Product catalogue 2011-2012

• • • Providing indoor climate comfort

Product catalogue 2011-2012

Content

LENNOX International

Through its subsidiaries 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 16,000 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 have a **vision**

To become Europe's principle manufacturer of heating and cooling equipment for commercial application by:

- Offering a comprehensive and superior product to **focused markets**
- Giving our customer superior **service** and application advice
- Developing products made of **passion** to serve a constantly changing market
- **Innovating** at every stage of our developments

Loyalty is based around true partnership

Your right Partner

LENNOX brings added-value to major players in Europe. Most of them have been our customers for 10 years and more.

- Understand **Customer perception** far beyond product or project
  - Key account organisation
  - Specialised 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 organisation is built around **customer satisfaction**
  - Strong customer service
  - Quality based organisation (ISO 9001, STEP+ programme)
  - Long-term satisfied relationships rather than «one shot» orders

Unlike any others ...

- Provide **solutions which best fit** customers needs
  - «Listen to the customer» to develop products
  - LENNOX International recognised «Research and Development Excellence»

- Be a **UNITED organisation**
  - Environment focus (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.

EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

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 wiht our customers.

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.

All our manufacturing centres of excellence are equipped with state of the art laboratories. This enables LENNOX to test products in all conditions to reach the highest level of reliability possible.

The laboratories are used with new product development and advanced research where new concepts are constantly tested.

- The laboratory at the **DIJON-LONGVIC** site **is unique in Europe**. It is the only laboratory capable of testing rooftop packages up to 250 kW. With an area of 250 m^2, the two climatic chambers are equipped with an AMCA air measurement tunnel with 4 air handling units (108,000 m^3/h) and 5 liquid chillers (610 kW).

- The **BURGOS** factory laboratory, allows the development of air conditioning products to be accurately tested. Any new product launched on the market has to undergo a series of strict tests.

- A high-tech test bay is operating in the LENNOX **LYON-MIONS** factory. This new equipment is used to test and adjust packaged chillers up to 500 kW. This test bay is paramount in the development of new chillers, with the addition of new components and new technologies.

- This LENNOX European laboratory network is complemented by LENNOX **USA** high standard laboratory centre. One of the most advanced research centres in our industry, with 12,000 m^2, 8 climatic chambers, corrosion lab, sound laboratories, wind test system, vibration platform and the famous «torture chamber» where units receive accelerated life test.

These laboratories demonstrate the significance for LENNOX Europe on innovation, reliability, improvement and Eurovent certification of equipment.

New models ...

Chillers and heat pumps

ECOLEAN™

Air/Water Liquid Chiller & Heat-pump:
20 ➔ 200 kW

- High efficiency with R410A & eDrive™
- Very low noise operation
- R410A scroll compressors
- Latest generation of OWLET™ fans
- Advanced CLIMATIC™ control
- Unit with pump & buffer tank (option)
- eDrive™ variable water flow option

Chilled water cassettes

ARMONIA™

1,3 – 11kW
300 – 1900m³/h

- Two versions 600x600 or 800x800
- 2 or 4 pipes
- 2 or 3 ways control valves
- Electric heater
- EC fan
- Fresh air kit
- Infrared remote control
- Metallic diffuser
- Stand alone control, Master/Slave card

