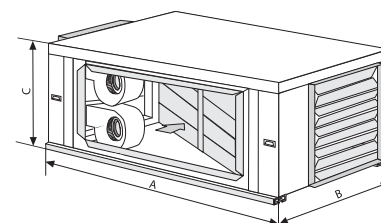
CIC/CIH		20 S	25 S	30 S	35 S	40 S	45 D	55 D	70 D	85 D	100 D	120 D	140 D
A	mm	1195				1445				2250			
B	mm	840				960				1140			
C	mm	645				735				1140			
Approximate operating weight ⁽¹⁾	kg	108	111	115	150	160	170	242	259	276	470	480	490

CIC/CIH

Free cooling module



Sizes 20S to 45D



Sizes 55D to 140D

CMC/CMH		20 S	25 S	30 S	35 S	40 S	45 D	55 D	70 D	85 D	100 D	120 D	140 D
A	mm	1195				1445				2250			
B	mm	674				697				1150			
C	mm	645				740				1140			
Approximate operating weight ⁽¹⁾	kg	50	50	50	75	75	75	165	165	165	190	190	190

Operating limits

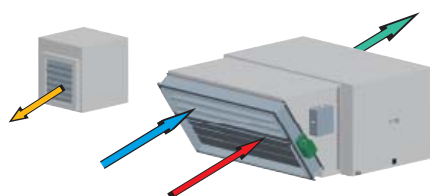
SPLIT UNIT		020	025	030	035	040	045	055	070	085	100	120	140
Maximum outdoor temperature Cooling mode	°C	45	45	45	45	45	47	47	47	47	47	47	47
Minimum outdoor temperature Cooling mode ⁽¹⁾		Cooling only : -15°C/0°C/+15°C Heat pump : 0°C											
Minimum outdoor temperature Heating mode		-10°C											

CONDENSING UNIT		020	025	030	035	040	045	055	070	085	100	120	140	200	230
Maximum outdoor temperature Cooling mode	°C	45	45	45	47	47	45	45	47	47	47	47	47	47	47
Minimum outdoor temperature Cooling mode ⁽¹⁾		Cooling only : -15°C/0°C/+15°C Heat pump : 0°C													
Minimum outdoor temperature Heating mode		-10°C													
Maximum evaporating temperature		+12°C													
Minimum evaporating temperature		Cooling only : -1°C Heat pump : -22°C													
Maximum condensing temperature		+65°C													
Minimum condensing temperature		+25°C													

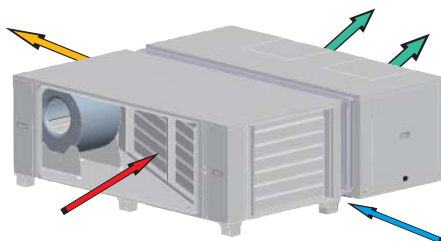
(1) : With low ambient kit : -15°C
 With low ambient kit : 0°C
 Standard

Principle sketches

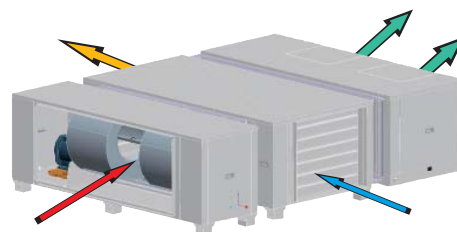
With exhaust fan
Sizes 020E to 045D



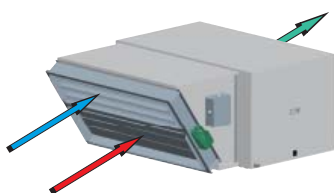
With exhaust fan
Sizes 055D to 140D



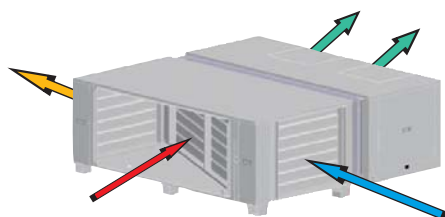
With return fan
Sizes 055D to 140D



With economizer
Sizes 020E to 045D



With economizer
Sizes 055D to 140D



	Fresh air
	Return air
	Exhaust air
	Supply air

Options

Fresh air

- **Free cooling:** The use of an economizer is the most efficient way to reduce running costs by using «Free cooling» when appropriate.
- **Fresh air management:** The economizer is able to ensure that fresh air is provided to the building to meet the Indoor Air Quality requirement.
- **Exhaust fan module:** this ensures overpressure extraction in case of high level of fresh air inlet.
- **Return module:** the return fan enables to overcome the return duct pressure drop, particularly during freecooling operation.

Indoor air quality

- **EU4 / F7 panel filters:** Set of G4 prefilter and F7 filter at return, operating on return air and fresh air. Adding a G4 pre-filter before the F7 filter reduces excessive replacement of F7 filters.
- **Dirty filter sensor:** A differential pressure sensor measures the pressure drop across the filters and coil to allow preventive filter change, thus reducing energy consumption and improving air quality.
- **Indoor air quality sensor:** This feature gives the possibility to match minimum fresh air requirements with occupancy. It measures CO₂ levels and adjusts fresh airflow rate accordingly.

Auxiliary heating

- **Electrical heater:** Standard, medium and high capacity heaters. Available with steps or modulating control.
- **Hot water coil heater:** includes the valves and has a proportional potential with **CLIMATIC** advanced control.

Control

- **eDrive, direct transmission on return fan and supply fan :** variable speed fans adjust airflow rate to the exact needs and during unoccupied period. This feature saves up to 30% annual energy consumption and reduces maintenance costs.
- **Smoke detector:** The optical head of the smoke detector can detect any type of smoke. When this occurs the unit will stop operating, the return air damper will close fully and the fresh air damper will open fully

Refrigerant options

- **Winter cooling operation down to 0°C:** Cooling operation are possible down to 0°C.
- **Winter cooling operation down to -15°C:** Cooling operation are possible down to -15°C.
- **Long refrigerant piping:** allows up to 65m piping between the internal and external units.
- **Shut off service valve:** facilitate installation & service operations. Includes a valve on the gas loop side and a valve on the liquid loop side of split units.
- **Refrigerant pre-charged:** split condenser supplied with factory filled refrigerant pre-charge. Includes shut off service valves, on liquid & gas loop sides.

Electrical & safety

- **Main switch:** situated on the Electrical panel of the condensing unit. The unit is shut off when the board panel is opened.
- **Phase sequencer:** this prevents the compressor from starting if the phases are reversed.

Control & communication

- **Advanced control pack:** thanks to specific **CLIMATIC** algorithm and sensors, this pack provides two advanced control features: Enthalpy control on economizer and humidity control.
- **Modbus Communication:** This board is a Modbus interface, which is needed for anyone who would like a BMS system to talk to the unit using «Modbus protocol». No other hardware than this board is required to have Modbus dialog. One board required per unit.
- **Lonworks Communication:** this board is a LonTalk® interface, which is needed for anyone who would like a BMS system to talk to the unit with «LON protocol». No other hardware than this board is required to have LonTalk® dialog. One board required per unit.
- **BACnet communication:** this board is a Bacnet® interface, which is needed for anyone who would like a BMS system to talk to the unit with "Bacnet protocol" RS485 or TCP/IP. No other hardware than this board is required to have BACNet® dialog. One board required per unit.

- **ADALINK II Distant monitoring:** ADALINK II is LENNOX answer to HVAC installation monitoring. It can control up to 16 units on the same site. It can show the whole site map with the status of the different units. By zooming on each unit the user can graphically change set points, access alarm list, look at trend curves and history. ADALINK II can be used locally, via LAN network or remotely via modem.
- **DC 60 Comfort display:** remote control for non-technical users. It was designed to fit aesthetically in the room and be very easy to use. With DC60, the customer can change the scheduling of the different time zones, modify temperature set points and the percentage of fresh air in each zone.
- **DS 60 Service display:** this service display controller is a plug and play feature. This allows service personnel to make up to 207 settings, read up to 188 variables, up to 45 faults and read the history of the last 32 faults.
- **DM 60 Multi unit display:** this has the exact same features of the DC60 and can handle up to 12 units on a single Bus.
- **BE 60 extension board:** additional analogic and digital input and output for the **CLIMATIC**.

Other options

- **Low noise:** Reduce radiated noise and noise in duct at condenser.
- **Precoated coil:** outdoor or indoor coils anticorrosion treatment. Particularly recommended in saline or polluted environment.
- **Coil protection grill:** It prevents condenser coil against accidental impacts.
- **High pressure 250 Pa FP1:** Available static pressure for outdoor unit up to 250 Pa.
- **Rubber anti-vibration mounts:** To avoid transmission of vibrations for the floor where the unit is installed while unit is operating.
- **Soft starter (400V/3):** This electronic element reduce the starting current up to 40%.
- **MO fire proof insulation :** This insulation will not burn and will not generate smoke in case of fire.

Rooftop packaged units



- Air cooled rooftop packaged units

BALTIC, FLEXY & FLEXY EC

24 - 234 kW

34

- Water cooled rooftop packaged units

BALTIC & FLEXY

46 - 196 kW

46

- Rooftop packaged units with heat recovery module

FX

25 - 162 kW

52



AIR COOLED ROOFTOP PACKAGED UNITS

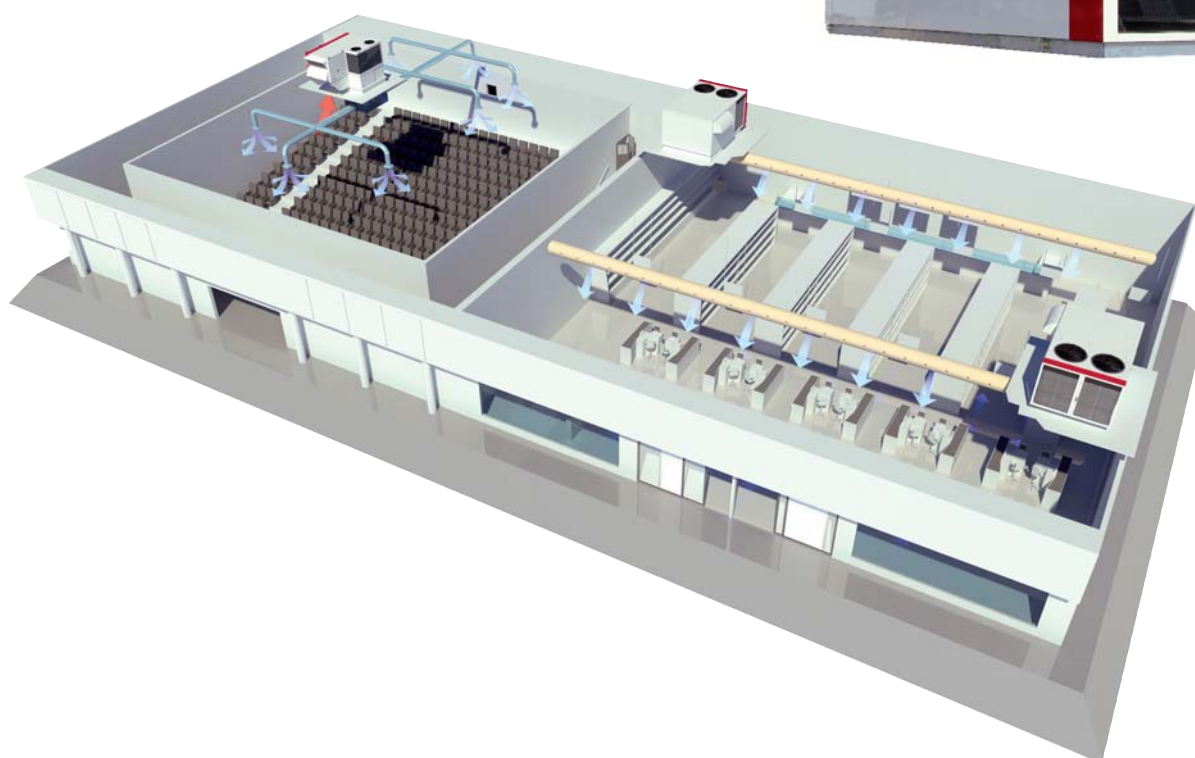
BALTIC
24 → 85 kW



FLEXY
85 → 234 kW



FLEXY EC
85 → 234 kW



Main applications

- Large and light commercial buildings (retail, airports restaurants, shops, petrol stations...)
- Cinemas, theatres
- Industrial buildings and logistic centers

Why this choice ?

- Energy efficient solution
- Cost effective package for fast and easy installation
- Multiple heating options available
- Fresh air control and free cooling/heating management
- Wide choice of communication interfaces
- Heat recovery modules to decrease energy consumption

General description

Rooftop solution is the most cost effective package solution for high efficiency comfort air conditioning of single volume buildings.

- First class efficiency system thanks to multiscroll compressor technology associated with chlorine free R410A refrigerant. The rooftop unit product line is Lennox most innovative equipment for commercial applications.
- eDrive variable speed direct transmission ventilation system to save even more energy on **BALTIC** and **FLEXY EC** ranges.
- Advanced **CLIMATIC** controller, designed to improve energy efficiency and reliability. This controller integrates master slave capability and a wide choice of communication interfaces.
- Cost effective package solution for fast and easy installation.
- Low weight construction for easy lifting in all site configurations.
- Many standard airflow configurations and wide range of adjustable roof curbs to suit all type of building designs.
- Multiple auxiliary heating options available, with intelligent control to allow the selection of the most efficient way to generate heating based on the outside temperature and/or energy costs.
- Fresh air control and free cooling/heating management for healthy and comfortable environments.
- Heat recovery solutions on exhaust air or to recover calories generated by refrigeration equipments
- The units are available with the following versions:
 - > Cooling only
 - > Heat pump
 - > Cooling only with gas burner standard heat or high heat
 - > Multiple fuels units combine heat pump with gas fired heating

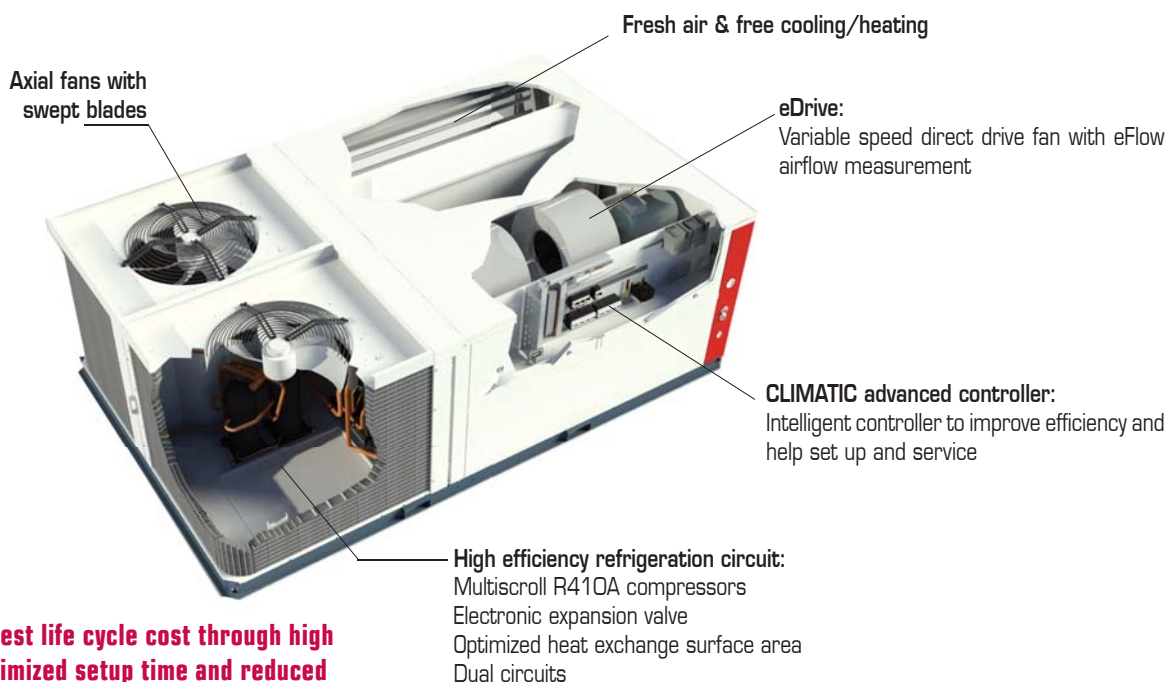
Main components

- R410A scroll compressors
- EN 60204-1 electrical cabinet with circuit breaker protection, numbered wires and connectors
- Fire proof MO insulation
- Wide choice of air filtration and pre-filtration up to F7
- Variable drive pulley or direct transmission coupling with variable speed drive depending on the range.
- Removable and washable drain pan and siphon.
- Corrosion resistant casing (galvanized steel or aluminum) with stainless steel fixings.
- Voltage 400V/3Ph/50Hz

CLIMATIC controller

- Full text fault display and history.
- Many settings and readings available for customization and diagnostic.
- Advanced control features: advanced compressor management; dynamic defrost; intelligent fresh air management; automatic summer/winter change, variable speed drive fan management with airflow measurement
- Extended communication capability : Master/Slave, ModBus and BACnet RS485 or TCP-IP, LonWorks,
- Compatible with Lennox monitoring and supervision solutions.

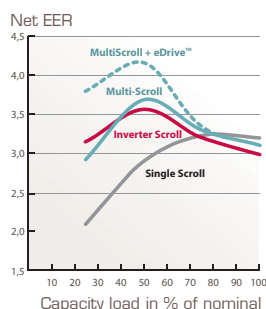
Energy savings through innovations



BALTIC provides the best life cycle cost through high energy efficiency, optimized setup time and reduced maintenance costs

Advanced refrigeration circuit

- Multiscroll compressor technology for best load performance year round
- R410A refrigerant for best efficiency
- Electronic expansion valves for optimum control in all conditions
- Optimised heat exchanger surface area to boost system energy



«Multiscroll» compressor technology allows energy consumption reduction when compared to «Inverter» solutions.

eDrive variable speed fan:

- 30% annual energy savings
- Variable airflow rate
- Easy commissioning and service:
 - Maintenance free system
 - eFlow airflow measurement
 - Integrated soft starter
 - Dirty filter DP compensation



eDrive, direct transmission, variable speed fan is a standard feature of Lennox BALTIC units that saves energy and reduces maintenance costs.

CLIMATIC advanced controller

- Intelligent control of all units parameters to guarantee long term energy efficiency
- Component monitoring and diagnostic for safe and reliable operation
- Easy set-up & service up with **CLIMATIC** Wizard and ADALINK II services
- User friendly interface:
 - High /low refrigerant pressure display
 - eFlow airflow reading
 - Energy metering
- Fully integrated communication:
 - Master/Slave , ModBus®, BACnet®, LonWorks®



Heat recovery solutions

- Cross flow heat exchanger or additional thermodynamic circuit to recover energy on exhaust air
- eRecovery heat recovery module to recover calories generated by refrigeration equipments and possibly cover 100% of the heating needs with free calories.



eRecovery reduces annual energy bill and improves environmental impact by recovering energy wasted by the food refrigeration system.

General data

BAC/BAH/BAG/BAM		024	030	038	042	045	052	057	065	075	085	
Cooling mode - BAC/BAG												
Gross cooling capacity ⁽¹⁾	kW	23,8	30	38,2	40,7	44,8	51,1	57,1	65,1	76,5	83,5	
Net cooling capacity ⁽¹⁾		23,4	29,2	37,2	39,5	43,9	49,8	55,2	62,5	74,2	80,7	
Absorbed power BAC units		7,1	9,7	12,3	14,1	14,1	16,5	18,2	22,2	24,7	28,5	
Gross EER ⁽²⁾		3,61	3,51	3,48	3,27	3,46	3,5	3,6	3,5	3,5	3,4	
Net EER ⁽³⁾		3,28	3,03	3,02	2,81	3,11	3,02	3,03	2,81	3,01	2,81	
Eurovent energy efficiency class Cooling mode		A	A	A	B	A	A	A	B	A	B	
Heating mode - BAH/BAM												
Net heating capacity ⁽¹⁾	kW	20,7	26,2	34,8	38,0	40,8	46,2	54,4	62,2	73,5	80,1	
Absorbed power BAH units		5,5	7,1	9,9	11,2	11,7	13,3	15,4	18,6	21,2	24,7	
Gross COP ⁽²⁾		4,04	4,12	3,80	3,74	3,71	3,80	3,91	3,75	3,85	3,62	
Net COP ⁽³⁾		3,79	3,70	3,51	3,39	3,48	3,47	3,53	3,34	3,47	3,25	
Eurovent energy efficiency class Heating mode		A	A	A	B	A	A	A	B	A	B	
Auxiliary heating												
Gas heat capacity	kW S/H ⁽⁵⁾	19/43	19/43	19/43	19/43	31/56	31/56	31/56	31/56	56/112	56/112	
Electric heater capacity		18/36	18/36	18/36	18/36	27/54	27/54	27/54	27/54	27/54	27/54	
Electric pre-heater capacity		18/36	18/36	18/36	18/36	24/48	24/48	24/48	24/48	36/72	36/72	
Hot water coil capacity Air 10°C/Water 90-70°C		kW ^l	50	59	63	66	84	93	103	109	178	186
Refrigeration circuit												
Number of compressors/Number of circuits		1/1	2/1	2/1	2/1	2/2	3/2	4/2	4/2	4/2	4/2	
Refrigerant charge per circuit		kg	6,1	6,1	8,1	8,1	11,5	11,6	15	15,2	21	21
Max. outdoor temp. at indoor 27°C DB/ 19°C WB ⁽⁴⁾		°C	48	46	46	46	48	46	46	46	48	48
Ventilation data												
Nominal airflow rate	m³/h	4200	5700	6300	6900	7100	8300	9900	11100	13500	14500	
Minimum airflow rate		3600	4600	5100	5500	5700	6700	7900	8900	10500	10500	
Maximum airflow rate		5600	6800	8400	8400	9700	11200	13100	13100	17000	19000	
Acoustic (external static pressure 100 Pa)												
Outdoor sound power Standard unit ⁽¹⁾	dB(A)	80	80	81	81	83	83	84	84	83	84	
Outdoor sound power Low noise unit ⁽¹⁾		77	77	78	79	80	80	81	82	80	81	
Indoor blower outlet sound power Standard unit ⁽¹⁾		71	76	78	80	74	83	81	83	83	84	

(1) All data at EUROVENT conditions
cooling : 35°C DB - 27°C DB 47% / 19°C WB
heating : 7°C DB - 20°C 60% / 15°C WB),
nominal airflow, nominal external static pressure, 400 V/3 Ph/50 Hz)

(2) Including the compressor and outdoor fan (axial) and indoor fan (centrifugal)

(3) Net EER = Net cooling capacity/ Total absorbed power
Net COP = Net heating capacity/ Total absorbed power

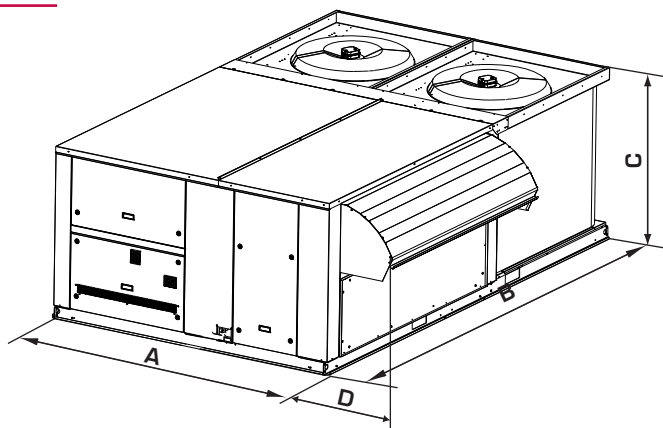
(4) The cooling and heating operating limits are given for steady state running condition with noted temperature condition

(5) S = Standard heat
H = High heat

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

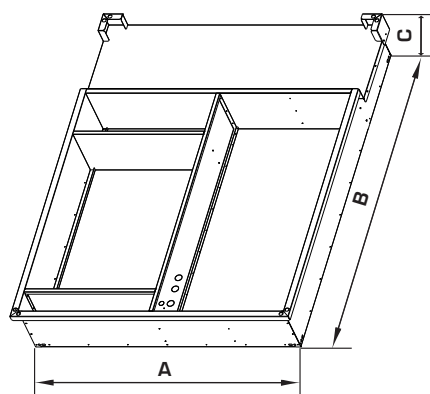


Dimensions and weights

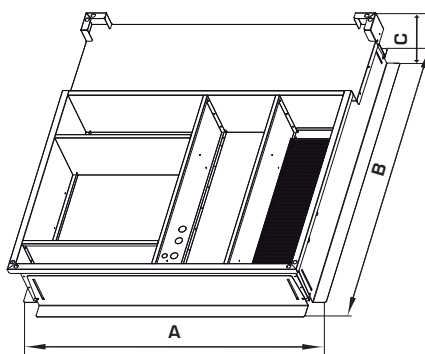


BAC/BAH/BAG/BAM		024	030	038	042	045	052	057	065	075	085
A	mm	2259				2259				2259	
B		2283				2783				3663	
C		1260				1260				1260	
D		435				435				435	
Weight of standard units											
Basic unit - BAC	kg	556	591	641	644	772	803	887	911	1092	1100
Weight of gas units											
Basic unit Standard Heat	kg	599	634	684	687	827	858	942	966	1162	1170
Basic unit High Heat		618	653	703	706	849	880	964	988	1222	1230

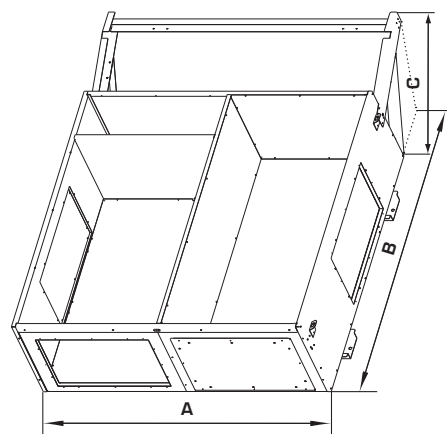
NON ADJUSTABLE, NON ASSEMBLED ROOFCURB



ADJUSTABLE ROOFCURB



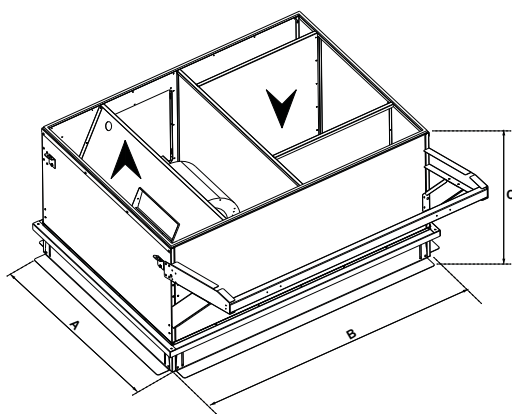
MULTIDIRECTIONAL ROOFCURB



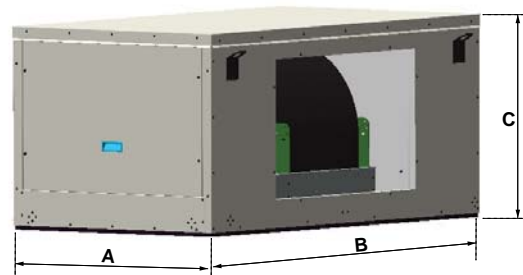
BAC/BAH/BAG/BAM		024	030	038	042	045	052	057	065	075	085
Non-adjustable, non assembled roofcurb											
A	mm	2123				2123				2123	
B		1818				2217				2719	
C		415				415				415	
Assembled adjustable roofcurb											
A	mm	2225				2225				2225	
B		1719				2318				2818	
C		495				495				495	
Multidirectional roofcurb (External dimensions. No roof opening required)											
A	mm	2222				2222				2222	
B		1808				2260				2763	
C		795				795				795	

Roofcurbs dimensions and weights

VERTICAL EXHAUST ROOFCURB



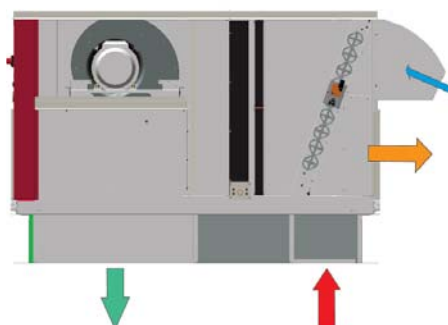
HORIZONTAL EXTRACTION BOX



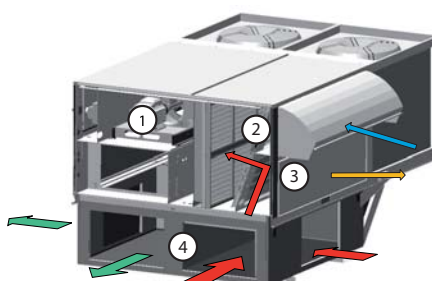
BAC/BAH/BAG/BAM		024	030	038	042	045	052	057	065	075	085
Vertical exhaust roofcurb											
A	mm	1872				2349				2731	
B		2323				2323				2127	
C		1110				1110				1110	
Horizontal extraction box											
A	mm	980				980				980	
B		1159				1659				2159	
C		720				720				720	

Principle sketches

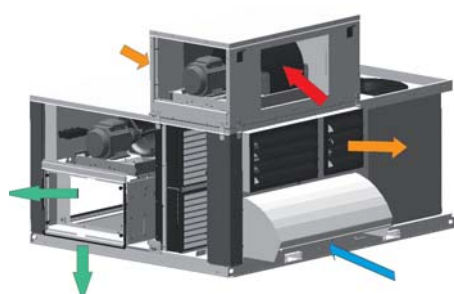
BALTIC
(vertical flow)



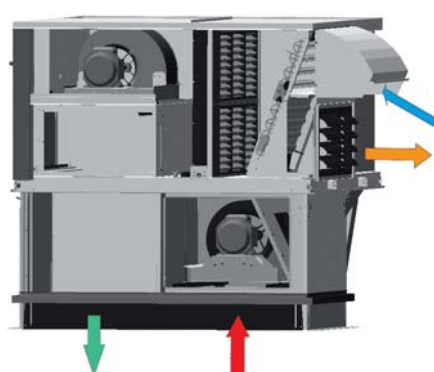
BALTIC
MULTIDIRECTIONAL ROOFCURB



BALTIC
HORIZONTAL EXTRACTION BOX

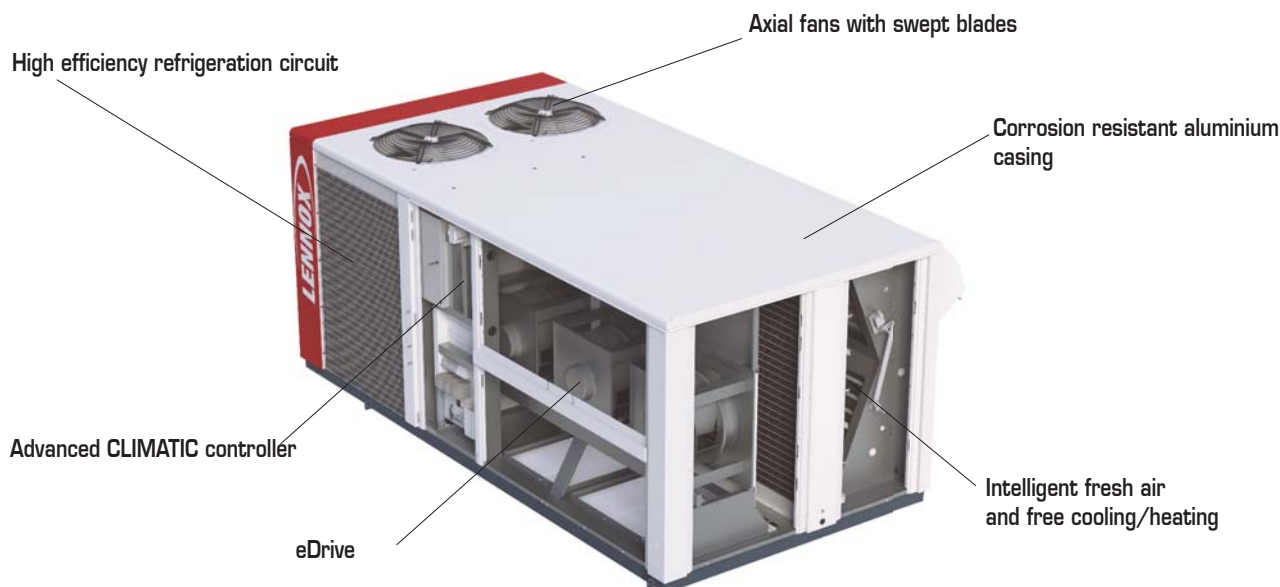


BALTIC
VERTICAL EXHAUST ROOFCURB



	Fresh air
	Return air
	Exhaust air
	Supply air
1	Supply fan
2	Economiser damper
3	Exhaust damper and exhaust fan
4	Multidirectional roofcurb
5	Exhaust roofcurb

High efficiency rooftop for long lasting energy saving



Guaranteed sustainable performance with eDrive

Variable speed drive

- Airflow reduction during part load operation and dead zone
- Very high efficiency «EC» technology fan motor
- Power factor correction to reduce current
- Soft starter to limit inrush current during start-up
- Easy airflow adjustment during commissioning
- Easy communication and service with eFlow airflow management



Direct drive transmission

- No friction means better efficiency even at full speed
- No efficiency reduction due to loose or worn-out belts
- Maintenance free fan

Energy recovery solutions

eRecovery

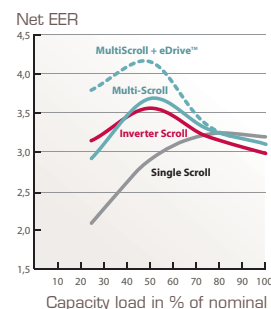
Food refrigeration heat recovery is the most advanced and flexible heat transfer and recovery solution on the market.

- 50% of supermarket annual energy consumption is used to cool food in display cases and cold room.
- eRecovery transfer «free» thermal energy produced by the food refrigeration systems to the sales area.
- eRecovery can cover 100% of the heating needs.
- The most flexible heat recovery solution: thermodynamic or auxiliary heating available on top of heat recovery.

eRecovery reduces annual energy bill and improves environmental impact by recovering energy wasted by the food refrigeration system.

Advanced refrigeration circuit

- Multiscroll compressor technology for best load performance year round
- R410A refrigerant for best efficiency
- Electronic expansion valves for optimum control in all conditions
- Optimised heat exchanger surface area to boost system energy



«Multiscroll» compressor technology allows energy consumption reduction when compared to «Inverter» solutions.

Energy recovery on exhaust air

Adiabatic energy recovery for exhaust air through enthalpy wheel allows total heat recovery (sensible + latent)

- The only Eurovent certified heat recovery system
- Efficiency up to 90%
- Reliable system: no coolant, no compressor, no pump



General data

FLEXY & FLEXY EC			085	100	120	150	170	200	230
FLEXY - Cooling mode - FCM/FGM									
Gross cooling capacity	kW	85,2	105	119	148	170	192	234	
Net cooling capacity		82,8	101,2	114,5	143,3	162,8	189,7	225,3	
Net absorbed power FCM units		29,0	38,8	44,9	51,0	64,9	63,7	88,1	
Gross EER		3,30	3,10	3,06	3,30	3,06	3,46	3,46	
Net EER		2,86	2,61	2,55	2,81	2,51	3,01	2,86	
Eurovent energy efficiency class Cooling mode		B	C	D	B	D	A	B	
FLEXY - Heating mode - FHM/FDM									
Net heating capacity	kW	83,0	103,4	116,7	142,4	168,5	188,4	226	
Net absorbed power FHM units		26,3	33,9	38,0	44,6	55,3	58,7	74,4	
Gross COP		3,48	3,45	3,50	3,60	3,49	3,69	3,45	
Net COP		3,16	3,06	3,07	3,19	3,04	3,21	3,21	
Eurovent energy efficiency class Heating mode		C	C	C	C	C	B	B	
FLEXY EC - Cooling mode - FCM/FGM EC									
Gross cooling capacity	kW	85,2	105	119	148	170	197	234	
Net cooling capacity		83,6	102,9	116,6	145,4	165,9	190,5	226,7	
Net absorbed power FCM EC units		27,9	36,5	42,1	48,3	60,8	62,6	83,8	
Gross EER		3,30	3,10	3,06	3,30	3,06	3,06	3,05	
Net EER		3,01	2,82	2,77	3,01	2,73	2,73	2,71	
Eurovent energy efficiency class Cooling mode		A	B	C	A	C	C	C	
FLEXY EC - Heating mode - FHM/FDM EC									
Net heating capacity	kW	82,1	101,7	114,6	140,4	165,2	186,4	225,2	
Net absorbed power FHM EC units		25,2	31,6	35,3	42,0	51,0	56,1	72,8	
Gross COP		3,41	3,36	3,40	3,51	3,40	3,69	3,45	
Net COP		3,26	3,22	3,25	3,35	3,24	3,32	3,09	
Eurovent energy efficiency class Heating mode		B	B	B	B	B	B	C	
Auxiliary heating (All FLEXY)									
Gas heat capacity	kW - S/H ⁽²⁾	55,2/110,4			110,4/165,6		165,6/220,8		
Electric heater capacity	kW - S/M/H ⁽²⁾	30/54/72			45/72/108		72/108/162		
Hot water coil capacity (20°C in/water 90-70 °C)	kW - S/H ⁽²⁾	112/175	124/197	130/209	140/251	149/272	177/296	199/313	
Refrigerant circuit (All FLEXY)									
Number of compressors/Number of circuits		2/2			3/2	4/2			
Refrigerant charge per circuit	kg	10,5/10,5	10,5/10,6	10,6/10,6	15,8/16	16/16	22/22	23,5/23,5	
Max. outdoor temp. at indoor 27°C DB/ 19°C WB	°C	46	44	44	44	46	46	44	
Ventilation (All FLEXY)									
Nominal airflow rate	m³/h	15000	18500	20500	26000	30000	35000	39000	
Minimum airflow rate		12000	14000	15000	18000	21000	24000	27000	
Maximum airflow rate		23000	23000	23000	35000	35000	43000	43000	
Acoustic (external static pressure 150 Pa)									
Outdoor sound power Standard unit ⁽¹⁾	dB(A)	87	88	87	92	92	88	89	
Outdoor sound power Low noise unit ⁽¹⁾		82	82	82	84	86	85	85	
Indoor blower outlet sound power Standard unit ⁽¹⁾		84	87	89	88	90	86	88	

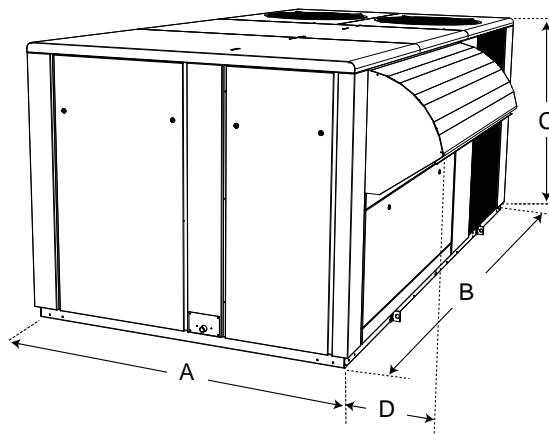
- (1) All data at EUROVENT conditions
Cooling : 35°C DB - 27°C DB 47% / 19°C WB
Heating : 7°C DB - 20°C DB 60% / 15°C WB
Nominal airflow, nominal external static pressure, 400 V/3 Ph/50 Hz
- (2) Including the compressor and outdoor fan (axial) and indoor fan (centrifugal)
- (3) Net EER = Net cooling capacity/ Total absorbed power
Net COP = Net heating capacity/ Total absorbed power
- (4) The cooling and heating operating limits are given for steady state running condition with noted temperature condition
- (5) S = Standard heat
M = Medium heat
H = High heat

FLEXY is part of RT Eurovent Certification Program up to 200 kW

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



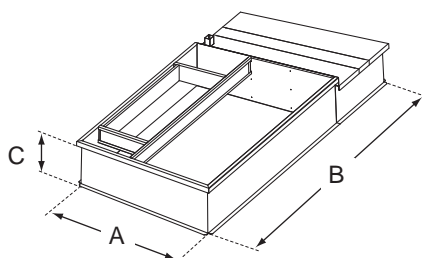
Dimensions and weights



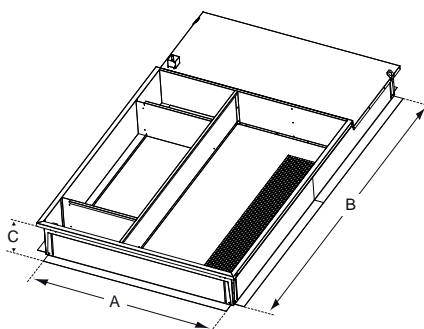
FCM/FHM/FGM/FDM		085	100	120	150	170	200	230
A	mm	2290			2290		2290	
B	mm	3348			4385		5530	
C	mm	1510			1830		2130	
D	mm	415			415		415	
Weight of standard units								
Basic unit - FCM	kg	990	1065	1142	1442	1505	1992	2292
Weight of gas unit								
Basic unit Standard Heat	kg	1097	1172	1249	1683	1746	2256	2556
Basic unit High Heat	kg	1167	1242	1319	1706	1769	2296	2596

Roofcurb dimensions and weights

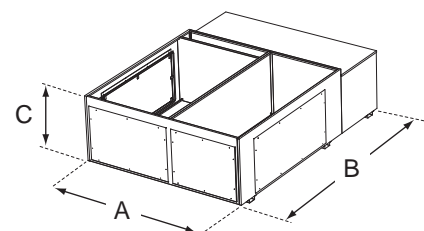
**NON ADJUSTABLE,
NON ASSEMBLED
ROOFCURB**



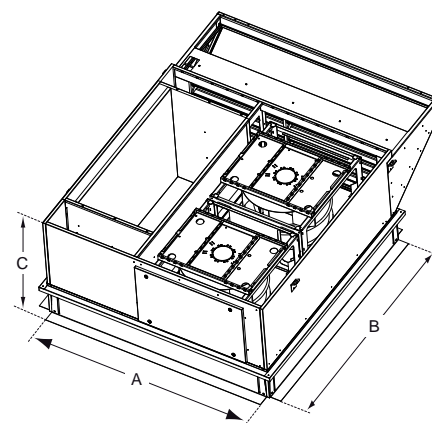
ADJUSTABLE ROOFCURB



MULTIDIRECTIONAL ROOFCURB



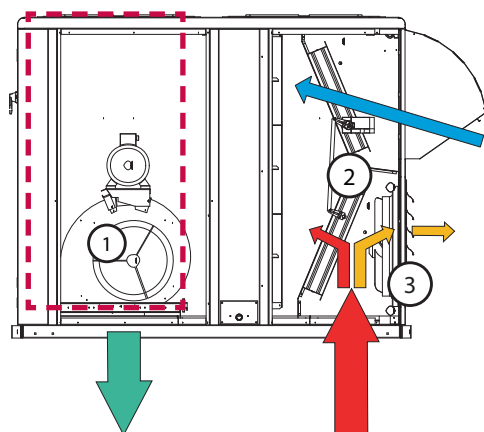
**CENTRIFUGAL RETURN
ROOFCURB
(vertical and horizontal)**



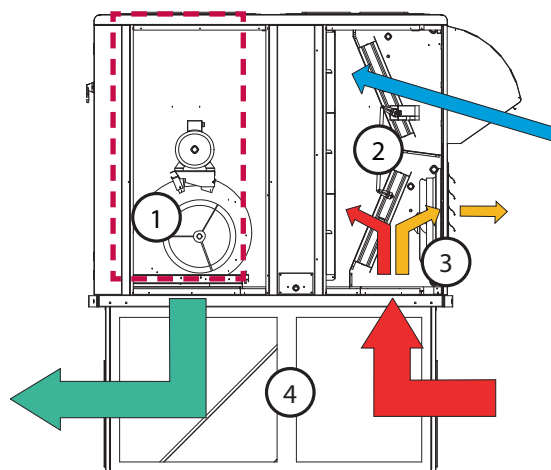
FCM/FHM/FGM/FDM		085	100	120	150	170	200	230
Non-adjustable, non assembled roofcurb	A	2059			2059		2059	
	B	2771			3466		4066	
	C	410			410		425	
Assembled adjustable roofcurb	A	2159			2159		2159	
	B	2872			3567		4167	
	C	400			400		425	
Multidirectional roofcurb	A	2154			2154		2154	
	B	2745			3441		4067	
	C	840			1140		1340	
Vertical return roofcurb	A	2256			2256		2256	
	B	3127			4193		4193	
	C	1220			1220		1220	
Horizontal return roofcurb	A	2083			2083		2083	
	B	3041			4107		4107	
	C	1220			1220		1305	

Principle sketches

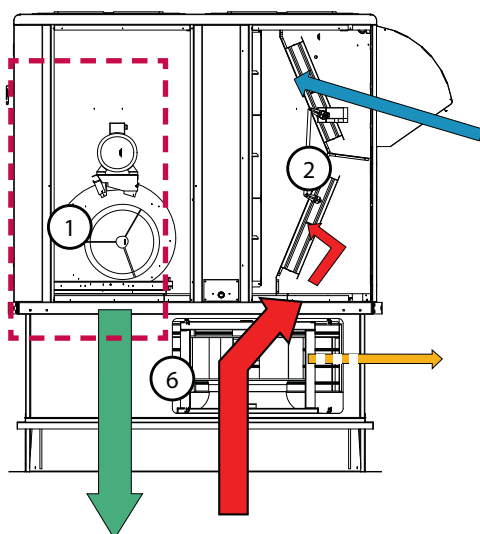
FLEXY
(vertical flow)*



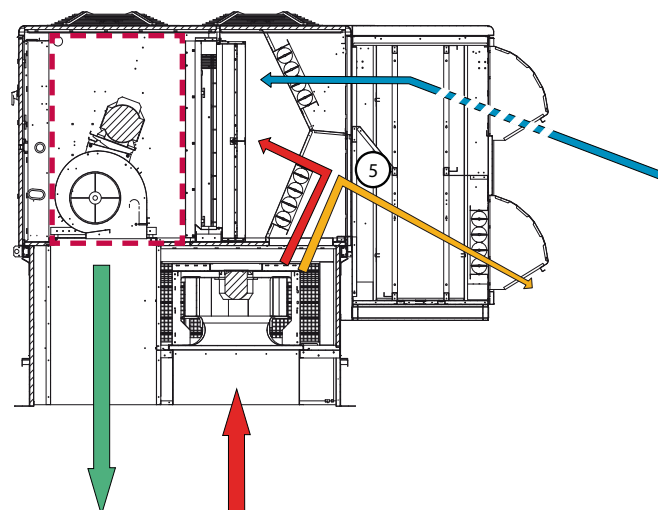
MULTIDIRECTIONAL ROOFCURB*



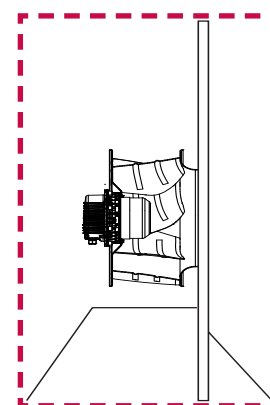
CENTRIFUGAL RETURN ROOFCURB
(vertical flow)*



ENERGY RECOVERY MODULE*



	Fresh air
	Return air
	Exhaust air
	Supply air
1	Supply fan
2	Return air damper
3	Exhaust damper
4	Multidirectional curb
5	Heat recovery exchanger
6	Return/Exhaust fan



***FLEXY EC**
Ventilation section

Standard features and options

Energy efficiency and comfort

- **eDrive (BALTIC & FLEXY EC):** eDrive is a standard feature of Lennox **BALTIC & FLEXY EC** units. It is a variable speed, direct transmission ventilation system that saves energy and reduces maintenance costs.
- **CLIMATIC** controls eDrive and automatically adjusts the airflow rate to the exact building needs, saving up to 30% annual rooftop energy consumption.
- eDrive is a direct transmission system without pulleys nor belts. It eliminates friction losses improving energy efficiency even at full speed.
- **Advanced multiscroll refrigeration circuit:** Lennox rooftops feature the high efficiency, environmentally friendly refrigeration circuits with multiscroll R410A compressors, optimized heat exchange area and electronic expansion valves (on **BALTIC** and **FLEXY EC** -optional on standard **FLEXY**).
- **Air sock control:** Soft start control allows the air socks to be progressively filled with air on start up. This feature is provided as standard on **BALTIC** and **FLEXY EC** thanks to eDrive.
- **Free cooling/heating:** Thermodynamic cooling or heating can be replaced by free-cooling/heating when outdoor temperature are favorable (below/above the building set point), saving up to 30% on annual energy consumption.
- **Accurate percentage of fresh air:** Managing fresh air is mandatory in a building to control CO₂ level and comfort. Introducing just the required amount of fresh air in a building can reduce energy consumption.
On all Lennox rooftops units, the damper position is periodically recalibrated to ensure the real percentage of fresh air is introduced into the building (patent 03 50616). This feature ensures a better CO₂ management while saving energy by reducing the amount of cooling or heating to treat the extra fresh air.
- **Dynamic defrost control:** Dynamic defrost is Lennox' answers to unnecessary defrost cycles. Dynamic defrost detects icing of the coil by monitoring the difference between refrigerant and outside temperature and starts the defrost cycle only when required. This feature allows significant energy savings by reducing the numbers of defrost cycles when they are not necessary.
- **Alternate defrost:** This feature is available on all dual refrigeration circuit units.
Alternate defrost saves energy by reducing the need for auxiliary heating during defrost cycles. With Alternate defrost, when one circuit starts a defrost cycle the other circuit is running in heat pump to minimize the need for auxiliary heating.
- **Low noise option:** To achieve low outside noise level, the rooftop can be equipped with a quieter fan, compressor jackets and acoustic insulation.
- **Energy recovery on exhaust air:** This option is designed to recover energy in the exhaust air to pre heat or pre cool the fresh air and save energy. Lennox heat recovery modules are built around EUROVENT certified heat exchangers and are fully controlled by the **CLIMATIC**. On **BALTIC** range, possibility to have an additional thermodynamic circuit to recover calories on exhaust air
- **Energy recovery on food refrigeration:** This option reduces annual energy consumption and improves environmental impact by recovering energy wasted by the food refrigeration systems.