BALTIC™

Air-to-air heat pump rooftop packaged unit: 20 ➔ 85 kW

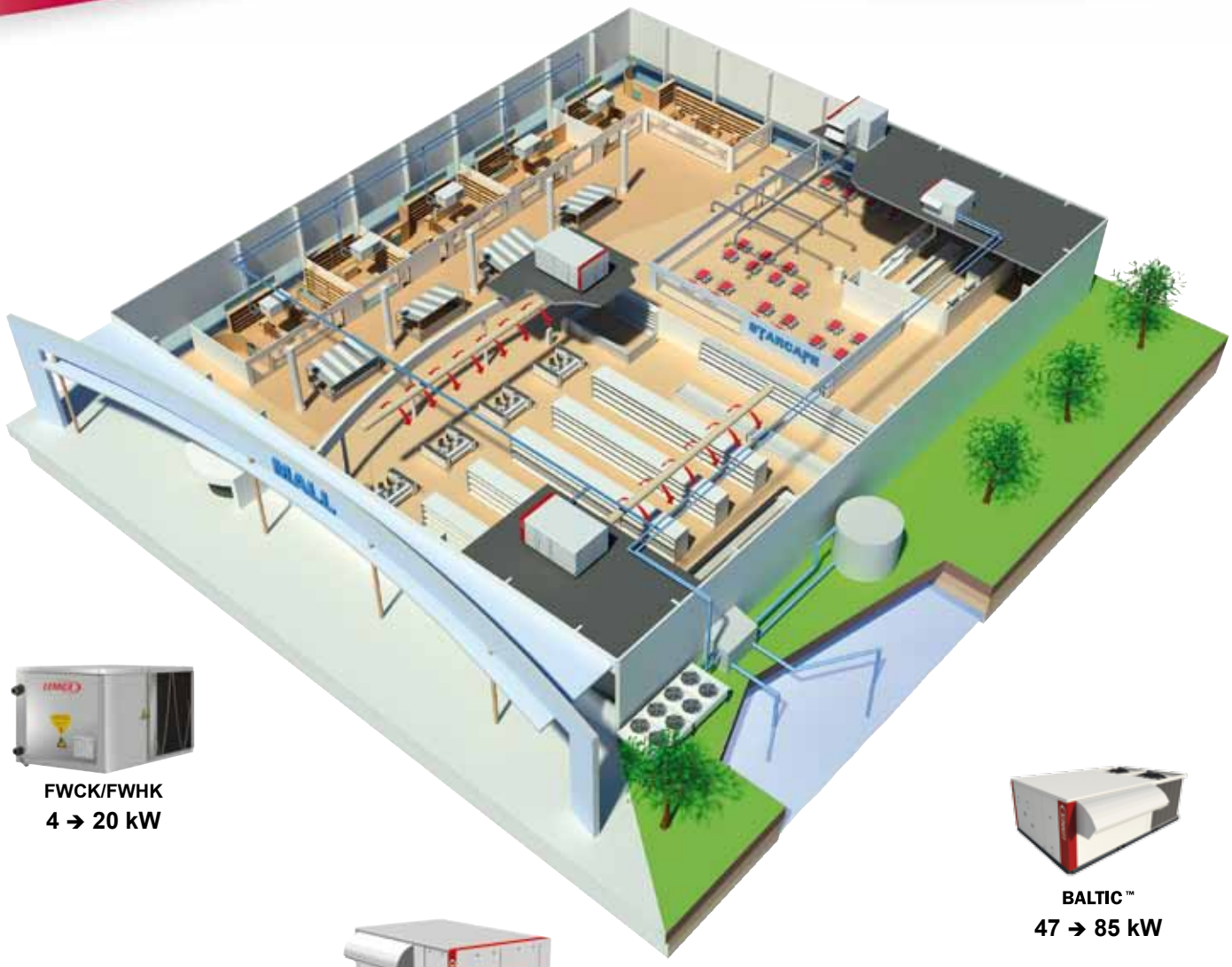
- Best life cycle cost through high energy efficiency, optimized set-up time and maintenance costs
- Class “A” efficiency
- Advanced refrigeration circuit
- eDrive™ variable speed direct transmission fan
- Advanced control CLIMATIC™ 60
- Precise fresh air and free cooling management
- Energy recovery solutions

FLEXY™ EC

High efficiency Rooftop for long lasting energy savings: 85 ➔ 234 kW

- Guarantied sustainable performance with eDrive™ variable speed direct transmission
- Advanced refrigeration circuit
- CLIMATIC™ advanced controller
- Intelligent fresh air and free cooling control
- Energy recovery solutions
- Light corrosion resistant aluminium casing

Leadership in Retail Solutions



FWCK/FWHK
4 → 20 kW

BALTIC™
47 → 85 kW

FLEXY™
95 → 196 kW

Ikea
(Portugal)

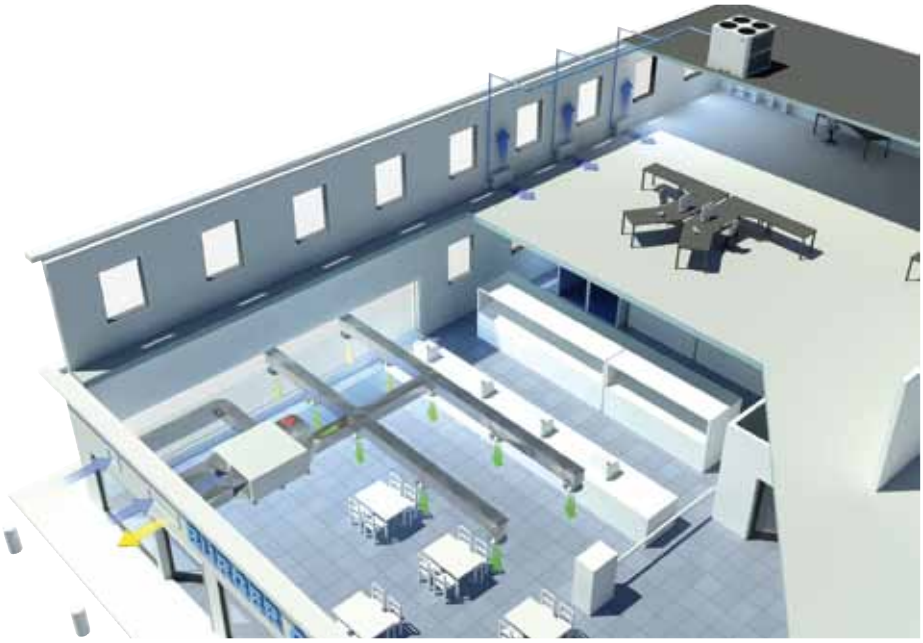
Weldom
(France)

Asda
(UK)

Géant Casino
(France)

Competences in Light Commercial Solutions

BALTIC™
20 → 85 kW



ECOLEAN™
9 → 200 kW

COMFAIR™
1 → 61 kW

FLATAIR™
10 → 28 kW

COMPACTAIR™
20 → 100 kW

AIRCOOLAIR™
19 → 134 kW

Zara
(Spain)

Esso
(Germany)

Quick
(France)