- **Energy meter:** This option measures and displays energy consumption and displays absorbed power, power factor, intensity and tension of each phase. Connected to the time counter of the **CLIMATIC**, it also provides these information for each heating or cooling periods as well as periods when the ventilation is activated

Auxiliary heating

- **Auxiliary electric heater:** Standard medium and high heat as option with fully modulating triac control heater for medium and high heat.
- **Auxiliary electric pre-heater:** The electric pre-heater is located before the main thermodynamic coil. It is designed to authorize heat pump operation with low mixed air temperature (low outdoor temperature with units running with a high fresh air rate in winter). Fully modulating.
- **Hot water coil:** Hot water coils 1 and 2 rows offer fully modulating control through the use of a 3 way valve. Frost protection through thermostat controlled valve.
- **92% high efficiency gas burner:** This high efficiency gas burner offers improved space comfort through 2 to 4 capacity stages.
- **Modulating gas burner:** The modulating gas burner maintains a constant gas/air mixture to optimize efficiency with changing air conditions and heating demand.

Architectural integration

- **Non adjustable, non assembled roofcurb:** Shipped folded flat for easy transport and handling, it is easily assembled on file.
- **Adjustable roofcurb:** This adjustable roofcurb can be installed on a sloped roof with vertical supply and return airflow configuration.
- **Multidirectional roofcurb:** Provide many airflow combinations, including horizontal supply and return on the same side.
- **Horizontal/Up and down air flow:** Horizontal and Downflow return and supply are available as standard on all Lennox rooftops. Up-flow return and supply is available on all **FLEXY**.
- **Adaptation Roofcurb:** This tailor-made roofcurb is used when you want to adapt a new Lennox Rooftop in place of an old existing unit.

Indoor air quality

- **Fresh air management:** The economiser is able to ensure that fresh air is provided to the building to meet the indoor air quality requirement (patent 03 50616).
- **Indoor air quality sensor:** This feature gives the possibility to match minimum fresh air requirements with occupancy. It measures CO₂ levels and adjusts fresh airflow rate accordingly.
- **Gravity exhaust damper:** Gravity exhaust damper relieves the pressure when outside air is being introduced in the system.
- **Axial power exhaust fan:** Provides exhaust air pressure relief when high levels of fresh air are being introduced in the system.
- **Centrifugal return roofcurb:** Where system balancing is critical, the fan is able to exhaust up to the nominal airflow rate of the unit and improves energy and maintenance cost.
- **Refillable G4 filter:** Instead of replacing the whole filter frame, only the media has to be changed. It's a good cost saving solution.

- **G4/F7 panel filters:** Adding a G4 pre-filter before the F7 filter reduces excessive replacement of F7 filters.
- **Double skin :** This feature prevents bacteria development on porous surface and allows an easy cleaning of the panel. It also prevents insulation particles to be carried away in the air stream.
- **Analog dirty filter sensor:** A differential pressure sensor measures the pressure drop across the filters and coil to allow preventive filter change, thus reducing energy consumption and improving air quality.

Safety

- **MO fire proof insulation:** All Lennox rooftops feature MO rock or glass wool insulation as standard. The insulation will not burn and will not generate smoke in case of fire.
- **Smoke detector:** The optical head of the smoke detector can detect any type of smoke. When this occurs the unit will stop operating, the return air damper will close fully and the fresh air damper will open fully.
- **Fire-stat:** This safety thermostat provides fire protection by switching off the unit and closing the fresh air damper.

CLIMATIC general description

This new generation of microprocessor based control, **CLIMATIC** equips the Lennox rooftop range. It is designed to provide best energy efficiency throughout the unit life cycle while ensuring reliable and consistent operation.

CLIMATIC integrates innovative PID control that will guaranty better temperature accuracy, while saving energy. It also ensures compressor running time optimisation.

It manages security algorithms and displays fault signals. It has extended scheduling capability with the possibility to adjust many set points over the various time zones.

It is user friendly through a wide choice of displays and communication interfaces while providing flexibility with the ability to control multiple rooftops on a single job site.

CLIMATIC standard features

- **Step of heating priorities:** Allows the user to choose which heating element should come first.
- **Automatic summer winter change:** **CLIMATIC** integrates an automatic time switch from winter to summer time.
- **Noise reduction feature:** The control will reduce the rooftop capacity during unoccupied zone to limit outdoor noise at night when capacity needed is lower and when noise matters more.
- **Staged start feature:** If there is a power shortage, units will not restart at the same.
- **Morning anticipation and dynamic set point:** The unit can be programmed to anticipate the morning cooling or heating needs depending on the outdoor temperature.
- **Dynamic set point** can be used in summer to offset the ambient temperature set point according to the outdoor temperature.
- **Dynamic defrost:** It is a standard feature of all Lennox heat pumps. It limits the number and the duration of the defrost cycles in winter to maximize COP.

CLIMATIC main options

- **Advanced control pack:** Thanks to specific algorithm and sensors, this pack provides two advanced control features: Enthalpy control on economiser and humidity control.
- **Service display:** This plug and play service display and controller allows service personal to set up to read and modify all unit parameters: Unit settings, operating time and number of compressor starts, low and high pressure reading, airflow rate of supply fan, and read the history of last 32 faults...
- **Comfort display:** This is a remote controller for non-technical customer. It was designed to aesthetically fit in the room and be very easy to use. With this display the customer can modify temperature set points.
- **Dry control board:** This option was developed for any customer who wants to take over the control of the unit using Digital or analogue input signal. It provides various logical dry contact inputs to be able to take over the control of the unit.

Communication interfaces and supervision

- **Standard master/slave link:** Master/slave or cascade control is a standard feature. It can be used to connect up to 8 rooftops. The units can then be programmed to optimize efficiency and improve reliability.
- **Communication Interface/ModBus Interface:** ModBus interface is required to connect the unit to a BMS using «ModBus protocol». No other hardware than this board is required to have ModBus communication. One board required per rooftop. The ModBus interface is available in two versions to be connected with RS485 or TCP/IP depending on site requirements.
- **LonWorks® interface:** This board is a LonWorks® interface, needed for any BMS with "Lon protocol" and RS485 connection to communicate with **BALTIC** and **FLEXY** ranges. No other hardware than this board is required to have LonWorks® dialog. One board required per rooftop.
- **BACnet® interface:** The BACnet® interface is required to connect the unit to a BMS using BACnet® protocol. One board required per rooftop. The BACnet® interface is available in two versions to be connected with RS485 or TCP/IP depending on site requirements.
- **ADALINK II:** It is Lennox's simplest solution for HVAC installation supervision to better control the system and improve reliability and energy efficiency. One ADALINK II can control up to 16 Lennox units on the same site (liquid chillers, rooftop or any other unit using **CLIMATIC** controller). It displays a site picture with the status of each unit and allows the user to change set points, access alarm history and plot charts. It is the ideal tool to save time and money on maintenance with an expert mode giving access to all the parameters and set point of the unit.



WATER SOURCE HEAT PUMP ROOFTOP PACKAGED UNITS (WSHP)

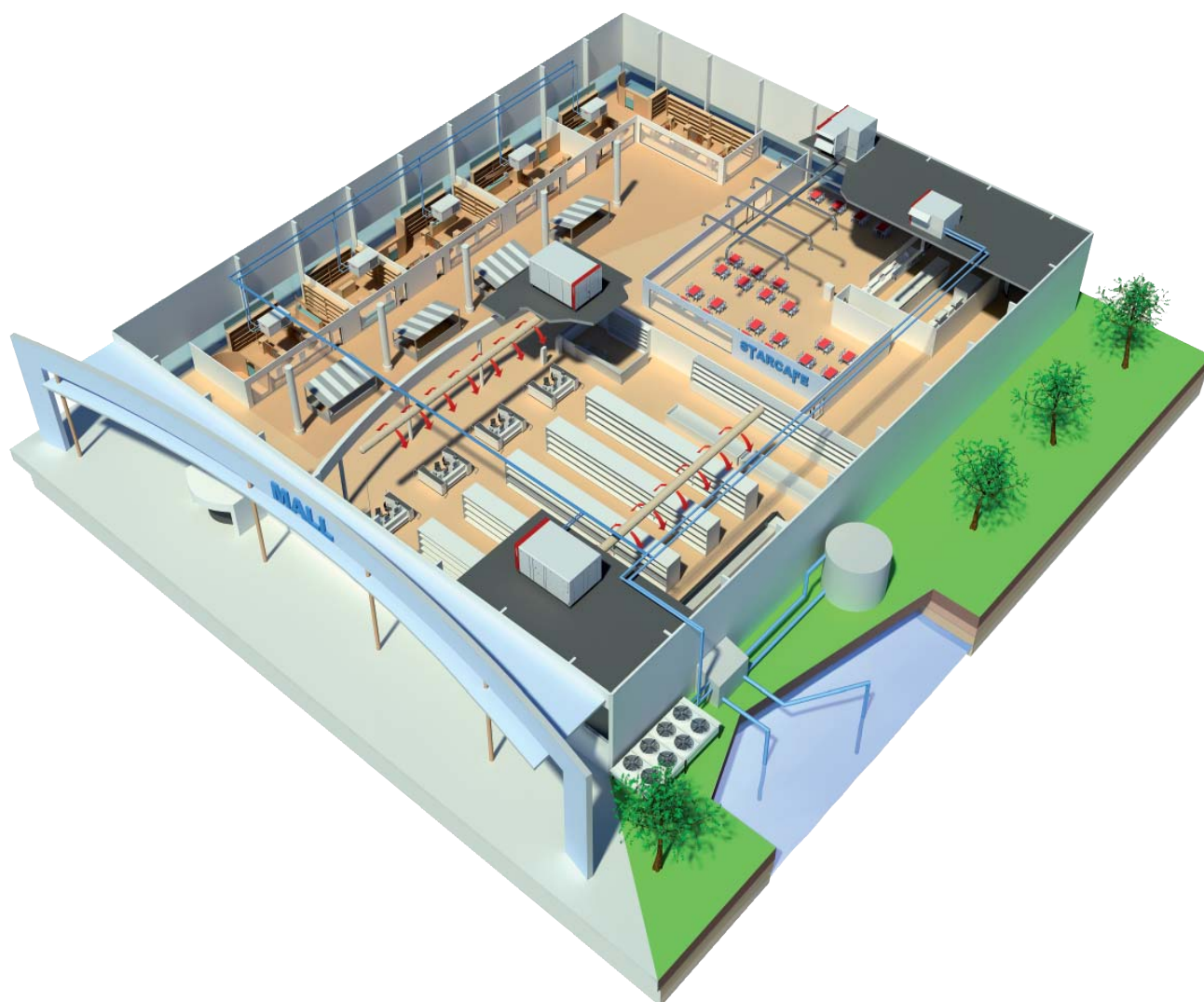
BALTIC WSHP

46 → 92 kW



FLEXY WSHP

95 → 196 kW



Main applications

- Large commercial buildings (retail, airports, shopping malls)
- Cinemas, theatres
- Buildings equipped with water loop

Why this choice?

- One of the most energy efficient solution
- Cost effective package for fast and easy installation
- Auxiliary heating options available
- Fresh air control and free cooling management
- Wide choice of communication interfaces
- Heat recovery modules to decrease energy consumption

General description

Water source heat pump systems are composed of individual packaged units that transfer heat via a single water loop. Each unit can be used in either heating or cooling mode year round and loop temperature is maintained via a cooling-only and boiler or heat pump chiller plus dry-cooler combination and/or geothermal loop. Lennox water source rooftop units provide the most energy efficient solution for comfort air conditioning of single volume buildings.

- First class efficiency system thanks to scroll compressor technology associated with environmentally friendly R410A refrigerant and high performance water plate heat exchanger.
- The water source heat pump rooftop unit product line is Lennox most innovative and flexible equipment for large integrated commercial applications; each unit being independent from the other it can be independently controlled.
- Very low noise solution as there is no outdoor fans on the unit.
- Advance **CLIMATIC** controller, designed to improve energy efficiency and reliability. This controller integrates master slave capability and a wide choice of communication interfaces.
- All in one cost effective package solution for fast and easy installation.
- Low weight construction for easy lifting in all site configurations.
- Many standard airflow configurations and wide range of adjustable roof curbs to suit all type of building designs.
- Auxiliary heating options available with intelligent control to allow the selection of the most efficient way to generate heat based on the outside temperature and/or energy costs.
- Fresh air control and free cooling/heating management for healthy and comfortable environments.
- The units are available with the following versions:
 - > Heat pump
 - > Multiple fuels units combine heat pump with gas fired heating

Main components

- R410A scroll compressors
- Compact Stainless steel plate heat exchanger with low pressure drop for pumps energy savings and full set of hydraulic features as standard.
- EN 60204-1 electrical cabinet with circuit breaker protection and numbered wires and connectors.
- Fire proof MO insulation
- Wide choice of air filtration and pre-filtration up to F7
- eDrive variable speed direct transmission (as standard on **BALTIC** range, optional on **FLEXY** one)
- Removable and washable drain pan and siphon
- Corrosion resistant casing (galvanized steel or aluminum) with stainless steel fixings

CLIMATIC controller

- Full text fault display and history.
- Many settings and readings available for customization and diagnostic.
- Advanced control features: advanced compressor management; dynamic defrost; intelligent fresh air management; automatic summer/winter change, variable speed drive fan management with airflow measurement
- Extended communication capability : Master/Slave, ModBus and BACnet RS485 or TCP-IP, LonWorks,
- Compatible with Lennox monitoring and supervision solutions.

BWH/FWH Water cooled heat pump rooftop

BWM/FWM Water cooled heat pump rooftop with gas fired heating

General data

WSHP		BALTIC WSHP						FLEXY WSHP				
		045	052	057	065	075	085	085	100	120	150	170
Cooling mode - BWH/BWM												
Gross cooling capacity ⁽¹⁾	kW	46,3	53,3	61,9	73,6	87,8	91,6	93,2	124	138	165	194
Net cooling capacity ⁽¹⁾		45,8	52,4	60,3	71,2	86,0	89,6	90,8	119,9	133,6	160,2	187,2
Absorbed power		11,1	12,7	14,3	18,1	20,9	23,5	21,8	29,3	33,2	38,2	47,5
Gross EER ⁽²⁾		4,44	4,67	4,88	4,91	4,80	4,46	5,0	5,1	5,1	5,2	5,0
Net EER ⁽³⁾		4,11	4,12	4,23	3,93	4,11	3,81	4,17	4,1	4,0	4,2	3,94
Eurovent energy efficiency class Cooling mode		B	B	B	C	B	C	B	C	C	B	C
Heating mode - BWM												
Gross heating capacity ⁽¹⁾	kW	56,7	65,9	78,4	91,1	105,3	112,8	111,0	140,1	157,1	186,25	225,5
Absorbed power		12,6	14,6	16,9	21,8	23,5	26,9	24,1	32,2	37,4	40,2	52,0
Gross COP ⁽²⁾		4,8	5,0	5,1	4,7	5,0	4,7	5,1	5,0	4,8	5,3	5,0
Net COP ⁽³⁾		4,51	4,53	4,63	4,18	4,48	4,19	4,60	4,35	4,20	4,63	4,34
Eurovent energy efficiency class Heating mode		B	B	B	C	B	C	B	C	C	B	C
Auxiliary heating												
Gas heating capacity Standard heat/High heat	kW - S/H ⁽⁴⁾	30,7/55,8				55,8/112,0		55,2/110,4			110,4 / 165,6	
Electric heater capacity Standard heat/High heat	kW - S/M/H ⁽⁴⁾	27/54						30/54/72			45/72/108	
Electric pre- heater capacity Standard heat/High heat	kW - S/H ⁽⁴⁾	24/48				36 / 72						
Hot water coil capacity Standard heat/High heat (air 10°C/water 90-70°C)	kW - S/H ⁽⁴⁾	84	93	103	109	178	186	134/ 210	149/ 236	156/ 250	169/ 301	180/ 326
Refrigeration circuit												
Number of compressors/Number of circuits		2/2	3/2	4/2	4/2	4/2	4/2	2/2	2/2	2/2	3/2	4/2
Refrigerant charge per circuit		kg	6,8	6,8	7,8	9,1	10,0	10,5	10,0	10,5	10,5	16,0
Hydraulic circuit												
Pressure drop at nominal airflow rate		kPa	27	35	22	31	42	47	60	58	58	76
Inlet/outlet connections		DN	65	65	65	65	65	65	65	65	65	80
Ventilation data												
Nominal airflow rate	m³/h	7100	8300	9900	11000	13500	14500	15000	18500	20500	26000	30000
Minimum airflow rate		5700	6700	7900	8900	10500	10500	12000	14000	15000	18000	21000
Maximum airflow rate		9700	11200	13100	13100	17000	19000	23000	23000	23000	35000	35000
Acoustic data												
Outdoor sound power Standard unit	dB(A)	72	74	76	79	78	80	76	78	78	80	83
Indoor blower outlet sound power Standard unit		78	81	85	87	87	89	85	90	89	91	94

Note:

(1) All data at EUROVENT conditions

Cooling : water inlet 30°C - 27°C DB 47% / 19°C WB

Heating : water inlet 20°C - 20°C 60% / 15°C WB)

Nominal airflow, nominal external static pressure, 400 V/3 Ph/50 Hz)

(2) Including the compressor and outdoor fan (axial) and indoor fan (centrifugal)

(3) Net EER = Net cooling capacity/ Total absorbed power

Net COP = Net heating capacity/ Total absorbed power

(4) The cooling and heating operating limits are given for steady state running condition with noted temperature condition

(4) S = Standard heat

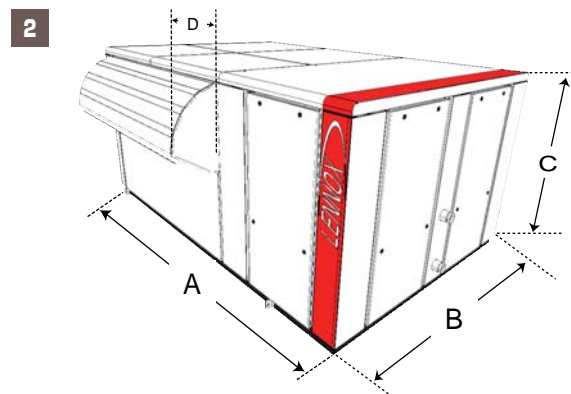
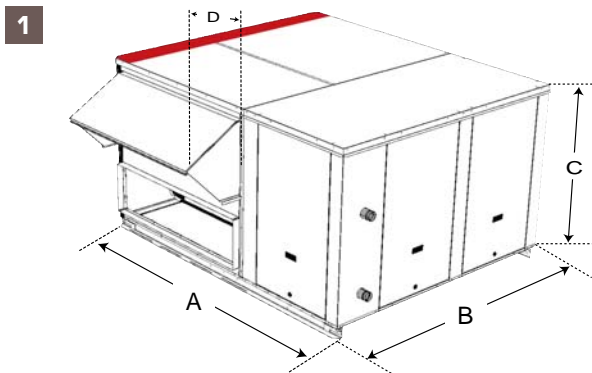
M = Medium heat

H = High heat

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



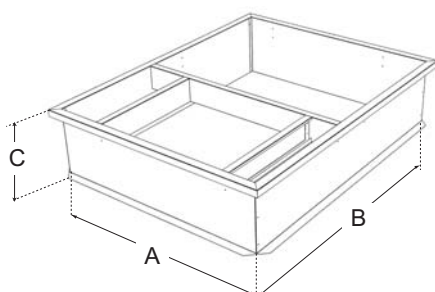
Dimensions and weights



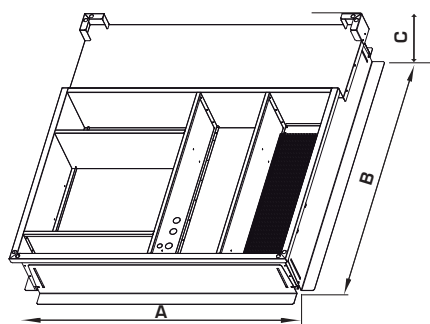
WSHP		BALTIC						FLEXY				
		045	052	057	065	075	085	085	100	120	150	170
View		1						2				
A	mm	2259						2290				
B		2783				3283		3348			4385	
C		1260						1510			1830	
D		435						415				
Weight												
Standard unit	kg	760	795	842	876	987	1007	790	874	955	1237	1300
Gas unit - Standard heat		819	854	913	931	1077	1079	897	981	1062	1478	1541
Gas unit - High heat		841	876	935	953	1135	1137	967	1051	1132	1501	1564

Roofcurbs dimensions and weights

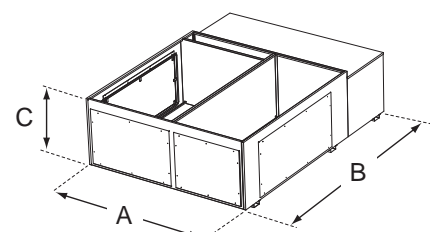
**NON ADJUSTABLE,
NON ASSEMBLED ROOFCURB**



ADJUSTABLE ROOFCURB

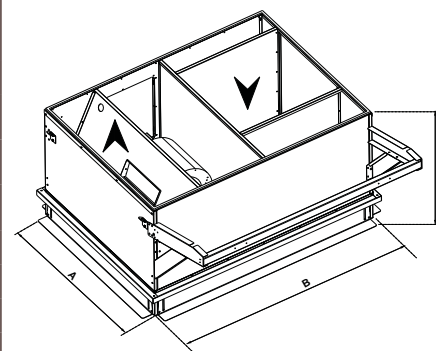


**MULTIDIRECTIONAL
ROOFCURB**



WSHP		BALTIC						FLEXY				
		045	052	057	065	075	085	85	100	120	150	170
Non-adjustable, non assembled roofcurb	A	2123		2123		2059		2059				
	C	2217		2719		2771		3466				
	B	415		415		410		410				
Assembled adjustable roofcurb	A	2225		2225		2159		2159				
	C	2318		2818		2872		3567				
	B	495		495		400		400				
Multidirectional roofcurb (External dimensions. No roof opening required)	A	2222		2222		2154		2154				
	C	2260		2763		2745		3441				
	B	795		795		840		1140				
Vertical exhaust roofcurb	A	2349		2731		2256		2256				
	C	2323		2127		3127		4193				
	B	1110		1110		1220		1220				
Horizontal exhaust box/ roofcurb	A	980		980		2083		2083				
	C	1659		2159		3041		4107				
	B	720		720		1220		1220				

**CENTRIFUGAL RETURN
ROOFCURB**



Standard features and options

Energy efficiency and comfort

- **eDrive (BALTIC & FLEXY EC):** eDrive is a standard feature of Lennox **BALTIC & FLEXY EC** units. It is a variable speed, direct transmission ventilation system that saves energy and reduces maintenance costs.
- **CLIMATIC** controls eDrive and automatically adjusts the airflow rate to the exact building needs, saving up to 30% annual rooftop energy consumption.
- eDrive is a direct transmission system without pulleys nor belts. It eliminates friction losses improving energy efficiency even at full speed.
- **Advanced multiscroll refrigeration circuit:** Lennox rooftops feature the high efficiency, environmentally friendly refrigeration circuits with multiscroll R410A compressors, optimized heat exchange area and electronic expansion valves (on **BALTIC** and **FLEXY EC** - optional on standard **FLEXY**).
- **Air sock control:** Soft start control allows the air socks to be progressively filled with air on start up. This feature is provided as standard on **BALTIC** and **FLEXY EC** thanks to eDrive.
- **Free cooling/heating:** Thermodynamic cooling or heating can be replaced by free-cooling/heating when outdoor temperature are favorable (below/above the building set point), saving up to 30% on annual energy consumption.
- **Accurate percentage of fresh air:** Managing fresh air is mandatory in a building to control CO₂ level and comfort. Introducing just the required amount of fresh air in a building can reduce energy consumption.
On all Lennox rooftops units, the damper position is periodically recalibrated to ensure the real percentage of fresh air is introduced into the building (patent O3 50616).
This feature ensures a better CO₂ management while saving energy by reducing the amount of cooling or heating to treat the extra fresh air.
- **Low noise option:** To achieve low outside noise level, the rooftop can be equipped with a quieter fan, compressor jackets and acoustic insulation.
- **Energy recovery on exhaust air:** This option is designed to recover energy in the exhaust air to pre heat or pre cool the fresh air and save energy. Lennox heat recovery modules are built around EUROVENT certified heat exchangers and are fully controlled by the **CLIMATIC**. On **BALTIC** range, possibility to have an additional thermodynamic circuit to recover calories on exhaust air
- **Energy recovery on food refrigeration:** This option reduces annual energy consumption and improves environmental impact by recovering energy wasted by the food refrigeration systems.
- **Energy meter:** This option measures and displays energy consumption and displays absorbed power, power factor, intensity and tension of each phase. Connected to the time counter of the **CLIMATIC**, it also provides these information for each heating or cooling periods as well as periods when the ventilation is activated

Auxiliary heating

- **Auxiliary electric heater:** Standard medium and high heat as option with fully modulating triac control heater for medium and high heat.
- **Auxiliary electric pre-heater:** The electric pre-heater is located before the main thermodynamic coil. It is designed to authorize heat pump operation with low mixed air temperature (low outdoor temperature with units running with a high fresh air rate in winter). Fully modulating.
- **Hot water coil:** Hot water coils 1 and 2 rows offer fully modulating control through the use of a 3 way valve. Frost protection through thermostat controlled valve.
- **92% high efficiency gas burner:** This high efficiency gas burner offers improved space comfort through 2 to 4 capacity stages.
- **Modulating gas burner:** The modulating gas burner maintains a constant gas/air mixture to optimize efficiency with changing air conditions and heating demand.

Architectural integration

- **Non adjustable, non assembled roofcurb:** Shipped folded flat for easy transport and handling, it is easily assembled on file.
- **Adjustable roofcurb:** This adjustable roofcurb can be installed on a sloped roof with vertical supply and return airflow configuration.
- **Multidirectional roofcurb:** Provide many airflow combinations, including horizontal supply and return on the same side.
- **Horizontal/Up and down air flow:** Horizontal and Downflow return and supply are available as standard on all Lennox rooftops. Up-flow return and supply is available on all **FLEXY**.
- **Adaptation Roofcurb:** This tailor-made roofcurb is used when you want to adapt a new Lennox Rooftop in place of an old existing unit.

Indoor air quality

- **Fresh air management:** The economiser is able to ensure that fresh air is provided to the building to meet the indoor air quality requirement (patent O3 50616).
- **Indoor air quality sensor:** This feature gives the possibility to match minimum fresh air requirements with occupancy. It measures CO₂ levels and adjusts fresh airflow rate accordingly.
- **Gravity exhaust damper:** Gravity exhaust damper relieves the pressure when outside air is being introduced in the system.
- **Axial power exhaust fan:** Provides exhaust air pressure relief when high levels of fresh air are being introduced in the system.
- **Centrifugal return roofcurb:** Where system balancing is critical, the fan is able to exhaust up to the nominal airflow rate of the unit and improves energy and maintenance cost.
- **Refillable G4 filter:** Instead of replacing the whole filter frame, only the media has to be changed. It's a good cost saving solution.
- **G4/F7 panel filters:** Adding a G4 pre-filter before the F7 filter reduces excessive replacement of F7 filters.
- **Double skin :** This feature prevents bacteria development on porous surface and allows an easy cleaning of the panel. It also prevents insulation particles to be carried away in the air stream.
- **Analog dirty filter sensor:** A differential pressure sensor measures the pressure drop across the filters and coil

to allow preventive filter change, thus reducing energy consumption and improving air quality.

Safety

- **MO fire proof insulation:** All Lennox rooftops feature MO rock or glass wool insulation as standard. The insulation will not burn and will not generate smoke in case of fire.
- **Smoke detector:** The optical head of the smoke detector can detect any type of smoke. When this occurs the unit will stop operating, the return air damper will close fully and the fresh air damper will open fully.
- **Fire-stat:** This safety thermostat provides fire protection by switching off the unit and closing the fresh air damper.

CLIMATIC general description

This new generation of microprocessor based control, **CLIMATIC** equips the Lennox rooftop range. It is designed to provide best energy efficiency throughout the unit life cycle while ensuring reliable and consistent operation.

CLIMATIC integrates innovative PID control that will guaranty better temperature accuracy, while saving energy. It also ensures compressor running time optimisation.

It manages security algorithms and displays fault signals. It has extended scheduling capability with the possibility to adjust many set points over the various time zones.

It is user friendly through a wide choice of displays and communication interfaces while providing flexibility with the ability to control multiple rooftops on a single job site.

CLIMATIC standard features

- **Step of heating priorities:** Allows the user to choose which heating element should come first.
- **Automatic summer winter change:** **CLIMATIC** integrates an automatic time switch from winter to summer time.
- **Noise reduction feature:** The control will reduce the rooftop capacity during unoccupied zone to limit outdoor noise at night when capacity needed is lower and when noise matters more.
- **Staged start feature:** If there is a power shortage, units will not restart at the same.
- **Morning anticipation and dynamic set point:** The unit can be programmed to anticipate the morning cooling or heating needs depending on the outdoor temperature.
- **Dynamic set point** can be used in summer to offset the ambient temperature set point according to the outdoor temperature.
- **Dynamic defrost:** It is a standard feature of all Lennox heat pumps. It limits the number and the duration of the defrost cycles in winter to maximize COP.

CLIMATIC main options

- **Advanced control pack:** Thanks to specific algorithm and sensors, this pack provides two advanced control features: Enthalpy control on economiser and humidity control.
- **Service display:** This plug and play service display and controller allows service personal to set up to read and modify all unit parameters: Unit settings, operating time and number of compressor starts, low and high pressure reading, airflow rate of supply fan, and read the history of last 32 faults...
- **Comfort display:** This is a remote controller for non-technical customer. It was designed to aesthetically fit in the room and be very easy to use. With this display the customer can modify temperature set points.
- **Dry control board:** This option was developed for any customer who wants to take over the control of the unit using Digital or analogue input signal. It provides various logical dry contact inputs to be able to take over the control of the unit.

Communication interfaces and supervision

- **Standard master/slave link:** Master/slave or cascade control is a standard feature. It can be used to connect up to 8 rooftops. The units can then be programmed to optimize efficiency and improve reliability.
- **Communication Interface/ModBus Interface:** ModBus interface is required to connect the unit to a BMS using «ModBus protocol». No other hardware than this board is required to have ModBus communication. One board required per rooftop. The ModBus interface is available in two versions to be connected with RS485 or TCP/IP depending on site requirements.
- **LonWorks® interface:** This board is a LonWorks® interface, needed for any BMS with "Lon protocol" and RS485 connection to communicate with **BALTIC** and **FLEXY** ranges. No other hardware than this board is required to have LonWorks® dialog. One board required per rooftop.
- **BACnet® interface:** The BACnet® interface is required to connect the unit to a BMS using BACnet® protocol. One board required per rooftop. The BACnet® interface is available in two versions to be connected with RS485 or TCP/IP depending on site requirements.
- **ADALINK II:** It is Lennox's simplest solution for HVAC installation supervision to better control the system and improve reliability and energy efficiency. One ADALINK II can control up to 16 Lennox units on the same site (liquid chillers, rooftop or any other unit using **CLIMATIC** controller). It displays a site picture with the status of each unit and allows the user to change set points, access alarm history and plot charts. It is the ideal tool to save time and money on maintenance with an expert mode giving access to all the parameters and set point of the unit.

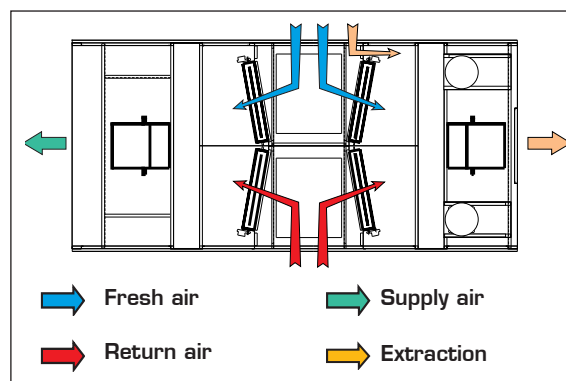
25 → 162 kW
Rooftop packaged units with heat recovery


Main applications

- Cinemas, theatres, convention centers
- Large and light commercial buildings (retail, airports, restaurants...)

Why this choice?

- One of the most energy efficient solutions with full thermodynamics air to air heat recovery
- Ideal for all application requiring large amounts of fresh air.
- Design to provide accurate ventilation balancing.
- Package solution for fast and easy installation
- Wide choice of communication interfaces with **CLIMATIC**



General description

Rooftop **FX** solution is the most cost effective package solution for high efficiency comfort air conditioning of buildings using high volumes of fresh air.

- First class efficiency system thanks to the full thermodynamic heat recovery 4 dampers systems
- High flexibility with two centrifugal fans (exhaust and supply) allowing full modulation of the air balancing in the building and control of exhaust and fresh air mix.
- Perfect control of the pressure inside the building to limit the risk of door opening due to pressure differences.
- Unit can be fully ducted (supply and exhaust) allowing indoor installation when required.
- Available as heat pump only the unit is also available for 100% fresh air application down to -10°C outside air
- Advance **CLIMATIC** controller, designed to improve energy efficiency and reliability. This controller integrates master slave capability and a wide choice of communication interfaces.

Main components

- R410A compressors
- EN 60204-1 electrical cabinet with circuit breaker protection and numbered wires and connectors
- Fire proof MO insulation
- Variable drive pulley on supply and exhaust as a standard feature
- Corrosion resistant casing with stainless steel fixings

CLIMATIC controller

- 16 bits, 21 megabytes flash memory processor
- Can display 50 different faults
- 100 settings and 100 readings available for customization and diagnostic
- Advanced control features: advanced compressor management; dynamic defrost; intelligent fresh air management; automatic summer/winter change
- Extended communication capability : Master/Slave, RS485 Modbus, Lon, Bacnet®
- Compatible with Lennox monitoring and supervision solutions

General data

FX		025	030	035	040	055	070	085	100	110	140	170
Cooling mode												
Gross cooling capacity ⁽¹⁾	kW	24,7	28,6	32,5	41,1	49,8	67,3	81,0	97,2	112,0	138	161,5
Gross EER ⁽¹⁾		3,04	3,15	3,50	3,12	3,14	3,91	3,68	4,13	4,14	4,45	4,01
Heating mode												
Net heating capacity ⁽¹⁾	kW	22,8	25,8	28,1	34,9	43,6	59,3	72,7	80,1	101,0	124,0	150,0
Net COP ⁽¹⁾		3,34	3,31	3,97	3,81	3,86	4,85	4,63	4,27	4,44	4,81	4,48
Refrigerant circuit												
Number of compressors/Number of circuits		2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	4/4	4/4	4/4
Refrigerant charge per circuit	kg	4,6	4,6	10,8	10,8	10,8	14,3	14,3	14,3	11,3	11,3	11,3
Maximum outdoor temperature in cooling mode	°C	40	39	42	41	42	42	42	44	44	43	41
Ventilation												
Nominal airflow rate at 150 Pa	m³/h	4000	5000	6000	7200	9000	10800	13500	17300	19000	24000	27000
Minimum airflow rate		3200	4000	4800	5800	7200	8600	10800	13800	15200	19200	24000
Maximum airflow rate ⁽¹⁾		4500	5500	6600	8100	9900	12200	15400	18200	21500	25500	30000
Acoustic data												
Outdoor sound power level	dB(A)	85	87	83	84	89	90	94	95	92	96	98
Indoor air discharge sound power level		80	83	78	80	83	84	88	93	87	91	93

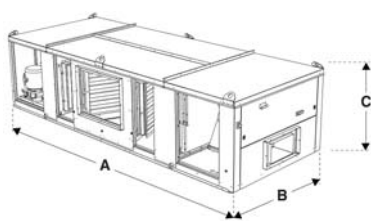
(1) : All data at summer operating conditions : 35°C DB - 27°C DB 47% / 19°C WB - 25% fresh air

Winter operating conditions : 7°C DB - 20°C - 25% fresh air

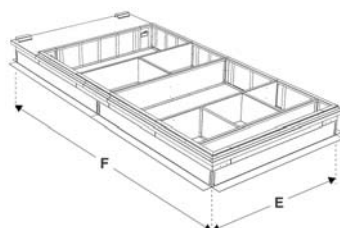
Cooling capacities at nominal airflow rate. Please use the multiplier 1,02 to obtain the cooling capacities to maximum airflow rate.

Dimensions and weights

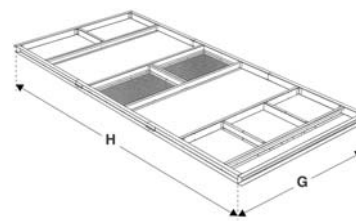
1 Unit



2 Roofcurb



3 Supporting frame



FX			25	30	35	40	55	70	85	100	110	140	170
View 1 - Unit dimensions													
A	mm	3970	3970	4750	4750	4750	5050	5050	5050	5650	5650	5650	
B		1610	1610	2255	2255	2255	2255	2255	2255	2255	2255	2255	
C		1055	1055	1340	1340	1340	1725	1725	1725	2150	2150	2150	
View 2 - Roofcurb dimensions													
E	mm	1540	1540	2175	2175	2175	2175	2175	2175	2175	2175	2175	2175
F		3960	3960	4730	4730	4730	5040	5040	5040	5630	5630	5630	
View 3 - Supporting frame dimensions													
G	mm	1540	1540	2175	2175	2175	2175	2175	2175	2175	2175	2175	2175
H		3960	3960	4725	4725	4725	5040	5040	5040	5630	5630	5630	
Weight													
Weight Standard unit.	kg	950	980	1400	1450	1600	1800	1900	2000	2300	2400	2600	

Air cooled **condensers** & **Dry-coolers**



- Dry coolers

FC NEOSTAR/FI NEOSTAR

20 - 1200 kW	56
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- Air cooled condensers - Standard coil

NEOSTAR

18 - 1250 kW	58
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- Air cooled condensers - Microchannel coil

NEOSTAR WAVE

50 - 1660 kW	60
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Main applications

- Air conditioning, free cooling...and cooling all kinds of fluids compatible with copper, with a maximum inlet temperature of 100°C.

Why this choice?

- Replace advantageously cooling towers :
no air and water bacteria contamination
no water consumption
reduced maintenance
low maintenance costs
no steam production
flexible use in winter time
simple and cheap installation (steel pipes)
easy control of fluid temperature in winter time
- The most economical solution.
- Reduced maintenance due to direct driven fans.
- An optimised solution (noise level, energy consumption, size, type of temperature control...) due to multiple selection possibilities.



General description

• Casing:

The casing is composed of galvanised sheet steel and pre-painted galvanized metal, colour grey RAL9002. The use of stainless steel screws guarantees excellent, long-lasting corrosion resistance (standard ISO 7253) and aesthetic quality. All components used have successfully passed the salt mist corrosion and Kesternich tests. The units are delivered screwed to a wooden base.

• Ventilation:

The **FC/FI NEOSTAR** range is equipped with 2 speed external rotor fans units (star or delta coupling) - Class F. The **FCH/FIH NEOSTAR** range is equipped with 2 speed external rotor fans units (star or delta coupling) - Class H. These motors are of the type 400V/3/50Hz, sealed, IP54, compliant with standard EN 60529 and permanently lubricated.

The motor fan units are wired as standard and factory connected as follows:

- 1 to 3 electrical boxes for the models L (motors connected in series),
- 2 to 8 electrical boxes for the models P (motors connected in parallel).

We are also able to deliver the units unwired upon request (option SCU).

The protection guards are compliant with standard NF EN 294.

EC type of motor fan units (MEC) is also optional available and enables optimised operation of your installation.

Fans units with special voltage ratings (**FC/FI NEOSTAR**):

- M60: Fan motor 400 V/3/60Hz, IP54, class F, in version 06P Ø 910 mm
- M26: Fan motor 230 V/3/60Hz, IP54, class F, in version 06P Ø 910 mm
- M25: Fan motor 230 V/3/50Hz, IP54, class F, in version 06P and 12P Ø 800 mm

• Coil:

The dry coolers are equipped with coils with the following characteristics :

- Copper tubes in a staggered arrangement and corrugated aluminium fins for optimum heat transfer.
- Headers with air vents and drain plugs.
- Connections: steel pipe, flanges.

Special coil coatings are available (Vinyl protection (option BAE), Blygold Polual XT protection (BXT)) offering greater corrosion resistance when used in aggressive atmospheres.

• Performances:

As the performance of a dry cooler varies a lot with each working condition, it is not possible to present a selection method in this document.

Only the selection software, at your disposal on simple request, will allow you to select the dry cooler which suits the best your needs.

In case of emergency, do not hesitate to consult us in specifying: capacity, maximum day/night noise level, type of fluid, ambient temperature, fluid inlet temperature, fluid outlet temperature (or flow), maximum allowed pressure drop, other external constraints.

Nomenclature

F (1)	I	H (2)	PU (3)	06 (4)	D (5)	L (6)	04 (7)	D5 (8)	
(1)	FC	"City" Dry cooler						(4)	Number of poles
	FI	"Industry" dry cooler						(5)	D Delta coupling
(2)	H	Class H motor (for PU and SN version only)						Y	Star coupling
(3)	PN	Power Normal						(6)	Fan arrangement :
	PE	Power Extra						L	Fans in line
	PU	Power Ultra						P	Fans in parallel
	SN	Silence Normal						(7)	Number of fans
	SE	Silence Extra						(8)	Type of module
	SU	Silence Ultra							

Options

Casing :		Coil :	
RAL	Special colour	MCI	Multi-circuits
REH	Legs extended by 240 mm (legs = 800 mm)	BXT	XT Blygold polual coating of the fins
RE2	Legs extended by 840 mm (legs = 1400 mm)	BAE	Coating of the fins
RE3	Legs extended by 1340 mm (legs = 1900 mm)	Free draining special circuit when not in operation	
RE4	Legs extended by 1840 mm (legs = 2400 mm)	Flanges, mating flanges, bolts and gaskets,...	
ECB	Full crate.	Steel or brass 1/2" G vents and drains	
Ventilation:		Miscellaneous:	
MTH	Motors equipped with overload thermostat. Recommended when the system could start very frequently (more than 30 starts per hour) or when used with a speed controller	VEX	Surge tank
IRP	Main switch(es) per fan	MSK	Floor mounting kit
C2V	Factory wiring of 2 speeds into a common junction box	Protection and controls :	
SCU	Without factory wiring. To be indicated when ordering if the unwired condenser unit is required	CMP	Motors protection cabinet
M60	Motor fan unit 400 V/3/60Hz ⁽¹⁾	RT1	CMP plus control by fan cycling
M25	Motor fan unit 230 V/3/50Hz ⁽¹⁾	RT2	CMP plus control by speed regulation (voltage variation)
M26	Motor fan unit 230 V/3/60Hz ⁽¹⁾	RT3	CMP plus control by speed regulation (frequency variation)
(1) : For FC/FI NEOSTAR version only - Please consult us.		MEC	Condensing pressure control with speed variation using electronic switching (EC) of motor

FC/FI NEOSTAR		POWER				SILENCE			
		PN	PE	PU	FCH PU FIH PU	SN	SE	SU	FCH SN FIH SN
Air temperature		<70 °C	< 70 °C	< 60 °C	< 80 °C	<70 °C	< 70 °C	< 60 °C	< 80 °C
Diameter		800	800	910	900	800	800	800	900
Number of poles		06P	06P	06P	06P	08P	12P	16P	08P
Voltage		400V/3/50Hz				400V/3/50Hz			
Class		F	F	F	H	F	F	F	H
DELTA (D)	RPM	880	910	885	910	660	435	360	687
	Maxi W	1940	2650	2650	2600	990	360	235	1230
	Maxi A	3.9	6.0	6.0	5.5	2.4	1.1	0.6	3.0
	dB(A)	80	85	88	84	72	64	60	78
STAR (Y)	RPM	670	730	685	738	485	340	255	540
	Maxi W	1210	1650	1650	1800	580	200	105	850
	Maxi A	2.2	3.1	3.1	3.0	1.2	0.5	0.2	1.6
	dB(A)	75	79	80	79	67	58	51	70

Main applications

- The air cooled condenser units of the **NEOSTAR** range are designed for refrigeration or air conditioning applications and outdoor installation. The 470 basic models cover a capacity range from 18 to 1250 kW.



General description

• High-tech heat exchanger :

The **NEOSTAR** air cooled condenser units are equipped with a high-performance, finned coil composed of profiled aluminium fins crimped onto ribbed copper tubes.

For this latest generation of condensers, fins have been specially designed and optimised to improve performance, efficiency and compactness of the units.

Special coil coatings are available (Vinyl protection (option BAE), Blygold Polual XT protection (BXT)) offering greater corrosion resistance when used in aggressive atmospheres.

• Ventilation :

The **NEOSTAR** air cooled condenser range is equipped as standard with 2 speed external rotor fans units (star or delta coupling).

The **NEOSTAR** Power range is equipped with the following motor fan units:

- > Ø 910 mm : 06P (D/Y)= 890/685 RPM,
- > Ø 800 mm : 06P (D/Y)= 895/685 RPM.

The **NEOSTAR** Silence range is equipped with the following motor fan units Ø 800 mm:

- > 08P (D/Y)= 660/ 515 RPM,
- > 12P (D/Y)= 435/ 330 RPM,
- > 16P (D/Y)= 360/255 RPM.

These motors are of the type 400V, three-phase, 50 Hz, sealed, IP54, class F, compliant with standard EN 60529 and permanently lubricated. If the temperature exceeds 60°C, consult us.

The motor fan units are wired as standard and factory connected as follows:

- > One electrical box for the models L (motors connected in series),
- > Two electrical boxes for the models P (motors connected in parallel).

We are also able to deliver the units unwired upon request (option SCU).

The protection guards are compliant with standard NF EN 294.

In the case of an installation with horizontal air flow, the predominant wind direction must be taken into consideration in order to avoid the risk of propeller damage (propeller turning in the wrong direction during stoppage periods) or difficult motor start up at low speed.

EC type of motor fan units (MEC) is also optional available and enables optimised operation of your installation.

Fans units with special voltage ratings:

- > M60: Fan motor voltage 400 V/3/60 Hz, IP54, class F, in version 06P Ø800 mm
- > M26: Fan motor voltage 230 V/3/60 Hz, IP54, class F, in version 06P Ø800 mm
- > M25: Fan motor voltage 230 V/3/50 Hz, IP54, class F, in version 06P and 12P Ø800 mm

• Casing :

The casing is composed of galvanised sheet steel and pre-painted galvanized metal, colour grey RAL9002.

The use of stainless steel screws guarantees excellent, long-lasting corrosion resistance (standard ISO 7253) and aesthetic quality.

All components used have successfully passed the salt mist corrosion and Kesternich tests.

The units are delivered screwed to a wooden base.

Nomenclature

PE	06	D	P	16	B3
SU	16	Y	P	14	A2
(1)	(2)	(3)	(4)	(5)	(6)

(1)	PN	Power Normal	(3)	D	Delta coupling
	PE	Power Extra		Y	Star coupling
	PU	Power Ultra	(4)	Fan arrangement :	
	SN	Silence Normal		L	Fans in line
	SE	Silence Extra		P	Fans in parallel
	SU	Silence Ultra	(5)	Number of fans	
(2)	Number of poles		(6)	Type of module	

Options

Casing :	
RAL	Special colour
REH	Legs extended by 240 mm (legs = 800 mm)
RE2	Legs extended by 840 mm (legs = 1400 mm)
RE3	Legs extended by 1340 mm (legs = 1900 mm)
RE4	Legs extended by 1840 mm (legs = 2400 mm)
ECB	Full crate.
Ventilation:	
MTH	Motors equipped with overload thermostat. Recommended when the system could start very frequently (more than 30 starts per hour) or when used with a speed controller
IRP	Main switch(es) per fan
C2V	Factory wiring of 2 speeds into a common junction box
SCU	Without factory wiring. To be indicated when ordering if the unwired condenser unit is required
M60	Motor fan voltage 400 V/3/60Hz ⁽¹⁾
M25	Motor fan voltage 230 V/3/50Hz ⁽¹⁾
M26	Motor fan voltage 230 V/3/60Hz ⁽¹⁾

Coil :	
MCI	Multi-circuits
BXT	XT Blygold polual coating of the fins
BAE	Vinyl protection of fins
Protection and controls :	
CMP	Motors protection cabinet
RP1	CMP + condensing pressure control with fan cycling
RP2	CMP + condensing pressure control with speed variation (voltage)
RP3	CMP + condensing pressure control with speed variation (frequency)
MEC	Condensing pressure control with speed variation using electronic switching (EC) of motor
MSK	Floor mounting kit

(1) : Please consult us.

Main applications

- Refrigeration applications for outside installation.
- Supermarkets and food-processing industry

Why this choice?

- A range designed to minimize unit footprint
- High power density for an optimized energy consumption
- Micro channel technology allowing a significant reduction of refrigerant charge
- State of the art design with hidden fans for a perfect architectural integration



General description

The **NEOSTAR WAVE** range is optimized to minimize the footprint required for installation by the combination of original design and innovative technology : the condenser is indeed built as modules around W-shaped micro-channels coils for easy installation in confined spaces.

Micro-channel coils allow a significant reduction of refrigerant charge of condenser. The modular construction allows each module to be connected independently offering autonomous regulation of discharges of several compressorised racks. The user may use one single condenser that reduces the space requirement and installation time.

• Casing :

Casing made of galvanised steel sheet metal painted with a white RAL 9002 powdered polyester paint.

Lateral anti-intrusive painted grilles with aesthetic design (option)

Unit with attractive design and low height (< 2 meters) for a perfect architectural integration

• Coil :

The **NEOSTAR WAVE** range is equipped with aluminum micro channel heat exchanger offering reliability and robustness (high mechanical fin resistance) and high corrosion resistance.

This technology has proven its value in the automobile sector and is now used for its numerous advantages in refrigeration and air conditioning sectors.

These coils offer greater efficiency than traditional coils (copper tubes/aluminum fins). Their reduced weight makes them easier to handle.

As the coil is brazed in a single operation, the risk of leakage is considerably reduced and the quality inspections are stringent: 100% of the products are tested.

Special coating for the coils is available to improve corrosion resistance to aggressive atmospheres.

• Ventilation :

The **NEOSTAR WAVE** range is equipped with high reliability external rotor fans.

AC MOTORS :

- > Ø 800 mm : 06P (D/Y) = 885/685 RPM
- > Ø 800 mm : 08P (D/Y) = 660/485 RPM
- > Ø 800 mm : 12P (D/Y) = 435/340 RPM
- > Ø 800 mm : 16P (Y) = 255 RPM
- > Ø 800 mm : 06P (D/Y) heavy-duty motor = 910/730 RPM

These enclosed motors are 400V/3/50 Hz, IP54, with 2-speed (star or delta connections), class F, compliant with standard EN 60529, permanently lubricated.

Please contact us when the temperature exceeds 60°C.

Fan guards are compliant with safety standard.

EC MOTORS :

High reliability electronic switching fan motors (EC) are also available as an option, enabling optimized operation of your installation:

- > Ø 800 mm : EC1 (EC oversized motor) = up to 1020 RPM,
- > Ø 800 mm : EC2 = up to 730 RPM.

This motor provides energy savings for a given power rating: a detailed comparison of the energy balance may be carried out for each project (please consult us).

Fan motors are wired as standard and factory connected.

Nomenclature

MXW (1)	06 (2)	D (3)	8 (4)	P (5)	04 (6)
(1) MXW	Range name			(4)	Fan diameter :
(2) 06	Number of poles			8	Ø 800 mm
(3)	D	Delta coupling			(5) Fan arrangement :
	Y	Star coupling			L Fans in line
				(6)	Number of fans

Options

Casing :		Coil :	
ACR	SilenTop (acoustic attenuation)	MCI	Multi-circuits
G2F	Protection grilles (2 faces)	BXT	Blygold Polual XT coil protection (please consult us)
		BOE	Lenguard coil protection
Ventilation:		Protection and controls :	
CMU	Factory wired motors (AC motors)	CMP	Motor protection cabinet (AC fans)
SCM	Without wired motors (EC motors)	RP2	CMP + condensing pressure control with speed variation (voltage)
C2V	2-speed factory wired in the switching box	RP3	CMP + condensing pressure control with speed variation (frequency)
IRP	Rotary proximity switch(es)	CSC	Signal comparator (multi-circuits configuration)
		Other options :	
		PAV	Anti vibration pads
		CON	Packaging for shipping in container



SilenTop option hides fans and acts as acoustic enclosure, ideal for urban environment

Chillers and heat pumps



- Air cooled chillers/Heat pumps

ECOLEAN

9 - 200 kW

64

- Air cooled chillers/Heat pumps

NEOSYS

200 - 1000 kW

74

- Water cooled chillers/Heat pumps

HYDROLEAN

20 - 165 kW

80

- Water cooled chillers & Heat pumps/Condenserless liquid chiller

MWC/MRC

180 - 720 kW

86

9 → 20 kW

Air cooled chillers/Heat pumps



Main applications

- Small offices
- Shops
- Hotels
- Industry
- Administration
- Small commercial and residential buildings

Why this choice?

- R407C scroll compressors
- Unit with pump and optional buffer tank
- Electronic controller
- Available from stock
- Very compact for outdoor or indoor installation



General description

ECOLEAN can be used for **comfort air conditioning requirements in small shops and offices.**

The **ECOLEAN** range benefits from the latest technological innovations such as scroll compressors, microprocessor control, brazed plate exchanger, etc. Each unit is available in the cooling only or heat pump version.

The original design of each cabinet provides the following advantages:

- Small overall dimensions
- Optimal access to the various components
- Condenser fan with available pressure (FP version - up to 200 Pa)

This range is also proposed with very compact integral hydraulic equipment incorporated in the same cabinet (HY version = hydraulic module). This one includes all the elements required for a right operation of the unit:

- Single pump
- Water filter
- Flow switch
- Expansion vessel,
- Air vent
- Pressure relief valves...

A version with the integral hydraulic equipment and a supplementary buffer tank incorporated in the same cabinet (HN version=Hydronic module) is available for cooling applications or heating applications where supplementary electric heaters into the tank can be provided.

Main components

- Galvanised sheet steel framework with fork lift pockets for ease of maintenance
- Pre-painted galvanised sheet steel casing
- Colour RAL 9002
- Sealed scroll compressor
- R407C refrigerant
- Insulated stainless steel 304 brazed plate evaporator
- Axial condenser fan - Available pressure depending on version
- Control and protection panel according to EN 60 204-1
- 1 cooling circuit
- Filter dryer, solenoid valve, thermostatic expansion valve, HP/LP pressure switches, liquid accumulator and 4-way valve (heat pump only)
- **CLIMATIC** electronic controller with display unit
- All-season control as standard
- Threaded hydraulic connection

Advanced control

CLIMATIC electronic controller with display

- Timer :
 - > Balanced compressor operation
 - > Short-cycling prevention
- Display of water inlet/outlet temperatures
- Control and display of faults for each component
- General alarm with report
- Remote start/stop
- Antifreeze protection
- De-frosting control (heat pump only)
- Hydraulic module control (pump, safety device, ...)
- Digital screens with function keys
- Remote control module (100 meters of cable)
 - > Read-out: Cold/hot set point
Water inlet/outlet
Defrosting temperature (heat pump)
Failure codes
Operating stats
 - > Selection: Start/Stop
Operating mode : heating/cooling

General data

ECOLEAN - EAC/EAR		91	111	151	191	211
Cooling mode						
Cooling capacity ⁽¹⁾	kW	8,84	11,2	13,4	17,4	19,2
EER ⁽³⁾		2,86	2,96	2,72	2,74	2,72
ESEER ⁽³⁾		3,16	3,22	3,17	3,21	3,30
Heating mode						
Heating capacity ⁽²⁾	kW	8,96	11	13,1	17,4	19,7
COP		2,66	2,47	2,48	2,55	2,56
Electrical data						
Voltage	400 V/3 Ph/50 Hz					
Refrigeration circuit						
Number of circuits	1					
Number of compressors	1					
Evaporator type	Brazed plates					
Capacity steps	1					
Refrigerant charge per circuit (cooling only/heat pump unit)	kg	3/3,1	3/3,1	3,4/3,9	4/5	5,5/6,5
Pressure drop						
Nominal water flow	m³/h	1,51	1,91	2,3	2,99	3,29
Pressure drop without water filter	kPa	25	39	29	47	41
Pressure drop with optional water filter		49	66	58	81	78
Hydraulic connection						
Type	Threaded - Female					
Diameter	1"					
Acoustic data						
Sound power level ⁽³⁾	dB(A)	73	75	76	76	79
Sound power level with acoustic jacket option ⁽¹⁾		72	75	75	75	76

General data - High static version

ECOLEAN FP - EAC/EAR		91	111	151	191	211
Cooling mode						
Cooling capacity ⁽¹⁾	kW	8,8	11,1	13,3	17,3	19,1
EER ⁽³⁾		2,3	2,1	2,0	2,2	2,2
Heating mode						
Heating capacity ⁽²⁾	kW	9	11,1	13,1	17,5	19,8
COP		2,3	1,9	2	2,2	2,3
Electrical data						
Voltage	400 V/3 Ph/50 Hz					
Refrigeration circuit						
Number of circuits	1					
Number of compressors	1					
Evaporator type	Brazed plates					
Capacity steps	1					
Refrigerant charge per circuit (cooling only/heat pump unit)	kg	3/3,1	3/3,1	3,4/3,9	4/5	5,5/6,5
Pressure drop						
Nominal water flow	m³/h	1,51	1,91	2,3	2,98	3,29
Pressure drop without water filter	kPa	24,8	38,9	28,5	46,5	41
Pressure drop with optional water filter		49	66	58	81	78
Hydraulic connection						
Type	Threaded - Female					
Diameter	1"					
Acoustic data						
Sound power level ⁽³⁾	dB(A)	79	82	82	82	83
Sound power level with acoustic jacket option ⁽¹⁾		79	81	82	82	82

(1) Water: 12°C/7°C - Air: 35°C

(2) Water: 45°C - Air: 7°C

(3) EUROVENT conditions data

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



Operating limits

ECOLEAN - EAC/EAR		91	111	151	191	211
Operating limits (cooling only/heat pump unit)						
Maximum outside air temperature	°C	46/23				
Minimum outside air temperature		0°C [-15°C as an option]/ -10°C [-15°C as an option]				
Maximum inlet water temperature		17/43				
Minimum outlet water temperature		+5°C and -10°C (as an option)/ +20°C				

General data - Integrated hydraulic module

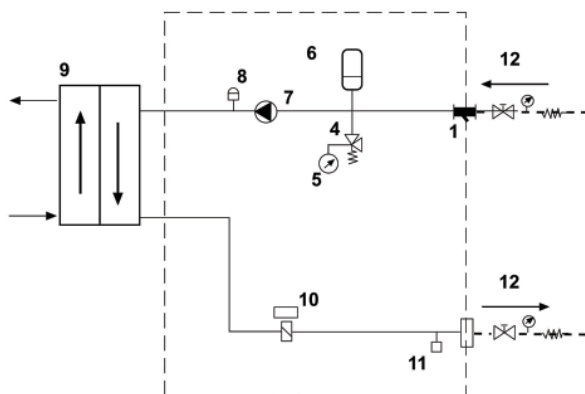
EAC/EAR - HY / HN		91	111	151	191	211
Pump module						
Nominal water flow	m³/h	1,51	1,91	2,3	2,98	3,29
Available static pressure	kPa	196	161	152	140	126
Voltage	V/Ph/Hz	230/1/50			400/3/50	
Absorbed power	kW	0,49			0,72	
Maximum current	A	2,3			1,4	
Expansion vessel volume	l	5				
Maximum pressure - Expansion vessel	Bar	4				
Weight	kg	14				15
Buffer tank ⁽¹⁾						
Volume	l	50				
Weight	kg	30				
Antifreeze heater (option)	kW	2,25				
Additional electrical heater (option for HP units only)		6				

(1) Available only for the "Hydronic" type version

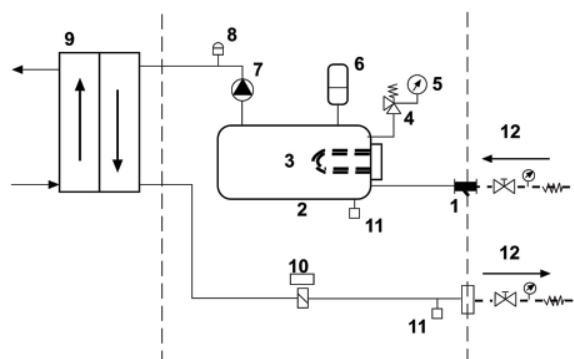
Principle sketches

Integrated hydraulic module

"Hydraulic" module (HY)



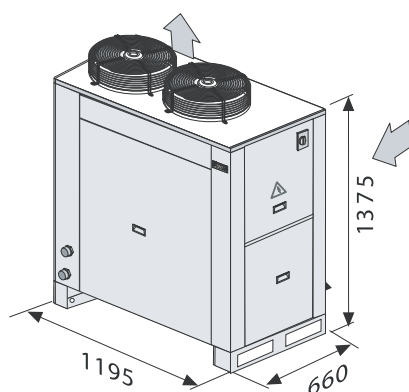
"Hydronic" module (HN)



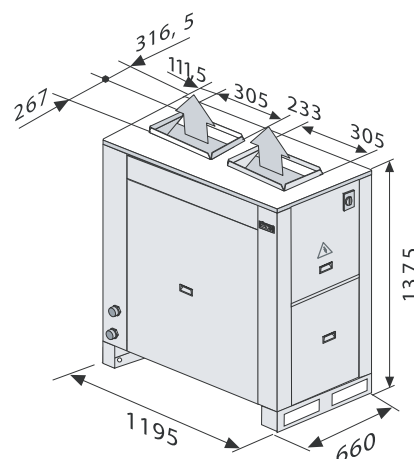
1	Water filter (removable)	5	Pressure gauge	9	Plate exchanger
2	Tank	6	Expansion tank	10	Flow switch
3	Immersion heater for tank (optional)	7	Pump	11	Drain valve
4	Safety valve	8	Air bleed valve	12	Water isolation valves (optional)

Dimensions and weights

Standard version



High static version



EAC/EAR		91	111	151	191	211
Standard version						
Operating weight ⁽¹⁾	kg	150	158	172	185	250
High static version						
Operating weight ⁽¹⁾	kg	159	176	190	204	268
Additional weight						
«HYDRAULIC» module without water ⁽²⁾	kg	14				15
«HYDRONIC» module without water ⁽²⁾		44				45

(1) Not including the «HYDRAULIC» or «HYDRONIC» module

(2) Weight to be added to that of the corresponding machine - Warning! Be sure to allow for the volume of the components when calculating the load weight

Options

- Water tank electrical heater (230V - 400V) ⁽²⁾
- Epoxy coated aluminium fins coils treated
- Main ON/OFF switch
- Softstarter ⁽¹⁾
- Three phase protection
- Evaporator antifreeze protection
- Buffer tank immersion heater
- Flow switch ⁽³⁾
- Water filter (supplied loose) ⁽³⁾
- Coils protection guards
- Low ambient kit [-15°C] - EAC only
- Low ambient kit [-15°C] - Heating mode ⁽²⁾
- Thermostatic hot gas injection
- Low water temperature kit (water outlet: 0°C/-5°C/-10°C)
- Compressor noise insulation jacket
- Anti-vibration mounts rubber (supplied loose)
- HP & LP refrigerant gauges
- In/out isolating valves (supplied loose)
- Modbus communication interface
- Dynamic set point
- Remote display (supplied loose)

(1) Available only for 400V/3 Ph/50 Hz

(2) Heat pump units only

(3) Included on "Hydraulic" and "Hydronic" versions

20 → 200 kW

Air cooled chillers/Heat pumps



Main applications

- Offices
- Hotels
- Hospitals
- Industry
- Administration
- Light commercial and residential buildings

Why this choice?

- Very high efficiency with R410A
- Very low noise operation
- R410A scroll compressors
- Advanced **CLIMATIC** control
- Unit with hydraulic module and buffet tank
- Very compact for outdoor or indoor installation



General description

The **ECOLEAN** range offers an optimal solution to all air conditioning applications in light commercial and retail applications (offices, shops, restaurants...) or applications in the industry.

This range is designed with the latest technologies to ensure high energy performance all along the year thanks to R410A multi scroll compressors, optimized heat exchange surface area associated with eDrive variable speed pump (optional). LENNOX has designed **ECOLEAN** targeting the lowest market noise level. This has been achieved by research and development innovations on fan blade technologies and noiseless compressor montage. **ECOLEAN** is achieving the best market acoustic performance thanks to the use of the latest generation of OWLET fans associated with acoustic compressor enclosure.

ECOLEAN range includes two basic models:

- Standard version (S) : mainly for outdoor installation (75 Pa available static pressure)
- Fan pressure version (F) : suited for indoor installation where high available static pressure is required (from 75 to 250 Pa).

Each **ECOLEAN** model is available in 3 main versions to match every customer need :

- **Standard version (-):** This version is featuring a standard efficiency unit with two speed fans.
- **Low noise version (LN):** This version is featuring low noise performance (-7 dB(A) average reduction) thanks to a low speed fan and compressor noise insulated in a high performance acoustic jacket.
- **Super Low Noise version (SLN):** This version is featuring very low noise performance (-10 dB(A) average reduction) thanks to a low speed fan and compressor noise insulated in a very high performance acoustic cabinet.

This range is also proposed with very compact integral hydraulic equipment (HY version = Hydraulic module). This one includes all the elements required for a right operation of the unit:

- Single pump (twin pump as option),
- Water filter (supplied as standard)
- Expansion vessel,
- Air vent,
- Pressure relief valves...

A version with the integral hydraulic equipment and a supplementary buffer tank (HN version = Hydronic module) is available for cooling applications or heating applications where supplementary electric heaters into the tank can be provided.

Main components

- Galvanized sheet steel framework with fork lift pockets for ease of maintenance
- Pre-painted galvanised sheet steel casing
- Colour RAL 9002
- Sealed scroll compressor
- R410A refrigerant
- Insulated stainless steel 304 brazed plate evaporator
- Axial condenser fan - Available pressure depending on version
- Control and protection panel according to EN 60 204-1
- 1 or 2 independent cooling circuit according to size
- Filter dryer, solenoid valve, thermostatic expansion valve, HP pressure switch, HP/LP pressure transducers, liquid accumulator and 4-way valve (heat pump only)
- **CLIMATIC** electronic controller with display unit
- All-season control as standard
- Threaded or flange hydraulic connection
- Main ON/OFF switch
- Flow switch
- Water filter

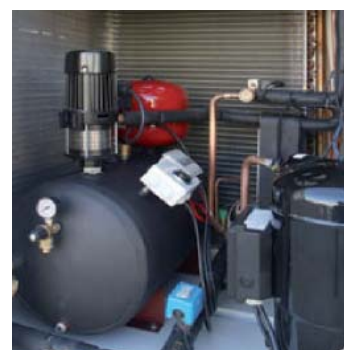
Advanced control

CLIMATIC microprocessor based control is providing the following functions:

- 7 scheduling time zones per day to allow energy consumption and sound level management.
- PI control of the water temperature with operating time equalization of the compressors.
- Water set-point offset based on outdoor air temperature.
- Noise setting capability per time zone (Auto mode, Auto Quiet mode or Quiet mode).
- Compressor anti short-cycling management.
- Dynamic defrost.
- Automatic compressor unloading in case of excessive condensing pressure.
- Water pump control with operating time equalization and automatic change-over in case of a pump fault.
- Variable water flow pump control to reduce annual pumping energy consumption.
- Master/slave or cascade control of 2, up to 8 chillers operating in parallel with operating time equalization and automatic change-over in case of a unit fault.

The DC60 user interface is supplied as standard mounted on the front panel and is protected from rain and UV by a plastic cover. The DC60 user interface is providing the following functions:

- Display and setting of hot and cold water temperatures.
- Display and setting of operating mode (cooling, heating, automatic).
- Display of occupancy mode (occupied, unoccupied).
- Main component status display.
- Alarm code and symbol display.
- Refrigerant LP and HP display.



Compact integral hydraulic equipment

General data - Standard version

EAC/EAR				251	291	351	431	472	552	672	812	
Cooling mode												
Cooling capacity ⁽¹⁾				kW	22,1	25,9	32,0	37,6	44,1	50,7	63,4	75,4
EER ⁽³⁾					2,9	2,85	2,86	2,81	2,9	2,79	2,83	2,82
ESEER					3,27	3,26	3,26	3,18	3,91	3,87	3,86	3,96
Heating mode												
Heating capacity ⁽²⁾				kW	23,6	27,6	33,6	37,8	47,8	54,7	68,0	75,7
COP					3,0	3,0	3,0	2,91	3,0	2,94	3,0	2,92
Electrical data												
Voltage				400 V/3 Ph/50 Hz								
Refrigeration circuit												
Refrigerant type				R410A								
Number of circuits (cooling/heating mode)				1								
Number of compressors				1				2				
Evaporator type				Brazed plates								
Capacity steps				1				2				
Refrigerant charge per circuit (cooling only/heat pump unit)				kg	5,5/ 5,8	6,11/ 6,5	8/ 8,7	9/ 10	11/ 11,4	12,2/ 12,7	16,1/ 16,8	18,5/ 19,3
Pressure drop												
Nominal water flow				m³/h	3,8	4,45	5,5	6,47	7,59	8,72	10,9	12,98
Pressure drop without water filter				kPa	51	54	30	34	32	34	40	47
Pressure drop with optional water filter					69	78	60	73	50	57	71	87
Hydraulic connection												
Type				Threaded - Female								
Diameter				1 1/2"					2"			
Acoustic data												
Sound power level /Sound pressure level ⁽⁴⁾	LN ⁽⁵⁾	dB(A)	71/40	70/39	71/40	72/41	74/43	73/42	74/43	75/44		
	STD		76/44	76/44	77/45	78/46	79/47	79/47	80/48	81/49		

EAC/EAR				1003	1103	1203	1303	1403	1604	1804	2104	
Cooling mode												
Cooling capacity ⁽¹⁾				kW	88,2	102	112	126	139	149	174	199
EER ⁽³⁾					2,83	2,9	2,79	2,86	2,87	2,76	2,9	2,8
ESEER					4,19	3,97	3,83	3,87	3,98	4,02	3,98	3,76
Heating mode												
Heating capacity ⁽²⁾				kW	95	108	118	130	143	159	180	205
COP					3,05	3	3	2,92	2,97	3	2,95	2,85
Electrical data												
Voltage				400 V/3 Ph/50 Hz								
Refrigeration circuit												
Refrigerant type				R410A								
Number of circuits (cooling/heating mode)				2								
Number of compressors				3						4		
Evaporator type				Brazed plates								
Capacity steps				3						4		
Refrigerant charge per circuit (cooling only/heat pump unit)				kg	23,5/ 23,3	26/ 28	27/ 29,5	30/ 32,2	33,7/ 35,5	36,2/ 40	45/ 52	47/ 54
Pressure drop												
Nominal water flow				m³/h	15,2	17,6	19,2	21,6	23,9	25,7	29,9	34,2
Pressure drop without water filter				kPa	35	34	40	48	48	43	48	64
Pressure drop with optional water filter					43	47	57	69	76	61	73	95
Hydraulic connection												
Type				Threaded - Female						Flange		
Diameter				2 1/2"						3"		
Acoustic data												
Sound power level /Sound pressure level ⁽⁴⁾	SLN ⁽⁵⁾	dB(A)	72/40	75/43	76/44	78/46	78/46	76/44	77/45	80/48		
	LN ⁽⁵⁾		75/43	76/44	79/47	81/49	81/49	78/46	81/49	83/51		
	STD		80/48	82/50	85/53	87/55	87/55	85/53	87/55	90/57		

(1) Water: 12°C/7°C - Air: 35°C

(2) Water: 45°C - Air: 7°C

(3) EUROVENT conditions data

(4) Sound power level and sound pressure level at 10 m from the unit, in free field, conformity with ISO3744 norm

(5) Maximum sound power level only if "Quiet" mode is selected. If "Auto Quiet" mode is selected, the unit may operate the high fan speed to work at full load and avoid compressor unloading in case of very high or very low ambient temperatures.

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Operating limits

EAC/EAR		ALL SIZES	
Operating limits		COOLING MODE	HEATING MODE
Maximum outside air temperature	°C	+48	+23
Minimum outside air temperature		-15	-12
Maximum water temperature - Standard version		+22	+43
Minimum outlet water temperature		-10 (option)/ +5 (standard)	-

General data - Integrated hydraulic module

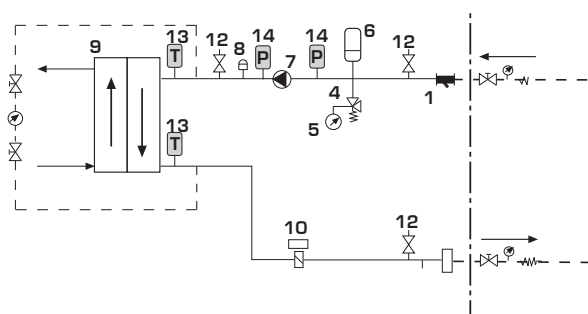
ECOLEAN HY / HN		251	291	351	431	472	552	672	812
Pump module									
Nominal water flow	m³/h	3,8	4,45	5,5	6,62	7,59	8,72	10,9	12,98
Available static pressure	kPa	131	106	150	96	128	115	165	107
Voltage		400 V/3 Ph/50 Hz							
Absorbed power	kW	0,72		1,1		1,17		1,55	
Expansion vessel volume	l	12				18			
Maximum pressure - Expansion vessel	Bar	4							
Weight	kg	16		17		23		24	
Buffer tank ⁽¹⁾									
Volume	l	75				100			
Weight	kg	31				32		33	
Antifreeze heater (option)	kW	2,25							
Additional electrical heater (option for HN units only)		9				12			

ECOLEAN HY / HN		1003	1103	1203	1303	1403	1604	1804	2104
Pump module									
Nominal water flow	m³/h	15,17	17,61	19,23	21,62	23,87	25,66	29,93	34,23
Available static pressure	kPa	186	176	155	132	119	116	140	176
Voltage		400 V/3 Ph/50 Hz							
Absorbed power	kW	2,45				2,93		3,7	4
Expansion vessel volume	l	35					50		
Maximum pressure - Expansion vessel	Bar	4							
Weight (EAC/EAR)	kg	26				29	74	92/97	
Buffer tank ⁽¹⁾									
Volume	l	240					350		
Weight	kg	55					70		
Antifreeze heater (option)	kW	6					8,25		
Additional electrical heater (option for HN units only)		24					36		

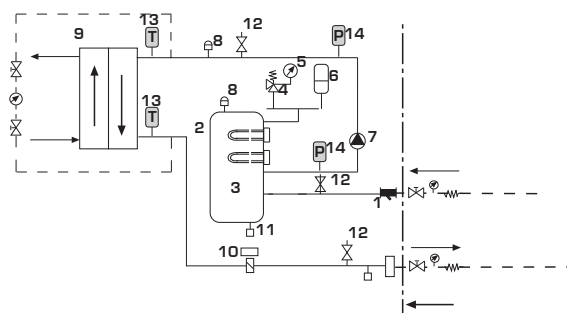
(1) Available only for the "Hydronic" type version

Principle sketches - Integrated hydraulic module

"Hydraulic" module (HY)



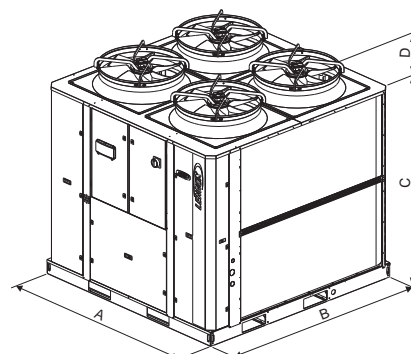
"Hydronic" module (HN)



1	Detachable water filter	6	Expansion vessel	11	Drain valve
2	Water tank	7	Water pump	12	Pressure check points
3	Water tank heater (in option)	8	Air purge valve	13	Water temperature sensor
4	Safety valve	9	Plate heat exchanger	14	Water pressure transducer (when variable water flow option is selected)
5	Manometer	10	Flow switch		

Dimensions and weights

Standard version



EAC/EAR		251	291	351	431	472	552	672	812
A	mm	1195				1960			
B		980				1195			
C		1375							
D		241	260	260	260	241	260	260	260
Operating weight ⁽¹⁾	kg	243	251	271	300	480	492	534	578

Additional weight

«HYDRAULIC» module without water ⁽²⁾	kg	16	17	23	24
«HYDRONIC» module without water ⁽²⁾		47	48	55	57

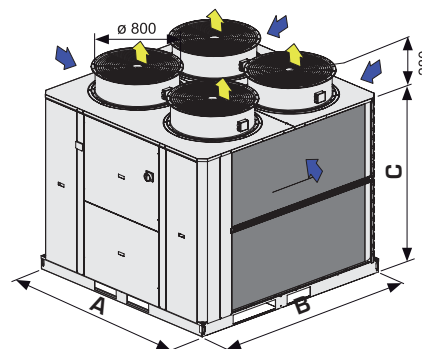
EAC/EAR		1003	1103	1203	1303	1403	1604	1804	2104
A	mm	2250							
B		1420					2300		
C		1855					1954		
D		273							
Operating weight ⁽¹⁾	kg	663	831	964	1016	1045	1347	1703	1723

Additional weight

«HYDRAULIC» module without water ⁽²⁾	kg	26	29	74	92/97
«HYDRONIC» module without water ⁽²⁾	EAC/EAR	81	84	144	162/167

Dimensions and weights

High static version



EAC/EAR FM		251	291	351	431	472	552	672	812
A	mm	1195	1195	1195	1195	1960	1960	1960	1960
B		980	980	980	980	1195	1195	1195	1195
C		1375	1375	1375	1375	1375	1375	1375	1375
Operating weight ⁽¹⁾	kg	258	266	286	315	510	522	564	608

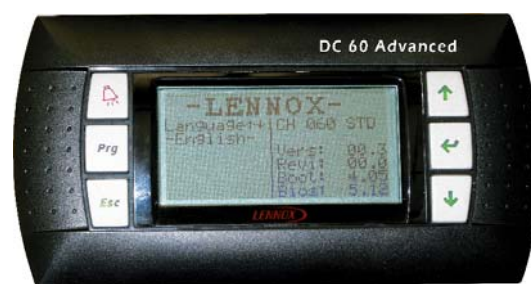
EAC/EAR FM		1003	1103	1203	1303	1403	1604	1804	2104
A	mm	2250	2250	2250	2250	2250	2250	2250	2250
B		1420	1420	1420	1420	1420	2300	2300	2300
C		1875	1875	1875	1875	1875	1975	1975	1975
Operating weight ⁽¹⁾	kg	703	871	1004	1056	1085	1387	1783	1803

(1) Not including the «HYDRAULIC» or «HYDRONIC» module

(2) Weight to be added to the unit's one - Warning! Be sure to allow for the volume of the components when calculating the load weight - These data are also available for high static version

Options

- Epoxy coated aluminium fins coils treated
- Soft starter
- Three phase protection
- Electronic flow switch
- Evaporator antifreeze protection
- Tank antifreeze heater
- Water tank electrical heater
- Winter cooling operation down to -15°C ambient temperature
- Low leaving water temperature operation (+5 → -10°C)
- Twin pump
- eDrive variable water flow
- Electronic flow switch
- Modbus, LonWorks® or BACnet® communication interface
- ADALINK II Supervision : customer friendly web based supervision
- DC60 advanced display
- DC60 remote customer display 24V (supplied loose)
- BE60 extension board for additional inputs/outputs
- DS60 service display (supplied loose)
- Compressor acoustic jacket
- Anti-vibration mounts rubber (supplied loose)
- Coils protection guards
- Pallet packaging for shipping in container



DC60 advanced user interface (option)



eDrive variable water flow option



200 → 1000 kW

Air cooled chillers/Heat pumps



Main applications

- Offices
- Hotels
- Hospitals
- Industry
- Administration
- Medium and large commercial buildings

Why this choice?

- High efficiency with R410A
- Very low noise operation
- R410A scroll compressors
- Advanced **CLIMATIC** control
- Integral hydraulic module equipment
- Energy saving options : heat recovery, free-cooling and eDrive
- Reduced total cost of ownership
- 3-year warranty*



General description

The **NEOSYS** unit is designed to be integrated into urban or residential environments.

As main characteristics the **NEOSYS** unit offers state of the art design to match architectural constraints and adjustable sound level performances during day and night to satisfy local environmental constraints.

The Active Acoustic Attenuation System™ automatically adjusts the airflow of the outlet variable speed fans according to the building load while complying with the permitted sound level. It also enables floating condensing pressure management. The noise level is programmed and set by time slot and then the performance or required noise level mode is chosen.

This range is also proposed with a compact hydraulic module. Depending on the nature of the hydraulic installation, **NEOSYS** can be fitted with the choice of a pump providing 150 or 250 kPa external static pressure. To facilitate start-up, you can choose a classical hydraulic module with manual water flow control valve or, as an option, an electronic control, that will adjust the water flow to the actual requirements of the installation (optional eDrive).

The **NEOSYS** liquid chiller and heat pump range offers three options for energy savings :

- eDrive, variable speed pump technology : the water flow in the chiller is electronically adjusted and different types of control are available.
- Partial Heat Recovery : integrated desuperheater recovers heat for the production of free hot water up to 70°C simultaneously with chilled or hot water production.
- Free Cooling : fully integrated option in the unit, is directly controlled by the product's control system to maximize the use of free cooling of outside air.

NEOSYS NAC: Cooling only version – Unit with hydraulic module, partial heat recovery (option)
Cooling capacity: 200 to 1000 kW

NEOSYS NAH: Heat-Pump version – Unit with hydraulic module, partial heat recovery (option)
Heating capacity: 200 to 500 kW

Main components

- Casing made of galvanised steel sheet metal painted with a white RAL 9002 powdered polyester paint
- Flat top, aesthetic side anti-intrusion grilles, very low unit height (< 2m)
- Low noise scroll compressors mounted in a sound-proofed technical cabinet to reduce noise emissions
- Plate heat exchanger located in a technical cabinet protecting the insulation against climatic conditions
- Aluminium Micro Channel heat exchangers with improved corrosion resistance (Cooling only version)
- Copper tubes/aluminium fins heat exchanger (Heat pump version)
- Inverter fans using external rotor technology associated with Owllet high performance aluminium fan blades
- Unit electrical cabinet, 400V, 50 Hz, 3 phases power supply (without neutral) with a single point of power connection
- Main ON/OFF switch mounted on the front panel
- DC advanced user interface mounted on the front panel
- **CLIMATIC** microprocessor based control
- Unit is built to meet European norms and standards & Eurovent certification performance standards.

Advanced CLIMATIC control

CLIMATIC microprocessor based control is providing the following functions:

- PI control of the water temperature with operating time equalisation of the compressors
- Automatic heating/cooling change-over based on ambient air temperature
- Water set-point offset based on outdoor air temperature
- Active Acoustic Attenuation System to automatically adjust the air flow to respect night and day sound level constraints while meeting building load requirements.
- Operation of the unit without buffer tank
- Dynamic defrost to limit the number and the duration of the defrost cycles in winter
- Free dry contacts: remote ON/OFF, alarm reset to re-start the unit, alarm or alert indications, free customer contact
- Master/slave or cascade control of two chillers operating in parallel with operating time equalization and automatic change-over in case of a unit fault
- ModBUS®, LonWorks®, or BacNET®, communication interface (options)

Options



- Hydraulic module with low or high pressure, single or dual pump (Vitaulic connections included)
- eDrive variable water flow
- Partial heat recovery
- Winter operation down to -20°C ambient temperature/ Antifreeze heaters.
- Brine operation down to -10°C leaving water temperature
- LenGuard heavy anti-corrosion coil treatment
- Rear coil guard
- Soft starter/Power factor correction (up to size NAC 640)
- Energy counter
- BE 60 extension board for remote control
- Remote DC60 comfort display/DS60 service display
- Modbus, Lon, BacNet communication interfaces
- ADALINK II Supervision : customer friendly web based supervision
- Flange water connection sleeve
- Anti vibration mounts

Versions

- **STANDARD VERSION:** Basic version with single speed fan and step fan control, no side grille and no side panel



NEOSYS NAC 300D
Pharmaceutical products storage
Isle of Mayotte

General data

NAC		200	230	270	300	340	380	420	480
Cooling mode									
Cooling capacity ⁽¹⁾	kW	208	236	273	308	351	387	430	490
EER ⁽²⁾		2,89	2,75	2,56	2,88	2,80	2,60	2,82	2,81
ESEER ⁽²⁾		4,24	4,03	3,99	4,04	4,15	3,90	4,19	4,01
Electrical data									
Voltage		400 V/3 Ph/50 Hz							
Refrigeration circuit									
Number of circuits		2							
Number of compressors		4				5		6	
Evaporator type		AISI 304 stainless steel plate brazed with copper heat exchanger							
Capacity steps		6			4	5		6	
Condenser type		Microchannel aluminium tube & fins - Air cooled							
Pressure drop									
Pressure drop ⁽¹⁾	kPa	43	54	56	48	35	42	50	48
Hydraulic connections									
Type		Victaulic							
Diameter In/Out		4"				5"			
Acoustic data									
Global sound power level ⁽¹⁾	dB(A)	89	89	89	91	91	91	92	92
Sound pressure level 10 meters from the unit		57	57	58	59	59	59	61	61
Minimum global sound power level with A³ system ⁽³⁾		82	83	84	85	86	86	87	87
Minimum sound pressure level with A³ system ⁽³⁾ 10 meters from the unit		51	52	54	54	55	55	56	56
Operating limits									
Min. outlet water temperature	°C	+5 (standard)/-10 (option)							
Max. Intlet water temperature		20							
Min. difference water inlet/outlet		3							
Max. difference water inlet/outlet		8							
Min. outside air temperature		+6 (standard)/-20 (option)							
Max. outside air temperature		46	46	46	46	46	43	46	46

(1) EUROVENT conditions data.

(2) ESEER according to EN14511 Eurovent calculation method

(3) A³ system : Active Acoustic Attenuation system to automatically adjust the air flow rate to respect night and day sound level constraints as standard

General data

NAC		540	600	640	680	760	840	960	1080
Cooling mode									
Cooling capacity ⁽¹⁾	kW	531	605	627	702	774	860	980	1062
EER ⁽²⁾		2,63	2,76	2,77	2,80	2,60	2,82	2,81	2,63
ESEER ⁽²⁾		4,0	4,15	4,17	4,15	3,90	4,19	4,01	4,0
Electrical data									
Voltage		400 V/3 Ph/50 Hz			2 x 400 V/3 Ph/50 Hz				
Refrigeration circuit									
Number of circuit		2			4				
Number of compressors		6			10		12		
Evaporator type		AISI 304 stainless steel plate brazed with copper heat exchanger							
Capacity steps		6			10		12		
Condenser type		Microchannel aluminium tube & fins - Air cooled							
Pressure drop									
Pressure drop ⁽¹⁾	kPa	56	59	58	57	51	56	66	71
Hydraulic connections									
Type		Victaulic							
Diameter In/Out		6"			8"				
Acoustic data									
Global sound power level ⁽¹⁾	dB(A)	93	94	94	94	94	96	96	96
Sound pressure level 10 meters from the unit		61	62	62	62	62	64	64	64
Minimum global sound power level with A³ system ⁽³⁾		88	89	89	89	90	90	90	91
Minimum sound pressure level with A³ system ⁽³⁾ 10 meters from the unit		57	59	59	58	58	59	59	60
Operating limits									
Min. outlet water temperature	°C	+5 (standard)/-10 (option)							
Max. Intlet water temperature		20							
Min. difference water inlet/outlet		3							
Max. difference water inlet/outlet		8							
Min. outside air temperature		+6 (standard)/-20 (option)							
Max. outside air temperature		43	46	46	46	43	46	46	43

(1) EUROVENT conditions data.

(2) ESEER according to EN14511 Eurovent calculation method

(3) A³ system : Active Acoustic Attenuation system to automatically adjust the air flow rate to respect night and day sound level constraints as standard

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General data

NAH		200	230	270	300	340	380	420	480	
Cooling mode										
Cooling capacity ⁽¹⁾	kW	191	217	271	295	324	361	397	454	
EER ⁽²⁾		2,60	2,50	2,54	2,52	2,52	2,71	2,56	2,53	
ESEER ⁽²⁾		3.99	3,76	3,98	3,94	4,01	4,08	3,86	4,14	
Heating mode										
Heating capacity ⁽¹⁾	kW	219	252	313	346	370	410	459	509	
COP		3,11	3,03	3,00	3,02	3,04	3,04	2,99	3,01	
Electrical data										
Voltage		400 V/3 Ph/50 Hz								
Refrigeration circuit										
Number of circuit		2								
Number of compressors		4				5	6			
Evaporator type		AISI 304 stainless steel plate brazed with copper heat exchanger								
Capacity steps		6			4	5	6			
Pressure drop										
Pressure drop ⁽¹⁾		kPa	37	46	55	44	30	37	44	42
Hydraulic connections										
Type		Victaulic								
Diameter In/Out		4"				5"				
Acoustic data										
Global sound power level ⁽¹⁾	dB(A)	89	89	91	91	91	92	92	92	
Sound pressure level 10 meters from the unit		57	57	59	59	59	61	61	61	
Minimum global sound power level with A ³ system ⁽³⁾		82	83	85	85	86	87	87	87	
Minimum sound pressure level with A3 system ⁽³⁾ 10 meters from the unit		51	52	54	54	55	56	56	56	
Operating limits										
Min. outlet water temperature Cooling mode	°C	+5 (standard)/-10 (option)								
Max. inlet water temperature		20								
Min. outside air temperature Cooling mode		+6 (standard)/-20 (option)								
Max. outside air temperature Cooling mode		46								
Max. outlet water temperature Heating mode		50								
Min. outdoor air temperature Heating mode		-12								

(1) EUROVENT conditions data.

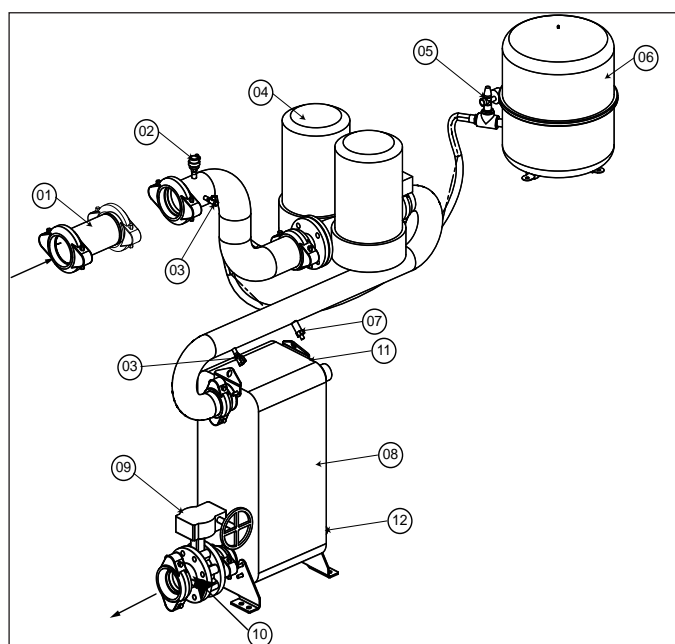
(2) ESEER according to EN14511 Eurovent calculation method

(3) A³ system : Active Acoustic Attenuation system to automatically adjust the air flow rate to respect night and day sound level constraints as standard

Check ongoing validity of certificate :
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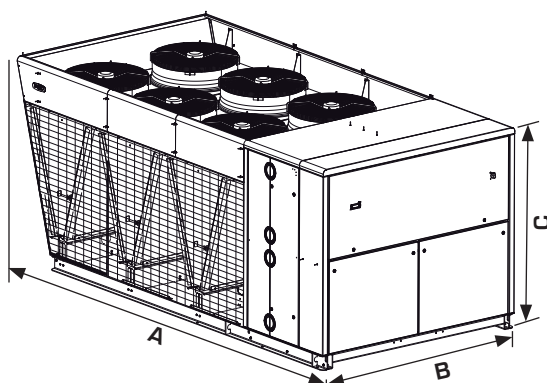
Integrated hydraulic module



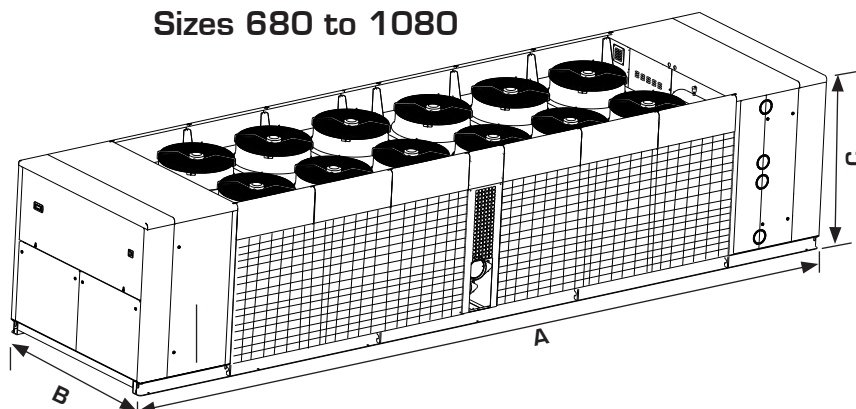
01	Water filter (supplied loose)
02	Air purge
03	Pressure tap
04	Pump
05	Safety valve with manometer
06	Expansion vessel
07	Electronic flow switch
08	Plate heat exchanger
09	Setting valve
10	Pressure tap and drain valve
11	Return temperature sensor
12	Supply temperature sensor

Dimensions and weights

Sizes 200 to 640



Sizes 680 to 1080



NAC		200	230	270	300	340	380	420	480
A	mm	3590	3590	3590	4620	4620	4620	5650	5650
B		2280	2280	2280	2280	2280	2280	2280	2280
C		1965	1965	1965	1965	1965	1965	1965	1965
Shipping weight	kg	2018	2046	2310	2708	3019	3062	3614	3687
Operating weight		2040	2068	2335	2741	3068	3110	3663	3744

NAC		540	600	640	680	760	840	960	1080
A	mm	5650	6680	6680	9240	9240	11300	11300	11300
B		2280	2280	2280	2280	2280	2280	2280	2280
C		1965	1965	1965	1965	1965	1965	1965	1965
Shipping weight	kg	3739	4168	3918	6495	6564	7681	7806	7884
Operating weight		3795	4233	4256	6770	6854	7981	8141	8229

NAH		200	230	270	300	340	380	420	480
A	mm	3590	3590	4620	4620	4620	5650	5650	5650
B		2280	2280	2280	2280	2280	2280	2280	2280
C		1965	1965	1965	1965	1965	1965	1965	1965
Shipping weight	kg	2211	2258	2946	3412	3365	4055	4100	4174
Operating weight		2233	2280	2971	3445	3414	4103	4149	4231

20 → 165 kW

Water cooled chillers/Heat pumps



Main applications

- Residential buildings
- Offices
- Hotels
- Industry
- Administration
- Light commercial buildings

Why this choice?

- R407C scroll compressors
- Cooling only application
- Water/water geothermal heat pump
- Real reversible heat pump unit
- Split version with remote condenser
- Advanced **CLIMATIC** control
- Very robust and compact for indoor installation



General description

HYDROLEAN can be used for **comfort air conditioning requirements in offices, shops and hotels, and especially when there are severe noise and dimensional constraints.**

The **HYDROLEAN** range benefits from the latest technological innovations such as scroll compressors, microprocessor control and brazed plate exchanger. Compact unit, the **HYDROLEAN** liquid chiller is easily installed in small spaces. Since it is fully enclosed, it does not need a dedicated machine room. One unit can be placed on top of another for better use of space, if required (only for A & B boxes).

The original design of each cabinet provides the following advantages: easy to service, no tools required to remove panels and optimal access to various components.

The **HYDROLEAN** range is also available in three versions: cooling only is the SWC, heat pump SWH and remote condenser SWR. It can be used as a geothermal heat pump.

The **HYDROLEAN** is connectable with a remote dry cooler (**FC NEOSTAR/FI NEOSTAR**) or with a remote condenser (**NEOSTAR**).