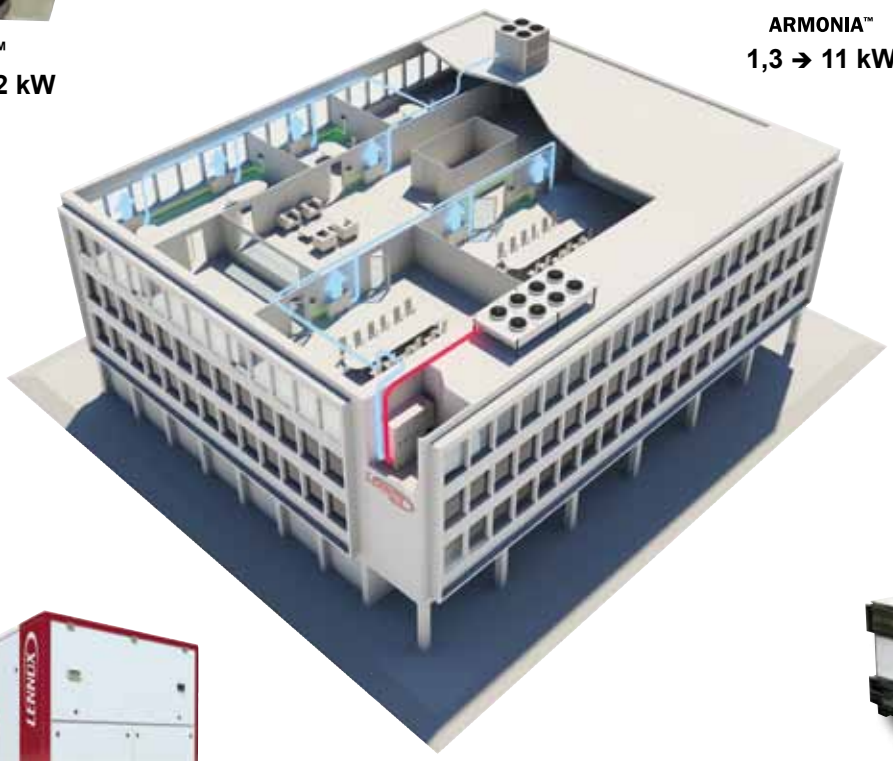
Maxi Dia
(Spain)

Innovations for Applied Solutions

ARIA™
1,2 → 7,2 kW

ARMONIA™
1,3 → 11 kW

COANDAIR™
0,8 → 5,1 kW



COMFAIR™
1 → 61 kW

CHILLERS & HEAT PUMPS
9 → 1000 kW

CLEANAIR™ 23LX
1 000 → 100 000 m³/h

MINIAIR™ & MINIAIR™+
2 → 44 kW

Torre Mutua
(Spain)

Holmes Place
(Portugal)

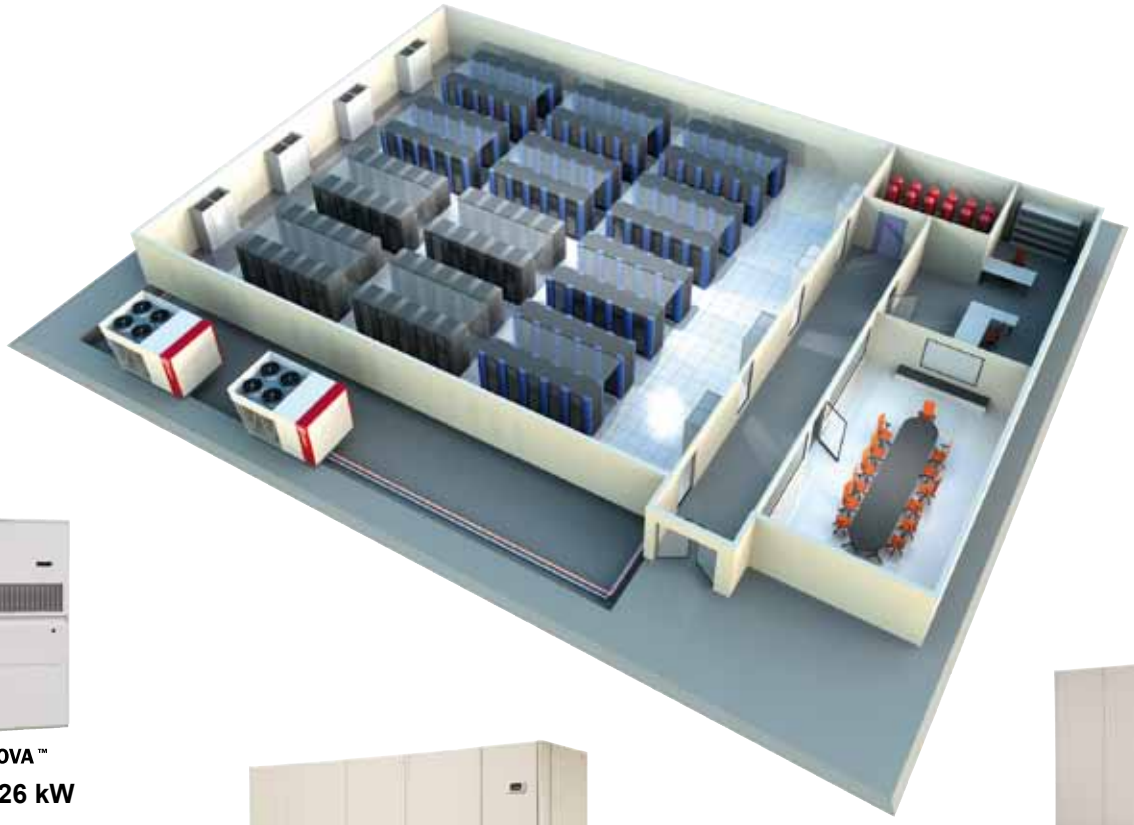
Tour de Lille
(France)

RBS
(UK)

Technopark
(Russia)

Monsanto
(Portugal)

Know-how in Tele/Data Communication Solutions



@DNOVA™
2,5 → 26 kW

INNOV@™
CHILLED WATER
8 → 128 kW

INNOV@™
DIRECT EXPANSION
6 → 125 kW

Atos Origin

kpn

TelecityGroup
where content meets connectivity

Rabobank

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:

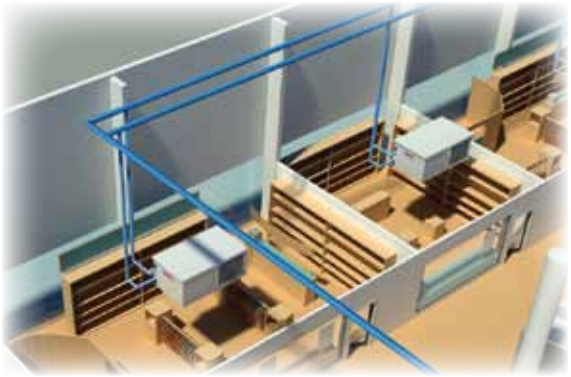
- Alcatel
- Auchan
- Axima
- Carrefour
- Cegelec
- City Facilities
- Cofacthec
- Dalkia
- Elyo Suez
- Ikea
- Johnson Control
- Jtek
- Mc Donald’s
- Veolia
- and more ...

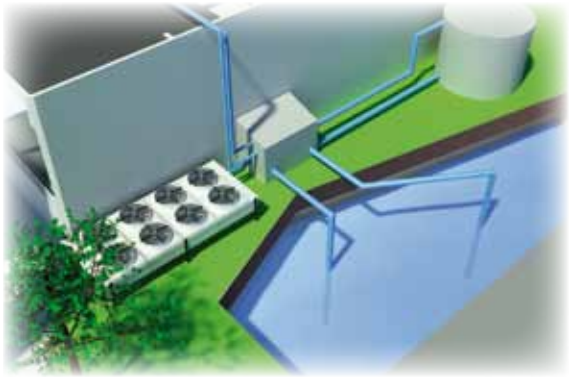
Packaged Air units

Providing indoor climate comfort

FWCK/FWHK . 4 → 20 kW

Horizontal water cooled packaged air conditioners



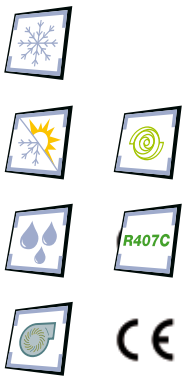


Main applications

- Stores in Shopping Gallery
- Small Offices in Building with Water Loop
- Medium & Large premises with zoning requirements

Why this choice?

- Independent Consumption & Maintenance in common building
- Optimize the floor space available: ceiling installation
- High efficiency solution
- Multispeed airflow
- Compact solution



General description

FWCK is a HVAC packaged unit made to regulate Cooling and Heating comfort requirement of **small locals integrated in large building.**
It is generally connected to water loop cooled by Dry-Coolers or Cooling Towers, although it can be part of a geothermal installation.
It exists in the following version:

- Horizontal design
- Cooling only
- Heat Pump

Main components

- Ductable Supply with Centrifugal fan
- High Quality Brazed plate Stainless steel plate heat exchanger
- Remote Control with ambient sensor
- Weekly programmer
- Galvanized steel sheet casing, non painted
- Ceiling fixtures
- Modular fan discharge position on site: side or front

Options

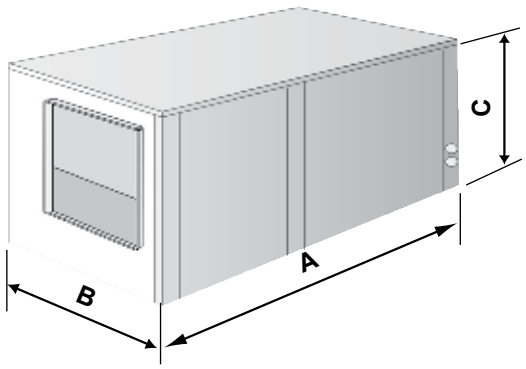
- Electrical heater
- Hot water coil
- Flow switch
- Water filter
- Presostatic valve (FWCK only)
- Low noise compressor jacket
- Main switch (up size 08)
- Return lock for the three phases models
- Return sensor
- Airflow configuration

General data

FWCK/FWHK		4	6	7	8	10	10	12	16	22
Cooling mode										
Cooling capacity (1)	kW	4	5,7	7,3	8,4	10,2		13	14,9	20,1
EER		3,57	3,8	3,78	3,53	3,74		3,75	3,48	3,4
Heating mode										
Heating capacity (2)	kW	5,7	7	8,6	10,4	12,3		15	18,5	24,5
COP		4,01	4,07	3,87	3,78	3,9		3,83	3,83	3,68
Electrical data										
Voltage	V/Ph/Hz	230/1/50					400/3/50			
Maximum power	kW	1,59	2,63	3,23	3,86	4,51		5,53	6,61	8,7
Refrigerant circuit data										
Compressors type		Rotary	Scroll							
Number of compressors		1								
Water cooled condenser data										
Nominal water flow	l/h	713	1019	1307	1505	1829		2340	2664	3618
Water pressure drop - Cooling	kPa	16	35	61	83	45		75	35	72
Water pressure drop - Heating	kPa	17	35	64,5	87,6	47,5		78,8	38,1	75,9
Centrifugal fan										
Minimum airflow	m^3/h	450	600	800	1000	1200		1500	1800	2250
Maximum airflow	m^3/h	1050	1550	1400	2350	2250		3100	3100	4500
Maximum available static pressure (3)	Pa	80	140	100	120	100		120		210
Acoustic										
Sound pressure level - Cooling (low/high speed)(4)	dB(A)	44/47	42/49	44/45	51/52	49/50		47/50	46/49	-/56,5
Sound pressure level - Heating (low/high speed)(4)	dB(A)	44/47	47/49	44/45	51/52	50/50		47/50	46/49	-/56,5