Main components

- Aluzinc sheet frame and casing
- Protection by Epoxy treatment (RAL 9002)
- R407C refrigerant
- Scroll compressor
- Dual compressors from 50 to 100 kW, three stages above
- Insulated stainless steel 304 brazed plate evaporator
- Stainless steel 304 brazed plate condenser
- Brazed filter dryer, thermostatic expansion valve, HP/LP pressure switches, 4 way valve for heat pump only and replaceable filter dryer, sight glass, suction and discharge valves by circuit for remote condenser version only.
- Control and protection panel according to EN 60204-1
- Main ON/OFF switch
- Paddle flow switch supplied loose on evaporator
- Victaulic hydraulic connection

Advanced control

- Microprocessor control
- Front panel display
- Control of refrigerant and water temperatures
- General alarms with report
- Time counter and run time equalization
- Antifreeze protection
- Remote ON/OFF
- Connectable to a BMS

General data

SWC - K		20	25	35	40	50	65
Cooling mode							
Cooling capacity ⁽¹⁾	kW	18,9	24,2	34,6	42,2	49,3	69,6
EER ⁽²⁾		4,02	3,64	3,65	3,73	3,70	3,63
ESEER ⁽²⁾		4,75	4,33	4,31	4,42	5,30	5,13
Electrical data							
Voltage	400 V/3 Ph/50 Hz						
Refrigeration Circuit							
Number of circuit	1						
Number of compressors	1					2	
Capacity steps	1					2	
Refrigerant charge per circuit	kg	1,3	1,5	2	2,5	3,3	4,5
Hydraulic connections							
Hydraulic connections type	Victaulic						
Water inlet/outlet	1"1/4 / DN32					2" / DN50	
Condenser							
Condenser type	AISI 304 stainless steel plate brazed with copper heat exchanger						
Water flow	m³/h	4	5,3	7,5	9,2	10,7	15,2
Water volume	l	1,6	1,6	2,5	3,1	4,1	5,6
Pressure drop	kPa	46	77	71	69	51	57
Water operating pressure		600					
Evaporator							
Evaporator type	AISI 304 stainless steel plate brazed with copper heat exchanger						
Water flow	m³/h	3,3	4,2	6	7,3	8,5	12
Water volume	l	1,6	1,6	2,5	3,1	4,1	5,6
Pressure drop	kPa	30	49	45	44	33	36
Water operating pressure		600					
Acoustic data							
Global sound power level ⁽¹⁾	dB(A)	72	78	80	80	81	83
Global sound power level with acoustic jacket option ⁽¹⁾		64	71	72	73	74	75

SWC-K		80	90	100	120	135	165
Cooling mode							
Cooling capacity ⁽¹⁾	kW	75,8	86	103	111	140	165
EER ⁽²⁾		3,56	3,78	3,55	3,61	3,69	3,47
ESEER ⁽²⁾		5,15	5,23	5,27	5,12	5,11	4,96
Electrical data							
Voltage	400 V/3 Ph/50 Hz						
Refrigeration circuit							
Number of circuit	1				2		
Number of compressors	2				3		
Capacity steps	2			3	4		
Refrigerant charge per circuit	kg	4,5	5,9	5,9	5,3	7,4	
Hydraulic connections							
Hydraulic connections type	Vitaualic						
Water inlet/outlet	2" / DN50						
Condenser							
Condenser type	AISI 304 stainless steel plate brazed with copper heat exchanger						
Water flow	m³/h	16,6	18,6	22,5	24,2	30,4	36,1
Water volume	l	5,6	7,4	7,4	13,4	18,6	18,6
Pressure drop	kPa	67	50	71	65	57	79
Water operating pressure		600					
Evaporator							
Evaporator type	AISI 304 stainless steel plate brazed with copper heat exchanger						
Water flow	m³/h	13,1	14,8	17,7	19,1	24,1	28,4
Water volume	l	5,6	7,4	7,4	13,4	18,6	18,6
Pressure drop	kPa	43	32	45	41	37	50
Water operating pressure							
Acoustic data							
Global sound power level ⁽¹⁾	dB(A)	83	83	87	85	88	91
Global sound power level with acoustic jacket option ⁽¹⁾		76	76	80	78	80	84

(1) EUROVENT conditions data
(2) EER and COP compressors only

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



General data

SWH - K		20	25	35	40	50	65
Cooling mode							
Cooling capacity ⁽¹⁾	kW	17,5	22,6	32,2	39,3	45,9	64,9
EER ⁽²⁾		3,83	3,48	3,48	3,56	3,53	3,47
ESEER ⁽²⁾		4,05	4,05	4,02	4,11	4,94	4,79
Heating mode							
Heating capacity ⁽¹⁾	kW	19,4	26	37	45,2	52,4	74,4
COP ⁽²⁾		3,29	3,21	3,19	3,23	3,21	3,18
Electrical data							
Voltage		400 V/3 Ph/50 Hz					
Refrigeration Circuit							
Number of circuit		1					
Number of compressors		1				2	
Capacity steps		1				2	
Refrigerant charge per circuit	kg	1,3	1,5	2,0	2,5	3,3	4,5
Hydraulic connections							
Hydraulic connections type		Victaulic					
Water inlet/outlet		1"1/4 / DN32				2" / DN50	
Condenser							
Condenser type		AISI 304 stainless steel plate brazed with copper heat exchanger					
Water flow	m³/h	3,8	5	7,1	8,7	10,1	14,4
Water volume	l	1,6	1,6	2,5	3,1	4,1	5,6
Pressure drop	kPa	41	69	64	62	46	51
Water operating pressure		600					
Evaporator							
Evaporator type		AISI 304 stainless steel plate brazed with copper heat exchanger					
Water flow	m³/h	3	3,9	5,6	6,8	7,9	11,2
Water volume	l	1,6	1,6	2,5	3,1	4,1	5,6
Pressure drop	kPa	26	42	40	38	29	32
Water operating pressure		600					
Acoustic data							
Global sound power level ⁽¹⁾	dB(A)	72	78	80	80	81	83
Global sound power level with acoustic jacket option ⁽¹⁾		64	71	72	73	74	75

SWH - K		80	90	100	120	135	165
Cooling mode							
Cooling capacity ⁽¹⁾	kW	70,7	80,1	95,7	103	130	154
EER ⁽²⁾		3,4	3,61	3,4	3,45	3,53	3,41
ESEER ⁽²⁾		4,81	4,88	4,91	4,76	4,76	4,61
Heating mode							
Heating capacity ⁽¹⁾	kW	81,9	91	110	119	147	177
COP ⁽²⁾		3,14	3,24	3,13	3,16	3,18	3,12
Electrical data							
Voltage		400 V/3 Ph/50 Hz					
Refrigeration circuit							
Number of circuit		1			2		
Number of compressors		2			3		
Capacity steps		2			3		
Refrigerant charge per circuit	kg	4,5	5,9	5,9	5,3	7,4	
Hydraulic connections							
Hydraulic connections type		Victaulic					
Water inlet/outlet		2" / DN50					
Condenser							
Condenser type		AISI 304 stainless steel plate brazed with copper heat exchanger					
Water flow	m³/h	15,8	17,6	21,3	22,9	28,8	34,2
Water volume	l	5,6	7,4	7,4	13,4	18,6	18,6
Pressure drop	kPa	61	45	64	59	52	71
Water operating pressure		600					
Evaporator							
Evaporator type		AISI 304 stainless steel plate brazed with copper heat exchanger					
Water flow	m³/h	12,2	13,8	16,5	17,8	22,4	26,5
Water volume	l	5,6	7,4	7,4	13,4	18,6	18,6
Pressure drop	kPa	37	28	39	36	32	44
Water operating pressure		600					
Acoustic data							
Global sound power level ⁽¹⁾	dB(A)	83	83	87	85	88	91
Global sound power level with acoustic jacket option ⁽¹⁾		76	76	80	78	80	84

(1) EUROVENT conditions data
(2) EER and COP compressors only

General data (Cont'd)

SWR - K		20	25	35	40	50	65
Cooling mode							
Cooling capacity ⁽¹⁾	kW	17,6	23,1	32,8	40	46,9	66,4
EER ⁽²⁾		3,33	3,22	3,2	3,26	3,28	3,23
Electrical data							
Voltage		400 V/3 Ph/50 Hz					
Refrigeration circuit							
Number of circuit		1					
Number of compressors		1				2	
Capacity steps		1				2	
Hydraulic connections							
Hydraulic connections type		Victaulic					
Discharge line		7/8"			1" 1/8		
Liquid line		5/8"				7/8"	
Evaporator							
Evaporator type		AISI 304 stainless steel plate brazed with copper heat exchanger					
Water flow	m³/h	3,0	4,0	5,7	6,9	8,1	11,4
Water volume	l	1,6	1,6	2,5	3,1	4,1	5,6
Pressure drop	kPa	26,2	44,3	41,2	39,7	29,9	33,2
Water operating pressure		600					
Acoustic data							
Global sound power level ⁽¹⁾	dB(A)	72	78	80	80	81	83
Global sound power level with acoustic jacket option ⁽¹⁾		64	71	72	73	74	75

SWR - K		80	90	100	120	135	165	
Cooling mode								
Cooling capacity ⁽¹⁾	kW	72,8	81,8	98,5	106,1	132,7	158,3	
EER ⁽²⁾		3,23	3,33	3,24	3,26	3,26	3,26	
Electrical data								
Voltage		400 V/3 Ph/50 Hz						
Refrigeration Circuit								
Number of circuit		1			2			
Number of compressors		2			3			
Capacity steps		2		3	4			
Hydraulic connections								
Hydraulic connections type		Victaulic						
Discharge line		1" 3/8			1" 3/8 & 1" 3/8			
Liquid line		7/8"						
Evaporator								
Evaporator type		AISI 316 stainless steel plate brazed with copper heat exchanger						
Water flow	m³/h	12,5	14,1	17,0	18,3	22,9	27,3	
Water volume	l	5,6	7,4	7,4	13,4	18,6	18,6	
Pressure drop	kPa	39,5	29,3	41,7	38,2	33,6	46,7	
Water operating pressure		kPa	600					
Acoustic data								
Global sound power level ⁽¹⁾			83	83	87	85	88	91
Global sound power level with acoustic jacket option ⁽¹⁾		dB(A)	76	76	80	78	80	84

(1) EUROVENT conditions data

(2) EER and COP compressors only

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



Operating limits

		SWC - SWH 20 > 165
Mini. evaporator outlet water temperature	°C	+5 (standard) -10 (option)
Maxi. evaporator inlet water temperature		20
Mini. difference water inlet/outlet		3
Maxi. difference water inlet/outlet		8
Maxi. condenser outlet water temperature ⁽¹⁾		53
Mini. condenser inlet water temperature ⁽²⁾		25

		SWR - K 20 > 165
Mini. evaporator outlet water temperature	°C	+5 (standard) -10 (option)
Maxi. evaporator inlet water temperature		20
Mini. difference water inlet/outlet		3
Maxi. difference water inlet/outlet		8
Mini. discharge temperature ⁽¹⁾		35
Maxi. discharge temperature ⁽²⁾		60

(1) Given for «Cooling Mode» and an evaporator outlet water temperature below 12°C

(2) Can be reduced if a water pressure regulated valve is used.

Options

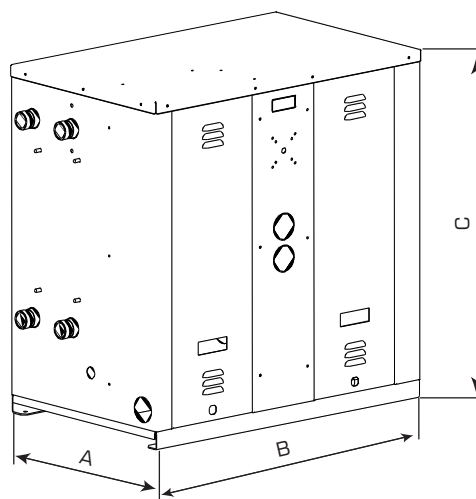
- Electrical equipment + control of outside fans
- Electrical equipment + control of outside pumps
- Pressure regulated water valve
- Water filter for evaporator
- Water filter for condenser
- Hot gas by-pass
- Flanged external water connections
- Low Noise with compressor jackets
- Anti-vibration mounts rubber
- Low water temperature kit on evaporator (- 8°C)
- HP/LP pressure gauge
- J-BUS interface KPO6
- Remote display
- Dynamic set point
- Hot water control
- Modbus communication interface : RS485

Dry-cooler & remote air-cooled condensers

LENNOX can provide you with **FC/FI NEOSTAR** dry-coolers and **NEOSTAR/NEOSTAR WAVE** remote air-cooled condensers. For more details, please refer to the specific **NEOSTAR** pages of this general catalogue.

Dimensions and weights

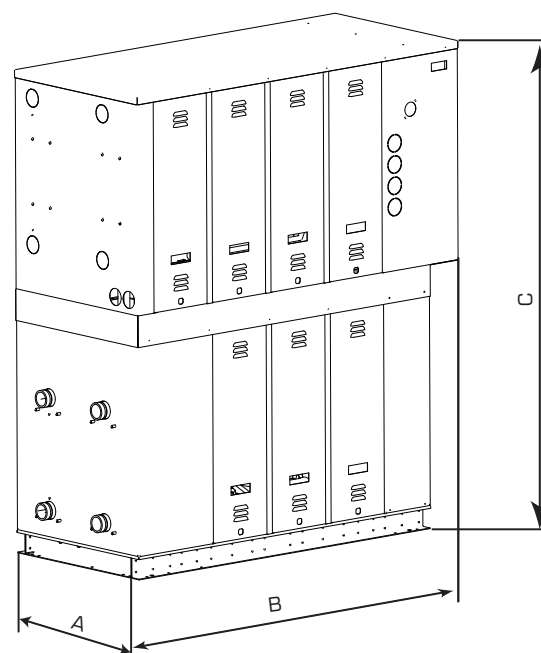
Sizes 020 to 100



HYDROLEAN		20	25	35	40	50	65	80	90	100
A	mm	502	502	502	502	645	645	645	645	645
B		802	802	802	802	1470	1470	1470	1470	1470
C		815	815	815	815	854	854	854	854	854
SWC										
Operating weight	kg	124	192	213	239	393	426	444	485	531
Weight without water		121	189	208	233	385	415	433	470	517
SWH										
Operating weight	kg	125	194	215	241	398	432	450	490	539
Weight without water		122	191	210	235	390	421	439	475	524
SWR										
Operating weight	kg	118	188	202	230	380	403	409	438	486
Weight without water		112	180	195	217	361	385	403	431	479

Sizes 120 to 165

HYDROLEAN		120	135	165
A	mm	645		
B		1470		
C		1705		
SWC				
Operating weight	kg	690	760	803
Weight without water		663	723	766
SWH				
Operating weight	kg	698	768	813
Weight without water		671	731	776
SWR				
Operating weight	kg	640	693	736
Weight without water		627	674	718



180 → 720 kW

Water cooled chillers & Heat pumps /
Condenserless liquid chiller



Main applications

- Offices
- Hotels
- Hospitals
- Industry
- Administration
- Medium and large commercial buildings

Why this choice?

- High efficiency with R410A
- Compact dimensions
- Cooling only application
- Water/water geothermal heat pump
- Split version with remote condenser
- Very low noise operation
- R410A scroll compressors
- Brazed plate heat exchangers
- Advanced **CLIMATIC** control



MWC with optional casing

General description

The **MWC** unit is designed for industrial and commercial applications where customers require reduced total cost of ownership for new air conditioning equipment.

As main characteristics the **MWC** unit offers multi scroll R410A compressors with two circuits for safety operation and oversized heat exchangers for high full and part load energy performances (ESEER > 6.0).

The **MWC** is the solution for indoor installation. Thanks to very compact dimensions and limited footprint **MWC** can be installed easily into any technical room.

The **MWC** is available in 2 main versions to meet all customer requirements and applications:

- **MWC** version is the water-cooled chiller. This version can be used for air conditioning applications in association with a separate dry-cooler or using ground water. The **MWC** version can also be used for heating applications. With the "hot water set point control" option, the **MWC** range can supply hot water up to +56°C.
- **MRC** version is the split version without condenser. This version can be used for air conditioning applications in association with a remote air-cooled condenser.

The **MWC** and **MRC** are connectable with a remote dry cooler (**FC NEOSTAR**/**FI NEOSTAR**) or with a remote condenser (**NEOSTAR** or **NEOSTAR WAVE**).

Main components

- 2 independent circuits
- R410A refrigerant.
- Multiple scroll compressors.
- Stainless steel brazed plate heat exchangers with true dual circuit.
- Thermostatic valve or electronic expansion valve (optional from size 180 to 570, standard on size 650 & 720).
- Moisture sight glass on the **MRC** version
- Filter drier with removable cartridge filter.
- Chassis made of galvanized steel sheet metal painted with a RAL 7016 (grey) powdered polyester paint.
- Optional casing with removable panels made of galvanized steel sheet metal painted with a RAL 7016 (grey) powdered polyester paint.
- Unit electrical cabinet, components and wiring in compliance with EN 60204-1 electrical directive.
- 400V/3/50 Hz power supply (without neutral) with a single point of power connection.
- IP24 protection class.
- Main on/off switch mounted on the front panel.
- **CLIMATIC** micro processor based control.
- DC60 user interface mounted on the front panel.

Advanced control

- **CLIMATIC** microprocessor based control is providing the following functions:
- PI control of the water temperature with operating time equalization of the compressors.
- Water set-point offset based on outdoor air temperature.
- Operation of the unit without buffer tank.
- Free dry contacts: remote on/off, alarm reset to restart the unit, alarm or alert indications, free customer contact.
- Master/slave or cascade control of two chillers operating in parallel with operating time equalization and automatic change-over in case of a unit fault.
- ModBUS®, LonWorks®, or BacNET®, communication interface (options).

Options

- Control/Power electrical equipment of single evaporator pump
- Control/Power electrical equipment of dual evaporator pump
- Control/Power electrical equipment of single condenser pump
- Control/Power electrical equipment of dual condenser pump
- Electronic expansion valve
- Evaporator filter (supplied loose)
- Condenser filter (supplied loose)
- Evaporator flange connections (supplied loose)
- Condenser flange connections (supplied loose)
- Hot water set-point control (heat pump mode)
- DC60 remote comfort display (supply loose)
- DS60 service display (supply loose)
- Modbus, LonWorks®, BACnet® communication interfaces
- ADALINK II Supervision : customer friendly web based supervision
- BE60 extension board for additional inputs/outputs
- Anti-vibration mounts (supplied loose)
- Panel enclosure (compressors)

Dry-cooler & remote air-cooled condensers

LENNOX can provide you with **FC/FI NEOSTAR** dry-coolers and **NEOSTAR/NEOSTAR WAVE** remote air-cooled condensers. For more details, please refer to the specific **NEOSTAR** pages of this general catalogue.



General data

MWC		180	230	280	330	380	450	510	570	650	720
Cooling mode											
Cooling capacity ⁽¹⁾	kW	182	228	275	327	372	432	488	540	628	693
EER ⁽²⁾		4,64	4,56	4,60	4,60	4,60	4,54	4,49	4,31	4,47	4,34
ESEER ⁽²⁾		6,74	6,31	6,38	6,25	6,03	6,04	6,04	5,97	5,97	5,67
Heating mode											
Heating capacity ⁽³⁾	kW	196	246	297	351	401	468	530	601	681	750
COP ⁽²⁾		4,05	4,00	4,06	4,05	4,05	4,02	3,98	4,02	4,01	3,89
Electrical data											
Voltage	400 V/3 Ph/50 Hz										
Refrigeration circuit											
Number of circuit	2										
Number of compressor	4					6					
Capacity steps	4	5	6	5	4	6					
Refrigerant charge per circuit	kg	8	12	14	14	22	27	29	31	30	30
Hydraulic connections											
Water inlet/outlet	4"						5"				
Condenser											
AISI 304 stainless steel plate brazed with copper heat exchanger											
Water flow	m³/h	33,8	42,4	51,1	60,5	69,1	80,6	91,2	103,7	117,4	129,1
Water volume	l	13	24	35	35	43	52	56	61	77	77
Pressure drop	kPa	38,6	32,1	25,4	34,8	33,7	36,4	42,6	51,1	28,4	34,0
Water operating pressure		600									
Evaporator											
AISI 304 stainless steel plate brazed with copper heat exchanger											
Water flow ⁽¹⁾	m³/h	31,3	39,2	47,3	56,2	63,9	74,2	83,9	92,8	107,9	119
Water volume	l	13	24	24	35	35	43	43	61	61	61
Pressure drop ⁽¹⁾	kPa	34,9	28,9	40,7	31,5	40,2	40,4	50,5	46,0	57,7	50,0
Water operating pressure		600									
Acoustic data											
Global sound power level ⁽¹⁾	dB(A)	82	87	89	91	92	93	93	94	96	98
Global sound power level with panel enclosure option ⁽¹⁾		71	78	81	83	84	85	85	86	87	88

MRC		180	230	280	330	380	450	510	570	650	720
Cooling mode											
Cooling capacity ⁽¹⁾	kW	161	202	242	289	329	382	433	494	555	615
EER ⁽²⁾		3,24	3,21	3,18	3,23	3,20	3,18	3,16	3,21	3,15	3,10
Electrical data											
Voltage	400 V/3 Ph/50 Hz										
Refrigeration circuit											
Number of circuit	2										
Number of compressor	4					6					
Capacity steps	4	5	6	5	4	6					
Hydraulic connections											
		Victaulic									
Discharge line	1" 1/8	1" 3/8 - 1" 1/8	2 x 1" 3/8				2 x 1" 5/8		2" 1/8- 1" 5/8	2 x 1" 1/8	
Liquid line	7/8"	1" 1/8 - 7/8"	2 x 1" 1/8				2 x 1" 3/8		1" 5/8 - 1" 3/8	2 x 1" 5/8	
Evaporator											
AISI 304 stainless steel plate brazed with copper heat exchanger											
Water flow	m³/h	26,8	22,3	31,0	24,1	30,6	30,7	31,3	35,0	43,6	53,2
Water volume	l	13	24	24	35	35	43	43	61	61	61
Pressure drop	kPa	148,3	186,3	223,3	266,4	303,3	352,6	399,9	456,5	512,2	568,0
Water operating pressure		600									
Acoustic data											
Global sound power level ⁽¹⁾	dB(A)	82	87	89	91	92	93	93	94	96	98
Global sound power level with panel enclosure option ⁽¹⁾		71	78	81	83	84	85	85	86	87	88

EUROVENT conditions data :

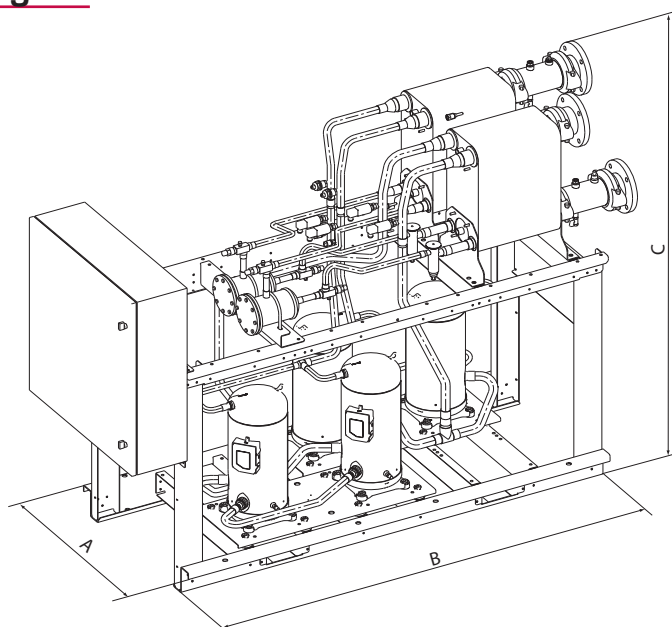
- (1) Gross cooling capacity with 12/7°C evaporator water temperature and 30/35°C condenser water temperature, except for MWC 720 : 13/7°C evaporator water temperature.
- (2) ESEER according to EN14511 Eurovent calculation method.
- (3) Gross heating capacity with 40/45°C condenser water temperature and 10°C evaporator water inlet, with the same evaporator water flow as in cooling mode.

Operating limits

MWC		MWC 180 > 720	MRC 180 > 720
Mini. evaporator outlet water temperature	°C	-10	
Maxi. evaporator outlet water temperature		20	
Mini. difference water inlet/outlet		3	
Maxi. difference water inlet/outlet		8	
Mini. condenser outlet water temperature		20	-
Minimum discharge temperature		-	25
Maximum condenser outlet water temperature : Full capacity operation		56	-
Maximum discharge temperature : Full capacity operation		-	62

Evaporator and condenser water Delta T = 5°C

Dimensions and weights



MWC/MRC		180	230	280	330	380	450	510	570	650	720
A	mm	820					1200				
B		2150					2200				
C		1645	1870								
MWC											
Footprint	m²	1,8					2,6				
Operating weight	kg	756	974	1158	1328	1534	1984	2100	2240	2440	2480
Weight without water		736	914	1088	1248	1444	1894	1990	2110	2270	2310
MRC											
Footprint	m²	1,8					2,6				
Operating weight	kg	650	810	950	1120	1290	1660	1740	1870	1980	2020
Weight without water		620	770	910	1080	1240	1620	1690	1790	1890	1930

Airside products



• Fan coil units	
ALLEGRA	
0,6 - 6,7 kW / 105 - 1500 m ³ /h	92
• High wall fan coil units	
COMFAIR HD	
1,2 - 4 kW / 230 - 620 m ³ /h	96
• High pressure modular fan coil units	
COMFAIR HH / HV	
2,8 - 61 kW / 840 - 8000 m ³ /h	98
• High pressure ductable fan coil	
ARIA / ARIA EC	
1,2 - 7,2 kW / 300 - 850 m ³ /h	100
• Chilled water cassettes	
ARMONIA / ARMONIA EC	
1,3 - 11 kW	104
Coanda comfort water cassettes	
COANDAIR / COANDAIR EC	
0,8 - 5,1 kW / 182 - 750 m ³ /h	110
• Unit heaters • Destratifier fans	
AXIL • EQUITHERM	
12 - 105 kW	114
• Compact air handling units	
MINIAIR	
2 - 44 kW / 500 - 7400 m ³ /h	118
• Heat recovery units	
MINIAIR + / MINIAIR + FO / MINIAIR + BP / MINIAIR + BF	
100 - 6000 m ³ /h	122
• Remote controls and communicating controller	132
• Modular air handling units	
CLEANAIR LX	
1000 - 100000 m ³ /h	134

0,6 → 6,7 kW
105 → 1500 m³/h

Fan coil unit

Main applications

- Any commercial building
- Offices
- Hotels

Why this choice?

- Range of fan coil with innovative designs
- Noise performance among the best on the market
- eDrive EC motor for comfort and energy saving
- Easy and quick to install
- Many available configurations and accessories



General description

9 sizes designed around 4 different versions, the extensive range includes wall and ceiling mounted units, exposed or concealed with centrifugal fan, delivering one of the most versatile ranges of fan coils on the market today.

Range from 105 to 1500 m³/h including 9 flow rates (5 sizes with EC motor) and 4 models (wall- and ceiling-mounted, with cabinet and concealed), each equipped with 3 or 4 row coil and with the possibility to add a 1 or 2 row coil for 4-pipe systems. It is the most comprehensive range,

perfect to meet all air-conditioning requirements of work environments like offices, shops, restaurants and hotel rooms featuring ducted installations with available pressure up to 40 Pa.



Main components

- Cabinet : made of galvanized and pre-painted steel casing. The plastic top grid has fixed louvres and is reversible in order to distribute the air in two different directions
- Frame : made from galvanized steel with closed cell insulation
- Filter : Polypropylene cellular fabric regenerating filter with galvanized steel frame
- The fans have aluminium or plastic blades directly keyed on the motor with double aspiration and they are dynamically and statically balanced
- AC motor : wired for single-phase and has six speeds, three of which are connected. The motor is fitted on sealed for life bearings and is secured on anti-vibration and self-lubricating mountings. Internal thermal protection with automatic reset, protection IP 20, class B
- EC motor : Three phase permanent magnet brushless electronic motor . The inverter board is powered by 230 Volt, single-phase
- Coil made of copper tube and the aluminium fins. Pipe connections can be on the left or right side. This service side can be modify easily on site during installation
- Condensate collection tray made from plastic with an "L"-shape fitted on the inner casing
- Control : Available fitted on the unit, remote wall mounted, or infra-red with also master-slaves and BMS possibility in the differents common protocols.

General data

3-row coil - AC motor

ALLEGRA		100			200			300			400			500		
Speed		1	4	6	1	3	5	2	3	5	2	3	5	2	4	6
		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Airflow rate	m³/h	105	175	220	145	220	295	235	270	385	265	335	485	315	495	650
Total cooling capacity	kW	0,59	0,86	1,03	0,91	1,25	1,56	1,57	1,78	2,39	1,73	2,14	2,87	2,03	2,94	3,64
Sensible cooling capacity		0,47	0,71	0,86	0,69	0,97	1,24	1,15	1,32	1,80	1,28	1,60	2,19	1,51	2,23	2,82
Heating capacity		0,76	1,15	1,39	1,12	1,59	2,02	1,87	2,15	2,92	2,09	2,61	3,56	2,42	3,59	4,50
	2 pipes															
	4 pipes (1 row)															
Dp cooling	KPa	0,9	1,7	2,3	2,5	4,4	6,5	9,4	11,8	19,7	11,2	16,2	27,2	5,8	11,1	16,2
Dp heating		0,8	1,4	2,0	2,1	3,7	5,5	8,0	10,0	16,7	9,5	13,8	23,1	4,9	9,4	13,8
		0,7	1,3	1,7	1,7	2,8	4,0	5,2	6,3	9,7	6,0	8,2	12,8	1,6	2,8	3,9
Fan	W	16	25	33	14	22	32	20	25	41	21	28	44	22	39	61
Sound pressure (*)	dB(A)	23	30	36	21	31	38	27	31	40	24	30	38	22	32	39

ALLEGRA		600			700			800			900		
Speed		1	3	5	2	4	6	2	4	6	2	4	6
		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Airflow rate	m³/h	415	590	760	535	735	925	655	1020	1200	830	1210	1500
Total cooling capacity	kW	2,54	3,37	4,09	3,34	4,29	5,11	3,74	5,19	5,82	4,47	5,87	6,74
Sensible cooling capacity		1,91	2,59	3,20	2,50	3,27	3,95	2,88	4,12	4,68	3,49	4,73	5,55
Heating capacity		3,07	4,13	5,09	4,01	5,19	6,27	4,80	6,74	7,66	5,71	7,72	9,06
	2 pipes												
	4 pipes (1 row)												
Dp cooling	KPa	8,6	14,1	19,8	16,2	25,1	34,2	8,7	15,5	19,0	11,9	19,3	24,6
Dp heating		7,3	12,0	16,8	13,8	21,3	29,1	7,4	13,2	16,2	10,1	16,4	20,9
		3,2	4,9	6,7	4,3	6,3	8,3	5,0	8,5	10,3	6,7	10,5	13,2
Fan	W	37	55	78	54	79	103	62	105	130	92	134	176
Sound pressure (*)	dB(A)	28	37	43	33	42	47	36	47	51	41	49	55

3-row coil - EC motor

ALLEGRA		200			400			600			700			900		
Inverter power		1	5	10	1	5	10	1	5	10	1	5	10	1	5	10
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Airflow rate	m³/h	120	220	330	210	350	515	305	495	735	400	610	890	605	945	1395
Total cooling capacity	kW	0,74	1,19	1,61	1,42	2,19	2,97	1,97	2,94	3,99	1,93	2,79	3,84	2,65	3,83	5,20
Sensible cooling capacity		0,56	0,93	1,30	1,04	1,65	2,28	1,47	2,23	3,11	2,65	3,56	4,63	3,40	4,62	5,98
Heating capacity		0,92	1,53	2,13	1,70	2,70	3,74	2,35	3,59	4,95	3,08	4,47	6,09	4,45	6,41	8,69
	2 pipes															
	4 pipes (1 row)															
Dp cooling	KPa	1,8	4,0	6,9	7,9	17,0	28,9	5,5	11,1	19,0	10,5	19,4	32,6	7,6	13,8	22,2
		1,6	3,8	6,7	7,3	16,0	28,1	5,1	10,5	18,5	9,7	18,4	31,8	7,1	13,2	21,7
Dp heating		1,4	3,4	5,7	6,6	13,8	23,9	4,5	9,2	15,7	8,4	16,1	26,8	6,3	11,4	18,5
	2 pipes															
	4 pipes (1 row)															
Fan	W	7,0	11,0	20,5	6,5	12,0	25,0	7,5	15,0	32,0	9,0	18,5	41,0	16,0	41,0	99,0
Sound pressure (*)	dB(A)	21	32	42	21	33	42	24	35	45	28	39	48	35	46	55

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Operating conditions :

Air inlet 27°C DB/19°C WB – Chilled water 7/12°C

Air inlet 20°C - 2-pipe unit : hot water inlet = 50°C – 4-pipe unit : hot water = 70/60°C

Standard connected speeds

MIN Minimum speed

MED Average speed

MAX Maximum speed

(*) The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.

4-row coil - AC motor - 2-pipe units

ALLEGRA		100			200			300			400			500		
		1	4	6	1	3	5	2	3	5	2	3	5	2	4	6
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Airflow rate	m³/h	105	175	220	145	220	295	235	270	385	265	335	485	315	495	650
Total cooling capacity	kW	0,67	1,02	1,23	1,01	1,43	1,81	1,65	1,89	2,57	1,83	2,28	3,12	2,19	3,25	4,09
Sensible cooling capacity		0,51	0,79	0,97	0,74	1,07	1,38	1,20	1,38	1,90	1,34	1,68	2,34	1,60	2,40	3,07
Heating capacity		0,82	1,27	1,55	1,18	1,72	2,20	1,94	2,23	3,07	2,16	2,72	3,76	2,53	3,81	4,83
Dp cooling	kPa	1,9	4,0	5,6	4,9	9,2	13,9	5,3	6,7	11,5	6,1	9,0	15,5	10,4	20,8	31,3
Dp heating		1,5	3,3	4,7	3,9	7,5	11,6	4,2	5,4	9,2	4,6	6,9	12,2	8,3	17,0	25,7
Fan	W	16	25	33	14	22	32	20	25	41	21	28	44	22	39	61
Sound pressure (*)	dB(A)	23	30	36	21	31	38	27	31	40	24	30	38	22	32	39

ALLEGRA		600			700			800			900		
		1	3	5	2	4	6	2	4	6	2	4	6
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Airflow rate	m³/h	415	590	760	535	735	925	655	1020	1200	830	1210	1500
Total cooling capacity	kW	2,83	3,86	4,79	3,56	4,64	5,58	4,03	5,73	6,47	4,88	6,54	7,60
Sensible cooling capacity		2,07	2,86	3,60	2,62	3,47	4,23	3,04	4,43	5,06	3,72	5,11	6,05
Heating capacity		3,39	4,69	5,88	4,20	5,55	6,71	5,06	7,36	8,43	6,22	8,53	10,1
Dp cooling	kPa	14,4	24,8	36,2	12,5	20,0	27,7	7,6	14,1	17,5	10,6	17,8	23,2
Dp heating		11,0	19,5	29,3	10,3	16,9	23,7	6,2	11,4	14,5	8,7	14,8	19,3
Fan	W	37	55	78	54	79	103	62	105	130	92	134	176
Sound pressure (*)	dB(A)	28	37	43	33	42	47	36	47	51	41	49	55

4-row coil - EC motor - 2-pipe units

ALLEGRA		200			400			600			700			900		
		1	5	10	1	5	10	1	5	10	1	5	10	1	5	10
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Airflow rate	m³/h	115	210	325	200	340	505	290	475	720	380	585	875	575	910	1365
Total cooling capacity	kW	0,78	1,33	1,88	1,44	2,28	3,19	2,06	3,20	4,54	2,62	3,84	5,34	3,61	5,25	7,14
Sensible cooling capacity		0,57	0,99	1,44	1,04	1,68	2,41	1,49	2,35	3,41	1,91	2,84	4,03	2,71	4,03	5,63
Heating capacity		0,94	1,63	2,37	1,70	2,75	3,91	2,43	3,87	5,60	3,09	4,61	6,51	4,50	6,70	9,39
Dp cooling	kPa	3,2	8,0	14,8	4,0	8,9	16,1	8,2	17,8	33,0	7,3	14,3	25,6	6,3	12,1	20,8
Dp heating		2,6	6,5	12,6	3,0	7,2	13,5	6,5	14,9	26,9	6,0	11,8	21,0	5,2	9,9	17,0
Fan	W	7,0	11,0	20,5	6,5	12,0	25,0	7,5	15,0	32,0	9,0	18,5	41,0	16,0	41,0	99,0
Sound pressure (*)	dB(A)	21	32	42	21	33	42	24	35	45	28	39	48	35	46	55

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Operating conditions :

Air inlet 27°C DB/19°C WB – Chilled water 7/12°C

Air inlet 20°C - 2-pipe unit : hot water inlet = 50°C – 4-pipe unit : hot water = 70/60°C

Standard connected speeds

MIN Minimum speed

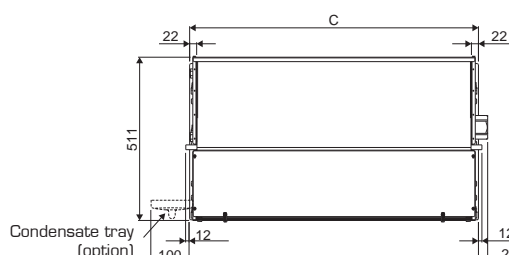
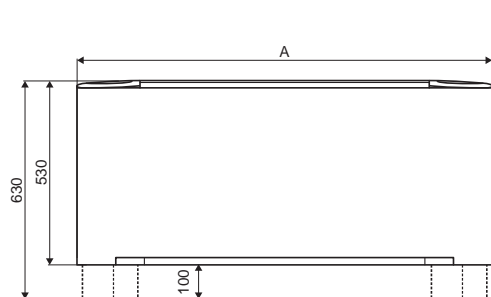
MED Average speed

MAX Maximum speed

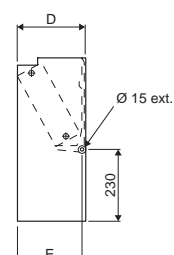
(*) The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.

Dimensions and weights

Cased units



Chassis units



ALLEGRA		100	200	300	400	500	600	700	800	900
A	mm	675	775	990	990	1205	1205	1420	1420	1420
B		225	225	225	225	225	225	225	255	255
C		374	474	689	689	904	904	1119	1119	1119
D		218	218	218	218	218	218	218	248	248
E		205	205	205	205	205	205	205	235	235
Weight - Without cabinet										
3 rows	kg	220	220	220	220	220	220	220	220	220
3 + 1 rows		480	480	480	480	480	480	585	585	585
3 + 2 rows		220	220	220	220	220	220	220	220	220
4 rows		460	460	460	460	460	460	565	565	565
4 + 1 rows		11	14	19	20	23	24	26	31	32

Accessories

- 3-way or 2-way valve ON/OFF fitted
- Electric heater with integral: safety thermostat and relay control
- Extension condensate collection tray
- Feet
- Fresh air mixing damper (can be motorized)
- Rear and Bottom closing panel(unit with cabinet)
- Frame for wall concealed installation
- Straight and 90° inlet and outlet flange
- Air inlet grid with or without filter
- Spigot plenum for return and discharge
- Auxiliary drain pan
- Condensat drain pump

Electrostatic filter : to match the need for better air conditioning with the concepts of space and design. With this filter the various stages of air treatment are combined in one appliance. Thanks to this new patented filter (efficiency compliant with new Standard UNI 11254), air pollutants such as cigarette smoke, dust (PM10, PM2.5), pollen and most biological organisms are eliminated. In addition, as fresh air is not being introduced to obtain the best climatic conditions, there are consequential energy savings. Not available on EC fan version.

- Efficiency close to F9 with very low pressure drop



1,2 → 4 kW
230 → 620 m³/h

High wall fan coils units

Main applications

- The ideal solution to be installed in residential and office buildings. Modern aesthetics and the innovative technical features designed for quality and room enhancement

Why this choice?

- Tangential fan that offers the maximum acoustic comfort
- Display Integrated in the cover cabinet shows the set-up of the unit
- An innovative solution including valve allows an easier installation and energy saving



General description

The consistent range with a tangential fan offers the maximum acoustic comfort, with four different sizes in 2 pipes installation, allows to regularly cover capacities going from 1.2 kW to 4.0 kW.


Main components

- **Tangential fan**, designed to reach high capacities at low motor speed, the tangential fan guarantees the best compromise between silence and excellent performances.
- With copper tubes and aluminium fins, the **coil** has a hydrophilic treatment that allows to avoid any risk of water dragging, and ensure more corrosion strength of the aluminium.
- The **air vent** is easily reachable and it discharges directly in the condensate drain pan.
- **Integrated valve** supplied as standard to avoid efficiently the waste of energy, because the water flow is stopped when the unit is off, unlike normal split systems on which the flow remains. This solution also ensure easy installation even when the unit is not working. and maintenance, without requiring any niche in the wall.

Control

- **Display**, integrated in the cover cabinet, shows room temperature, fan speed and running mode.
- **Remote control**, comfortable and intuitive, it has a minimal and ergonomic design that enhances its functionality and handiness.
- **Automatic swing**, with a simple click of the remote control you can have a complete control of the airflow to suit your needs and to ensure the maximum room comfort.
- **The sleep mode** allows you a complete relax during sleep. Activating this mode the unit sets automatically temperature and fan speed to ensure the maximum comfort, noiselessness and low cost.
- **Timer real time** programmable startup and shutdown allow you to program (within 24 hours), the startup and shutdown of the unit, in a completely automatic way even in your absence, so that you will find the right room comfort at your arrival.

General data

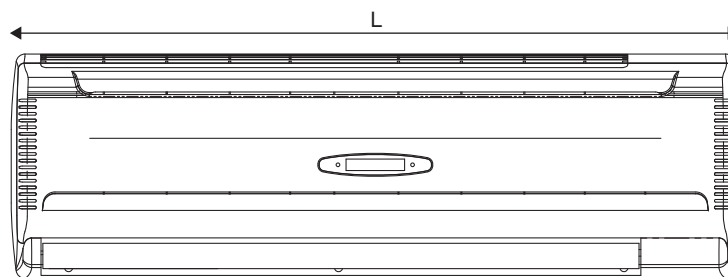
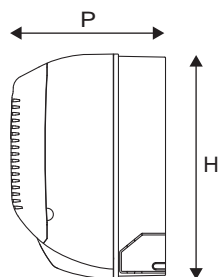
COMFAIR HD				1			2			3			4		
Speed				MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
(1)	Total cooling capacity		W	1550	1730	1960	1830	2100	2380	2420	2960	3340	2920	3640	4000
	Sensible cooling capacity			1240	1410	1610	1410	1640	1900	1890	2320	2680	2260	2850	3130
	Water flow		l/h	266	297	336	314	359	409	415	508	573	501	625	686
	Water pressure drop		kPa	10	12,5	15,9	14,3	18,3	22,9	9,7	11,3	14,8	11,8	17,8	21,6
(2)	Heating capacity		W	2000	2240	2570	2280	2610	2970	3000	3800	4390	3860	4450	4920
	Water flow		l/h	266	297	336	314	359	409	415	508	573	501	625	686
	Water pressure drop		kPa	9,3	11,6	15	13	16,4	20,5	8,3	13,8	17,3	10,6	15,9	19,8
(3)	Heating capacity		W	3390	3810	4390	3850	4400	5030	5070	6450	7480	6540	7500	8280
	Water flow		l/h	298	334	386	338	386	442	445	566	657	574	659	727
	Water pressure drop		kPa	10,9	13,8	18,4	14,1	17,7	22,4	8,8	16	21,1	13,1	16,9	21,2
Air flow rate			m³/h	234	282	344	273	333	417	375	476	553	426	544	620
Sound power level			db(A)	47	50	53	45	50	54	43	50	54	45	52	56
Sound pressure level				38	41	45	37	41	45	34	41	45	37	44	48
Power supply				230V/50Hz											
Power input			W	25	26	29	25	27	29	35	42	48	35	45	51
Absorbed current			A	0,11	0,12	0,13	0,11	0,12	0,13	0,17	0,22	0,26	0,18	0,24	0,30
Water content			l	0,81			0,85			1,24			1,85		
(1) Cooling mode : Inlet water temperature = 7°C Outlet water temperature = 12°C Inlet air temperature : 27°C DB/19°C WB			(2) Heating mode : Air temperature = 20°C Inlet water temperature = 50°C					(3) Heating mode : Air temperature = 20°C Inlet water temperature = 70°C / 60°C							
Check ongoing validity of certificate : 															

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- Standard unit with free outlet: external static pressure = 0 Pa
- Sound power level: ISO 23741
- Sound pressure level: 8,6 dB(A) lower that the sound power level for a room of 90 m³ with a reverberation time of 0,5 sec.
- Supported power supply: ~230V±10%/1 Ph/50 Hz

Dimensions and weights



COMFAIR HD		1	2	3	4
L	mm	880	990	1172	1172
H		298	305	360	360
P		205	210	220	220
Weight	kg	11,5	12,4	19	20,5

2,8 → 61 kW
840 → 8000 m³/h

High pressure fan coil units



Main applications

- Any light commercial building
- Offices and shops
- Hotels

Why this choice?

- Very high performances
- Easy and quick to install like a fan coil
- Many available configurations

General description

Centrifugal high pressure fan coils available in 7 capacity sizes, vertical (HV) or horizontal (HH) configuration, 2 and 4 pipe systems or 2 pipe system with additional electric heater.

Standard configuration: 3 or 4 row coils for the 2 pipe system and 3 or 4 row coils + 1 or 2 row coils for the 4 pipe system.

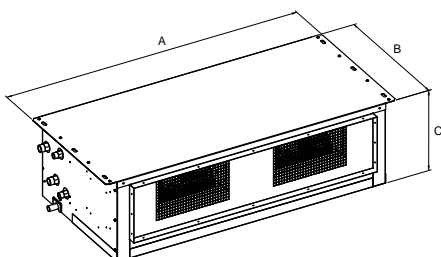
Main components

- Main structure in galvanized sheet metal, 1 mm thickness, with insulation. Heat exchanger condensate drain pan and drainage fittings supplied as standard.
- Ventilation group factory tested. One or two dual inlet centrifugal fans with horizontally extending aluminium blades; static and dynamical balancing. Single phase asynchronous electric motor with overload cut-off.
- Heat exchanger made copper tubes expanded into aluminium fins. Male fittings and standard air vents. Left side water connection as standard, right side on request.

Available accessories - Configurations

- Internal or external thermal or/and acoustic insulation
- G3 or activated carbons G2 filters
- Coils with different row numbers (4, 5 or 6 row coils, 1 or 2 row auxiliary coils)
- Direct expansion coils
- Electric heaters (from 3 to 24 kW)
- 2 and 3 way regulation valves, 230 ON/OFF, 24V ON/OFF, 24V 3 points, 24 V 0-10V
- Manual or motorized fresh air dampers
- Condensate drain pumps
- Straight or 90° supply or return plenums with or without spigots, antivibrating joints, connecting flanges
- Supply or return aluminium diffusers (with or without filters)
- Wide range of remote controls
- Non standard units built on customer request

Dimensions and weights



COMFAIR HH/HV			10	20	30	40	50	60	70
Standard coil	Rows	Nr	3	3	3	3	3	4	4
	Connections	Ø mm	1/2"	1/2"	3/4"	3/4"	1"	1" 1/4	1" 1/2
Auxiliary coil	Rows	Nr	1	1	1	1	1	2	2
	Connections	Ø mm	1/2"	1/2"	1/2"	1/2"	3/4"	1"	1" 1/4
Drain connection (out)		Ø mm	20	20	20	20	20	20	20
A		mm	650	1000	1100	1339	1339	1341	2028
B		mm	533	533	533	533	533	853	853
C		mm	299	299	324	324	374	674	674
Net weight		kg	28	36	41	46	57	117	192

COMFAIR HH/HV			Speed	10	20	30	40	50	60	70
2 pipe system (3 row coil for HH/HV 10-50 - 4 row coil for HH/HV 60-70)										
Cooling capacity ⁽¹⁾	Sensible	1	kW	2,18	3,30	5,26	5,75	6,37	15,3	29,2
		2		2,30	3,97	6,22	7,13	8,40	17,4	32,8
		3		2,40	4,34	,57	7,51	9,60	18,4	34,4
	Total	1		2,83	4,76	7,39	7,40	9,00	20,8	38,4
		2		2,96	5,63	7,80	8,98	11,5	23,3	2,9
		3		3,09	6,11	8,90	9,40	13,1	24,6	44,8
Heating capacity ⁽²⁾		1		3,60	5,60	6,68	8,80	10,8	24,0	51,9
		2		3,79	6,75	10,4	10,5	14,4	27,2	50,9
		3		3,97	7,40	11,5	11,2	16,5	28,8	53,2
Water flow			l/h	626	1213	1582	1823	2253	4782	8703
Water pressure drop	Cooling	1	kPa	13,1	17,2	22,2	16,5	13,3	21,1	28,0
		2		14,2	23,2	22,5	25,3	20,8	25,3	27,2
		3		15,3	26,9	31,4	27,8	26,0	27,7	29,3
	Heating	1		11,0	14,4	18,5	13,9	11,2	17,4	18,6
		2		12,0	19,5	19,7	21,2	17,6	20,5	22,4
		3		13,0	22,6	26,1	23,3	22,0	22,6	23,9
Electrical heater	Standard	kW		3	6	6	9	9	12	18
	High			4,5	9	9	12	12	18	24
Airflow		1		m³/h	570	737	1293	1262	1480	3102
		2	610		940	1627	1728	2163	3645	7248
		3	650		1064	1764	1780	2650	3946	7731
Sound power level ⁽⁴⁾	Inlet + radiated	1	dB(A)	54	51	57	57	57	64	65
		2		57	54	61	61	57	9	70
		3		60	57	63	62	60	74	75
	Outlet	1		58	55	60	60	59	61	62
		2		61	58	65	64	61	66	67
		3		64	61	67	66	65	70	72
4 pipe system (3 +1 row coil for HH/HV 10-50 - 4+2 row coil for HH/HV 60-70)										
Cooling capacity ⁽¹⁾	Sensible	1	kW	2,38	3,68	5,07	6,12	6,34	14,3	26,7
		2		2,53	3,94	6,00	6,84	7,54	15,9	30,1
		3		2,60	4,34	6,53	8,72	9,65	17,0	32,0
	Total	1		3,33	5,26	5,50	8,68	8,47	18,3	33,3
		2		3,52	5,07	6,34	9,57	9,97	20,2	37,3
		3		3,60	6,11	7,96	11,9	12,3	21,5	39,5
Heating capacity ⁽³⁾		1		3,05	4,70	6,73	7,60	8,15	29,4	52,8
		2		3,22	5,90	8,00	8,40	9,50	31,9	58,1
		3		3,30	6,20	7,76	10,1	11,50	33,7	61,0
Water flow	Cooling		l/h ⁽¹⁾	15,9	26,8	28	29,2	30,8	27	32
	Heating		l/h ⁽³⁾	26,8	22,9	37	21,7	33,8	33	36
Water pressure drop	Cooling	1	kPa	13,4	15,0	19,9	21,7	13,2	16,0	52,8
		2		14,8	19,0	22,0	25,9	17,5	18,9	58,1
		3		15,4	26,9	31,5	37,9	25,8	21,0	61,0
	Heating	1		17,7	8,00	21,0	9,50	12,4	13,4	14,8
		2		19,5	11,1	29,0	11,4	16,3	15,6	17,7
		3		20,3	13,0	23,7	15,9	23,0	17,6	19,6
Airflow		1	m³/h	580	850	1180	1460	1470	2905	5613
		2		631	1014	1461	1700	1860	3308	6570
		3		654	1065	1750	2400	2640	3623	7143
Sound power level ⁽⁴⁾	Inlet + radiated	1	dB(A)	54	52	57	54	58	64	65
		2		56	56	60	56	65	69	70
		3		60	57	63	60	69	74	75
	Outlet	1		58	55	62	58	58	61	62
		2		60	60	64	60	66	66	67
		3		64	61	68	64	69	70	72
Available static pressure/Maximum external static pressure (50% performance reduction)										
2 pipes system		1	Pa	35	35	31	35	35	67	77
		2		50	50	50	50	50	100	100
		3		60	60	59	60	60	122	121
4 pipes system		1		35	35	35	35	25	68	80
		2		50	50	50	50	50	100	100
		3		60	60	60	50	60	123	125

Data given at medium speed - 50 Pa available static pressure, except for sizes 60 & 70 : 100 Pa available static pressure.