(1) Air inlet temperature : 27°C DB/19°C WB - Water inlet temperature : 30°C - With nominal water flow.
(2) Air inlet temperature : 20°C DB - Water inlet temperature : 20°C - With nominal water flow.
(3) For minimum airflow
(4) Measured at 2 meters from the unit

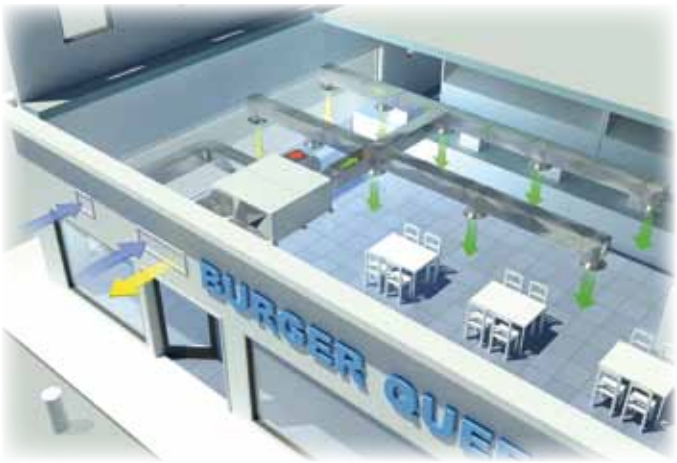
Physical data



FWCK/FWHK		4	6	7	8	10	12	16	22
A	mm	792	792	792	1083	1083	1503	1503	1503
B	mm	492	492	492	623	623	703	703	703
C	mm	440	440	440	465	465	505	505	505
Weight (cooling / heating)	kg	54/56	75/77	78/80	101/103	104/106	147/150	155/158	168/171

FLATAIR™ · 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

- Ductable Supply & Condenser
- Centrifugal fans at condenser up to 160 Pa
- Centrifugal supply fan
- Scroll compressor
- Remote Thermostat with ambient sensor
- Galvanized steel sheet casing
- Protection grill at Compressor section

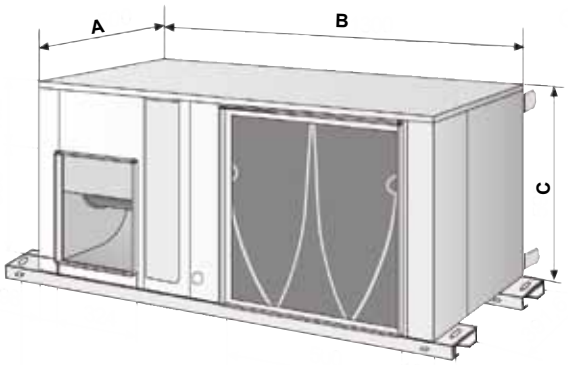
General data

FLATAIR™	FLCK / FLHK	10	10	12	16	22	24	28	30
Cooling mode									
Gross Cooling capacity (1)	kW	10,2		12,2	16,2	20,8	23,4	27,7	29,5
Gross EER		2,77		2,67	2,53	2,57	2,59	2,66	2,41
Power input	kW	3,68		4,57	6,4	8,1	9,0	10,4	12,2
Heating mode									
Net Heating capacity (2)	kW	10		12	15,5	20,2	22,5	27	28,7
Net COP		3,16		2,92	2,77	3,01	2,62	2,93	2,79
Power input	kW	3,16		4,11	5,6	6,7	8,6	9,2	10,3
Electrical data									
Voltage	V/Ph/Hz	230/1/50	400/3/50						
Refrigerant circuit data									
Number of circuits		1							
Number of compressors		1							
Refrigerant charge Cooling only - Monobloc	kg	2,24		2,56	3,55	5	6,7	7	
Refrigerant charge Heat pump - Monobloc	kg	2,62		2,92	4	5,5	7,5	8	8,2
AIR TREATMENT SECTION	**LFXO / LFCK / LFHK**	**10**	**10**	**12**	**16**	**22**	**24**	**28**	**30**
Capacity									
Absorbed power	kW	0,38			0,9	1,3	1,35		
Electrical data									
Voltage	V/Ph/Hz	230/1/50			400/3/50				
Ventilation									
Minimum airflow	m^3/h	1500		1650	2400	3200	4000	4250	4500
Maximum airflow	m^3/h	2350		2300	3700	5350	6300	6000	6000
Maximum available static pressure	Pa	120		110	160	180	240	200	180
Acoustic									
Sound power level (3)	dB(A)	65			69	80	83	81	81
CONDENSING UNIT	**KFCK / KFHK**	**10**	**10**	**12**	**16**	**22**	**24**	**28**	**30**
Absorbed power									
Absorbed power - cooling mode (1)	kW	3,30		4,19	5,50	6,79	7,67	9,05	10,9
Absorbed power - heating mode (1)	kW	2,78		3,73	4,7	5,44	7,25	7,85	8,97
Electrical data									
Voltage	V/Ph/Hz	230/1/50	400/3/50						
Ventilation									
Minimum airflow	m^3/h	2350		2400	3750	4350	4500	5000	5250
Maximum airflow	m^3/h	3500		3400	4950	5900	6600	6400	
Available static pressure	Pa	100		90	120	150	160	120	100
Acoustic									
Sound power level (3)	dB(A)	69			73	80	81	80	80
Operating limits (cooling only / heat pump)									
Maximum inside temperature	°C	32 / 27							
Minimum inside temperature	°C	21 / 15							
Maximum outside temperature	°C	45 / 24							
Minimum outside temperature (4)	°C	19/-10				0/-10			