(1) Cooling: Water inlet temperature: 7°C; water outlet temperature: 12°C; air inlet temperature: 27°C D.B - 19°C W.B

(2) Heating: Water inlet temperature: 50°C; water flow rate as in cooling mode; air inlet temperature: 20°C

(3) Heating: Water inlet temperature: 70°C; water outlet temperature: 60°C; air inlet temperature: 20°C

(4) Sound power level: according to ISO 23741

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1,6 → 7,2 kW
380 → 820 m³/h

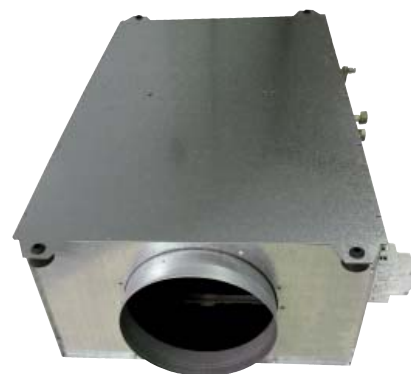
High pressure ductable fan coil

Main applications

- Light commercial
- Large and medium size offices

Why this choice?

- High performing fans
- Installation flexibility
- Energy and maintenance savings



General description

The LENNOX **ARIA** fan coil unit is a horizontal ducted fan coil unit for installations requiring medium and high static pressure. It is available in 4 sizes : 2 pipes and 2 pipes with electric heater, 4 pipes.

The **ARIA** unit is a mono-block design including discharge and return spigots and fresh air connection.



Main components

- Galvanized steel main structure 10/10 mm thickness with internal insulation (10 mm melamine foam. Fire test M1)
- Mounting brackets with anti-vibration rubber mounts (options)
- 2, 3, 4 or 5 row copper aluminium heat exchangers, 1/2" connection, tested to 13 bars and provided with air vents. Left or right hand connection
- Primary & auxiliary monobloc condensate tray made from galvanized steel with a thick coat of bitumous paint
- Single or Double Direct driven double inlet forward curved centrifugal fans. 5 available speeds. All electrical connections in a terminal block positioned on the same side as the hydraulic connections with a plastic box protection (option)
- G3 Class cleanable filter supplied as standard

Available accessories - configurations

- Internal or external thermal or/and acoustic insulation
- G4 filters
- Auxiliary coils for 4 pipe installations
- Electric heaters (500, 800, 1000, 1500, 2000 and 2300 W)
- 2 and 3 way regulation valves, 230 ON/OFF, 24V ON/OFF, 24V 3 points, 24 V 0-10V
- Fresh air connection 100 and 125 mm with or without damper
- Condensate drain pumps
- Fitting of free issue controls kit
- Stand alone or communicating controls

General data

ARIA	Fan speed ⁽⁴⁾		10	20	30	40
Airflow Available external static pressure	2	m³/h	290	270	600	630
		Pa	40	40	30	30
	3	m³/h	385	360	810	825
		Pa	50	50	50	50
	4	m³/h	490	455	1020	1065
		Pa	65	65	70	75
Cooling capacity ⁽¹⁾						
Total cooling capacity	2	W	1420	2080	3940	4680
	3		1680	2580	4810	5710
	4		1920	3040	5540	6810
Sensible cooling capacity	2	W	1140	1540	3000	3460
	3		1390	1940	3770	4280
	4		1620	2330	4460	5210
Water flow	2	l/h	244	357	677	836
	3		289	443	826	1024
	4		330	523	953	1227
Water pressure drop	2	kPa	20,1	11,9	17,9	18,0
	3		27,1	17,6	25,8	26,1
	4		34,5	23,7	33,4	36,4
Heating capacity 2 pipes ⁽²⁾						
Heating capacity	2	W	1640	2240	4380	4990
	3		1990	2850	5490	6190
	4		2320	3430	6480	7550
Water flow	2	l/h	142	194	379	447
	3		172	246	475	557
	4		201	297	561	681
Water pressure drop	2	kPa	6,4	3,4	5,4	5,0
	3		9,0	5,2	8,1	7,4
	4		12,0	7,3	11,0	10,8
Heating capacity 4 pipes ⁽³⁾						
Heating capacity	2	W	1320	1380	2410	2927
	3		1530	1610	2810	3460
	4		1750	1850	3180	3937
Water flow	2	l/h	113	121	211	277
	3		134	141	245	328
	4		153	161	278	374
Water pressure drop	2	kPa	1,6	1,7	6,7	14,3
	3		2,0	2,2	8,8	19,4
	4		2,6	2,9	11,1	24,6
Electrical data						
230V/1Ph/50Hz	3	W	197	196	403	407
Acoustic data						
Sound power level	2	Lw dB(A)	51	50	56	53
	3		55	54	62	58
	4		58	57	64	61

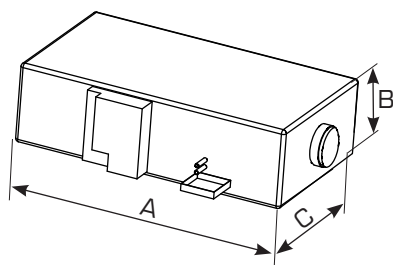
(1) Inlet air conditions 27°C/47%, Water temperature 7/12°C

(2) Inlet air temperature 20°C, Water temperature 50/40°C

(3) Inlet air temperature 20°C, Water temperature 70/60°C

(4) Data for 3 speeds factory wired among 5 available one below and one above.

Dimensions and weights (including supply and return plenums)



ARIA		10	20	30	40
A	mm	886	886	886	886
B		233	233	233	233
C		428	428	728	1028
Weight	kg	16	16	28	35

1,2 → 6 kW
300 → 850 m³/h

High pressure ductable fan coil with EC fan

Main applications

- Light commercial
- Large and medium size offices

Why this choice?

- Low energy consumption
- Low sound level
- Easy maintenance
- Reliability



General description

The LENNOX **ARIA EC** fan coil unit is a horizontal ducted fan coil unit for installations requiring medium to high static pressure. **ARIA EC** is supplied with standard EC fan for low energy consumption.

The LENNOX **ARIA EC** is available in 4 sizes : 2 pipes and 4 pipes. The **ARIA EC** unit is monobloc and includes discharge and return spigots together with fresh air connection.



Main components

- Galvanized steel main structure 10/10 mm thickness with internal insulation (10 mm melamine foam. Fire test M1)
- Mounting brackets with anti-vibration rubber mounts
- 2, 3, 4 or 5 row copper aluminium heat exchangers, 1/2" connection, tested to 13 bars and provided with air vents. Left or right hand connection
- Primary & auxiliary monobloc condensate tray made from galvanized steel with a thick coat of bitumous paint
- Single or Double Direct driven double inlet forward curved centrifugal fans with brushless motor (EC fan)
- Supplied current 230/1/50 and 0-10V control
- G3 Class cleanable filter supplied as standard

Available accessories - configurations

- Internal or external thermal or/and acoustic insulation
- G4 filters
- Auxiliary coils for 4 pipe installations
- 2 and 3 way regulation valves, 230 ON/OFF, 24V ON/OFF, 24V 3 points, 24 V 0-10V
- Fresh air connection 100 and 125 mm with or without damper
- Condensate drain pumps
- Fitting of free issue controls kit
- Stand alone or communicating controls

General data

ARIA EC		Voltage V ⁽⁴⁾	10	20	30	40
Airflow Available external static pressure	6	m³/h	265	265	500	620
		Pa	19	21	20	20
	8	m³/h	385	385	680	850
		Pa	40	40	40	40
	10	m³/h	445	445	820	910
		Pa	47	50	50	46
Cooling capacity ⁽¹⁾						
Total cooling capacity	6	W	1335	2037	3470	4620
	8		1680	2701	4284	5825
	10		1819	2987	4842	6116
Sensible cooling capacity	6	W	1063	1507	2616	3412
	8		1379	2049	3305	4376
	10		1520	2291	3806	4617
Water flow	6	l/h	230	350	596	795
	8		288	464	737	997
	10		313	514	833	1051
Water pressure drop	6	kPa	18,1	11,7	14,2	16,4
	8		27,1	19,2	20,9	25,1
	10		31,4	23,0	26,1	27,4
Heating capacity 2 pipes ⁽²⁾						
Heating capacity	6	W	1523	2202	3800	4926
	8		1985	3003	4820	6335
	10		2184	3366	5538	6686
Water flow	6	l/h	132	190	329	426
	8		171	260	416	549
	10		189	291	425	579
Water pressure drop	6	kPa	5,7	3,3	4,1	4,5
	8		9,0	5,7	6,4	7,2
	10		10,7	7,0	8,3	7,9
Heating capacity 4 pipes ⁽³⁾						
Heating capacity	6	W	1242	1361	2160	2898
	8		1529	1684	2554	3520
	10		1655	1824	2828	3656
Water flow	6	l/h	109	119	189	253
	8		134	147	223	308
	10		145	159	247	320
Water pressure drop	6	kPa	1,4	1,7	5,5	12,2
	8		2,0	2,4	7,4	17,3
	10		2,3	2,8	8,9	18,6
Electrical data						
230V/1Ph/50Hz	6	W	22	21	55	56
	8		35	33	70	70
	10		65	62	90	84
Acoustic data						
Sound power level	6	Lw dB(A)	49	49	56	53
	8		53	53	60	55
	10		58	58	63	59

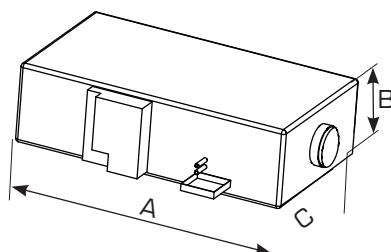
(1) Inlet air conditions 27°C/47%, Water temperature 7/12°C

(2) Inlet air temperature 20°C, Water temperature 50/40°C

(3) Inlet air temperature 20°C, Water temperature 70/60°C

(4) Driving voltage for fan EC motor

Dimensions and weights (including supply and return plenums)



ARIA		10	20	30	40
A	mm	886	886	886	886
B		233	233	233	233
C		428	428	728	1028
Weight	kg	16	16	28	35

1,3 → 11 kW

Water cassette

Main applications

- Light commercial buildings
- Offices
- Shops

Why this choice?

- Silent operation
- Pleasant integration
- Low energy consumption with EC fan
- Optimized air distribution
- Easy installation and maintenance

General description

ARMONIA water cassettes cover any comfort air conditioning requirement and are available in :

STANDARD VERSION

- 7 capacity sizes for 2 pipe systems/2 pipes with additional electric heater
- 11 capacity sizes for 4 pipe systems

EC VERSION

- 5 capacity sizes for 2 pipe systems/2 pipes with additional electric heater
- 5 capacity sizes for 4 pipe systems

Both plastic and metallic diffusers have a very pleasant design and have been designed to perfectly fit into 600 x 600 mm false ceiling standard modules.

Bigger sizes have 800 x 800 mm dimensions and grant the best sound level/capacity ratio.

To reply to any installation requirement, several possibilities are available : infrared remote control, stand alone controls and master slave kit.



ARMONIA water cassettes are available in the following configurations :

Version	Codification example
Standard version	2 pipes CWC 2 ST 020
Basic unit	4 pipes CWC 4 ST 040
MB version	2 pipes CWC 2 MB 020
Basic unit with electronic board for Modbus, master/slaves, infrared and electronic remote control	4 pipes CWC 4 MB 040
EH version	2 pipes CWC 2 EH 120
Basic unit with electric heater	
EHMB version	2 pipes CWC 2 MBEH 120
Basic unit with electrical heater and electronic board for Modbus, master/slaves, infrared and electronic remote control	
EC version	2 pipes CWC 2 EC 120
Basic unit with EC fan	4 pipes CWC 4 EC 140
ECMB version	2 pipes CWC 2 ECMB 120
Basic unit with EC fan and electronic board for Modbus, master/slaves, infrared and electronic remote control	4 pipes CWC 4 ECMB 140
ECMBEH version	2 pipes CWC 2 MBEH 120
Basic unit with EC fan, electrical heater and electronic board for Modbus, master/slaves, infrared and electronic remote control	

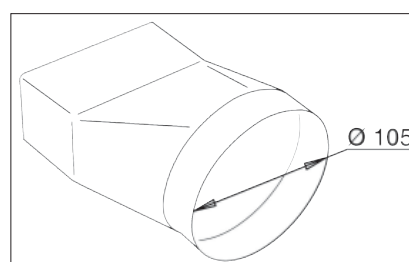
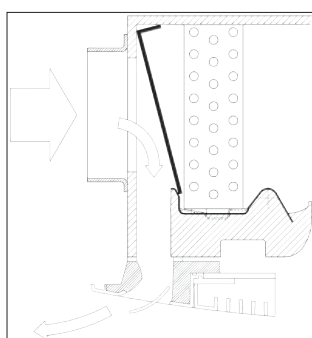
Construction

- Main casing is made of galvanised steel with inside closed cell polyethylene 10 mm thick thermal insulation and outside anti-condensate lining.
- Air diffuser available in ABS white colour and metallic white colour (up to size 320)
- Air filter is washable, easily accessible and removable
- Fan-motor assembly includes single inlet radial fan and 6 speed electric motor with single phase 230V/50 Hz supply, class B insulation and klixon thermal contact motor protection.
- In standard supplied wired in 3 speeds; but can be chosen among the 6 available and modified on site.
- EC low energy consumption motor is also available. Thanks to inverter card continuous air flow/ heating/cooling variation is allowed.
- Heat exchangers are made of copper tubes and bonded aluminium fins. 2 pipe range are 1,2 or 3 rows while 4 pipe range are 2+1 rows mono block coils.
- 4 pipe range has been especially designed to reply higher cooling (CWC 260-360-560-660) or higher heating (CWC 040-140-240-340-440-540-640) site demand.
- Condensate pump with floating switch is supplied as standard and has 650 mm maximum head.
- Main and auxiliary condensate drain pan are supplied as standard. Main drain pan is high density ABS polystyrene foam and fire retardant B2 rating.
- Auxiliary drain pan is ABS and it is connected with the main drain pan to collect condensate of heat exchanger and control valve(s).
- Control board is easily accessible and positioned externally.



Available accessories - Configurations

- Different RAL colours for ABS diffusers (on request, with minimum quantities)
- 2 and 3 way control valves
- Infrared remote control
- Stand alone controls
- Master/Slave card (MSC)
- EC fan control
- Fresh air kit (1 way metallic duct and bypass) and fresh air duct (Ø 105 mm plastic connection)



General data - Standard version

CWC		600 x 600											
2-pipe version		020			120			220			320		
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Airflow	m³/h	310	420	610	310	420	520	320	500	710	430	610	880
Cooling capacity	kW	1,27	1,63	1,98	1,84	2,34	2,68	2,25	3,34	4,33	2,94	3,88	5,02
Sensible cooling capacity		1,01	1,32	1,64	1,35	1,75	2,04	1,57	2,39	3,18	2,08	2,81	3,74
Heating capacity		1,62	2,12	2,64	2,22	2,90	3,35	2,56	3,93	5,23	3,43	4,63	6,17
Water flow	l/h	219	280	340	316	402	461	387	574	745	506	667	863
Δ P cooling	kPa	4,5	7,0	10,0	4,9	7,6	9,7	4,6	9,4	15,1	7,5	12,4	19,7
Δ P heating		4,0	6,0	9,0	4,1	6,3	8,2	3,5	7,3	11,4	6,7	11,2	17,7
Fan	W	25	32	57	25	32	44	25	44	68	32	57	90
	A	0,11	0,15	0,27	0,11	0,15	0,20	0,11	0,20	0,32	0,15	0,27	0,45
Water content	l	0,8	0,8	0,8	1,4	1,4	1,4	2,1	2,1	2,1	2,1	2,1	2,1
Sound power level - Lw	dB(A)	33	40	49	33	40	45	33	45	53	41	49	59
Sound pressure level - Lp		24	31	40	24	31	36	24	36	44	32	40	50

CWC		800 x 800								
2-pipe version		420			520			620		
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Airflow	m³/h	630	820	1140	710	970	1500	710	1280	1820
Cooling capacity	kW	4,21	4,91	6,16	5,31	6,78	9,51	5,31	8,45	11,1
Sensible cooling capacity		3,03	3,58	4,59	3,46	4,48	6,48	3,71	6,09	8,25
Heating capacity		5,12	6,03	7,77	5,61	7,34	10,71	6,13	10,30	14,0
Water flow	l/h	724	845	1060	913	1166	1636	913	1453	1909
Δ P cooling	kPa	10,9	14,3	21,6	9,4	14,7	26,9	9,4	21,8	35,6
Δ P heating		6,7	9,9	15,1	7,9	12,4	23,0	7,9	18,6	30,6
Fan	W	33	48	77	42	63	120	42	95	170
	A	0,15	0,23	0,36	0,18	0,28	0,53	0,18	0,42	0,74
Water content	l	3,0	3,0	3,0	4,0	4,0	4,0	4,0	4,0	4,0
Sound power level - Lw	dB(A)	33	40	48	34	40	53	34	48	58
Sound pressure level - Lp		24	31	39	25	31	44	25	39	49

CWC		600 x 600																	
4-pipe version		040			140			240			260			340			360		
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Airflow	m³/h	310	420	610	310	420	520	320	500	710	320	500	710	430	610	880	430	610	880
Cooling capacity	kW	1,51	1,96	2,33	1,85	2,36	2,70	1,85	2,65	3,34	2,09	3,06	3,93	2,36	3,02	3,81	2,72	3,53	4,53
Sensible cooling capacity		1,15	1,55	1,90	1,34	1,71	1,98	1,34	1,98	2,56	1,49	2,24	2,95	1,75	2,29	2,97	1,97	2,62	3,46
Water flow	l/h	260	337	401	318	406	464	318	456	574	359	526	676	406	519	655	468	607	779
Δ P cooling	kPa	6,0	10,0	13,5	4,6	6,9	8,8	4,6	8,8	13,4	4,0	7,0	10,5	7,2	11,2	17,0	6,0	9,0	14,0
Heating capacity	kW	1,96	2,54	3,03	2,43	3,02	3,46	2,43	3,46	4,40	1,98	2,71	3,35	3,10	3,97	4,95	2,46	3,06	3,79
Water flow	l/h	169	219	261	209	260	298	209	298	378	170	233	288	267	341	426	212	263	326
Δ P heating	kPa	6,5	10,5	14,5	5,7	8,5	10,8	5,7	10,8	16,6	3,6	6,0	9,0	8,8	13,8	20,5	5,0	7,8	11,0
Fan	W	25	32	57	25	32	44	25	44	68	25	44	68	32	57	90	32	57	90
	A	0,11	0,15	0,27	0,11	0,15	0,20	0,11	0,50	0,32	0,11	0,20	0,32	0,15	0,27	0,45	0,15	0,27	0,45
Water content Cooling mode	l	1,0	1,0	1,0	1,4	1,4	1,4	1,4	1,4	1,4	1,7	1,7	1,7	1,4	1,4	1,4	1,7	1,7	1,7
Water content Heating mode		0,6	0,6	0,6	0,7	0,7	0,7	0,7	0,7	0,7	0,5	0,5	0,5	0,7	0,7	0,7	0,5	0,5	0,5
Sound power level - Lw	dB(A)	33	40	50	33	40	45	33	45	53	33	45	53	41	49	59	41	49	59
Sound pressure level - Lp		24	31	41	24	31	36	24	36	44	24	36	44	32	40	50	32	40	50

Cooling : Air inlet temperature: 27°C D.B - 19°C W.B/Water temperature 7/12 °C.

Heating: Air inlet temperature: 20°C - Water inlet temperature: 50°C; water flow rate as in cooling mode.

The sound pressure levels apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 seconds.

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



General data - Standard version

CWC 4-pipe version		800 x 800														
		440			540			560			640			660		
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Airflow	m³/h	630	820	1140	710	970	1500	710	970	1500	710	1280	1820	710	1280	1820
Cooling capacity	kW	4,14	5,03	6,34	4,52	5,66	7,71	4,99	6,33	8,77	4,52	6,93	8,89	4,99	7,84	10,2
Sensible cooling capacity		2,96	3,65	4,69	3,25	4,15	5,83	3,53	4,55	6,49	3,25	5,18	6,84	3,53	5,73	7,68
Water flow	l/h	712	865	1090	777	974	1326	858	1089	1508	777	1192	1529	858	1348	1754
Δ P cooling	kPa	8,8	12,5	18,9	10,3	15,4	26,9	9,0	14,0	25,0	10,3	22,1	34,7	9,0	20,0	32,0
Heating capacity	kW	5,91	7,19	9,10	6,45	8,10	11,0	5,23	6,42	8,56	6,45	9,98	12,7	5,23	7,74	9,80
Water flow	l/h	508	618	783	555	697	946	450	552	736	555	858	1092	450	666	843
Δ P heating	kPa	9,8	14,0	21,4	11,5	17,4	29,9	6,5	9,2	15,3	11,5	25,3	38,8	6,5	13,0	19,5
Fan	W	33	48	77	42	63	120	42	63	120	42	95	170	42	95	170
	A	0,15	0,23	0,36	0,18	0,28	0,53	0,18	0,28	0,53	0,18	0,42	0,74	0,18	0,42	0,74
Water content Cooling mode	l	3,0	3,0	3,0	3,0	3,0	3,0	3,6	3,6	3,6	6,0	6,0	6,0	3,6	3,6	3,6
Water content Heating mode		1,4	1,4	1,4	1,4	1,4	1,4	1,1	1,1	1,1	1,4	1,4	1,4	1,1	1,1	1,1
Sound power level - Lw	dB(A)	33	40	48	34	40	53	34	40	53	34	48	58	34	48	58
Sound pressure level - Lp		24	31	39	25	31	44	25	31	44	25	39	49	25	39	49

General data - EC Version

CWC EC 2-pipe version		600 x 600									800 x 800					
		120			220			320			420			520		
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Airflow	m³/h	310	380	535	310	445	710	360	610	880	630	870	1165	710	1130	1770
Cooling capacity	kW	1,84	2,17	2,75	2,24	3,05	4,33	2,56	3,87	5,02	4,21	5,15	6,33	5,29	7,72	10,75
Sensible cooling capacity		1,35	1,61	2,09	1,57	2,17	3,18	1,81	2,81	3,74	3,03	3,77	4,72	3,69	5,53	7,94
Water flow	l/h	317	373	473	385	524	744	441	666	864	723	885	1089	909	1328	1848
Δ P cooling	kPa	4,9	6,6	10,1	4,6	9,4	15,1	5,9	12,4	19,7	10,9	15,6	22,7	9,4	18,5	33,6
Δ P heating		4	5,5	8,7	3,6	6,6	13,1	4,7	10,5	17,7	8,7	12,8	19,5	7,2	14,9	28,8
Fan	W	5	8	16	5	11	31	7	21	62	10	17	33	10	32	108
Water content	l	1,4	1,4	1,4	2,1	2,1	2,1	2,1	2,1	2,1	3,0	3,0	3,0	4,0	4,0	4,0

CWC EC 4-pipe version		600 x 600									800 x 800					
		140			260			360			440			560		
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Airflow	m³/h	310	380	535	310	445	710	360	610	880	630	870	1165	710	1130	1770
Cooling capacity	kW	1,85	2,18	2,77	2,09	2,81	3,93	2,38	3,53	4,53	4,3	5,28	6,51	4,98	7,17	9,87
Sensible cooling capacity		1,34	1,6	2,08	1,49	2,04	2,95	1,71	2,62	3,46	3,08	3,84	4,83	3,52	5,2	7,4
Water flow	l/h	318	375	476	359	483	676	409	608	779	740	908	1120	856	1233	1697
Δ P cooling	kPa	4,6	6,2	9,5	3,5	5,7	10,5	4,1	8,4	13,1	9,4	13,6	19,8	8,8	17	30,1
Heating capacity	kW	2,43	2,85	3,62	1,98	2,53	3,35	2,2	3,06	3,79	6,14	7,54	9,36	5,22	7,16	9,51
Water flow	l/h	209	245	311	170	217	288	189	263	326	528	649	805	449	616	818
Δ P heating	kPa	5,7	7,6	11,7	3,5	5,5	9	4,5	7,5	11	10,5	15,5	22,5	6,5	11	18
Fan	W	5	8	16	5	11	31	7	21	62	10	17	33	10	32	108
Water content Cooling mode	l	1,4	1,4	1,4	1,7	1,7	1,7	1,7	1,7	1,7	3,0	3,0	3,0	3,6	3,6	3,6
Water content Heating mode		0,7	0,7	0,7	0,5	0,5	0,5	0,5	0,5	0,5	1,4	1,4	1,4	1,1	1,1	1,1
Sound power level - Lw	dB(A)	33	39	47	33	43	54	37	50	60	33	39	48	34	47	57
Sound pressure level - Lp		24	30	38	24	34	45	28	41	51	24	30	39	25	38	48

Cooling : Air inlet temperature: 27°C D.B - 19°C W.B/Water temperature 7/12 °C.

Heating: Air inlet temperature: 20°C - Water inlet temperature: 50°C; water flow rate as in cooling mode.

The sound pressure levels apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 seconds.

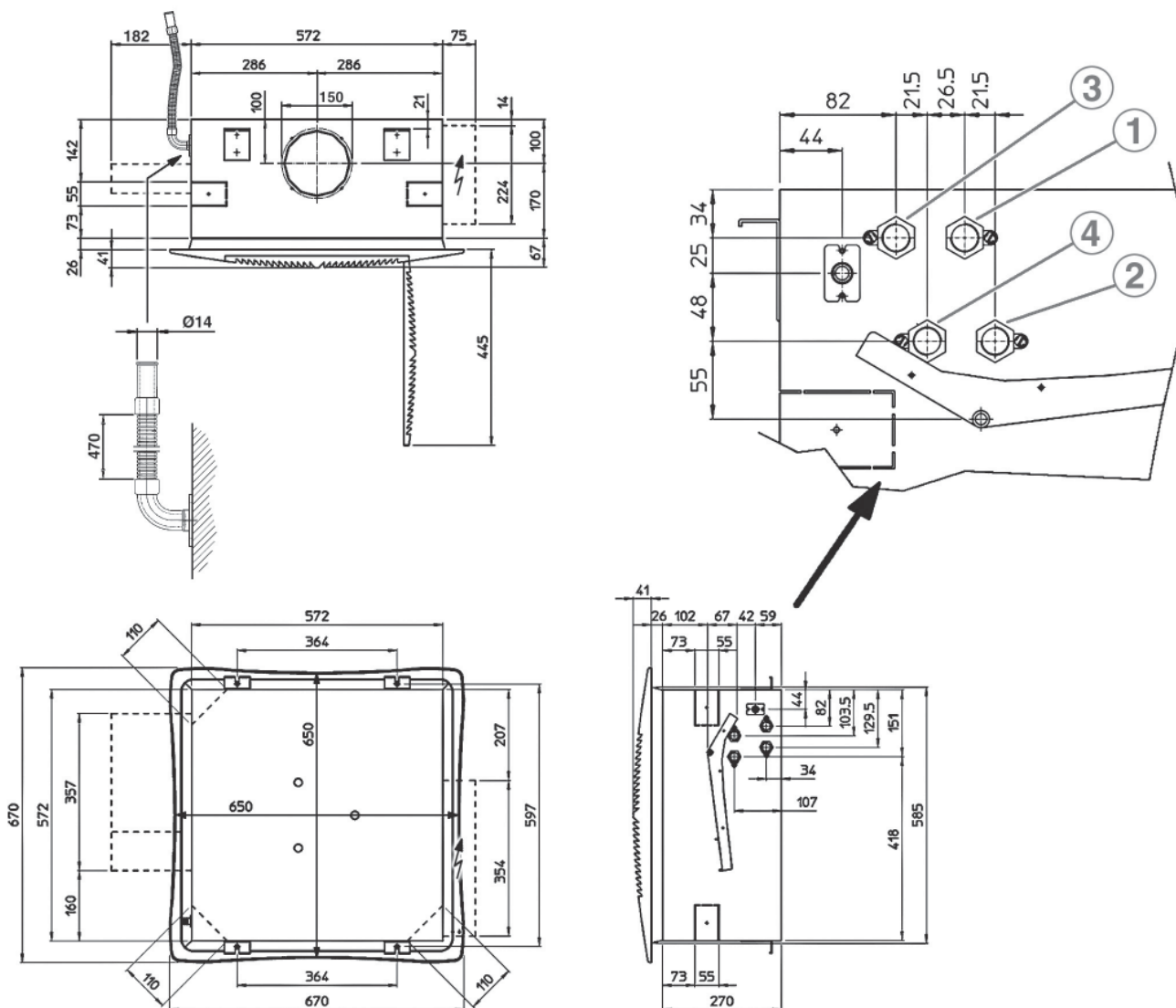
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certiflash.com



Dimensions

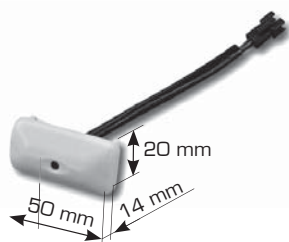
CWC 020 - 040 - 120 - 140 - 220 - 240 - 260 - 320 - 340 - 360

Version 600 x 600



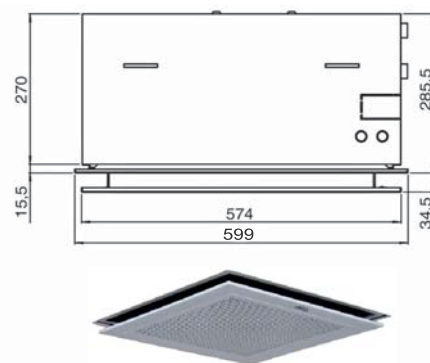
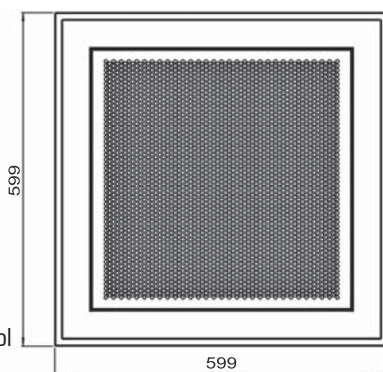
2-pipe units		4-pipe units	
3	Inlet, heating/cooling 1/2"	1	Heating 1/2"
4	Outlet, heating/cooling 1/2"	2	Heating 1/2"
		3	Cooling 1/2"
		4	Cooling 1/2"

Metallic diffuser



Infrared receiver mandatory

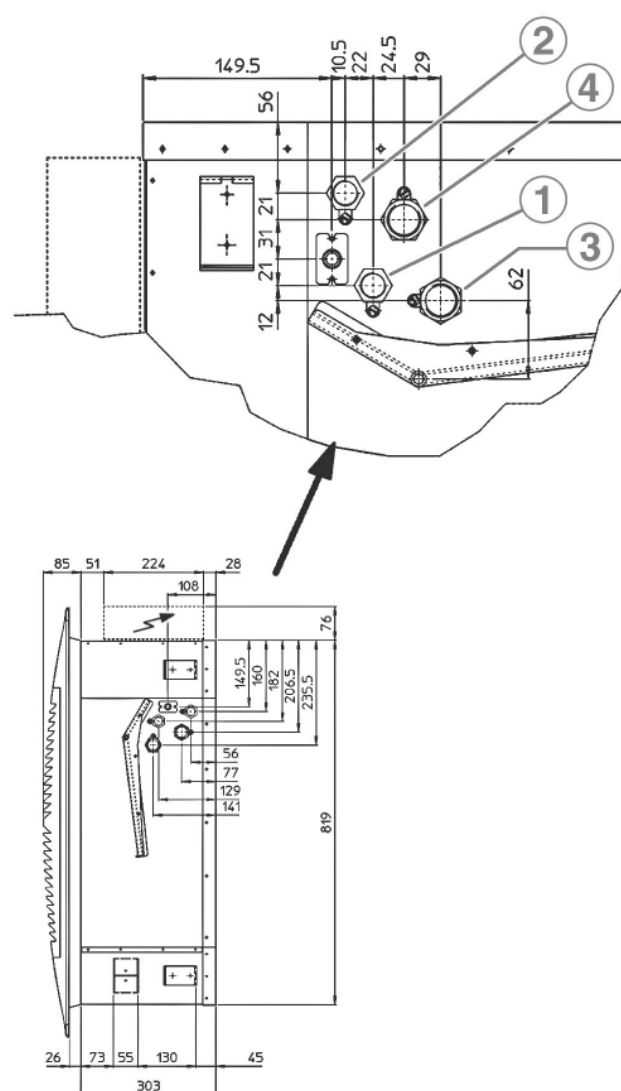
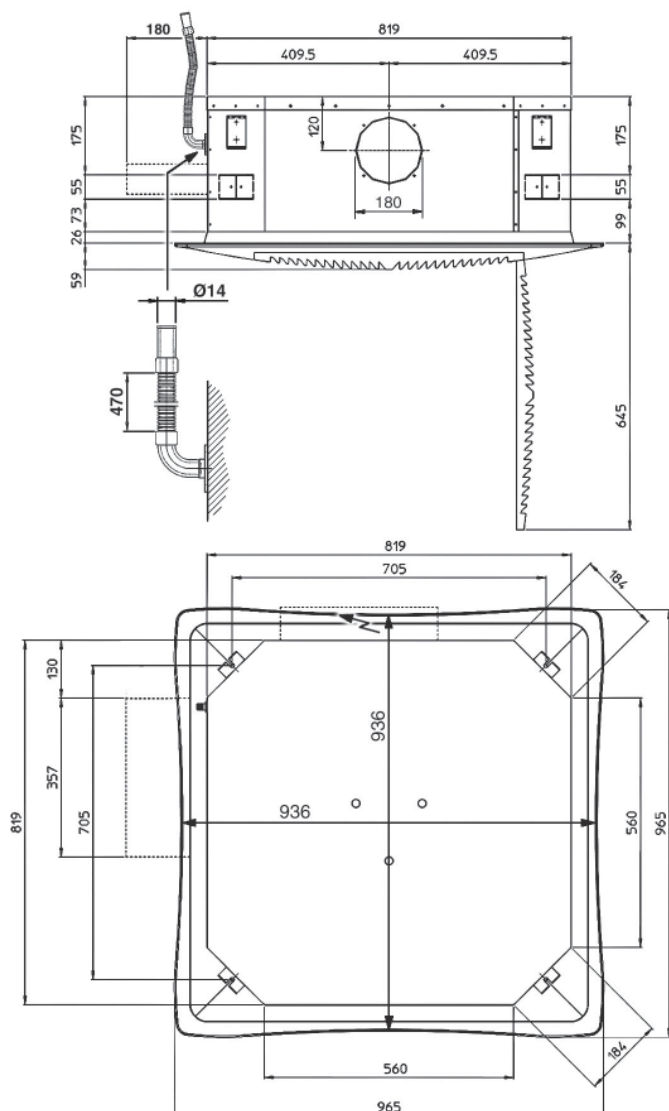
With metallic diffuser + infrared remote control



Dimensions

CWC 420 - 440 - 520 - 540 - 560 - 620 - 640 - 660

Version 800 x 800



2-pipe units		4-pipe units	
3	Inlet, heating/cooling 3/4"	1	Inlet, heating 1/2"
4	Outlet, heating/cooling 3/4"	2	Outlet, heating 1/2"
		3	Inlet, cooling 3/4"
		4	Outlet, cooling 3/4"

0,8 → 5,1 kW
182 → 750 m³/h

Main applications

- Light commercial buildings
- Offices, hotels, schools
- Hospitals

Why this choice?

- Optimal user comfort
- Low noise level
- Excellent architectural integration
- EC fan for low energy consumption: up to 80% annual economy



General description

- Centrifugal 2 way water cassettes engineered to obtain the best comfort result, thanks to Coanda diffuser
- **SE** version (low version, 301 mm) used in reduced dimension ceiling installation (condensate pump installation is needed)
- **HE** version (high version, 366 mm) used when ceiling dimension allows gravity condensate discharge
- Available in 2 pipe configuration (3 sizes with 4 row coils) and in 4 pipe configuration (3 sizes with 3 rows cooling and 1 row heating), right or left side connections
- Standard configuration 4 row coil for the 2 pipe system and 3+1 row coil for the 4 pipe system with air diffuser
- **Codification example:** CD 06 2P 4 HE SX (Coandair size 06 - 2 pipe system - 4 row coil - High version - Left water connection side)

Main components

- Ventilation group, factory tested, single or twin dual inlet fan, according on the unit size. 5 available speeds, 3 wired to the terminal block
- G3 filter: 15 mm thickness, M fire classification
- Heat exchanger with aluminium fins mechanically bonded to a 3/8" diameter copper tubes
- Coils are available in 3 or 4 rows for 2 pipe systems and 3 rows + 1 row for 4 pipe system
- Standard monobloc condensate drain pan (coil and valves)
- Air Diffuser: 2 ways, white colour, 10/10 mm electro-zinc galvanized steel

Available accessories - configurations

- G2 filter
- Fresh air connection spigots (external dimension from 99 to 124 mm)
- Constant volume fresh air controllers (variation between 50 and 200 Pa)
- Condensate water pump
- Electric heaters (from 800 to 1500 W)
- 2 and 3 way regulation valves, 230 ON/OFF, 24V ON/OFF, 24V 3 points, 24 V 0-10V
- Remote controls
- EC fans for low Energy consumption

General data

COANDAIR CD	Speed		06-3	06-4	09-3	09-4	12-3	12-4
Cooling capacity ⁽¹⁾								
Sensible cooling capacity	2	kW	1,17	1,26	1,35	1,48	1,65	1,79
	3		1,43	1,48	1,83	2,05	2,22	2,44
	4		1,96	1,83	2,35	2,66	3,07	3,44
Total cooling capacity	2	kW	1,56	1,76	1,85	2,08	2,30	2,54
	3		1,88	2,04	2,47	2,83	3,05	3,43
	4		2,50	2,48	3,10	3,61	4,13	4,75
Water flow - Cooling	2	l/h	268	306	318	357	395	436
	3		324	349	424	486	524	589
	4		430	427	532	621	710	816
Water pressure drop - Cooling	2	kPa	2,40	10,7	4,16	6,30	7,70	11,3
	3		9,01	13,6	7,03	11,0	11,2	19,5
	4		15,1	19,6	10,7	17,2	22,4	35,1
Heating capacity								
Heating capacity 2 pipes ⁽²⁾	2	kW	NA	1,83	NA	2,14	NA	2,56
	3		NA	2,14	NA	2,95	NA	3,53
	4		NA	2,64	NA	3,85	NA	4,95
Water flow - 2 pipes	2	l/h	NA	159	NA	185	NA	222
	3		NA	185	NA	256	NA	305
	4		NA	229	NA	333	NA	429
Water pressure drop - 2 pipes	2	kPa	NA	2,76	NA	1,63	NA	2,83
	3		NA	3,69	NA	2,94	NA	5,05
	4		NA	5,39	NA	4,75	NA	9,37
Heating capacity 4 pipes ⁽³⁾	2	kW	1,30	NA	1,61	NA	2,00	NA
	3		1,54	NA	2,08	NA	2,55	NA
	4		2,01	NA	2,56	NA	3,34	NA
Water flow - 4 pipes	2	l/h	113	NA	141	NA	175	NA
	3		134	NA	182	NA	223	NA
	4		176	NA	223	NA	292	NA
Water pressure drop - 4 pipes	2	kPa	1,45	NA	4,89	NA	9,17	NA
	3		3,26	NA	7,73	NA	14,3	NA
	4		5,31	NA	11,2	NA	23,1	NA
Electrical data (230V/1Ph/50Hz)								
Fan absorbed power	2	W	43	43	37	37	37	37
	3		44	44	42	42	43	43
	4		44	44	52	52	53	53
Acoustic data								
Sound power level	2	dB(A)	42	42	39	39	34	34
	3		46	46	45	45	38	38
	4		51	51	50	50	48	48

NA = Non applicable

Data given at maximum speed

(1) Cooling: water inlet temperature: 7°C; water outlet temperature: 12°C; air inlet temperature: 27°C D.B - 19°C W.B

(2) Heating: water inlet temperature: 50°C; water flow rate as in cooling mode; air inlet temperature: 20°C

(3) Heating: water inlet temperature: 70°C; water outlet temperature: 60°C; air inlet temperature: 20°C

General data

COANDAIR EC	Volts			06-3	06-4	09-3	09-4	12-3	12-4
Cooling capacity ⁽¹⁾									
Sensible cooling capacity	2	kW	0,54	0,59	1,00	1,00	1,07	1,52	
	4		1,06	1,18	1,96	2,01	2,12	2,34	
	6		1,57	1,80	2,35	2,44	3,25	3,54	
Total cooling capacity	2	kW	0,76	0,83	1,40	1,55	1,50	1,63	
	4		1,43	1,66	2,62	3,02	2,93	3,29	
	6		2,05	2,45	3,10	3,61	4,23	4,87	
Water flow - Cooling	2	l/h	130	144	241	266	260	280	
	4		245	285	450	519	503	565	
	6		352	421	532	621	727	837	
Water pressure drop - Cooling	2	kPa	1,7	2,7	2,5	3,7	3,6	5	
	4		5,5	9,4	7,9	12,4	11,9	18	
	6		10,5	19,1	10,7	17,2	23,3	36,8	
Heating capacity									
Heating capacity 2 pipes ⁽²⁾	2	kW	NA	0,84	NA	1,57	NA	1,62	
	4		NA	1,72	NA	3,17	NA	3,37	
	6		NA	2,60	NA	3,85	NA	5,09	
Water pressure drop - 2 pipes	2	kPa	NA	0,7	NA	0,9	NA	1,2	
	4		NA	2,5	NA	3,3	NA	4,6	
	6		NA	5,3	NA	4,8	NA	9,8	
Heating capacity 4 pipes ⁽³⁾	2	kW	0,69	NA	1,3	NA	1,4	NA	
	4		1,2	NA	2,2	NA	2,47	NA	
	6		1,7	NA	2,56	NA	3,41	NA	
Water flow	2	l/h	60	73	111	136	123	140	
	4		105	148	192	274	216	292	
	6		145	224	223	333	298	441	
Water pressure drop - 4 pipes	2	kPa	0,8	NA	3,2	NA	4,8	NA	
	4		2,1	NA	8,5	NA	13,4	NA	
	6		3,7	NA	11,2	NA	24	NA	
Electrical data (230V/1Ph/50Hz)									
Fan absorbed power	2	W	2	2	2	2	5	5	
	4		8	8	8	8	18	18	
	6		30	30	30	30	50	50	
Acoustic data									
Sound power level	2	dB(A)	42	42	39	39	34	34	
	4		46	46	45	45	38	38	
	6		51	51	50	50	48	48	

NA = Non applicable

Data given at maximum speed

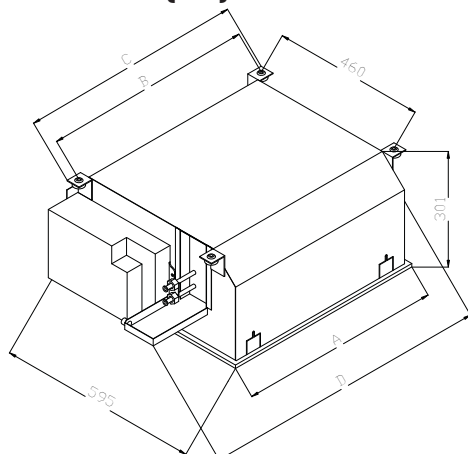
(1) Cooling: water inlet temperature: 7°C; water outlet temperature: 12°C; air inlet temperature: 27°C D.B - 19°C W.B

(2) Heating: water inlet temperature: 50°C; water flow rate as in cooling mode; air inlet temperature: 20°C

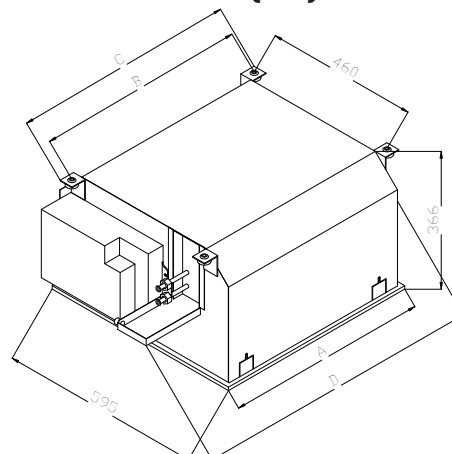
(3) Heating: water inlet temperature: 70°C; water outlet temperature: 60°C; air inlet temperature: 20°C

Dimensions and weights

Standard (SE)

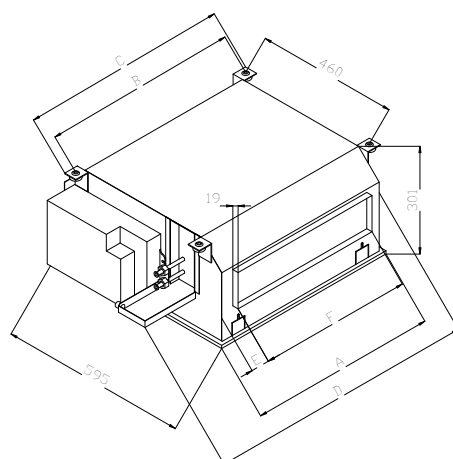


Raised version (HE)



COANDAIR		06	09	12
Standard (SE)				
A	mm	595	895	1195
B		616	916	1216
C		655	955	1255
D		779	1079	1379
Weight	kg	25	36	47
Raised (HE)				
A	mm	595	895	1195
B		616	916	1216
C		655	955	1255
D		779	1079	1379
Weight	kg	26	37	48

Ductable version



COANDAIR		06	09	12
Ducted				
A	mm	595	895	1195
B		616	916	1216
C		655	955	1255
D		779	1079	1379
E		40	95	125
F		485	675	915
Weight	kg	25	36	47

Main applications

- Any industrial building
- Any large surface

Why this choice?

- High heating performances
- Long lasting and sturdy coils
- Easy and quick to install



General description

AXIL unit heaters and **EQUITHERM** destratifier fans are suitable to any industrial building or big surface and are able to reach very high performances thanks to their advanced engineering.

Available configurations:

- **AXIL**: hot water version
- **AXIL F**: chilled water version
- **AXIL Z**: electrical heating version
- **AXIL V**: steam heating and superheated water version
- **EQUITHERM**: destratifier fans without heating

Operating limits:

- 120°C – 16 bars hot water for AXIL and AXIL F
- 210°C – 20 bars steam and superheated water

Main components

- Main casing in galvanized prepainted steel finished in dove grey
- Hermetically sealed motor (three phase 230/400V/50 Hz), fan and finger proof guard
- Heat exchangers of Axil and Axil F with 3/8" OD copper tubes and aluminium fins
- Heat exchangers of Axil V with 22 mm OD steel tubes and aluminium fins

Available accessories - configurations

- Control for EQUITHERM (thermostat + protection)
- Motor 1 speed (6P) 230/1/50Hz
- Motor 1 speed (4P) 230/1/50Hz
- Star/Delta switch
- Control w/o clock - 2 speeds/2 setpoints/Antifreeze protection supplied w/o thermostats
- Control with electromechanical clock - 2 speeds/2 setpoints/Antifreeze protection supplied w/o thermostats
- Control with digital clock - 2 speeds/2 setpoints/Antifreeze protection supplied w/o thermostats
- 2 speeds manual control
- 2 speeds auto. With thermostat
- For AXIL Z - 2/3 manual power step control - with electronic thermostat
- For AXIL Z - 2/3 automatic power step control - with electronic thermostat
- Remote Control board for motorized Jetstream
- Wall bracket
- Multidirection diffuser
- High air stream diffuser
- Air curtain diffuser
- Return air duct with or without filter
- Return air duct with mixing damper with or without filter
- Return air plenum with or without filter
- Return air plenum with damper with or without filter
- Mixing box with flaps (Manual operation) with or without filter
- Mixing box with dampers with or without filter
- Outdoor air intake grill
- Straight duct for full fresh air introduction
- Rain hood
- Straight duct
- Additionnal protection grill
- Jetstream VERTICAL or CEILING install/manual or with actuator

General data

AXIL		402-4	403-4	404-4	502-4	503-4	504-4	602-4	602-6
Technical information									
Airflow rate	m³/h	2300/1600	2200/1500	2000/1400	3950/2550	3800/2500	3400/2150	6500/4500	4500/3700
Heating capacity	kW	15,0/12,1	20,4/16,2	23,6/18,8	25,2/20,9	34,8/27,2	40,4/30,4	42,3/34,1	34,1/30,1
Number of rows		2	3	4	2	3	4	2	2
Motor poles		4/6	4/6	4/6	4/6	4/6	4/6	4/6	6/8
Fan speed	RPM	1350/950	1350/950	1350/950	1350/950	1350/950	1350/950	1350/950	950/700
Water connection		1 "	1 "	1 "	1 "	1 "	1 "	1"1/4	1"1/4
Sound pressure level at 5 m	dB(A)	59/51	59/51	59/51	64/54	64/54	64/54	69/60	60/52
Air throat – Horizontal discharge									
Height - High speed	m	3-4	3-4	3-4	3,5-4,5	3,5-4,5	3,5-4,5	4,5-6	4-5,5
Height - Low speed		2,5/3,5	2,5 - 3,5	2,5 - 3,5	3-4	3-4	3-4	4-5,5	3,5-5
Air throat - High speed		11	10	9,5	16	15	14	25	18
Air throat - Low speed		7,5	7,5	7	12	10	9	19	15
Air throat – Vertical discharge									
Height - High speed	m	4,5	4,5	4,5	5,5	5,5	5,5	7	6
Height - Low speed		3,5	3,5	3,5	4,5	4,5	4,5	6	5,5
Air throat - High speed		60	58	56	80	75	70	145	110
Air throat - Low speed		45	43	41	60	55	50	125	90

AXIL		603-4	603-6	604-4	604-6	902-6	903-6	904-6
Technical information								
Airflow rate	m³/h	6200/4350	4350/3600	5500/4000	4000/3150	9500/7200	9100/6000	8500/6500
Heating capacity	kW	58,1/47,3	47,3/41,3	69,8/53,5	53,5/45,5	73,1/63,1	96,0/82,0	111,9/89,9
Number of rows		3	3	4	4	2	3	4
Motor poles		4/6	6/8	4/6	6/8	6/8	6/8	6/8
Fan speed	RPM	1350/950	950/700	1350/950	950/700	950/700	950/700	950/700
Water connection		1"1/4	1"1/4	1"1/4	1"1/4	1"1/2	1"1/2	1"1/2
Sound pressure level at 5 m	dB(A)	69/60	60/52	69/60	60/52	68/62	68/62	68/62
Air throat – Horizontal discharge								
Height - High speed	m	4,5-6	4-5,5	4,5-6	4-5,5	4-6	4-6	4-6
Height - Low speed		4-5,5	3,5-5	4-5,5	3,5-5	3,5-5,5	3,5-5,5	3,5-5,5
Air throat - High speed		23	16	22	15	28	25	22
Air throat - Low speed		17	13	18	12	21	18	15
Air throat – Vertical discharge								
Height - High speed	m	7	6	7	6	11	11	11
Height - Low speed		6	5,5	6	5,5	9	9	9
Air throat - High speed		135	100	125	90	200	180	160
Air throat - Low speed		115	80	105	70	160	140	120

(1) Air inlet temperature = 12°C / Hot water temperature = 90/70°C

AXIL F		403-4	404-4	503-4	504-4	603-6	604-6	903-6	904-6
Technical information									
Airflow rate	m³/h	1600	1600	2500	2500	3600	3600	6900	6900
Total cooling capacity ⁽¹⁾	kW	4,8	5,7	8,2	9,6	12,5	14,4	22,7	25,6
Sensible cooling capacity ⁽¹⁾	kW	3,4	4,0	5,9	6,6	8,7	9,7	16,0	17,5
Number of rows		3	4	3	4	3	4	3	4
Motor poles		4/6	4/6	4/6	4/6	6/8	6/8	6/8	6/8
Fan speed	RPM	1350/950	1350/950	1350/950	1350/950	950/700	950/700	950/700	950/700
Sound pressure level at 5 m	dB(A)	51	51	54	54	52	52	62	62
Air throat – Horizontal discharge									
Height	m	2,5/3,5	2,5/3,5	3-4	3-4	3,5-5	3,5-5	3,5-5,5	3,5-5,5
Air throat		7,5	7	10	9	13	12	18	15

(1) Air inlet temperature = 26°C/55% - Chilled water temperature = 7/12°C

General data (cont'd)

AXIL Z		414	524	639
Airflow rate	m ³ /h	1560	2910	4790
Electrical heater capacity	kW	14 (7+7)	24 (12+12)	39 (3 x 13)
Air temperature increase	°K	25,7	23,6	23,3
Stages		2	2	3
Motor poles		6	6	6
Fan speed	RPM	900	900	900
Sound pressure level at 5 m	dB(A)	51	54	60

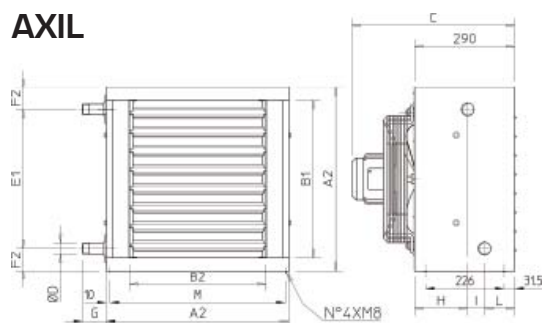
AXIL V		402-4	502-4	602-4	902-6
Technical information					
Airflow rate	m ³ /h	2100/1400	3600/2400	6300/4100	9200/7000
Heating capacity (steam 8 bs)	kW	18,6/15,1	29,9/24,6	49,6/40,3	87,7/78,4
Heating capacity (water 120/100)	kW	32,1/26,2	52,2/43,2	87,2/70,3	154,6/138,6
Number of rows		2	2	2	2
Motor poles		4/6	4/6	4/6	6/8
Fan speed	RPM	1350/950	1350/950	1350/950	950/700
Sound pressure level at 5 m	dB(A)	59/51	64/54	69/60	68/62
Air throat - Horizontal discharge					
Height - High speed	m	3-4	3,5-4,5	4,5-6	4-6
Height - Low speed		2,5/3,5	3-4	4-5,5	3,5-5,5
Air throat - High speed		11	16	25	28
Air throat - Low speed		7,5	12	19	21

(1) Air inlet temperature = 12°C

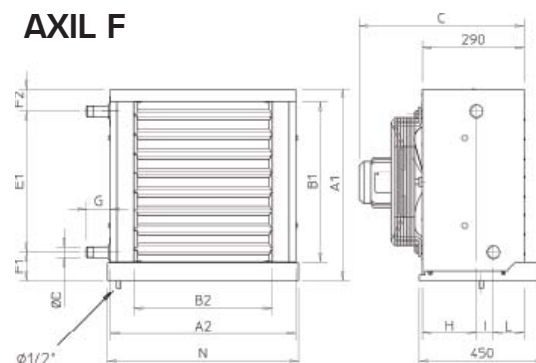
EQUITHERM		404	406	504	506	604	606	906	908
Airflow rate	m ³ /h	2500	1700	4200	3000	7500	5200	13000	8500
Motor poles		4	6	4	6	4	6	6	8
Fan speed	RPM	1400	900	1400	900	1400	900	900	700
Installation height	m	5 - 7	3 - 6	7 - 10	6 - 8	7 - 12	6 - 10	8 - 12	6 - 10
Sound pressure level at 5 m	dB(A)	59	51	64	54	69	60	68	62

Dimensions and weights

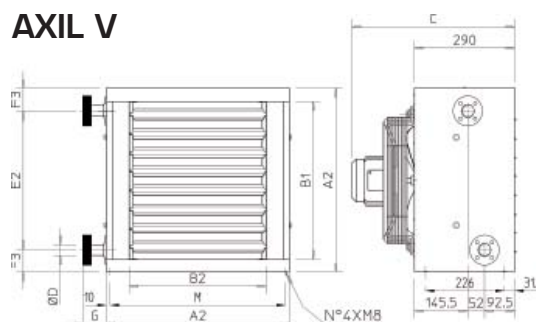
AXIL



AXIL F



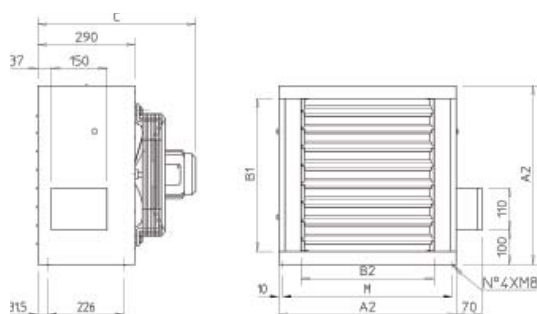
AXIL V



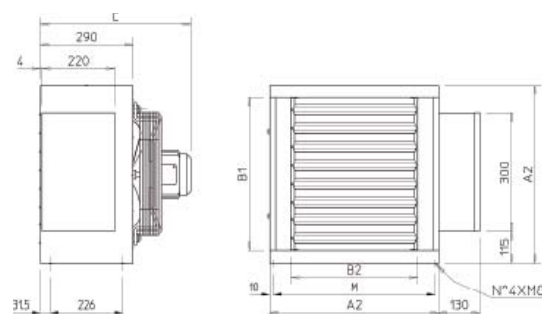
Dimension data on next page, in opposite table.

Dimensions and weights (cont'd)

AXIL Z



Without control

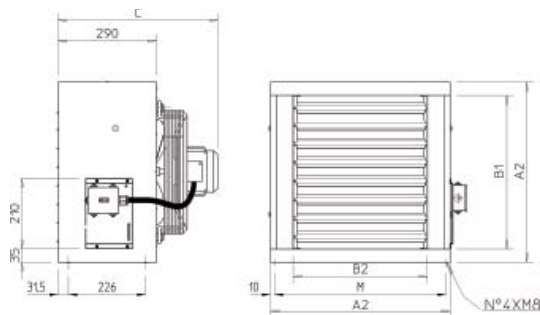


With control

AXIL Z		414	524	639
A2	mm	526	636	743
B1		450	550	641
B2		394	500	610
C		468	468	468
M		506	616	723

AXIL Z		414	524	639
Weight without control	kg	22	30	38
Weight with control		24	32	40

EQUITHERM



EQUITHERM		400	500	600	900
A2	mm	526	636	743	1011
B1		450	550	641	885
B2		394	500	610	875
C		468	468	468	576
M		506	616	723	991
Weight	kg	14	20	25	42

AXIL - AXIL F - AXIL V

AXIL / -V / -F		4...	5...	6...	9...
A1	mm	537	647	754	1022
A2		526	636	743	1011
B1		450	550	641	885
B2		394	500	640	875
C		468	468	468	576
Ø D		1"	1"	1" 1/4	1" 1/2
E1	mm	397	467	588	832
E2		330	467	588	832
F1		75,5	80,5	88,5	100,5

AXIL / -V / -F		4...	5...	6...	9...
F2	mm	64,5	69,5	77,5	89,5
F3		98	69,5	77,5	89,5
G		69	69	60	91,5
H		154	154	154	150
I		48	48	48	50
L		88	88	88	90
M		506	616	723	991
N		542	650	758	1026

AXIL / -V / -F			4...	5...	6...	9...
Water						
Content	2R	l	1,4	2,1	3,1	6,1
	3R		1,9	2,9	4,3	8,4
	4R		2,7	4	5,7	11,2
Weight	2R	kg	22	25	34	81
	3R		23	28	39	90
	4R		25	32	45	100
Steam						
Content		l	2,5	4,5	5,9	12
Weight		kg	30	38	51	92

2 → 44 kW

500 → 7400 m³/h

Compact air handling units

Main applications

- Any commercial building
- Light industrial building
- Offices
- Hotels

Why this choice?

- Easy to install and service
- Filtering, heating, cooling and humidifying treatment like an air handling unit
- Many available configurations and accessories



General description

Compact air handling units in 7 different capacity sizes, 2 and 4 pipe systems or 2 pipe with electric heater.

Main components

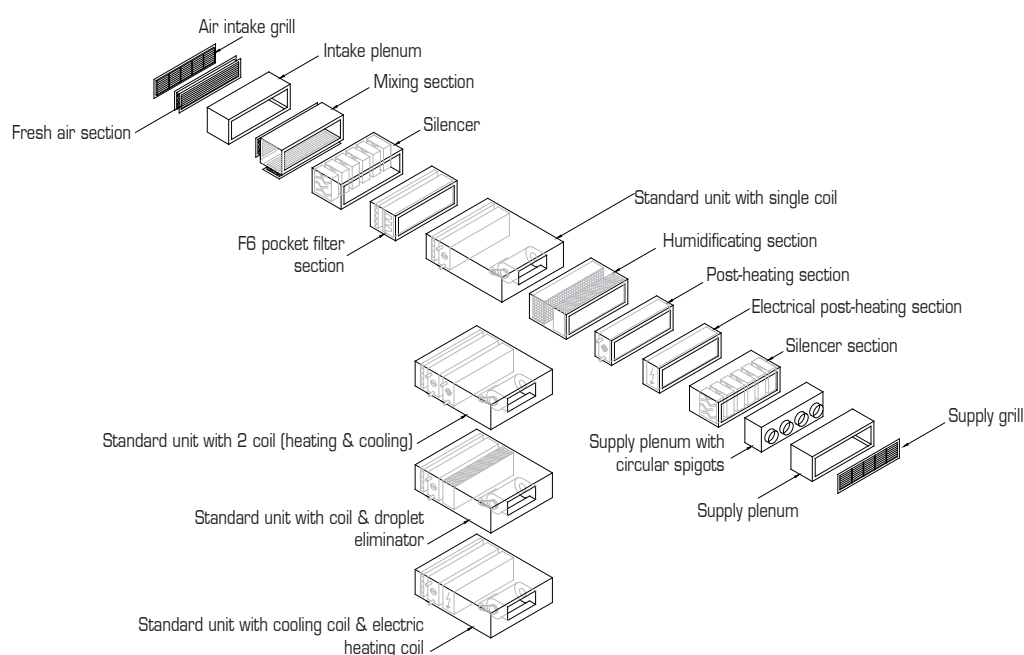
- Pre coated steel frame RAL 9002
- Sandwich panels, galvanized steel sheet metal inside and RAL 9002 pre coated steel sheet metal outside. Mineral wool thermal and sound insulation 10 mm thickness for sizes 10 to 40 and 20 mm for sizes 50 and 60
- Inspection and extraction by lower removable panels for fans, coils and filters
- Galvanized steel drain tray with a special fixing system for easy extraction; side condensate discharge
- Multi speed direct driven double inlet forward curved fans (as accessory can be supplied with built-in frequency converter motors); fan groups installed on anti-vibrators
- External terminal box with relay board
- G4 synthetic cell filter installed in air intake and fresh air damper, easily removable from bottom (or side)

Basic unit available configurations:

- 2 pipe system (2,4 or 6 row coils)
- 2 pipe system with coil (4 or 6 row) and electric heater (max 2 stages electric heater)
- 2 pipe system with coil (4 or 6 row) and droplet eliminator
- 4 pipe system (4+2 rows or 6+2 rows)

Available accessories - configurations

- F6 soft bag filter section
- Mixing box 2 dampers section
- Evaporative pack humidifier with droplet eliminator
- Heating coil section 2 rows
- 1, 2, 3 or 4 stages electric heater section
- Return and supply grills
- Adjusting dampers
- Return and supply plenums
- Supply plenums with spigots
- Return or supply sound attenuator
- Fan speed control
- Control panel
- Filter pressostat
- Anti freeze thermostat
- Damper motor 230V
- Complete modulating electronic control devices
- 3-way valves



Acoustic data

MINIAIR			10	20	30	40	50	60	
Sound power level	Octave band [Hz]	63	dB	78,6	85,1	90,8	93,1	93,9	103,4
		125		79,4	82	84,8	85,9	86,6	83,2
		250		77,6	82,9	85,6	87,2	88,3	88,7
		500		69	72,3	75,4	77,4	78,8	78,6
		1000		70,4	73,2	75,3	76,5	77,3	80
		2000		71,4	73,8	75,4	76,6	77,3	79,9
		4000		66,9	70	72,1	73,8	75	77,6
		8000		62,2	65,2	67,4	69,1	70,1	72,6
Global sound power level		dB	84	89	93	95	96	104	
		dB(A)	77	80	83	84	85	87	
Discharge sound pressure level	1 m. ⁽¹⁾	dB(A)	63	66	69	69	70	72	
	5 m. ⁽¹⁾		52	54	57	58	59	61	
	10 m. ⁽¹⁾		46	49	52	53	54	56	
Outside sound pressure level	1 m. ⁽¹⁾		51	55	57	58	57	59	
	5 m. ⁽¹⁾		40	43	45	47	46	48	
	10 m. ⁽¹⁾		34	38	40	42	41	43	
Return sound pressure level	1 m. ⁽¹⁾		60	63	66	66	67	69	
	5 m. ⁽¹⁾		49	51	54	55	56	58	
	10 m. ⁽¹⁾		43	46	49	50	51	53	

[1] 1 m./5 m./10 m. = 1/5/10 meter(s) from the unit

General data

MINIAIR			10	20	30	40	50	60	
Airflow rate	MAX	m³/h	1000	2000	3600	4200	5100	6500	
	MED		890	1660	3150	3400	3100	4100	
	MIN		750	1020	2200	2060	1800	2700	
External static pressure	MAX	Pa	187	160	135	111	160	189	
	MED		148	110	105	72	110	145	
	MIN		105	40	50	30	125	120	
Sound pressure level at 1 m ⁽¹⁾	MAX	dB(A)	51	55	57	58	57	59	
	MED		49	52	54	55	50	52	
	MIN		47	49	47	51	42	47	
Maximum current		A	1,54 x 1	2,90 x 1	2,80 x 2	2,90 x 2	3,80 x 2	3,80 x 3	
Maximum power input		kW	0,36 x 1	tbd	tbd	tbd	0,96 x 2	0,96 x 3	
Specific fan power		W/[m³/s]	1105	tbd	tbd	tbd	1 026	1011	
Efficiency grade N			49	tbd	tbd	tbd	43,3	43,3	
2009/125/EC ErP compliant for year			2 015	2013	2013	2013	2013	2013	
Number of fan speed			3	3	3	3	3	3	
Number of poles			4	4	4	4	4	4	
Minimum protection degree			IP44	IP55	IP55	IP55	IP20	IP10	
Minimum temperature class			F	F	F	F	F	F	
Electrical power supply			230V/1Ph/50Hz						
2-row coil									
Heating capacity ⁽¹⁾		MAX	kW	8,77	16,30	27,00	31,80	33,30	43,20
Water flow rate ⁽¹⁾			m³/h	0,75	1,40	2,32	2,73	2,86	3,72
Water pressure drop ⁽¹⁾			kPa	30	10	36	11	70	4
4-row coil									
Heating capacity ⁽¹⁾		MAX	kW	13,0	25,4	42,5	50,4	59,4	73,5
Water flow rate - Heating mode ⁽¹⁾			m³/h	1,12	2,18	3,66	4,33	5,11	6,32
Water pressure drop - Heating mode ⁽¹⁾			kPa	17	30	39	34	35	17
Total cooling capacity ⁽²⁾			kW	5,72	11,30	18,50	21,90	27,10	30,70
Sensible cooling capacity ⁽²⁾			kW	4,45	8,80	14,80	17,40	20,90	24,90
Water flow rate - Cooling mode ⁽¹⁾			m³/h	0,98	1,94	3,18	3,77	4,66	5,28
Water pressure drop - Cooling mode ⁽¹⁾			kPa	14	24	30	26	30	12
6-row coil									
Total cooling capacity ⁽²⁾		MAX	kW	7,19	13,50	23,70	26,00	31,10	40,20
Sensible cooling capacity ⁽²⁾			kW	5,25	10,10	17,70	20,00	24,30	31,00
Water flow rate ⁽¹⁾			m³/h	1,24	2,32	4,08	4,47	5,35	6,91
Water pressure drop ⁽¹⁾			kPa	13	9	36	7	4	7

MIN Minimum speed

MED Average speed

MAX Maximum speed

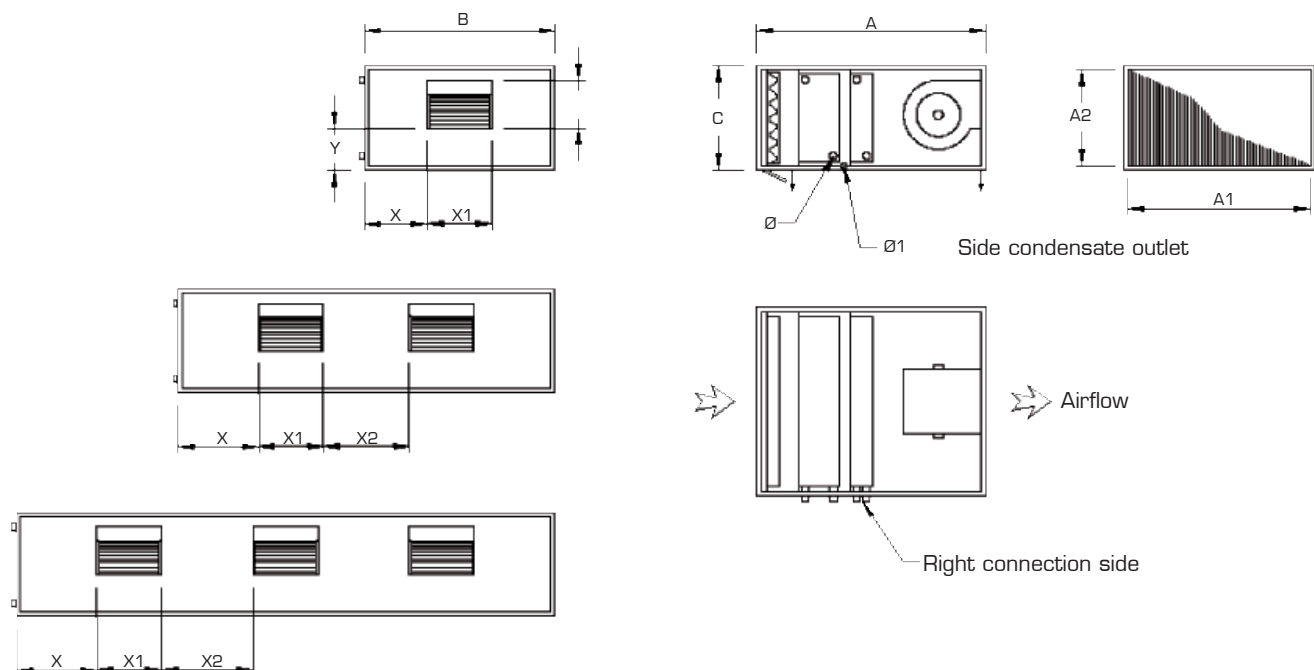
(1) Air inlet temperature = 20 °C/50% RH
Water inlet temperature = 70°C
Water outlet temperature = 60°C

(2) Air inlet temperature = 27 °C/47% RH
Water inlet temperature = 7°C
Water outlet temperature = 12°C.

(3) With 4-row coil and G4 filter

TBD = To be decided

Dimensions and weights



MINIAIR		10	20	30	40	50	60
A	mm	850	850	850	850	960	960
B		710	1070	1400	1680	1780	2000
C		390	390	390	390	480	480
Ø 2-row coil		3/4"	3/4"	3/4"	1"	1"	1"
Ø 4-row coil		3/4"	3/4"	1"	1"	1"	1" 1/4
Ø 6-row coil		3/4"	1"	1"	1" 1/4	1" 1/4	1" 1/4
Ø 1	mm	20	20	20	20	20	20
X1		240	300	240	300	300	300
Y1		215	270	270	270	270	270
X2		-	-	335	535	580	-
X3		-	-	-	-	-	360
A1		675	1035	1365	1645	1720	1940
A2		355	355	355	355	420	420
X		235	385	295	270	300	185
Y	140	80	80	80	160	160	
Weight	kg	52/60	60/70	78/90	96/110	101/120	120/140

Main applications

- Any commercial or residential building

Why this choice?

- Energy saving and air renewal
- Easy to install and service



General description

Compact air to air heat recovery units, vertical or horizontal, in 10 different capacity sizes.

Main components

- Pre coated metal steel frame
- Fully removable sandwich panels
- 10 mm thickness (up to 10 size) or 20 mm thickness (for upper sizes) with mineral wool thermal and acoustic insulation
- Galvanised steel drain tray extended to all cooling components
- Multi speed direct driven double inlet forward curved fans, supplied with built-in frequency inverter motors in option; fan groups installed on anti-vibrations system
- G4 synthetic cell filter (F6, F7 or F8 soft bag as option)
- High efficiency crossflow heat recovery (Eurovent certified), aluminium heat exchanger plates with additional sealing

Available accessories - configurations

- Internal water heating coil
- 1 stage electric heater
- Water cooling section, external
- Inlet/exhaust dampers
- Mixing box 3 dampers section
- Adiabatic cooling/humidifier section
- Circular duct connection and flexible duct joint
- Roof cover for outdoor installation
- F6 compact filter
- F6 soft bag filter
- F7 soft bag filter
- F8 soft bag filter
- Air filter pressure switch
- Antifreeze thermostat
- 230V damper motor
- 3-way valves
- Frequency converter fan motors

General data

MINIAIR +			Speed		03	06	10	14	19	25	30	40	50	60
Airflow rate	MAX	m³/h	300	500	930	1300	1900	2500	3200	4000	5000	6000		
	MED		200	300	800	1200	1400	1700	2600	-				
	MIN		100	150	710	1000	1000	1150	2100	3000	4000	5000		
External static pressure	MAX	Pa	163	121	121	118	125	120	114	114	99	188		
	MED		184	136	136	112	97	56	164	-				
	MIN		167	144	144	72	82	46	142	61	139	208		
Sound pressure level ⁽¹⁾	MAX	dB(A)	51	51	52	62	58	56	59	62	64	64		
	MED		50	47	49	57	54	51	53	-				
	MIN		44	41	45	46	42	45	51	55	59	62		
Maximum current		A	1,4	1,4	3,0	5,6	7,8	7,6	12,6	6,6	11,2	10,8		
Maximum power input		kW	0,34	0,34	0,72	tbd	1,8	1,92	3	6,6	7,23	7,73		
Specific fan power	W / (m³/s)		1376	1019	tbd	tbd	1172	1019	1301	tbd	1428	1594		
Efficiency grade N			37,9	37,9	49,0	tbd	44,8	43,3	42,4	59,8	51,0	48,5		
2009/125/EC ErP compliant for year			2013	2013	2015	2013	2013	2013	2013	2015	2015	2013		
Number of fan speeds			3	3	3	3	3	3	3	2	2	2		
Number of poles			2	2	4	4	4	4	4	4	4	4		
Minimum protection degree			IP 32	IP 32	IP 44	IP 55	IP 20	IP 20	IP 20	IP 55	IP 55	IP 20		
Minimum temperature class			B	B	F	B	B	B	F	B	F	F		
Electrical power supply			230 V/1 Ph/50 Hz							430 V/3 Ph/50 Hz				
Winter operation														
Recovery efficiency ⁽²⁾	MAX	%	53,3	58,7	57	51,6	50,3	55,5	53,9	54,9	53,8	53,1		
	MED		55,7	62,2	58	52,1	52,1	57,9	55,2	-				
	MIN		59,6	66,8	58,8	53,1	54	60,3	56,6	56,7	55,3	54,3		
Recovery heating capacity ⁽²⁾	MAX	kW	1,3	2,4	4,4	5,6	7,9	11,5	14,3	18,2	22,4	26,5		
	MED		0,9	1,6	3,9	5,2	6,1	8,2	11,9	-				
	MIN		0,5	0,8	3,5	4,4	4,5	5,8	9,9	14,1	18,4	22,6		
Supply temperature ⁽²⁾	MAX	°C	7,1	8,3	7,9	6,7	6,4	7,6	7,2	7,4	7,2	7,1		
	MED		7,6	9,1	8,2	6,8	6,8	8,1	7,5	-				
	MIN		8,5	10,1	8,3	7	7,3	8,7	7,8	7,9	7,5	7,3		
Summer operation														
Recovery efficiency ⁽²⁾	MAX	%	46,2	50,8	49,3	44,8	43,7	48,0	46,7	47,5	46,7	46,1		
	MED		48,2	53,7	50,2	45,2	45,2	50,1	47,8	-				
	MIN		51,4	57,5	50,9	45,6	46,8	52,1	49,0	49,1	47,9	47,1		
Recovery heating capacity ⁽²⁾	MAX	kW	0,30	0,50	0,90	1,10	1,60	2,30	2,80	3,60	4,40	5,20		
	MED		0,20	0,30	0,80	1,00	1,20	1,60	2,40	-				
	MIN		0,10	0,20	0,70	0,90	0,90	1,10	1,90	2,80	3,60	4,50		
Supply temperature ⁽²⁾	MAX	°C	29,2	29,0	29,0	29,3	29,4	29,1	29,2	29,1	29,2	29,2		
	MED		29,1	28,8	29,0	29,3	29,3	29,0	29,1	-				
	MIN		28,9	28,5	28,9	29,3	29,2	28,9	29,1	29,1	29,1	29,2		

(1) Fresh air -5°C 80% RH, ambient air 20°C 50% RH

(2) Fresh air 32°C 50% RH, ambient air 26°C 50% RH

Acoustic : At high fan speed, nominal airflow, supply ducted, return free inlet

Standard connected speeds

MIN Minimum speed

MED Average speed

MAX Maximum speed

General data - Accessories

MINIAIR +			03	06	10	14	19	25	30	40	50	60
Electrical coil (LXMAPSKE)	Heating capacity	kW	2	4	4,5	6	9	12	12	12	18	24
	Air side ΔT ⁽¹⁾	°C	20	24	13	13	14	14	11	9	11	12
	Electrical power supply	V/Ph/Hz	230 V/ 1 Ph/ 50 Hz		400 V/3 Ph/50 Hz							
	Air side pressure drop	kPa	5	5	6	6	8	6	9	13	11	13
Heating coil 3R ⁽²⁾ (LXMAPSKW)	Heating capacity ⁽¹⁾	kW	-		11,3	16,3	20,4	29,7	35,1	44,3	46,6	53,8
	Supply air temperature	°C	-		40,5	41,5	39	42,2	39,6	39,9	34,9	33,8
	Air side pressure drop	Pa	-		66	63	85	61	85	90	95	115
	Water side pressure drop	kPa	-		13	31	18	20	27	49	22	24
Cooling coil 3R ⁽³⁾ (LXMAPSAF)	Total cooling capacity ⁽¹⁾	kW	2,6	3,8	7,4	9,6	13,1	20,3	24,2	30,7	31,6	37,9
	Supply air temperature	°C	15	17	17	18	18	17	17	17	18	18
	Air side pressure drop	Pa	23	67	74	82	90	66	100	98	66	69
	Water side pressure drop	kPa	8	15	18	13	14	27	38	51	33	43
High efficiency filter ⁽¹⁾	F6 compact filter - FC6 pressure drop	Pa	-			40	40	40	40	40	40	40
	F6 bag filter - FT6 pressure drop		-			140	160	160	160	180	175	160
	F7 bag filter - FT7 pressure drop		-			165	185	185	185	215	205	185
	F8 bag filter - FT8 pressure drop		-			207	225	225	225	260	248	225

(1) Maximum fan speed

(2) Air inlet temperature 8°C, water temperature 70/60°C.

(3) Air inlet temperature 29 °C, RH 60 %, inlet/outlet water temperature 7/12°C.

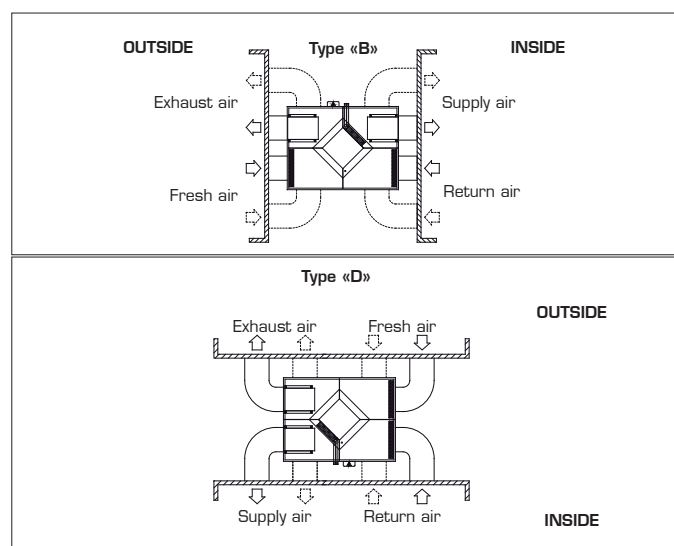
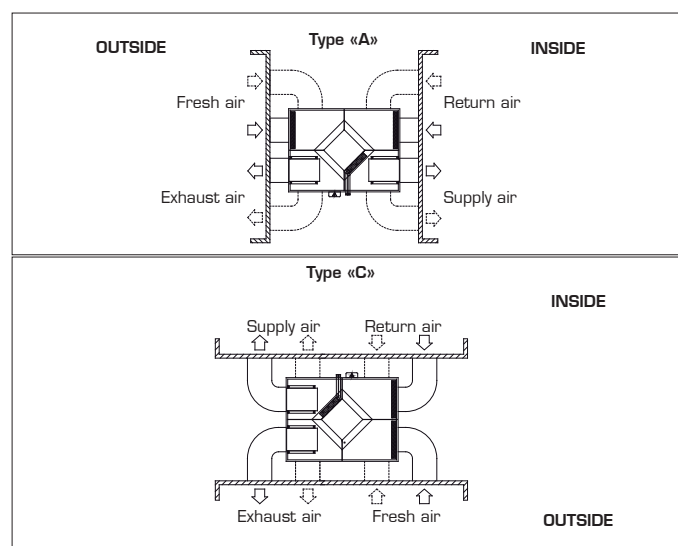
Acoustic data

MINIAIR			03	06	10	14	19	25	30	40	50	60	
Sound power level	Octave band [Hz]	dB	63	78,6	78,6	72,4	94,1	90,7	93,1	103,4	95,4	110,0	111,0
			125	79,4	79,4	78,9	86,9	82,9	85,9	83,2	89,0	89,9	90,9
			250	77,6	77,6	75,9	92,4	90,1	87,2	88,7	92,5	93,6	94,6
			500	69,0	69,0	71,1	85,6	79,4	77,4	78,6	87,7	84,2	85,2
			1000	70,4	70,4	72,8	80,9	78,6	76,5	80,0	81,5	84,1	85,1
			2000	71,4	71,4	73,7	81,8	79,5	76,6	79,9	82,6	84,5	85,5
			4000	66,9	66,9	71,7	82,7	79,3	73,8	77,6	83,5	82,8	83,8
			8000	62,2	62,2	69,0	78,2	75,5	69,1	72,6	79,0	78,5	79,5
Global sound power level		dB	84,0	84,0	83,0	98,0	94,0	95,0	104,0	99,0	110,0	111,0	
		dB(A)	77,0	77,0	79,0	90,0	87,0	84,0	87,0	91,0	92,0	93,0	
Discharge sound pressure level	1 m. ⁽¹⁾	dB(A)	63,0	63,0	65,0	76,0	72,0	69,0	72,0	76,0	76,0	77,0	
	5 m. ⁽¹⁾		52,0	52,0	53,0	64,0	61,0	58,0	61,0	65,0	66,0	67,0	
	10 m. ⁽¹⁾		46,0	46,0	48,0	59,0	56,0	53,0	56,0	60,0	61,0	62,0	
Outside sound pressure level	1 m. ⁽¹⁾	dB(A)	60,0	60,0	62,0	73,0	69,0	66,0	69,0	72,0	73,0	74,0	
	5 m. ⁽¹⁾		49,0	49,0	50,0	61,0	58,0	55,0	58,0	61,0	63,0	64,0	
	10 m. ⁽¹⁾		43,0	43,0	45,0	56,0	53,0	50,0	53,0	56,0	58,0	59,0	
Return sound pressure level	1 m. ⁽¹⁾	dB(A)	51,0	51,0	52,0	62,0	58,0	56,0	59,0	62,0	64,0	65,0	
	5 m. ⁽¹⁾		40,0	40,0	40,0	50,0	47,0	45,0	48,0	51,0	54,0	55,0	
	10 m. ⁽¹⁾		34,0	34,0	35,0	45,0	42,0	40,0	43,0	46,0	49,0	50,0	

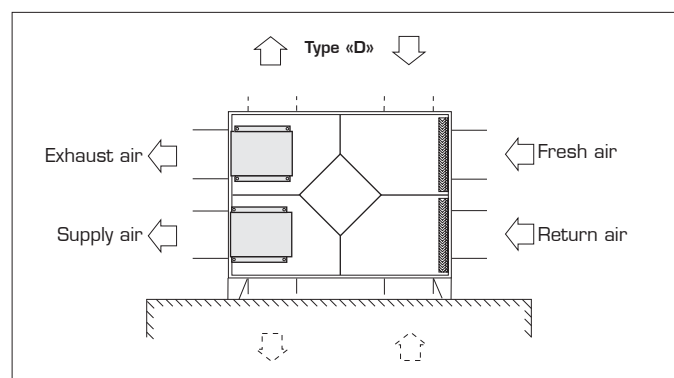
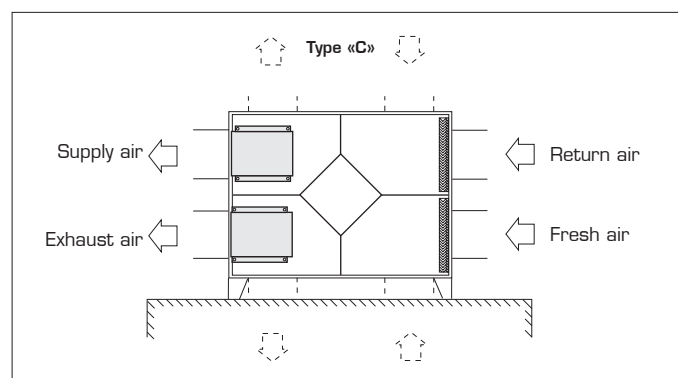
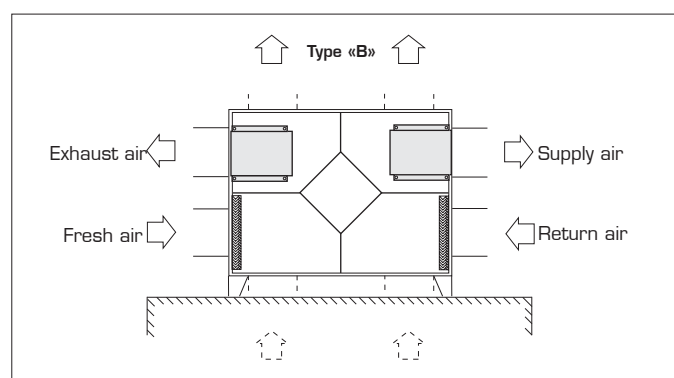
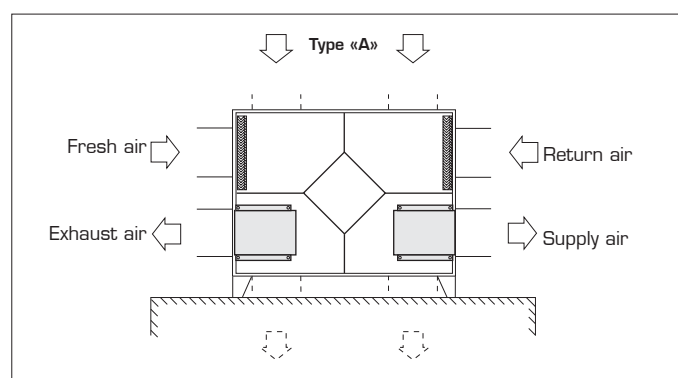
(1) 1 m./5 m./10 m. = 1/5/10 meter(s) from the unit

Possible installations

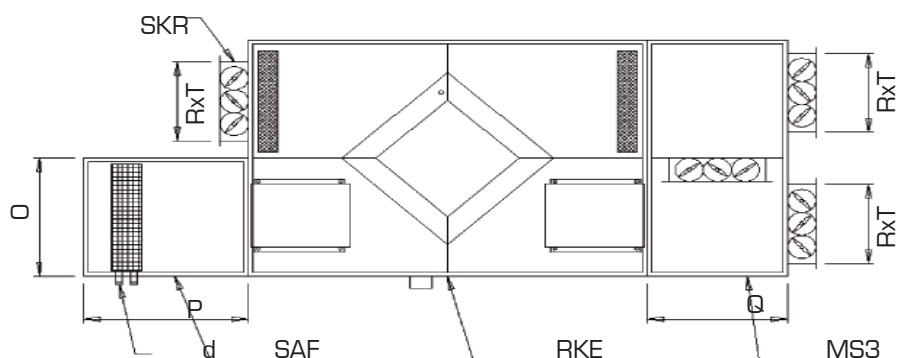
Horizontal configuration



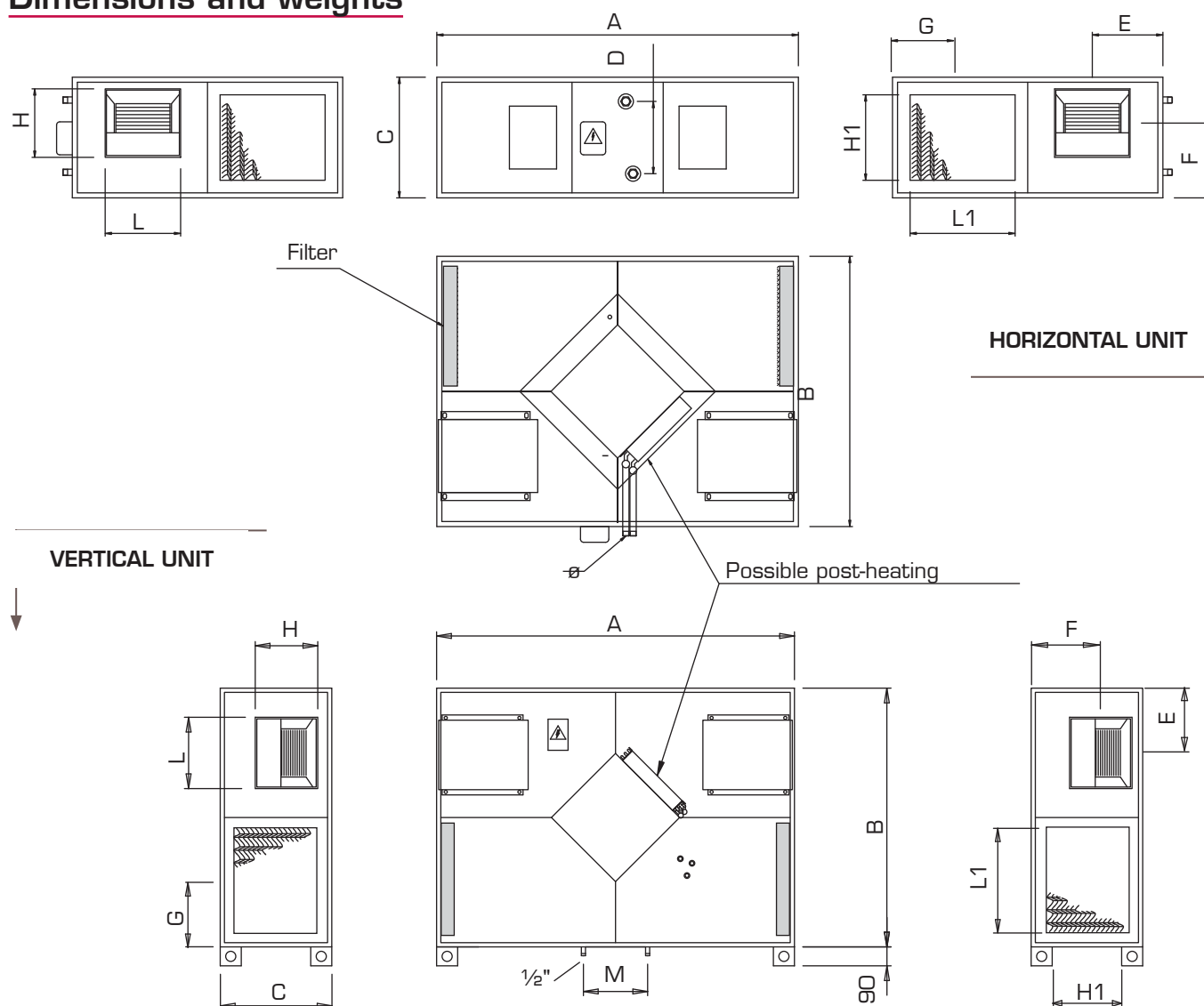
Vertical configuration (with re-heating system - only type B or C)



Dimensions and weights



Dimensions and weights



MINIAIR +		03	06	10	14	19	25	30	40	50	60
A	mm	990	990	1150	1350	1450	1700	1700	1700	1700	1900
B		750	750	860	900	900	1230	1230	1230	1350	1450
C		270	270	385	410	470	490	530	630	705	755
D		-	-	230	230	280	305	305	405	480	530
Ø		-	-	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	1"	1"
E	mm	195	195	245	241	241	323	308	308	353 (278)	379 (334)
F		170	170	238	224	284	290	331	377	427 (353)	419 (379)
G		197	197	225	241	241	323	323	323	353	379
H		100	100	218	270	270	270	297	297	297 (339)	350 (403)
H1		153	153	267	267	327	347	387	487	555	615
L		162	162	240	240	240	306	339	339	339 (297)	403 (350)
L1		275	275	330	337	337	502	502	502	555	615
M		119	119	81	81	81	131	101	101	101	101
Weight	kg	39	41	68	91	99	140	155	179	235	273
O	mm	375	375	430	450	450	615	615	615	675	725
P		400	400	400	700	700	700	700	800	850	900
Q		-	-	450	480	480	650	650	650	707	757
R		210	210	310	310	410	410	410	510	610	610
T		280	280	330	330	330	500	500	500	600	600
D		3/4"	3/4"	3/4"	3/4"	3/4"	1"	1"	1"	1" 1/2	1" 1/2

Within brackets data = dimensions of vertical version.

MINIAIR + FO

1400 → 6000 m³/h

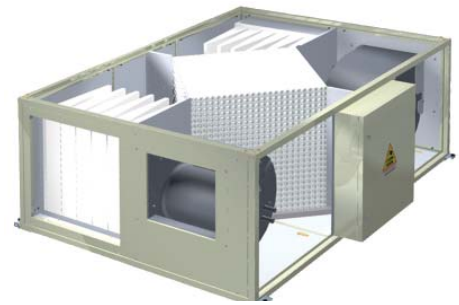
Heat recovery unit with high efficiency filters and built-in control (LXMAPRQU)

Main applications

- Any commercial or residential building

Why this choice?