(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
(4) For models 10, 12 and 16, temperature 0°C with «All-Season Kit (ON/OFF)»
FLATAIR™ is part of AC1/AC2 Eurovent Certification Programs (www.eurovent-certification.com)

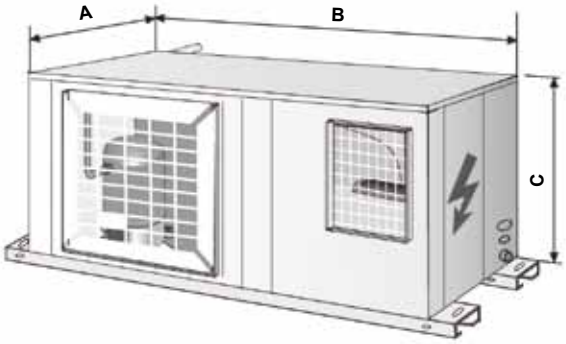
Physical data

Air treatment section



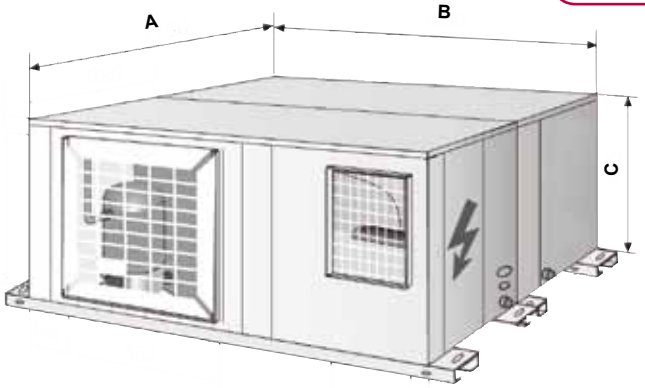
AIR TREATMENT SECTION	LFXO / LFCK / LFHK	10	12	16	22	24	28	30
A	mm	430	430	500	620	775	775	775
B	mm	1250	1250	1300	1450	1500	1500	1500
C	mm	495	495	595	595	645	645	645
Weight	kg	70	70	100	130	140	150	150

Condensing unit



CONDENSING UNIT	KFCK / KFHK	10	12	16	22	24	28	30
A	mm	820	820	830	900	1025	1025	1025
B	mm	1250	1250	1300	1450	1500	1500	1500
C	mm	495	495	595	595	645	645	645
Weight (cooling / heating)	kg	130/135	135/140	180185	195/200	265/270	275/280	280/285

Monobloc unit



MONOBLOC UNIT	FLCK/FLHK	10	12	16	22	24	28	30
A	mm	1250	1250	1330	1520	1800	1800	1800
B	mm	1250	1250	1300	1450	1500	1500	1500
C	mm	495	495	595	595	645	645	645
Weight (cooling / heating)	kg	200/205	205/210	280/285	325/330	405/410	425/430	430/435

Options

Auxiliary heating

- Electrical heater (1 stage): Add an auxiliary heating stage to heat pump or cooling units. 2 sizes available on each model
- Hot water coils: Add an auxiliary heating stage to heat pump or cooling units. 2 rows available on each model.

Architectural Integration

- External air filter equipment: Air filter for the condensing unit. This allows the condensing coil to be kept clean, especially when the unit is installed in dirty and polluted environments such as city centres or industrial areas.
- Outdoor installation kit: This option equips the FLATAIR™ with extra casings, hoods and air filters to protect it from rain and dust when the unit is installed outdoor.
- Sound muffler: This option is installed on the exhaust air duct and helps to reduce the noise level of the condensing unit. The sound muffler is particularly recommended when the condensing exhaust air is freely discharged