- Integrated high efficiency filters and control
- Optimised control and energy efficiency



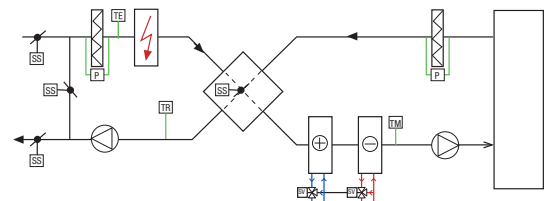
General description

MINIAIR + FO versions includes motor with frequency converter, high efficiency filters (class F6, F7 or F8), air filter pressure switches and electronic built-in control LXMAPRQU for:

- Heating/cooling/free-cooling automatic mode (2/4 pipe plant)
- Antifreeze
- Electric heater on/off mode
- Winter heating speed-up
- Heat recovery defrost
- Manual or automatic fan speed selection
- Dirty filter alarm
- Timer

Available versions

- LXMAPFO1 : with G4 filter on return and F6 on supply side
- LXMAPFO2 : with G4 filter on return and G4+F6 on supply side
- LXMAPFO3 : with G4 filter on return and G4+F7 on supply side
- LXMAPFO4 : with G4 filter on return and G4+F8 on supply side
- LXMAPFO5 : with F6 filter on return and F6 on supply side
- LXMAPFO6 : with F6 filter on return and F6+F7 on supply side
- LXMAPFO7 : with F6 filter on return and F6+F8 on supply side



Available accessories

- Adiabatic cooling section
- Electric heater
- Water heating coil
- Water cooling coil (external section)
- 3 way modulating valve
- Damper
- 3-damper mixing box
- On/Off damper servocontrol
- Round adapter for circular duct
- Ductable CO₂ sensor
- Pressure sensor

General data

MINIAIR + FO		14	19	25	30	40	50	60
Airflow rate	m³/h	1400	1900	2500	3000	4000	5000	6000
Shaft power	W	2x450	2x650	2x650	2x650	2x1050	2x1500	2x1500
Maximum current	A	12,6	15,6	15,6	16,0	16,4	11,2	11,2
Number of poles		4	4	4	4	4	4	4
Protection class		IP 44					IP 20	
Temperature class		F						
Power supply	V/Ph/Hz	230/1/50					400/3/50	
Recovery efficiency ⁽¹⁾	%	52,1	51,8	57,6	56,8	55,7	54,6	54,5
Recovery ⁽¹⁾	kW	6,7	9,0	13,2	15,6	20,3	24,9	29,9

(1) Room air temperature 20°C D.B., 50% R.H.; fresh air temperature : -5°C.

650 → 5500 m³/h

Heat recovery unit with integrated by-pass for free-cooling

Main applications

- Any commercial or residential building

Why this choice?

- Integrated by-pass for free-cooling
- Energy saving and air renewal



General description

MINIAIR + BP is the configuration of MINIAIR + with integrated by-pass for free-cooling.

Available accessories

- Electric heater
- Water cooling coil external section
- Adiabatic cooling/humidify section
- Round adapter for circular duct
- 3-damper mixing box
- Damper connection lever
- F6 compact filter
- F6 soft bag filter
- F7 soft bag filter
- F8 soft bag filter
- Frequency converter fan-motors
- Roof cover
- Adjusting damper
- Antivibrating flexible joint
- Casing with bird net
- Supports legs H 90 (kit 4 p)
- Supports legs H 200 (kit 4 p)
- Control

General data

MINIAIR + BP			Speed	10	14	19	30	40	60
Airflow rate	MAX	m³/h	700	1000	1600	2 600	3400	5500	
	MED		650	960	1400	2250	-		
	MIN		590	840	1100	1 920	2670	4000	
External static pressure	MAX	Pa	88	110	145	134	140	160	
	MED		80	100	38	100	-		
	MIN		60	78	48	73	86	269	
Sound pressure level ⁽¹⁾	MAX	dB(A)	52,0	60,0	58,0	59,0	61,0	64,0	
	MED		49,0	58,0	54,5	55,0	-		
	MIN		45,0	54,0	45,5	55,0	55,0	62,0	
Maximum current			A	3,0	5,6	7,8	11,4	6,6	10,8
Number of fan speeds				3	3	3	3	2	2
Number of poles				4	4	4	4	4	4
Minimum protection degree				IP44	IP55	IP20	IP10	IP55	IP20
Minimum temperature class				F					
Electrical power supply				230 V/1 Ph/50 Hz				430 V/1 Ph/50 Hz	
Winter operation									
Recovery efficiency ⁽²⁾	MAX	%	56,3	51,2	50,1	53,5	53,5	52,8	
	MED		56,9	51,4	50,8	54,4	-		
	MIN		57,5	52,2	52,8	55,4	55	54,9	
Recovery heating capacity ⁽²⁾	MAX	kW	3,3	4,3	6,7	11,6	15,1	24,1	
	MED		3,1	4,1	5,9	10,2	-		
	MIN		2,8	3,6	4,4	8,8	12,2	18,2	
Supply temperature ⁽²⁾	MAX	°C	7,8	6,6	6,4	7,1	7,1	7,0	
	MED		7,9	6,7	6,5	7,3	-		
	MIN		8	6,8	7	7,6	7,5	7,4	
Summer operation									
Recovery efficiency ⁽²⁾	MAX	%	48,8	44,4	43,5	46,4	46,4	45,8	
	MED		49,3	44,6	44,1	47,2	-		
	MIN		49,8	45,3	45,8	48,0	47,7	47,5	
Recovery heating capacity ⁽²⁾	MAX	kW	0,6	0,8	1,3	2,3	3,0	4,8	
	MED		0,6	0,8	1,2	2,0	-		
	MIN		0,6	0,7	0,9	1,7	2,4	3,6	
Supply temperature ⁽²⁾	MAX	°C	29,1	29,3	29,4	29,2	29,2	29,2	
	MED		29,0	29,3	29,4	29,2	-		
	MIN		29,0	29,3	29,3	29,1	29,1	29,1	
Acoustic data									
Global sound power level		dB	85,7	97,9	104,3	100,0	101,9	100,4	
		dB(A)	80,0	87,0	85,0	87,0	89,0	94,0	
Discharge sound pressure level	1 m. ⁽³⁾	dB(A)	66,0	73,0	70,0	72,0	74,0	78,0	
	5 m. ⁽³⁾		54,0	61,0	59,0	61,0	63,0	68,0	
	10 m. ⁽³⁾		49,0	56,0	54,0	56,0	58,0	63,0	
Outside sound pressure level	1 m. ⁽³⁾		61,0	68,0	65,0	67,0	69,0	72,0	
	5 m. ⁽³⁾		51,0	58,0	56,0	58,0	59,0	63,0	
	10 m. ⁽³⁾		45,0	52,0	50,0	52,0	54,0	58,0	
Return sound pressure level	1 m. ⁽³⁾		52,0	60,0	58,0	59,0	61,0	64,0	
	5 m. ⁽³⁾		40,0	48,0	47,0	48,0	50,0	54,0	
	10 m. ⁽³⁾		35,0	43,0	42,0	43,0	45,0	49,0	

(1) Fresh air -5°C 80% RH, ambient air 20°C 50% RH

(2) Fresh air 32°C 50% RH, ambient air 26°C 50% RH

(3) 1 m./5 m./10 m. = 1/5/10 meter(s) from the unit

Acoustic : At high fan speed, nominal airflow, supply ducted, return free inlet

Standard connected speeds

MIN Minimum speed

MED Average speed

MAX Maximum speed

1100 → 5500 m³/h

Heat recovery unit with integrated by-pass for free-cooling, high efficiency filters and built-in control (LXMAPRQU)

Main applications

- Any commercial or residential building

Why this choice?

- Integrated by-pass for free-cooling
- Integrated high efficiency filters and control
- Energy saving and air renewal
- Optimised control and energy efficiency



General description

MINIAIR + BF includes motorized integrated by-pass motor with frequency converter; high efficiency filters (class F6, F7 or F8), air filter pressure switches and electronic built-in control. Electronic built-in control LXMAPRQU allows:

- Heating/cooling/free-cooling automatic mode (2/4 pipe plant)
- Antifreeze
- Electric heater on/off mode
- Winter heating speed-up
- Heat recovery defrost
- Manual or automatic fan speed selection
- Dirty filter alarm
- Timer

Available versions

- LXMAPBF1 : with G4 filter on return and F6 on supply side
- LXMAPBF2 : with G4 filter on return and G4+F6 on supply side
- LXMAPBF3 : with G4 filter on return and G4+F7 on supply side
- LXMAPBF4 : with G4 filter on return and G4+F8 on supply side
- LXMAPBF5 : with F6 filter on return and F6 on supply side
- LXMAPBF6 : with F6 filter on return and F6+F7 on supply side
- LXMAPBF7 : with F6 filter on return and F6+F8 on supply side

Available accessories

- Adiabatic cooling section
- Electric heater
- Water heating coil
- Water cooling coil (external section)
- 3 way modulating valve
- Damper
- 3-damper mixing box
- On/Off damper servocontrol
- Round adapter for circular duct
- Ductable CO₂ sensor
- Pressure sensor

General data

MINIAIR + BF		14	19	30	40	60
Airflow rate	m³/h	1100	1600	2500	3300	5500
Shaft power	W	2x450	2x650	2x650	2x1050	2x1500
Maximum current	A	12,6	15,6	16,0	16,4	11,2
Number of poles		4	4	4	4	4
Protection class		IP 44				
Temperature class		F				
Power supply	V/Ph/Hz	230/1/50				400/3/50
Recovery efficiency ⁽¹⁾	%	50,6	50,8	55,5	55,6	52,6
Recovery ⁽¹⁾	kW	5,1	7,4	12,7	16,7	26,4

(1) Room air temperature 20°C D.B., 50% R.H.; fresh air temperature : -5°C.

MINIAIR +/ MINIAIR + BP/FO/BF

Controls

Remote 3 point control (LXMAMAPPCR)

Manual or automatic regulation of the fan speeds by 3 steps, manual or automatic mode summer/winter, room thermostat (remotable by NTC 4,7 sensor, optional), handling of two water coils for heating/cooling or coil (cold or promiscuous) and electric heater.

Accessories controlled by LXMAMAPPCR :

- 3 way valve with electric actuator, power supply 230V
- Remotable temperature sensor (NTC4, 7)

Accessories not controlled are LXMAMAPTEG (antifreeze thermostat), LXMAMAPSSE (ON/OFF damper servocontrol power supply 230V) and LXMAMAPPSTD (air filter pressure switch).



Modulating control (LXMAPRQU)

The modulating control LXMAPRQU is composed by an electronic kit, an hydronic kit and a range of accessories used for the control. Fonctioning is optimized thanks to the precise control of air flow and water flow rate. It is standard in MINIAIR + FO and MINIAIR + BF

Electronic kit (LXMAPRQU) : temperature analogical regulator with nr 3 NTC sensors and electronic board.

Control allows :

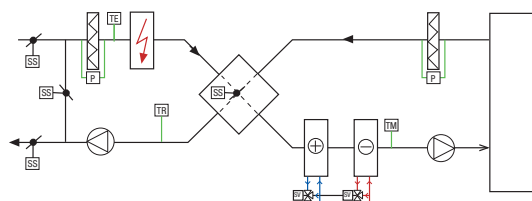
- Heating/cooling/free-cooling automatic mode (2/4 pipe plant)
- Antifreeze
- Electric heater on/off mode
- Winter heating speed-up
- Heat recovery defrost
- Manual or automatic fan speed selection (by CO₂ or pressure sensor)
- Dirty filter alarm (by air filter pressure switch)
- Missing ventilation alarm (by pressure switch)
- Timer
- Prearrangement for BMS (via MODBUS protocol)



Hydronic kit (LXMAPV33) : 3 way valve with electric actuator, power supply 230V.

Accessories :

- LXMAPSSE : ON/OFF damper servocontrol supply 230V
- LXMAPSTD : air filter pressure switch



Airflow control

LXMAPAQ, ductable CO₂ sensor, must be connected to the LXMAPRQU control.

LXMAPKAQ, air quality control system includes:

- Ductable CO₂ sensor
- Modulating control
- 24V transformer

LXMAPDPS is a sensor for constant pressure working mode.



Stand alone and communicating controls

Main applications

- Commercial buildings
- Residential buildings
- Light industrial buildings

General description

Lennox mechanical and electronic remote controls have been especially designed to satisfy any request of control and to be most efficient solutions in terms of comfort and energy saving for heating and cooling systems.

LXRAB31 - Mechanical room thermostat

2-pipe units/2-pipe + electrical heater units/4-pipe + 3-speed fan units



- Room thermostat with manual switch for heating or cooling
- Two-position control
- Manual three-speed fan switch
- Switching voltage AC 250 V
- Control output ON/OFF

LXRCC20 - Electronic room thermostat

2-pipe units/2-pipe + electrical heater units/4-pipe + 3-speed fan units



- Room thermostat with automatic switch for heating or cooling
- Control depending on the room or return air temperature
- Automatic heating/cooling changeover
- Operating modes: normal, energy saving and frost protection mode or OFF
- Operating mode changeover input for remote control
- Selectable control parameters
- Economical mode through external contact
- LEDs indicating control mode and fan
- Operating voltage AC 230 V
- Control output ON/OFF

RDF 600T - Electronic room thermostat

2-pipe units/2-pipe + electrical heater units/4-pipe + 3-speed fan units



- Operating voltage AC 230 V, ON/OFF or 3-position control outputs
- 2 multifunctional inputs for keycard contact, external sensor, etc.
- Operating modes: comfort, economical and protection
- Automatic or manual fan speed control
- Automatic or manual heating/cooling changeover
- Adjustable commissioning and control parameters
- Minimum and maximum setpoint limitation
- Backlit LCD
- Infrared remote control receiver
- Auto timer mode with 8 programmable timers
- Type of mounting/suitable conduit boxes, with min 60 mm diameter, min 40 mm depth

Accessories

- QAH11.1 remote sensor : suitable as return sensor or change-over sensor
- LXARG86.3 Clip for change over sensor
- C/O-38505 Change-over thermostat

COMMUNICATING CONTROLLER

LONWORKS protocol : CTRL2302D2A-L-DC
BACNET protocol : CTRL2302D2A-B-DC

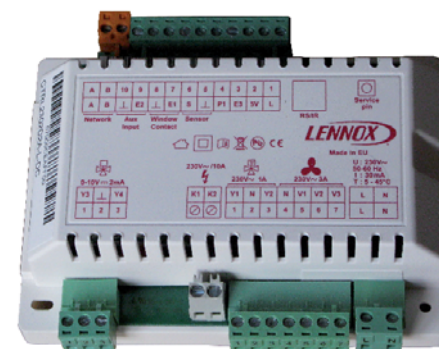
Main applications

- Commercial buildings
- Residential buildings
- Light industrial buildings

General description

The LENNOX controllers communicating on the LONWORKS® network (LONWORKS 2.0, latest Neuron microprocessor) or BACNET.

Terminal controllers allow room parameters management to optimize occupants comfort for our fan coils and ceiling cassettes ranges.



Features and benefits

- Configurable controller, 230 VAC power supply, electric heater 2 kW, 230 VAC valves.
- 5 x configurable inputs (window contact/presence contact/auxiliary contact for dew point detector or change-over/room, air return or blow temperature sensor/flow controller/impulse counter/air quality sensor)
- 1 x 0-10V input air quality sensor
- 1 x RJ9 digital input
- 8 x configurable outputs (electric battery relay 230 VAC/2 analog outputs 0-10 VDC/2 TRIAC outputs 230 VAC/3 fan speed outputs)
- Temperature control by regulating heating and cooling (using a valve and an electric heater)
- Limiting electric heater (load shedding)
- Control of ventilation : 3 speed or variable fan (EC)
- Valves management : On/off , 3 -pin , 0-10V
- Air quality management by controlling an air damper
- Pulse counting
- Presence detection management
- Limiting high and low discharge temperatures
- Latest generation processor LON FT5000 eliminating LNS costs.
- Integration into a global HVAC management solution (controllers + accessories) and energy savings enhancement
- They can be integrated into a multi-discipline solution (communication with lighting and sunblind controllers through the LONWORKS® network).
- Eu.bac certified solutions ensures users an optimal energy efficiency and quality in buildings, certifying solutions meeting the strictest guidelines of European Directives and Standards.

Accessories



RC-LCD-DC

Wall mounted LCD remote control



RC-4F-DC

Wall mounted remote control



RC-IR-DC

Infrared technology remote control

RC-RF-DC Radio technology remote control

1000 → 100 000 m³/h

Modular air handling unit

Main applications

- Commercial
- Industrial
- Healthcare

Why this choice?

- Modular unit
- Flexibility
- Certified product



General description

Lennox **CLEANAIR LX** modular air handling units satisfy all forms of air treatment such as ventilation, filtration, heating, cooling, humidity and recovery.

They are available in 44 sizes to cover an airflow range from 1 000 up to 100 000 m³/h with total pressures up to 2 500 Pa. Special units can also be supplied for airflows and pressures outside the normal range.

The wide range allows the best choice in relation to the requested face velocity.

CLEANAIR LX units have been developed and dimensioned in length, width and height, using a module of 160 mm with 28 basic sizes and 16 low profile sizes. When site conditions request it, the low profile units have a distinctly rectangular cross-section in order to reduce the height while increasing the width.

Construction

Frame and panels:

- Frame and panel structure of **CLEANAIR LX** air handling units have been developed with particular care on thermal insulation and resistance
- Casing consists of aluminium frame with 60 mm sandwich panels, insulated with injected polyurethane to 45 kg/m³ density or mineral wool to 90 kg/m³ density
- Internal surface of the unit is completely smooth and no screws are visible inside the unit
- Gasket between the panels to ensure airtight seal, to eliminate thermal bridges, to reduce air leakages and to eliminate dust accumulation
- 3 way corner joint is in glass fibre reinforced nylon
- EN 1886 Classification for standard construction:
Mechanical resistance: D1
Leakage : L1/L2
Filter by-pass: F9
Transmittance: T2
Thermal bridges: TB2 in standard for single section and TB3 for multi-section configuration (TB2 in option)

Base frame: Base frame consists of galvanized steel "C" shaped frame 2,5 mm thickness according to the unit length and it is supplied with four corner feet with lifting holes suitable for 2" diameter thickness walled steel pipe.



Options and available configurations



- **Coils:**

Water, direct expansion, steam and electric coils, housed in a separate section on slide rails. On request ARI certified coils.

Coils are factory tested at 30 Bar by injecting with dry air while the coil is immersed in water. Electric coils are supplied with safety thermostat with manual reset.

- **Recovery sections,** heat recovery module available in R/A coils, cross flow, heat wheel and heat pipes, heat wheels and run around coils.

- **Drain pans:** Condensate drain pans in aluminium or stainless steel and can be inclined to ensure complete drainage (option).

- **Fan sections:**

Fan sections include fan, electric motor, motor slide rail, belt driven transmission, base frame with anti-vibrating mounts, flexible connection on the fan outlet, earthing cable on the fan and motor base frame.

When plug fans are supplied the drive motor is mounted directly on the fan shaft. Inverter can be supplied to control motor speeds.

Fans are double inlet double width, DIN R20 series, available in:

Forward curved for low pressures

Backward curved for medium-high pressures

Backward curved airfoil blades for high efficiency and medium-high pressures.

Motors are three phase asynchronous, closet construction with external fan, squirrel cage, horizontal shaft type B3, IP55 protection with F class insulation, IEC, CEI and UNEL approved. On request inverter motors, monophase, antispark, with bimetallic protection, with heater ...

Transmissions are V belts and pulleys type SPZ, SPA, SPB and SPC (fixed or variable pitch)

Fans up to size 400 are mounted on rubber antivibration mounts and all other sizes are fitted with spring mounts.

Attenuators, standard or envelopped

- **Safety devices:** Motors are fitted on belt tensioning skid provided with manual adjustment. Transmission is achieved by V-belt and pulleys

- Empty sections

- Mixing box with external or internal damper

- 3-way in line mixing box external or internal damper

- Roof (aluminium alloy perimetral rain shelter suitable for outdoor unit application, with PVC joints covers and man-safe covers on the angles)

- **Inspection doors** with nylon hingers and handles optionally supplied with inner handle and keyed lock. Doors can be supplied with dual well sight glass made of polycarbonate along with bulk light bulb.

- **Dampers:** aluminium airfoil shaped provided with nylon gears optionally supplied with manual operated control or suitable linkages for motorized control application

- Flexible connections, DIN certified

- **Filters:**

Medium efficiency flat filters

Medium efficiency bag filters (loose or rigid)

Medium efficiency roll filters

High efficiency bag filters (loose or rigid)

High efficiency rigid bag filters

HEPA filters

Activated carbon filters

- Droplet eliminators, in several materials

- **Humidifiers:** adiabatic, recirculated, steam generators, atomized water, air washers with single or twin spray nozzle bank.

- **Gas fired burner** : Available with as standard with CIB unigaz or WEISHAUP T burner, for gas and fuel.

- **Built-in control** : This range can be delivered with full control managed by CAREL controller – with communication possibility in common protocols : Modbus, LonWorks, BACnet, TCP/IP – SNMP, TREND

Close Control units



- Telecom units

@DNOVA

2,5 -26 kW **138**

- Close control units

INNOV@

6 - 128 kW **140**

- Close control units

INNOV@ ENERGY INVERTER

3 - 63 kW **144**

- "In Row" close control unit for high density systems

R@CKCOOLAIR

3 - 51 kW **146**

2,5 → 26 kW
Telecom units


Main applications

- Telecom shelters

Why this choice?

- Energy efficiency
- Reliability
- High quality



General description

The **ADNOVA** units are designed for **inside or outside installation of Telecom shelters**. They are used for efficient and reliable management of temperature of technological environments with high thermal loads.

The installation is a simple and fast. The THN and the THX are plug and play systems which requires just screw fitting and electrical cable connections.

For maintenance and service activities, all components are fully accessible from the front of the units. No further access of service staff to the sensitive internal is required.

Available types and configurations

- **THN** : Wall mounted packaged indoor unit (Upflow/Downflow/Displacement)
- **THX** : Wall mounted packaged outdoor unit (Upflow/Downflow on request for several models)
- **THS** : Ceiling mounted split unit

Main components

The unit supports are made of thick galvanised sheet, while the outer part is in aluminium alloy 5005 (THX) or in painted galvanized sheet metal RAL 9002 (THN, THS).

The refrigerant circuit is entirely in house manufactured, using welders certified according to the PED 97/23, and relevant components are certified according to the same directive. Rotary or scroll compressors are available in refrigerant HFC (R410A, R134a, R407C).

The **ADNOVA** (THX, THN) units are fitted with centrifugal fans, with backward curved blades and single intake.

The evaporator is made with copper tubes and aluminium fins (steel).

The drip tray is galvanized as standard (stainless steel as an option).

Condensing axial fan (THX, THS) all use 6 poles motor to limit the sound emissions.

Control

The **ADNOVA** are fitted as standard with Basic Microprocessor with LCD display.

Available options

- Emergency Free-cooling
- Dual power supply
- Potential free contacts for alarms
- Epoxy condenser coating
- High sensible heat ratio
- Electronic expansion valve
- EU4 filtration + clogged filter
- Free-cooling
- Free-cooling technology
- Microprocessor
- Electronic condenser fans speed control
- Interconnectivity (ModBus, TCP/IP, Bacnet ...)

General Data

ADNOVA - THN - R407C		0045	0056	0073	0090	0105	0120	0150	0170	0180	0200	0220	0250
Total cooling capacity ⁽¹⁾	kW	4,4	5,6	7,1	9,0	10,9	11,9	15,0	17,2	17,1	20,8	22,4	25,6
Sensible cooling capacity		4,4	5,4	7,1	9,0	10,9	11,9	14,7	16,5	17,1	20,8	22,4	24,6
Sensible heat ratio		1	0,96	1	1	1	1	0,98	0,96	1	1	1	1
Number of scroll compressors ⁽²⁾		1r											
Airflow rate	m³/h	1450	1450	2100	3020	3020	3020	3800	3800	5000	5500	6500	6500
Sound power level	dB(A)	69	69	69	72	72	72	72	72	80	80	81	82
Sound pressure level (10 m free field)		41	41	41	44	44	44	44	44	52	52	53	54
Height	mm	1850	1850	1850	1850	1850	1850	1850	1850	2050	2050	2050	2050
Width		800	800	800	1010	1010	1010	1160	1160	1500	1500	1500	1500
Depth		550	550	550	550	550	550	550	550	800	800	800	800

ADNOVA - THX - R407C		0045	0056	0073	0090	0105	0120	0145	0902	1102	1302	1502
Total cooling capacity ⁽¹⁾	kW	4,5	5,6	7,3	8,9	10,2	12	14,1	9,1	10,8	13,1	15,2
Sensible cooling capacity		4,5	5,5	7,3	8,9	10,2	12	13,7	9,1	10,2	11,4	13,5
Sensible heat ratio		1	0,98	1	1	1	1	0,97	1	0,94	0,87	0,89
Number of scroll compressors ⁽²⁾		1r	1	1	1	1	1	1	2	2	2	2
Airflow rate	m³/h	1450	1450	2150	3020	3020	3020	3020	2800	2800	2800	2800
Sound power level	dB(A)	69	70	70	71	71	71	74	72	72	72	72
Sound pressure level (10 m free field)		42	43	43	44	44	44	46	45	45	45	45
Height	mm	1580	1580	1580	1630	1630	1790	1790	1790	1790	1790	1790
Width		804	804	804	1000	1000	1000	1000	1000	1000	1000	1000
Depth		498	498	498	596	596	596	596	596	596	596	596

ADNOVA - THS - R407C		0025	0035	0045	0056	0073	0090	0105	0120	0145
Total cooling capacity ⁽¹⁾	kW	2,7	3,5	4,5	5,6	7,3	9,0	10,4	12,0	14,3
Sensible cooling capacity		2,7	3,1	4,5	5,4	7,3	8,7	9,9	11,8	12,9
Sensible heat ratio		1	0,89	1	0,96	1	0,97	0,95	0,98	0,90
Number of scroll compressors ⁽²⁾		1r	1r	1r	1	1	1	1	1	1
Evaporator airflow rate	m³/h	950	930	1400	1400	2200	2200	2200	3200	3200
Condensor airflow rate		2250	2050	3450	3350	3350	5100	5100	5580	5450
Sound power level	dB[A]	68	68	69	69	70	70	73	71	71
Sound pressure level (10 m free field)		41	41	41	41	42	42	45	43	43
Indoor unit										
Height	mm	350	350	350	350	350	350	350	400	400
Width		590	590	990	990	990	990	990	1090	1090
Depth		1040	1040	1040	1040	1040	1040	1040	1040	1040
Outdoor unit										
Height	mm	580	580	630	630	630	630	630	1128	1128
Width		600	600	990	990	990	990	990	1120	1120
Depth		350	350	360	360	360	360	360	578	578

(1) Indoor conditions 27°C/40% / Outdoor temperature : 35 °C

(2) 1r means Rotary compressor

DX : 6 → 128 kW
CW : 8 → 240 kW



Main applications

- Computer rooms
- Datacenters

Why this choice?

- Energy efficiency
- Reliability
- High quality
- Full frontal access



General description

The series of **INNOV@** Close Control Air Conditioning units are designed to guarantee and respect all environment protection parameters; they represent **the perfect answer to all technical requirements of different technological plant concepts (computer rooms, datacenters, control rooms, EDP rooms, textile industry, metrological rooms, etc ...).**

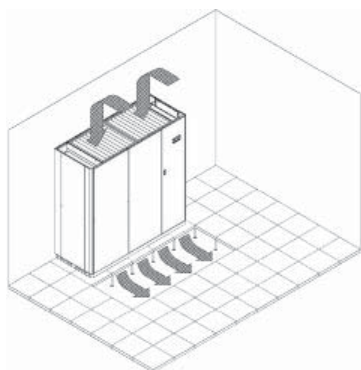
The exclusive design with rounded edges, innovative colour and the excellent performances of the **INNOV@** series have become the new high quality standard in the close control air conditioning sector. R410A is a new option.

Highest energy efficiency, smallest dimensions and lowest noise levels: these were LENNOX's targets when developing it's new **INNOV@** series, units designed in order to operate 24 hours a day, 365 days a year.

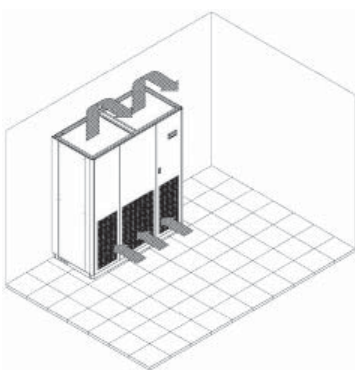
The reduction of energy consumption in comparison with traditional technologies reaches values up to 45%.

Available configurations

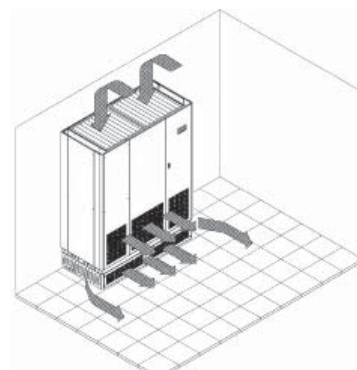
Downflow version



Upflow version



Displacement version



Main components

All main components are reachable from the front of the unit in order to reduce costs for installation and maintenance: electrical panel, compressor, fans, humidifier, electrical heaters, expansion valve and liquid flow filter can be reached by just opening the front panel. This guarantees fast and safe intervention.

Only internationally recognised quality components and latest technology devices are used in the **INNOV@** series in order to guarantee top efficiency and reliability. Technical features such as electronic expansion valves, radial fans with reverse blades and electronically commutated (EC) DC motors offers various opportunities in energy saving.

Operating mode

- Air cooled with remote condenser
- Water cooled with remote dry-cooler
- Water cooled for city tap water
- Chilled water

Indirect free-cooling

- Water cooled with remote dry-cooler and indirect free-cooling

Indirect free-cooling is the only way of air-conditioning when the room has to be insulated from the external air, when hard-filtering is requested (as white rooms) or if is not possible to link the unit to the external environment.

In this case the external air flow is used to cool the water in a dry cooler, then this can be used to cool the internal air. A modulating three-way valve provides the cooled water flow through to the Chilled water section of the coil.



Dual cooling units

- Air cooled with remote condenser and chilled water coil
- Water cooled with remote dry-cooler and chilled water coil
- Water cooled for city tap water and chilled water coil

This units allow to have a backup mode, they can operate with chilled water from a chiller in normal mode and then swap to stand alone mode in case of problem or maintenance with the chiller. This units allow also to have an over capacity in case of extreme conditions.

Control

The microprocessor control, available in Basic or Advanced Graphics version, manages all functions of the **INNOV@** series. This control offers the opportunity to connect up to 8 units together creating a local network (LAN) and allowing, among different options, to balance operation times in an automatic stand by and rotation function. The microprocessor controls are available with a LCD display (Basic version) or with a graphic display (Advanced version) and are compatible with the most wide spread communication protocols. LENNOX Software Development Team (LSDT) moreover, is able to develop control strategies according to customers special requirements.

Available accessories - configurations

- Dual fluid
- Potential free alarms contacts
- Water detection kit
- Flash memory
- Microprocessor
- Electronic condenser fans speed control
- Interconnectivity (ModBus, TCP/IP, Bacnet ...)
- Touch screen graphic display



General data

DM RANGE / Air cooled and water cooled INNOV@ DX

INNOV@ DX			0060	0080	0100	0110	0130	0132	0160	0190	0205	0212
Airflow rate	m ³ /h		1785	2150	3530	3530	3700	3700	5100	5100	5100	5100
Maximum available static pressure	Pa		776	725	624	624	574	458	292	292	408	292
Number of radial EC fan			1									
Total cooling capacity	Air cooled unit ⁽¹⁾	kW	6,5	8,6	10,7	11,8	13,9	13	16,6	19,4	22,4	22,7
	Water cooled unit ⁽²⁾		6,7	8,1	10,5	11,6	13,9	13	16,6	19,5	21,6	22,2
Sensible heat ratio	Air cooled unit		1,00	0,96	0,99	0,97	0,90	0,91	1	0,96	0,9	0,9
	Water cooled unit		0,98	0,96	1,00	0,98	0,90	0,91	0,99	0,96	0,92	0,91
Number of scroll compressors/Number of circuits			1/1	1/1	1/1	1/1	1/1	2/2	1/1	1/1	1/1	2/2
Height		mm	1875	1875	1875	1875	1875	1875	1875	1875	1875	1875
Length			600	600	900	900	900	900	900	900	900	900
Depth			600	600	600	600	600	600	600	600	600	600
Weight	Air cooled unit	kg	150	157	195	210	230	230	245	255	260	264
	Water cooled unit		165	172	214	231	253	253	269	280	286	291
Sound pressure level ⁽³⁾		dB(A)	47	49	52	52	53	53	55	56	56	56

Performances given considering units installed in combination with the suggested remote condenser and with 35°C outside air temperature

(1) Indoor conditions 24°C/50%.

(2) Indoor conditions 24°C/ 50% - Water temperature 40/45°C

(3) 1,5 meter above and 2 meters from the unit in free field – downflow units (30 Pa AESP), nominal airflow rate, compressor speed 50Hz

DM RANGE / Chilled water INNOV@

INNOV@		0060	0110	0140	0160	0200	0230
Airflow rate	m ³ /h	2300	2400	3800	3800	5100	4040
Maximum available static pressure	Pa	716	678	573	552	320	293
Radial EC fan number		1					
Total cooling capacity ⁽¹⁾	kW	8	11,1	11,4	14,7	17,7	23,5
Sensible heat ratio		0,92	0,84	1,00	0,88	0,97	0,87
Height		1875	1875	1875	1875	1875	1875
Length		600	600	900	900	900	900
Depth		600	600	600	600	600	600
Weight		140	150	165	175	187	190
Sound pressure level ⁽²⁾	dB(A)	50	51	53	53	55	55

(1) Indoor conditions 24°C/ 50%.- Water temperature 40/45°C

(2) 1,5 meter above and 2 meters from the unit in free field – downflow units (30 Pa AESP), nominal airflow rate, compressor speed 50Hz

DH RANGE / Air cooled and water cooled INNOV@ DX

INNOV@ DX			0201	0251	0281	0311	0401	0272	0302	0362	0422
Airflow rate	m ³ /h		6800	6800	7280	7280	12950	12950	12950	12950	12950
Maximum available static pressure	Pa		397	397	329	329	412	412	412	412	412
Number of radial EC fan			1	1	1	1	2	2	2	2	2
Total cooling capacity	Air cooled unit ⁽¹⁾	kW	23,4	25,9	30,2	33,6	42	27,1	34,2	37,7	45
	Water cooled unit ⁽²⁾		23,4	25,5	29,9	32,5	43,7	28,1	34,2	39,2	43,7
Sensible heat ratio	Air cooled unit		0,97	0,95	0,93	0,88	0,95	1,00	1,00	1	0,94
	Water cooled unit		0,97	0,95	0,92	0,88	0,95	1,00	1,00	1	0,95
Number of scroll compressors/Number of circuits			1/1	1/1	1/1	1/1	1/1	2/2	2/2	2/2	2/2
Height		mm	1998	1998	1998	1998	1998	1998	1998	1998	1998
Length			1010	1010	1280	1280	1760	1760	1760	1760	1760
Depth			795	795	795	795	795	795	795	795	795
Weight	Air cooled unit	kg	375	385	394	401	552	565	580	590	605
	Water cooled unit		412	423	433	442	611	621	638	649	665
Sound pressure level ⁽³⁾		dB(A)	55	56	58	58	63	59	61	62	65

DH RANGE / Air cooled and water cooled INNOV@ DX

INNOV@ DX		0452	0532	0592	0602	0692	0762	0852	1002	1204
Airflow rate	m ³ /h	12950	14150	14150	19415	19415	19415	21500	21500	24000
Maximum available static pressure	Pa	412	304	304	393	393	393	226	226	440
Number of radial EC fan		2	2	2	3	3	3	2	2	3
Total cooling capacity	Air cooled unit ⁽¹⁾	kW	50	57,7	61,9	66,3	75,3	82,5	89,3	125,9
	Water cooled unit ⁽²⁾		48,1	55,6	61,2	65,1	72,5	79,3	84,7	126
Sensible heat ratio	Air cooled unit		0,9	0,89	0,85	0,89	0,89	0,85	0,94	0,83
	Water cooled unit		0,91	0,88	0,85	0,89	0,87	0,84	0,94	0,83
Number of scroll compressors/Number of circuits		2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	4/2
Height	mm	1998	1998	1998	1998	1998	1998	1998	1998	1998
Length		1760	2030	2030	2510	2510	2510	2510	2510	3160
Depth		795	795	795	795	795	795	950	950	950
Weight	Air cooled unit	kg	615	740	905	940	958	979	1001	1013
	Water cooled unit		676	985	995	1034	1053	1076	1099	1114
Sound pressure level ⁽³⁾	dB(A)	65	67	67	68	68	68	76	76	79

Performances given considering units installed in combination with the suggested remote condenser and with 35°C outside air temperature

(1) Indoor conditions 24°C/ 50%.

(2) Indoor conditions 24°C/ 50%.- Water temperature 40/45°C

(3) 1,5 meter above and 2 meters from the unit in free field – downflow units (30 Pa AESP), nominal airflow rate, compressor speed 50Hz

DH RANGE / Chilled water INNOV@

INNOV@		0300	0380	0450	0550	0650	0750
Airflow rate	m ³ /h	7450	7450	9120	9120	14550	14550
Maximum available static pressure	Pa	401	349	229	206	355	320
Number of radial EC fan		1	1	1	1	2	2
Total cooling capacity ⁽¹⁾	kW	28,1	42,6	49,5	55,6	74,2	85,7
Sensible heat ratio		0,90	0,82	0,82	0,79	0,82	0,80
Height	mm	1998	1998	1998	1998	1998	1998
Length		1010	1010	1270	1270	1270	1760
Depth		795	795	795	795	795	795
Weight	kg	310	350	360	395	430	475
Sound pressure level ⁽²⁾	dB(A)	58	60	62	63	62	62

INNOV@		0890	1090	1200	1500	1800	2100
Airflow rate	m ³ /h	18020	18020	21400	26200	26200	36120
Maximum available static pressure	Pa	166	133	313	99	85	142
Number of radial EC fan		2	2	3	2	2	3
Total cooling capacity ⁽¹⁾	kW	92,6	111,4	127	151,5	167,1	236,2
Sensible heat ratio		0,81	0,79	0,80	0,80	0,78	0,76
Height	mm	1998	1998	1998	1998	1998	1998
Length		2020	2020	2510	2510	2510	3160
Depth		795	795	795	950	950	950
Weight	kg	470	497	530	720	753	785
Sound pressure level ⁽²⁾	dB(A)	66	67	65	71	72	74

(1) Indoor conditions 24°C/ 50%.- Water temperature 40/45°C

(2) 1,5 meter above and 2 meters from the unit in free field – downflow units (30 Pa AESP), nominal airflow rate, compressor speed 50Hz

3 → 63 kW


Main applications

- Computer rooms
- Datacenters

Why this choice?

- Energy efficiency
- Reliability
- High quality



General description

The **INNOV@ ENERGY** Inverter close control air conditioning units introduce **modulating cooling capacity for computer room and datacenter solutions**. e-Drive technology integrated in close control unit allows to optimize cooling capacity to the requirement, especially in X-treme density environments where the cooling capacity is normally lower than the design value. Modulating cooling capacity from 25 – 100%, combined with quick reaction against heat load variation [6 Hz/second] **INNOV@ ENERGY INVERTER** introduces a new flexibility in close control air-conditioning.

Variable temperature control combined with the related power consumption lives up to the required energy efficiency. Thanks to EC motors, obviously on fans but also on compressors we are able to maximize the energy saving.

Highest energy efficiency, smallest dimensions and lowest noise levels: these were LENNOX's targets when developing it's **INNOV@ ENERGY** series, units designed in order to operate 24 hours a day, 365 days a year delivering only required cooling. The reduction of energy consumption in comparison with traditional technologies reaches values up to 45%.

Main components

All main components are reachable from the front of the unit in order to reduce costs for installation and maintenance: electrical panel, compressor, fans, humidifier, electrical heaters, expansion valve and liquid flow filter can be reached by just opening the front panel. This guarantees fast and safe intervention.

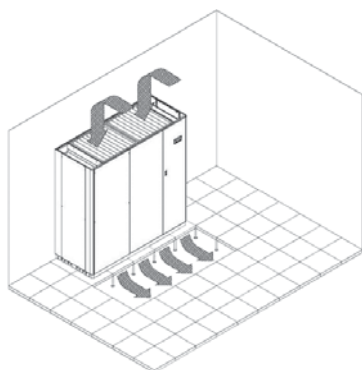
Only internationally recognised quality components and latest technology devices are used in the **INNOV@ ENERGY** series in order to guarantee top efficiency and reliability. Standard technical features such as electronic expansion valves, backward curved fan with EC motors offers various opportunities in energy saving.

Control

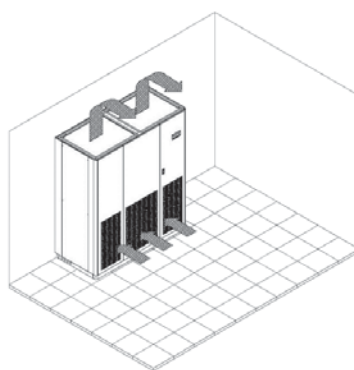
The advanced microprocessor control, available with in a standard or a Touch Screen Graphics version, manages all functions of the **INNOV@ ENERGY** series. The advanced control offers the opportunity to connect up to 8 units together creating a local network (LAN) and allowing, among different options, to balance operation times in an automatic stand by and rotation function. The microprocessor controls are available with a LCD display (Basic version) or with a graphic display (Advanced version) and are compatible with the most wide spread communication protocols. LENNOX Software Development Team (LSDT) moreover, is able to develop control strategies according to customers special requirements.

Available configurations

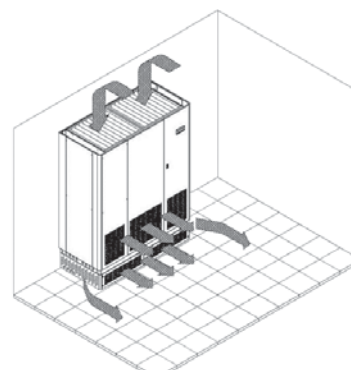
Downflow version



Upflow version



Displacement version



General Data

NNOV@ ENERGY INVERTER		0091	0131	0241	0341	0462	0682
Airflow rate	m ³ /h	2150	3700	6800	7280	14150	19415
Maximum available static pressure	Pa	540	430	400	330	300	400
Radial-EC fan		1	1	1	2	2	3
Compressor frequency : 30 Hz							
Total cooling capacity ⁽¹⁾	kW	3	3,9	7,3	12,1	14,3	24,2
Sensible heat ratio		1,00	1,00	1,00	1,00	1,00	1,00
Compressor frequency : 70 Hz							
Total cooling capacity	kW	6,6	8,6	16,9	23,9	32,2	49,5
Sensible heat ratio		1,00	1,00	1,00	1,00	1,00	1,00
Compressor frequency : 110 Hz							
Total cooling capacity	kW	9,3	13,9	24,4	34,4	46,5	68,5
Sensible heat ratio		0,89	0,92	0,94	0,84	0,99	0,92
EC motor compressors		1 x Twin-Rotary		1 x Scroll		2 x Scroll	
Length	mm	1875	1875	1998	1998	1998	1998
Height		600	900	1010	1280	2020	2510
Depth		600	600	795	795	795	795
Weight	kg	160	250	515	580	998	1019
Sound pressure level ⁽²⁾	dB(A)	47	52	54	57	63	65

Performances given considering units installed in combination with the suggested remote condenser and with 35°C outside air temperature
 (1) Indoor conditions 24°C/ 50%.

(2) At 1,5 meter height, 2 meters frontal distance in free field – down flow units (30 Pa AESP), nominal airflow rate, cp speed 50Hz

Available accessories - configurations

- Freecooling optional (direct / indirect)
- Potential free alarms contacts
- Water detection kit
- Full frontal access
- Flash memory
- Microprocessor
- Electronic condenser fans speed control
- Interconnectivity (ModBus, TCP/IP, Bacnet...)
- Dataweb
- Touch screen graphic display



3 → 51 kW

“In Row” close control unit
for high density systems



Main applications

- Medium and small sizes datacenter
- Server rooms

Why this choice?

- EC motor compressor technology
- Flexibility
- high quality standard



General description

Thanks to the **R@CKCOOLAIR** series, LENNOX offers an ideal solution for cooling of server racks in medium and small sizes data centres. They are also best suitable for extension of existing sites or in server rooms without raised floor. It's position next to the heat source guarantees an immediate and efficient reaction to varying heat dissipations from the servers.

Standard features

- Spot cooling: where and when you need it
- Airflow switch
- Full accessibility
- High pressure radial fans with backward curved blades
- High efficiency hydrophilic finned coil with aluminium structure
- Two drain pans made of AISI 430 stainless steel EDX
- Hydraulic connections from the top or from the bottom
- Powder-coated metal sheet structure
- Footprint : 300 x 1200 mm or 600 x 1200 mm only
- Fully insulated panels
- 2 or 3 way water valve, modulating by means of a 0-10 V signal
- Display of 3-way water valve mixing percentage
- Programmable control with LCD display
- Two separate zones control (top and bottom of the unit)
- Different airflow configurations
- Modulating airflow rate according to the cooling capacity for a much higher energy saving
- Built-in condensing control for air-cooled units (modulating fan-speed control) with dedicated automatic breaker
- Lockable panels
- LAN connection up to 8 units
- 4 alarms with extra potential free contacts

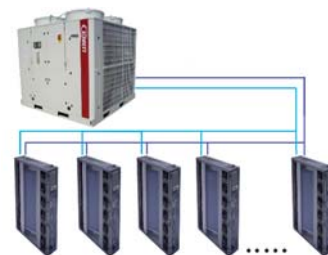
Options and accessories

- Dehumidification with humidity sensor
- Clogged filter sensors
- Water leakage, fire and smoke sensors
- Temperature and humidity additional sensors
- Condensate water pump
- Water-flowmeter with current cooling capacity display
- Integrated IT racks and hotspot cooling solutions
- Automatic airflow control with display visualization
- Serial cards for protocols: Carel/Modbus/Lonworks/Trend
- PCOWEB Hardware: Ethernet card for protocols: Bacnet/SNMP
- DATAWEB Software: Ethernet card for web connectivity
- Touch-Screen colour graphic display

RHC units

Chilled water unit with high performance coil and modulating water valve which distinguishes for:

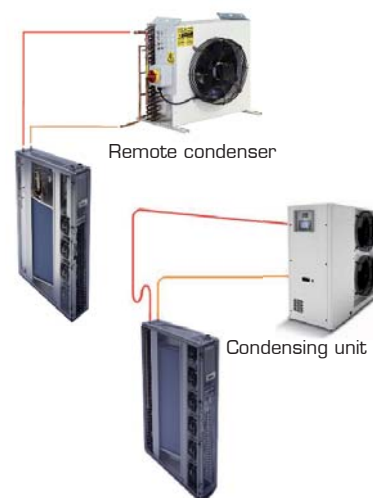
- Highest specific cooling capacity (W/m^2) due to the large heat exchanger surface;
- Precise temperature control (PID type regulation);
- The possibility to increase return air temperature, thus to rise the medium chilled water temperature (while keeping the cooling capacity stable). This results in a maximized EER of the chiller and extends free-cooling operation range.



RND : Motor-evaporating/RNV : Motor-condensing unit with variable speed compressors which guarantee:

- Precise temperature control (PID type regulation);
- Reduced power consumption at partial load;
- Avoiding of electrical peaks and compressor's mechanical stress in ON/OFF cycles;
- Extension of the application field.

This is the solution for small and medium size installations where no chilled water system is available or where no chiller can be placed or where site specific constraints do not allow water in the datacenter. Adjusting the facility configuration with the distance between indoor and outdoor unit enables a simple and economical installation.



Ventilation

Positioning of the **R@CKCOOLAIR** unit next to the server itself minimizes the ventilation consumption needed to overcome pressure drops from ducting or raised floor systems. Using of plug fans with backward curved blades (in contrast to axial fans) particularly guarantees maximum stability in airflow even in most packed server racks where as the optionally available EC fans allows efficient modulation of the air volume. The integrated microprocessor modulates the airflow rate in combination with either the chilled water valve (on RHC units) or the compressor frequency (on RND/RNV units) and thus significantly reduces the electrical consumption of the airflow ($P = k \times [\text{airflow}]^3$).

Alternatively is available the optional "automatic airflow control" which keeps the airflow constant in case of variable pressure drops of the system, or the "Delta P control" for a pressure control in the cold aisle.



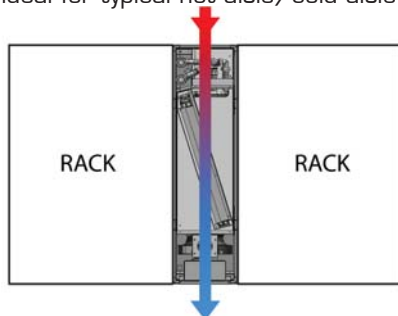
Airflow configuration

No ducting systems or raised floors are necessary, the HRC units simplify the installation of the system.

Several available configurations fit to all needs of modern data centers such as retrofit/expansion of existing sites :

In row : (horizontal airflow)

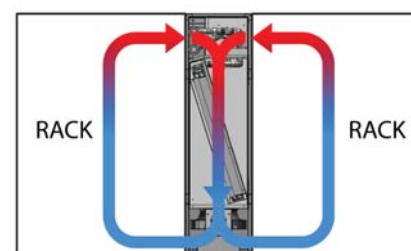
ideal for typical hot aisle/cold aisle applications



- Hot air flow
- Cold air flow



In Rack: (re-circulating left-right)
For a total closed loop hotspot cooling



General Data

RHC : chilled water unit

R@CKCOOLAIR				RHC 0200			RHC 0250			RHC 0450			RHC 0510		
Indoor operating conditions Temperature - Relative humidity				24°C 50%	30°C 35%	35°C 26%	24°C 50%	30°C 35%	35°C 26%	24°C 50%	30°C 35%	35°C 26%	24°C 50%	30°C 35%	35°C 26%
Total cooling capacity ⁽¹⁾			kW	13,9	22	28,1	18,3	28,6	36,7	28	42,9	54,9	37,1	58,2	74,7
Sensible cooling capacity				13,9	22	28,1	18,3	28,6	36,7	28	42,9	54,9	37,1	58,2	74,7
Fan absorbed power				0,6			0,8			2,1			2,5		
Voltage				230 V/1 Ph/50 Hz						400 V/3 Ph/50 Hz					
Water flow rate			l/h	2395	3780	4840	3150	4919	6297	4805	7375	9429	6376	9997	12830
Airflow rate			m³/h	4000			5300			9000			11000		
Dimensions Length x Height x Depth			mm	300 x 2000 x 1200						600 x 2000 x 1200					

RND : DX unit with remote condenser

R@CKCOOLAIR		RND 0100			RND 0260		
Indoor operating conditions Temperature - Relative humidity		24°C 50%	30°C 35%	35°C 26%	24°C 50%	30°C 35%	35°C 26%
Compressor frequency	Hz	30	70	120	30	70	120
Total cooling capacity	kW	3,1	7,6	11,2	7,6	16,6	25,8
Sensible heat ratio		1					
Compressor absorbed power	kW	0,7	1,5	2,7	1,2	3,2	6,9
Compressor absorbed current	A	3,1	7,2	13,0	1,9	4,8	10,5
Evaporator airflow rate	m³/h	700	1600	2700	1500	3000	5000
Fan absorbed power	kW	0,05	0,12	0,40	0,11	0,21	0,50
Voltage		230 V/1 Ph/50 Hz			400 V/3 Ph/50 Hz		
Compressor type		1 x EC motor compressor - Twin Rotary			1 x EC motor compressor - Scroll		
Dimensions Length x Height x Depth	mm	300 x 2000 x 1200			600 x 2000 x 1200		

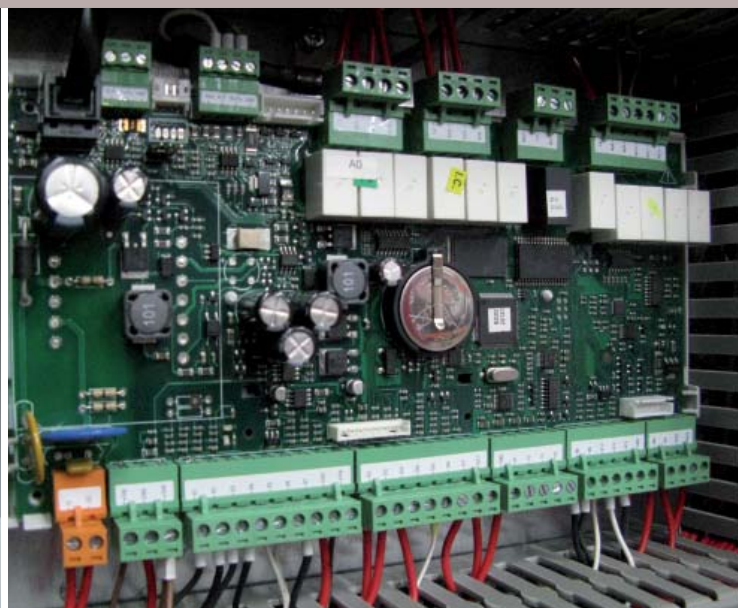
R@CKCOOLAIR		RND0400			RND 0450		
Indoor operating conditions Temperature - Relative humidity		24°C 50%	30°C 35%	35°C 26%	24°C 50%	30°C 35%	35°C 26%
Compressor frequency	Hz	30	70	120	30	70	120
Total cooling capacity	kW	12,9	26,5	40,0	14,9	30,9	44,7
Sensible heat ratio		1					
Compressor absorbed power	kW	1,9	5,4	11,3	2,4	6,5	14,4
Compressor absorbed current	A	2,9	8,2	17,2	3,6	9,9	21,9
Evaporator airflow rate	m³/h	2700	5500	9000	2700	5500	9000
Fan absorbed power	kW	0,20	0,65	2,10	0,20	0,65	2,10
Voltage		400 V/3 Ph/50 Hz					
Compressor type		1 x EC motor compressor - Scroll					
Dimensions Length x Height x Depth	mm	600 x 2000 x 1200					

RND : DX unit with remote condensing unit

R@CKCOOLAIR		RNV 0140			RNV 0240			RNV 0330		
Indoor unit										
Compressor frequency	Hz	30	70	120	30	70	120	30	70	120
Total cooling capacity	kW	3,9	8,1	12,8	7,8	16	24,2	12,8	23	33,5
Sensible heat ratio		1	1	1	1	1	1	1	0,9	0,83
Evaporator airflow rate	kW	900	1800	3100	1650	2900	4400	2900	3600	4400
Fan absorbed power		0,08	0,17	0,38	0,14	0,35	0,99	0,3	0,56	0,99
Voltage		230 V/1 Ph/50 Hz								
Dimensions Length x Height x Depth	mm	300 x 2000 x 1200								
Outdoor condensing unit										
Compressor frequency	Hz	30	70	120	30	70	120	30	70	120
Compressor absorbed power	kW	0,6	1,7	4,3	1,2	3,2	7	2	5,2	10,7
Compressor absorbed current	A	2,9	8,2	20,8	1,8	4,9	10,6	3,1	7,9	16,2
Number of scroll compressors		1								
Condenser airflow rate	m³/h	3500			9300			16280		
Soud power level	dB(A)	62			72			73		
Sound pressure level (10 m free field)		34			44			45		
Voltage		230 V/1 Ph/50 Hz			400 V/3 Ph/50 Hz					
Dimensions Length x Height x Depth	mm	1270 x 880 x 500			1565 x 1300 x 600			1990 x 1485 x 950		
Weight	kg	100			332			492		



Controls & BMS



• **ADALINK II** 152

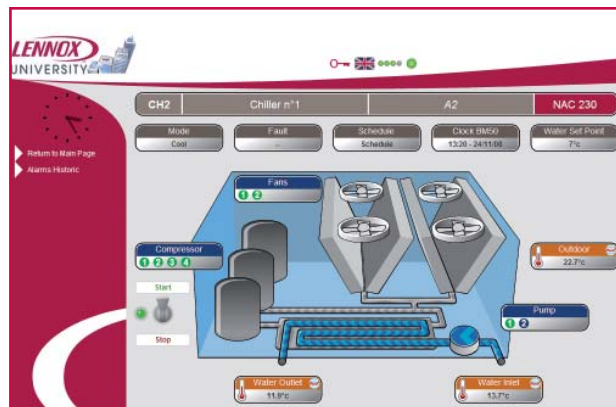
• **LENNOXVISION** 153

Main applications

- BMS "light" system
- Small installations: up to 16 units

Why this choice?

- Dedicated to Lennox units
- Plug-and-play system
- No computer issue
- Accessible through any internet browser
- Very easy to use
- Scheduling and setpoint adjustment
- Remote ethernet or ADSL connection
- Alarms management

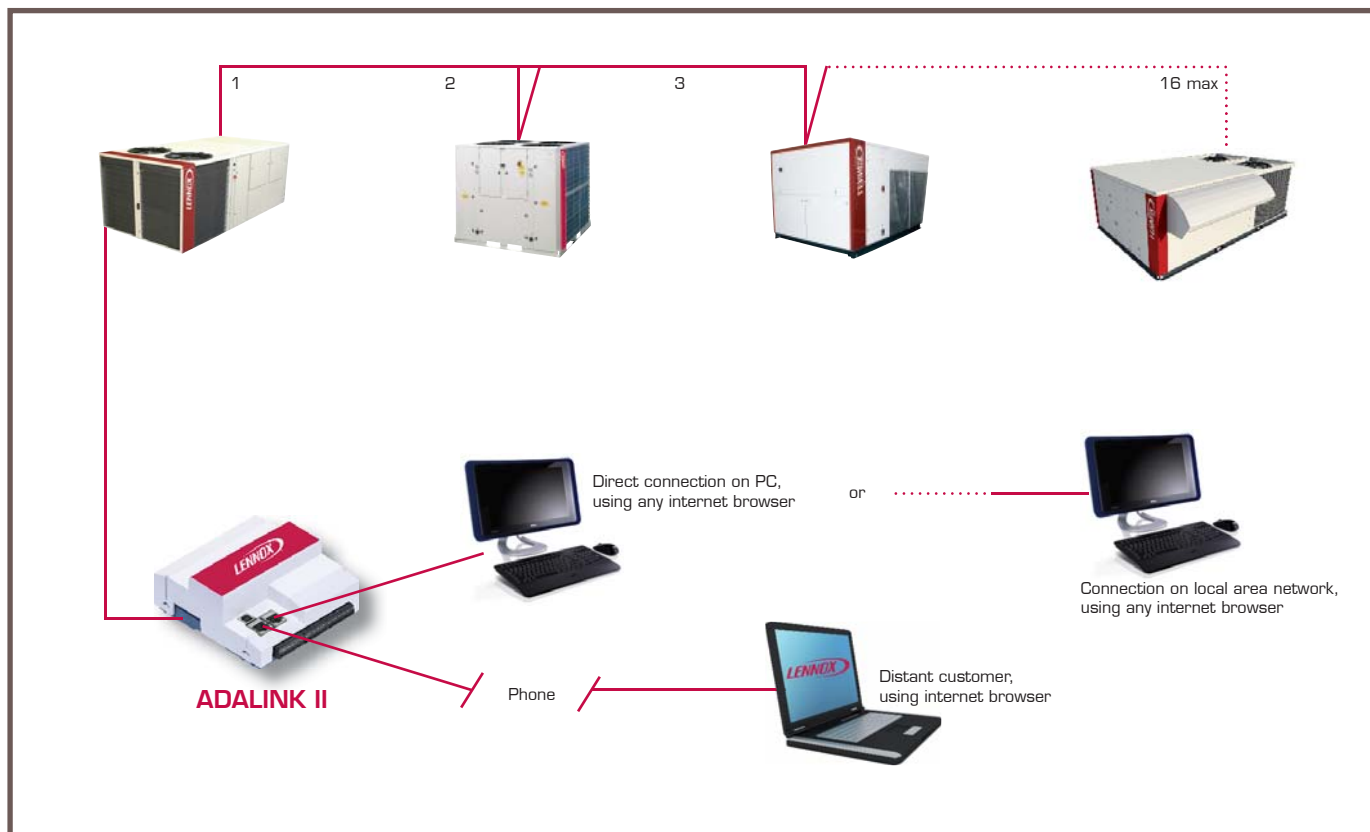


ADALINK II is the Lennox solution for HVAC installation monitoring. It can control up to 16 units on the same site. It can be connected to different units of the Lennox range, rooftops and chillers.

As an option, possibility to integrate other communication devices (energy meters, boilers, lighting...).

ADALINK II system allows to show operating status of the different units, zoom on each unit and allows the user to change set point, access to alarm list, or look at trend curves.

ADALINK II is very easy to install, and can be used locally on any computer through any internet browser, or remotely via an ethernet or internet network.





Main applications

- Real and full BMS system
- Large installations: No unit limit

Why this choice?

- Communication with all Lennox controllers (including **CLIMATIC**) and other devices
- Dedicated hardware with pre-installed software
- Alert messages by SMS or Email
- Lighting management
- Communication with other BMS
- Remote connection via ADSL Modem

LennoxVision is the Lennox supervision and telemaintenance system. It can be connected to all the Lennox units and external components without limit. Real BMS system gives you access to the variables of all the units and carries out monitoring, scheduling and energy management.

The **LennoxVision** software gives you access to different pages in order to fully manage the different units on the site : unit page, service, alarm, curves and scheduling pages. The system includes remote connection via modem (options), communication with other BMS, management of alert messages by SMS or Email and lighting management.

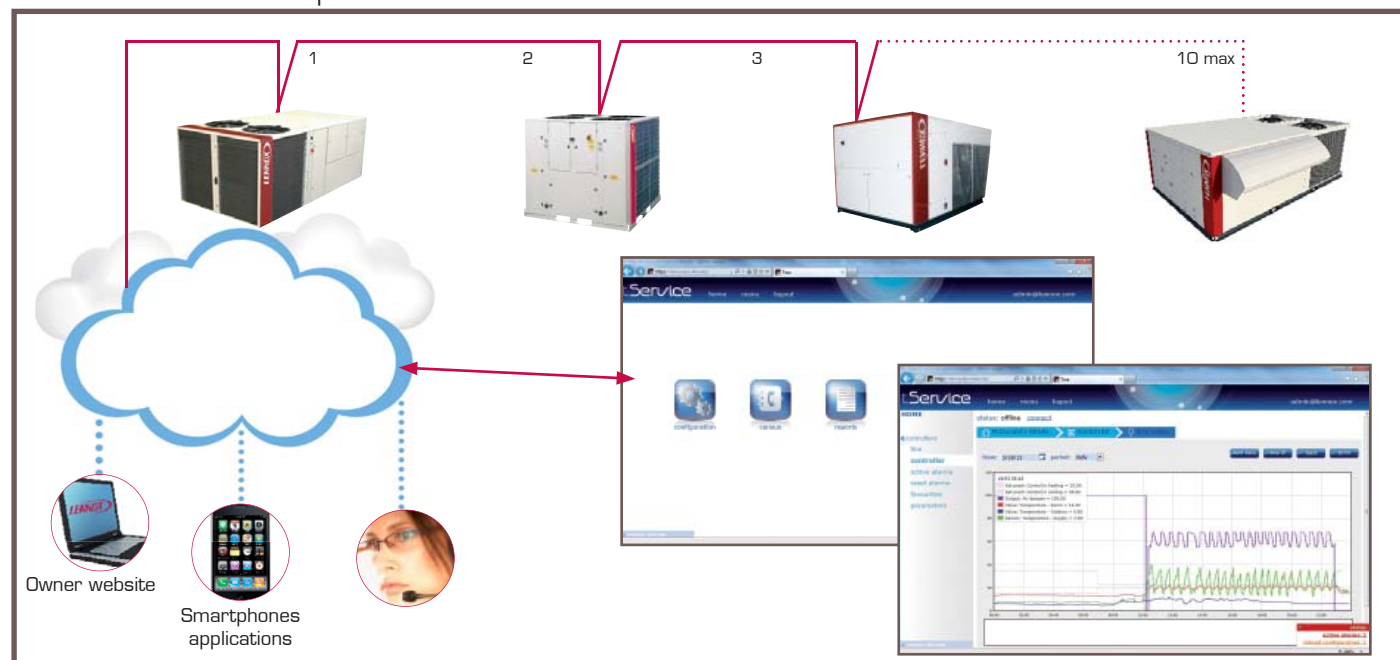
LennoxVision can be used as a local system with mouse, keyboard and monitor, or as a monitoring system with access from a remote workstation via modem or network. **LennoxVision** includes a complete pre-configured version of software running on dedicated hardware, and features all the communication ports required to best exploit its Web Server and installation supervision functions.

Remote monitoring

Lennox proposes a remote monitoring system, available for all our product ranges.

Thanks to this system, all units are remotely monitored, controlled and diagnosed by our technicians.

Lennox CLOUD allows to remote visualize all the units installed on sites, save the data and diagnostic information, and make them available on our web portal.



General information



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Power level and pressure level

Noise is generated by a moving body: thus we can use a concept of mechanical pressure expressed in watts. The noise is compared to a reference value of 10⁻¹² watts, using the following formula:

$$L_w = 10 \times \log (W \text{ emitted} / W \text{ reference})$$

We can therefore speak of the **pressure level**.

The noise striking the ear or a measuring instrument is a vibration of the air, in other words a pressure variation, expressed in Pa. This can also be described by comparing it to a reference value of 2.10⁻⁵ Pa by means of the following formula:

$$L_p = 20 \times \log (P \text{ emitted} / P \text{ reference})$$

NOTE : In these two equations, we have ratios of numbers expressed in the same units, i.e. dimensionless numbers. In this particular case, the result is expressed in decibels (dB).

The spectrum

31,5	63	125	250	500	1000	2000	4000	8000	16000
	1st	2nd	3rd	4th	5th	6th	7th	8th	
SEVERE				MEDIUM			ACUTE		

In practice, a noise always consists of a multiplicity of noises emitted at different frequencies. On average, the human ear perceives frequencies from 20 to 16000 Hz with greater or lesser acuity. It is useful to describe noise in terms of a frequency bands.

The frequency range of the human ear is therefore divided into 10 bands of octaves (a frequency octave extends from one frequency, f, to 2f.

Example: from 320 to 640 Hz).

These octave bands are named according to their average frequency.

Weighting

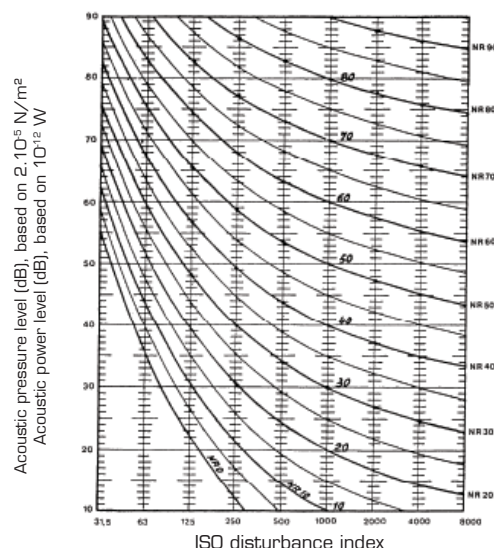
To give more importance to the auditory disturbance than to the physical measurement, weightings have been determined by experimental methods. These values are classed according to the three following filters:

Frequencies	63	125	250	500	1000	2000	4000	8000
Filter A: Values below 55 dB"	26,2	-16,1	-8,6	-3,2	0	1,2	1	-1,1
Filter B: Values from 55 dB to 85 dB"	-9,3	-4,2	-1,3	-0,3	0	-0,1	-0,7	-2,9
Filter C: Values above 85 dB"	-0,8	-0,2	0	0	0	-0,2	-0,8	-3

NOTE : Filter A is the most commonly used filter. Note that dB and dBlin are sound levels without weighting, and dBA, dBB and dBC are weighted sound levels.

A chart called the ISO disturbance index, or noise rating (NR), is also used. The ISO or NR level is defined as the nominal value of the curve at 1000 Hz (there is also an NC index, a chart similar to the NR one but with the nominal value at 1500 Hz).

IMPORTANT : All logarithms shown in this document are common (base 10) logarithms.



Free air or free field noise diffusion

In the theoretical case of a source emitting in all directions in space without obstacles, the pressure waves are propagated in concentric spheres like circles made by throwing a pebble into water. When a wave reaches you, its energy is distributed over the surface of a sphere whose radius is the distance between you and the source. Thus we can derive the following equation:

$$L_p = L_w + 10 \times \log Q / (4 \times \pi \times r^2)$$

The term **Q** is called the directivity factor.

Its value is:

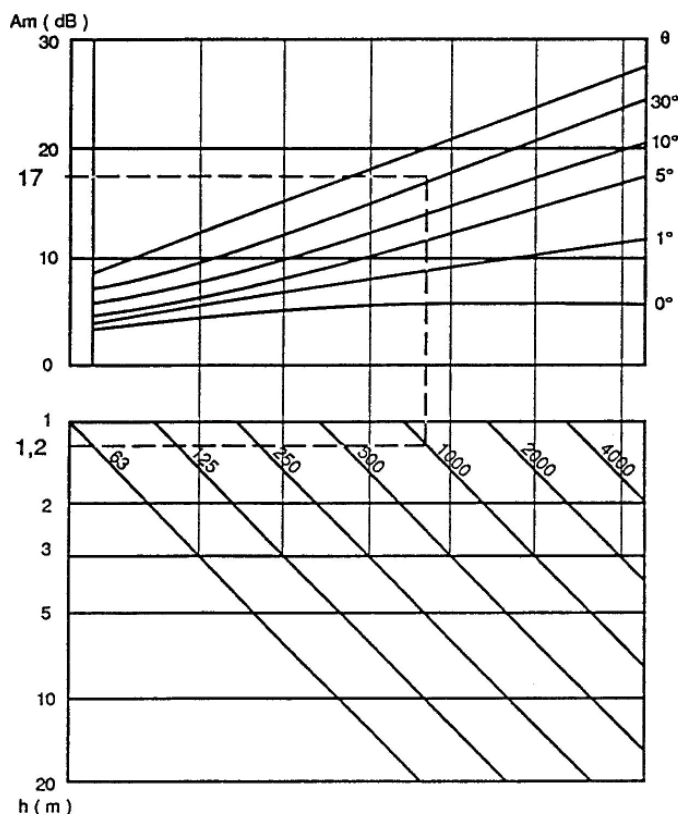
- 1 when the source is in space, emitting in a complete sphere
- 2 for a source on the ground, i.e. emitting in a hemisphere
- 4 if the source is on a wall, emitting in a quarter of a sphere
- 8 for a source located in a corner of a wall, emitting in an eighth of a sphere

Free air or noise diffusion with an obstacle

We can use the general diffusion equation shown above:

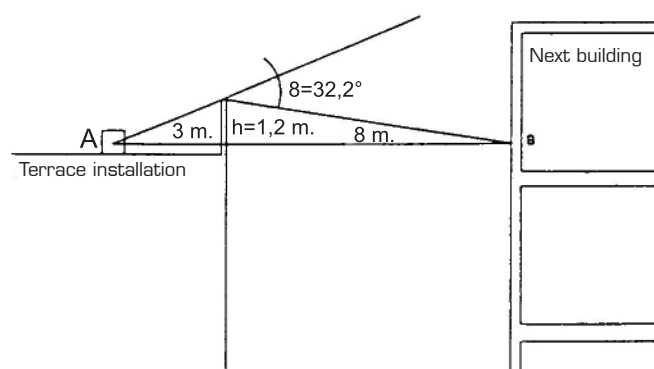
$$L_p = L_w + 10 \times \log Q / (4 \times \pi \times r^2) - A_m$$

with the addition of the term A_m , which is the attenuation created by the obstacle.



Examples :

A unit installed in a raised position with a power level of 77 dB at 1000 Hz :



1. Perceived pressure level in B if there were no obstacles:

$$L_p = 77 - 8 - 20 \log (3 + 8) = 48 \text{ dB}$$

2. Perceived pressure level in B, allowing for the obstacle:
 A_m according to the chart = 17

$$L_p = 77 - 8 - 20 \log (3 + 8) - 17 = 31 \text{ dB}$$

Diffusion of noise in an enclosed space

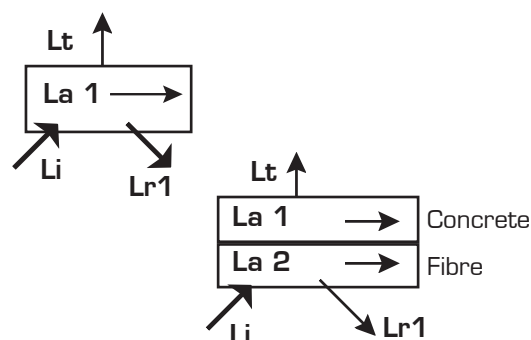
When a noise is emitted in a room, we perceive a pressure wave which comes to us directly from the source as in the free field case, but we also perceive waves reflected by the walls of the room.

Wave reflection

When a wave strikes a wall (li), then, in simplified terms, part of the energy is transmitted through the wall (lt), another part of the energy is absorbed by the wall, and the final part is reflected into the room.

In the example shown opposite, we see that, for a given incident wave li, the transmitted lt varies very little according to whether the wall is lined or not. The energy transmitted is a function of the mass of the wall; since the absorbent lining (glass wool for example) has a low density with respect to concrete, it is affected only slightly.

Conversely, we note that the absorbed energy is much greater in the fibre. In this case, the energy is expended on moving the air molecules trapped in the material.



Absorption capacity of a surface

Examples of absorption coefficients:

If the incident wave has a value of 1 and the material absorbs α , the reflected wave is $1 - \alpha$.

α is the absorption coefficient of the material. It is a dimensionless number in the range from 0 to 1, defined by the frequency.

Frequency	125	250	500	1000	2000	4000
Concrete wall	0,01	0,01	0,01	0,01	0,02	0,02
Mineral wool, 25 mm	0,09	0,23	0,56	0,72	0,75	0,77

The absorption capacity of a surface is :

$$A = S \cdot \alpha$$

S in m²
A in m² Sabine

For a room:

$$A = \sum S_i \cdot \alpha_i$$

Constant r of a room

$$\alpha_m = \sum S_i \cdot \alpha_i / \sum S_i = A / S$$

$$R = S \cdot \alpha_m / (1 - \alpha_m)$$

Reverberation time of a room

When noise emission is stopped abruptly in a room, the sound takes a certain time to decay. The time taken by the sound to decrease by 60 dB is called the reverberation time of the room.

Some examples of reverberation time in seconds:

- Concert hall : 1 to 2
- Meeting room : 0.5 to 1.5
- Hotel room : 1
- Church : 2 to 7
- Swimming pool : 1.5 to 4

The following formula, for guidance only, relates the reverberation time to the room characteristic:

$$T = 0,16 \cdot V / A$$

Having examined the diffusion of a noise in a free field and the reverberation in a room, we obtain the following general formula:

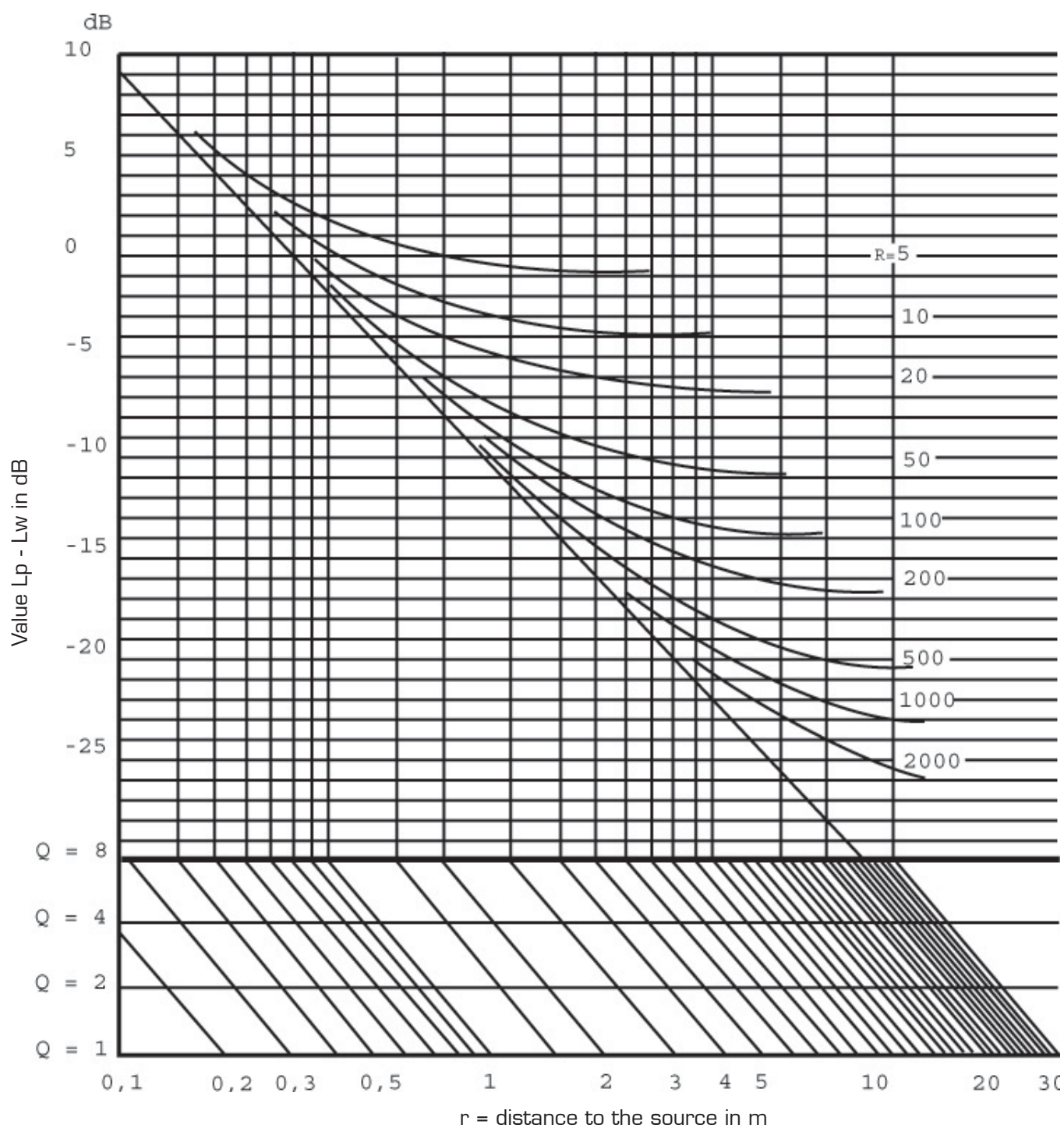
$$L_p = L_w + 10 \log (Q / (4 \pi r^2) + 4 / R)$$

NOTA:

- $Q / 4 \pi r^2$ represents the direct field
- $4 / R$ represents the reflected field

Graphic expression of the equation

$$L_p = L_w + 10 \log \left(\frac{Q}{4 \times \pi \times r^2} + \frac{4}{R} \right)$$



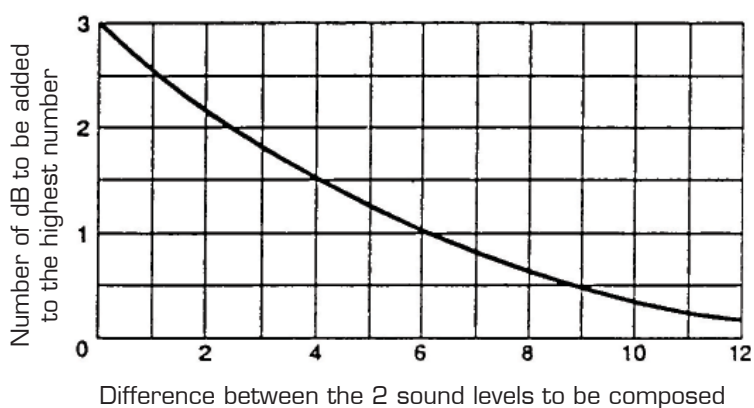
The attenuation decreases with distance in the direct field, but is constant in the reflected field.

Overall level - combination of a number of noises

Since decibels are not added in an arithmetical way, the following formula is used to find the overall level of a number of simultaneous noises :

$$L_p = 10 \times \text{Log} \sum 10^{(L_{pi} / 10)}$$

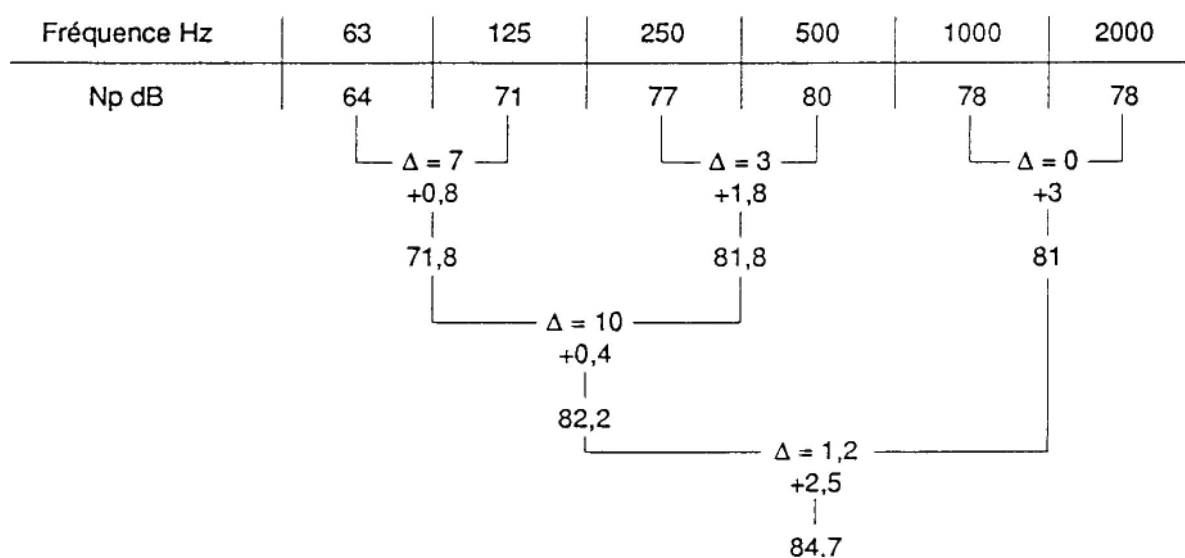
In practice, the following curve is used:



In the case of a number of noise sources having the same value:

$$L_p = L_{pi} + 10 \times \text{Log} (\text{number of sources})$$

Example :



I.e. an overall power level of 85 dB.

Efficiency of air filters: standards

The efficiency of filters is currently evaluated by methods based on very different principles. In the ASHRAE method, the «gravimetric» section relates to the volume of synthetic particles retained by the filter, while the «opacimetric» section relates to the projected surface of the natural particles retained. Most of the ASHRAE 52/76 method has been incorporated in the standard NF EN779 (X 44-012) which also includes the essentials of Eurovent recommendation 4/5. This standard classifies filters on the basis of 0.3 μm particles. The NF X 44-013 (CINa-flame photometry) and NF X 44-011 (fluorescence) standards should also be mentioned. The NF EN 1822 (X 44-014) is based on a measurement of the «most penetrating particle size» (MPPS).

The main standards currently used in Europe are produced by:

- AFNOR (France)
- ASHRAE (USA) (American Society of Heating Refrigerating and Air conditioning Engineers)
- EUROVENT (European Committee of Air Handling and Refrigerating Equipment Manufacturers)
- CEN (European Committee for Standardization)
- Mil. Standard (American military standards)



CEN european standards

In the European Union, air filters are divided «for administrative purposes» into 17 efficiency classes, as follows:

Air filters used in general ventilation NF EN 779 (X 44-012):

The test procedure for air filters used in general ventilation is based on the procedure established by ASHRAE (ASHRAE 52/76), later adopted as a Eurovent Recommendation (Eurovent 4/5), and on AFNOR NF EN 779 (X 44-012), differing only in certain details.

The filters are subjected to two types of test:

Gravimetric test: Standardized dust is injected upstream of the filter; the proportion by weight retained by the filter is then determined by weighing.

The operation is conducted on a new filter, and then at different stages of clogging, using an accelerated clogging procedure. The accepted filter efficiency (A_m) is the weighted mean efficiency calculated from the values found at different stages of clogging up to a final pressure drop of 250 Pa.

Notes:

1. The filter does not operate in normal conditions (accelerated clogging, concentrations by weight 700 times greater than atmospheric concentrations, test dust composition not representing the aerosol present in the atmosphere).
2. It is not possible to translate this weight-based (gravimetric) efficiency, measured with a synthetic dust, into spectral efficiency (Eurovent 4/9).
3. The displayed efficiency value (A_m) is greater than the initial efficiency found with a new filter.

Opacimetric test: Atmospheric air is used as the aerosol. The dust levels upstream and downstream of the filters is found by the dust spot method by sucking the air through a pad of very high efficiency white filter paper. The degrees of darkening upstream and downstream are compared by the opacimetric method and from this the «atmospheric dust spot efficiency» (opacimetric efficiency) of the filter is determined.

The operation is conducted on a new filter, and then at different stages of clogging, using an accelerated clogging procedure.

The accepted filter efficiency (E_m) is the weighted mean efficiency calculated from the values found at different stages of clogging up to a final pressure drop of 450 Pa.

Notes:

1. The filter does not operate in normal conditions (accelerated clogging)
2. This opacimetric efficiency cannot be translated into spectral efficiency (Eurovent 4/9).
3. The displayed efficiency value (E_m) is a mean value weighted for clogging, and is therefore greater than the initial efficiency found with a new filter.

EN 779 :2012 - Revision of the European standard for HVAC filters

The European Committee for Standardization (CEN) has introduced the EN 779:2012. This is a revision of the existing EN779:2002 already widely accepted as an international standard for filter classification.

The goal of this evolution is to address the problem of the 2002 version. It did not take in consideration the variation of the efficiency of the filter according to the stage of the service life.

Especially for filter with electrostatic charge, where over the time the charge diminish dramatically and then the filter is no longer at the stipulate level.

This revision 2012 has introduced a new value for F7 to F9; 'minimum efficiency' (ME) based on Minimum Efficiency defined at the lowest value of three different tests with 0.4 µm particles. Any air filters that do not meet the ME requirements will be automatically dropped one or more classes and even to new 'medium' classification.

Now there are three testing stages:

- Initial efficiency : New filter totally clean
- Discharged efficiency : New clean filter but immersed in solvent to remove all the electrostatic charge.
- Dirtying efficiency : Efficiency throughout the test's loading procedure.

The former F5 and F6 are not concerned by this rule then they have been renamed M5 and M6.

With this revision there are three new class description:

- G1 - G4 Coarse filters
- M5 -M6: Medium filters
- F7 - F9 Fine filters

The table below shows the EN 779:2012 classification and efficiencies.

Filter class	Final pressure drop (Pa)	Average arresstance (Am) of synthetic dust (%)	Average efficiency (Em) of 0.4 µm particles (%)	Minimum efficiency (ME) for 0.4 µm particles %
G1	250	$50 \leq Am \leq 65$	/	
G2	250	$65 \leq Am < 80$	/	
G33	250	$80 \leq Am < 90$	/	
G4	250	$90 \leq Am$	/	
M5	450	/	$40 \leq Em < 60$	
M6	450	/	$60 \leq Em < 80$	
F7	450	/	$80 \leq Em < 90$	35
F8	450	/	$90 \leq Em < 95$	55
F9	450	/	$95 \leq Em$	70

ENERGY LABEL (EUROVENT 4/11)

Since the 1st January 2013, all EUROVENT members have an an Energy label on their certified filters (G4-F9), from A to G (A being the best).

The energy rating system is calculated for filter partially dirty (Ashrae dust).

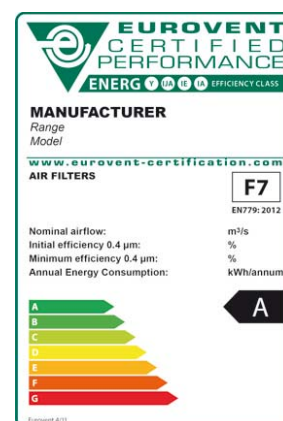
- 350g for G
- 250g for M
- 150g for F

Formula :

Energy consumption (kWh) =

Airflow (m³/s) x Pressure drop (Pa) x annual time (h)

Efficiency of the fan x 1000



Filter class	G4	M5	M6	F7	F8	F9
	Mg = 350g ASHRAE	Mm = 250g ASHRAE		Mf = 100g ASHRAE		
A	-> 600 Kwh	-> 650 Kwh	-> 800 Kwh	-> 1200 Kwh	-> 1600 Kwh	-> 2000 Kwh
B	-> 700 Kwh	-> 780 Kwh	-> 950 Kwh	-> 1450 Kwh	-> 1950 Kwh	-> 2500 Kwh
C	-> 800 Kwh	-> 910 Kwh	-> 1100 Kwh	-> 1700 Kwh	-> 2300 Kwh	-> 3000 Kwh
D	-> 900 Kwh	-> 1040 Kwh	-> 1250 Kwh	-> 1950 Kwh	-> 2650 Kwh	-> 3500 Kwh
E	-> 1000 Kwh	-> 1170 Kwh	-> 1400 Kwh	-> 2200 Kwh	-> 3000 Kwh	-> 4000 Kwh
F	-> 1100 Kwh	-> 1300 Kwh	-> 1550 Kwh	-> 2450 Kwh	-> 3350 Kwh	-> 4500 Kwh
G	> 1100 Kwh	> 1100 Kwh	> 1550 Kwh	> 2450 Kwh	> 3350 Kwh	> 4500 Kwh

Energy efficiency class for filter class (EN779) - For nominal airflow 3400 m³/h - 6000 h - Fan efficiency = 50%

EN 1822-1:2009 - Revision of the European standard for HVAC filters

To evaluate the efficiency of these filters this European standard has introduced a new methods based on particle counting. The goal was to cover most requirement of different applications.

This regulation include new method to test; leakage of H filters, using a solid instead of a liquid, classification of filters made out of membrane-type media or synthetic fiber media.

Class descriptions :

The filters previously named H10 to H12 do not need to meet a Local Value, then they have been renamed E10 to E12. During cleanroom design and to comply with ISO 14644 environments, you must consider that these filters have no Local value test.

- E10 – E12: Efficiency Particulate Air filters (EPA)
- H13 – H14: High Efficiency Particulate Air filters (HEPA)
- U15 – U17: Ultra Low Penetration Air filters (ULPA)

The table below shows classifications and their requirement:

Filter class	Integral value		Local value	
	Collection efficiency	Penetration	Collection efficiency	Penetration
	%	%	%	%
E10	85	15	-	-
E11	95	5	-	-
E12	99,5	0,5	-	-
H13	99,95	0,05	99,75	0,25
H14	99,995	0,005	99,975	0,025
U15	99,9995	0,0005	99,9975	0,0025
U16	99,99995	0,00005	99,99975	0,00025
U17	99,999995	0,000005	99,9999	0,0001

Integral / Local value ?

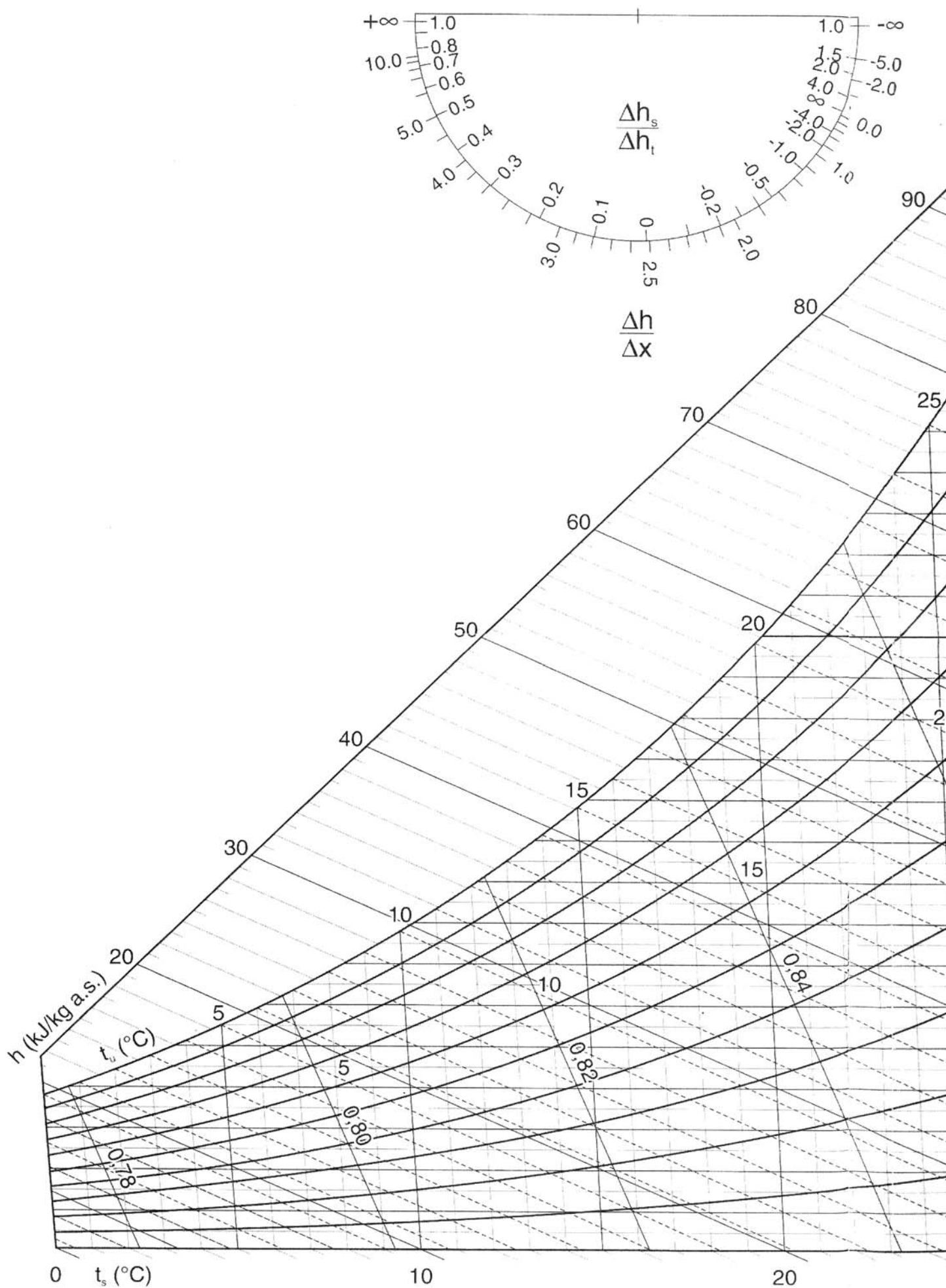
Integral value, because the test is done with aerosol probe moving over the entire surface of the filter.

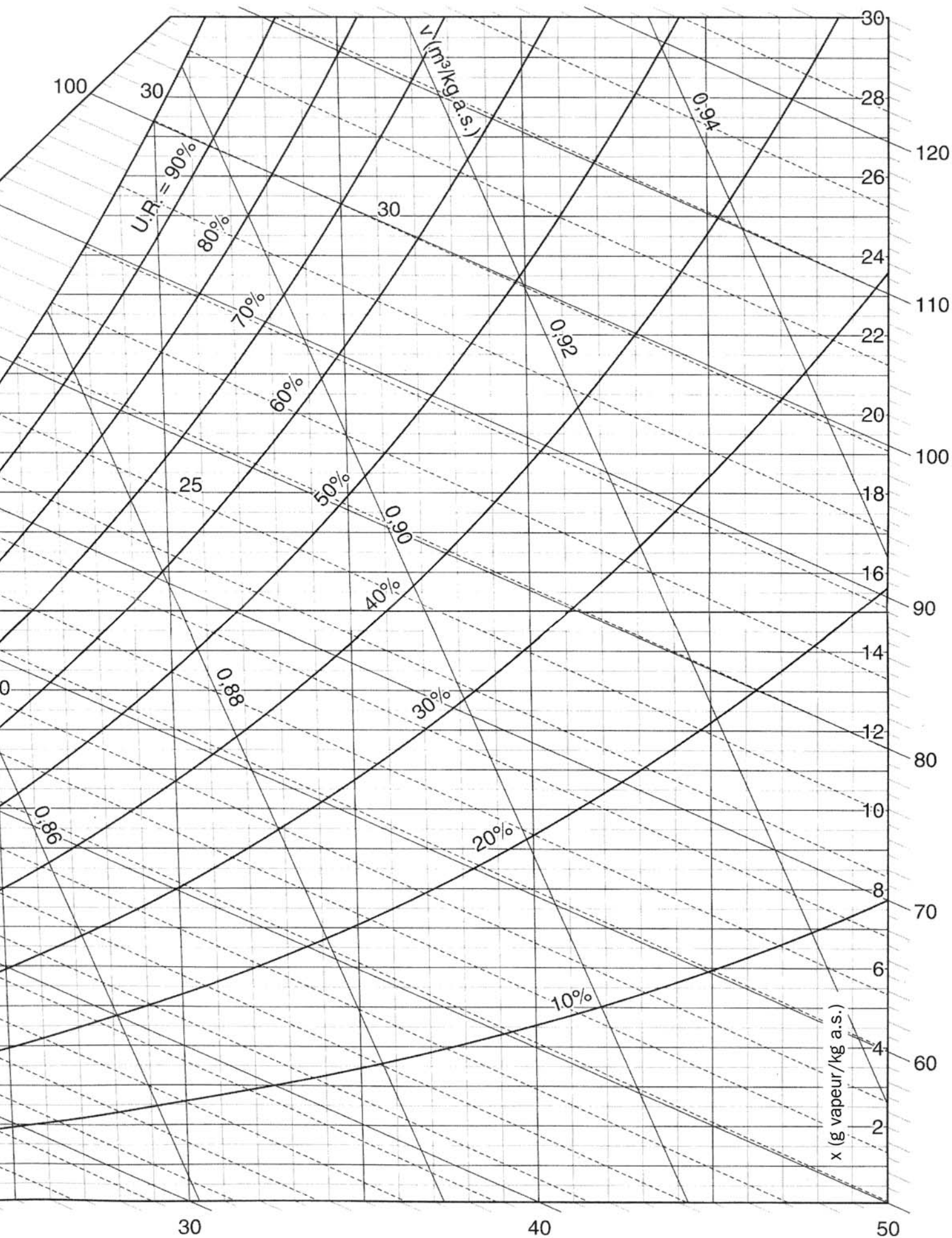
The overall efficiency calculation is based on the collection of many local value measurements.

The local value is the worst value get during this scanning.

Tests are performed at specified nominal volumetric air flow, with oil thread test for HEPA filter, with particle for ULPA filters.

Psychrometric diagram





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