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

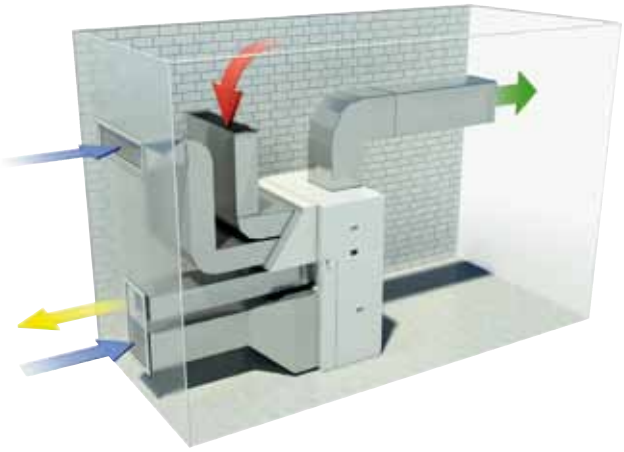
- Three phase protection: Electrical circuit protection to avoid wrong wiring of 400 volts power supply. This protects the compressor on 1st start.
- Crankcase heater (cooling only): The crankcase heater heats the Compressor oil when the Outdoor temperature is low and the unit is not operating. This is a safety measure to ensure that the compressor is lubricated on start-up.
- 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.
- Hot gas by-pass valve: FLATAIR™ can operate in cooling mode down to -10°C outdoors.
- Programmable thermostat: Control display that includes a weekly program for more comfort. The controller can program 4 stages in 6 periods a day.
- Remote ON/OFF: Remote switch to start and stop the unit manually.

COMPACTAIR™ · 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
- Freecooling operation & Fresh Air management
- Low noise
- Flexibility
- Best efficiency on the market

General description

COMPACTAIR™ can be used for **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
- Dual Split with Supply sections operating independently for zoning function
- Cooling only & Heat Pump
- Economizer with multiple airflow configuration

Main components

- Vertical construction with small footprint
- Centrifugal fans in supply section with up to 550 Pa ESP
- Centrifugal fans in Outdoor section
- Scroll Compressors
- Galvanized Sheet steel casing
- Filtration G4 and G4/F7
- Voltage 400 / 3 + N / 50
- RAL 9002 white colour

Control

All units are equipped with:

- Dynamic Defrost control
- Dynamic Set Point
- Time Schedule programmer

2 control platform with exclusive LENNOX Air-to-Air software are used ont he whole range:

- **CLIMATIC™ 40:** integrated service display and remote comfort display
- **CLIMATIC™ 50** control for advanced comfort & communication devices: Master-Slave, Multi-Unit display, BMS communication or LENNOX **ADALINK™** Supervision.
- Advanced default analyse, enthalpy and humidity control (optional), CO_2 level control (optional), Stepped and Modulating auxiliary heaters
- Low Noise control option reducing the noise level down to 9 dB(A)
- Top of the art «Dirty filter airflow control»: keep the comfort optimum all along the filter lifecycle.

General data

COMPACTAIR™		20S	25S	30S	35S	40S	45D	55D	70D	85D	100D
Monobloc	CMC / CMH										
Split	CSC/CSH - CIC/CIH										
Dual Split	CDC / CDH - 2x CIC/CIH							2x30S	2x35S	2x40S	

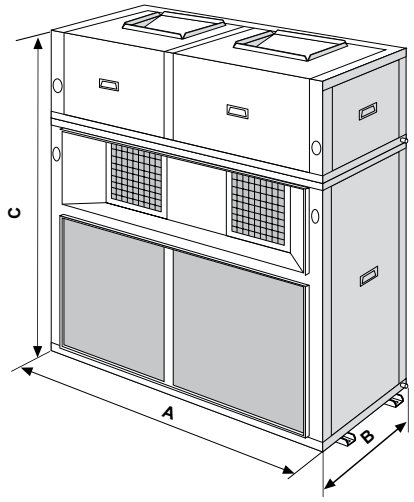
COMPACTAIR™		20S	25S	30S	35S	40S	45D	55D
Cooling CMC/ CSC + CIC - CMH / CSH + CIH								
Gross Cooling capacity	kW	19,6	25	28	36	42	48	58
Gross EER		2,7	2,7	2,5	2,6	2,6	2,6	2,7
Power input	kW	7,3	9,2	11,0	13,7	15,9	18,8	21,5
Heating CMH / CSH + CIH								
Net heating capacity	kW	19,3	25	29,5	36	42	49,5	59
Net COP		2,9	2,9	2,75	2,9	3	2,85	2,9
Net power input	kW	6,66	8,62	10,7	12,4	14	17,4	20,3
Electrical heater capacity - Standard (1)	kW	10	10	10	15	15	15	20
Electrical heater capacity - Medium (2)	kW	15	15	15	20	20	20	27
Electrical heater capacity - High (3)	kW	20	20	20	27	27	27	40
Hot Water Coil capacity (4)	kW	31	38	40	56	61	66	91
Refrigerant circuit								
Nr of compressors - Nr of circuits		1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	2 / 2	2 / 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
Air treatment ventilation								
Minimum airflow	m³/h	3150	4250	4650	6200	6950	7950	9950
Maximum airflow	m³/h	4100	5500	6000	8050	9050	9750	12850
Maximum available static pressure	Pa	483	550	535	548	602	589	689
Condensing unit ventilation								
Nominal airflow	m³/h	7600	8500	10000	12000	11700	14000	10000
Maximum available static pressure	Pa	178	223	272	209	205	237	299
Acoustic								
Outdoor blower outlet sound power on standard unit (Lw)	dB(A)	80	83	86	84	84	88	87
Outdoor blower outlet sound power on Low Noise unit (Lw)	dB(A)	73	74	77	75	75	78	78
Radiated sound power level in room on standard monobloc unit (Lw)	dB(A)	75	77	80	78	80	82	82
Radiated sound power level in Room on Low Noise unit (Lw)	dB(A)	74	74	77	76	77	80	78
Indoor blower outlet sound power level (Lw)	dB(A)	73	78	80	80	83	86	80

COMPACTAIR™		70D	85D	100D	55D	70D	85D
Cooling		CMC/ CSC + CIC CMH/ CSH + CIH			CDC + 2 x CIC CDH + 2 x CIH		
Gross Cooling capacity	kW	72	87	105	58	72	87
Gross EER		2,6	2,7	2,6	2,7	2,6	2,7
Power input	kW	27,8	32,5	40,4	21,5	27,8	32,5
Heating		CMH/ CSH + CIH			CDH + 2 x CIH		
Net heating capacity	kW	69,5	81	101	59	69,5	81
Net COP		2,8	2,85	2,85	2,9	2,8	2,85
Net power input	kW	24,8	28,4	35,4	20,3	24,8	28,4
Electrical heater capacity - Standard	kW	20	20	27	20	20	20
Electrical heater capacity - Medium	kW	27	27	40	27	27	27
Electrical heater capacity - High	kW	40	40	50	40	40	40
Hot Water Coil capacity (1)	kW	105	113	171	40	56	61
Refrigerant circuit							
Nr of compressors - Nr of circuits		2 / 2	2 / 2	3 / 2	2 / 2	2 / 2	2 / 2
Refrigerant charge per circuit (approximate)	kg	8,86 + 8,86	10,33 + 10,33	15,2 + 10,56	7,14 + 7,14	8,86 + 8,86	10,33 + 10,33
Air treatment ventilation							
Minimum airflow	m³/h	12450	14000	17350	2 x 4650	2 x 6200	2 x 6950
Maximum airflow	m³/h	15090	16725	22450	2 x 6000	2 x 8050	2 x 9050
Maximum available static pressure	Pa	662	636	606	2 x 535	2 x 548	2 x 602
Condensing unit ventilation							
Nominal airflow	m³/h	10500	11000	15500 + 11700	10000	10500	11000
Maximum available static pressure	Pa	272	277	239 + 201	299	272	277
Acoustic							
Outdoor blower outlet sound power on standard unit (Lw)	dB(A)	88	89	92	87	88	89
Outdoor blower outlet sound power on Low Noise unit (Lw)	dB(A)	79	80	83	78	79	80
Radiated sound power level in Room on standard monobloc unit (Lw)	dB(A)	82	83	-	-	-	-
Radiated sound power level in Room on Low Noise unit (Lw)	dB(A)	80	81	-	-	-	-
Indoor blower outlet sound power level (Lw)	dB(A)	85	87	85	2 x 80	2 x 80	2 x 83

(1) 20°C air inlet, Water temperature – 90-70°C
COMPACTAIR™ is part of AC2/AC3 Eurovent Certification Programs (www.eurovent-certification.com)

Physical data

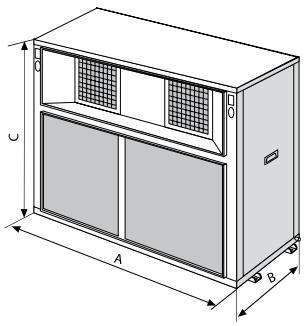
Monobloc unit



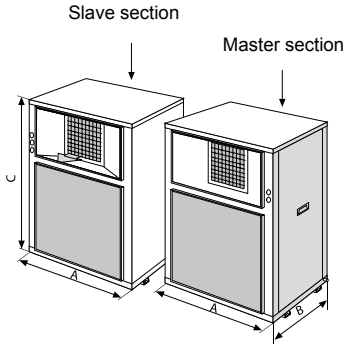
COMPACTAIR™	CMC/CMH	20S	25S	30S	35S	40S	45D	55D	70D	85D
A	mm	1195			1445			2251		
B	mm	840			960			956		
C	mm	2050			2145			2145		
Operating weight (standard unit) (1)	kg	376	412	424	516	539	630	785	831	883

Condensing unit

Sizes 20S to 85D



Sizes 100D

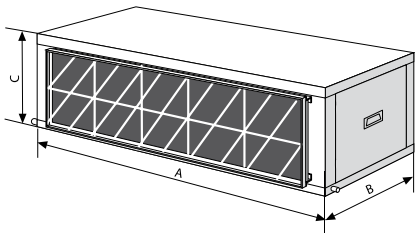


CONDENSING UNIT	CSC/CSH CDC/CDH	20S	25S	30S	35S	40S	45D	55D	70D	85D	100D
A	mm	1194			1445			2251			2890
B	mm	745			870			867			870
C	mm	1410			1410			1410			1410
Operating weight approx. (1)	kg	262	295	302	357	370	448	529	554	586	870

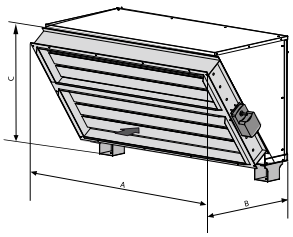
(1) Heat pump

Physical data (Cont'd)

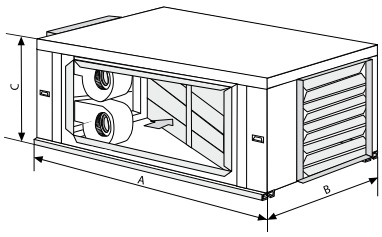
Air treatment section



AIR TREATMENT SECTION	CIC/CIH	20S	25S	30S	35S	40S	45D	55D	70D	85D	100D
A	mm	1195			1445			2250			2900
B	mm	840			960			956			1135
C	mm	645			740			740			1140
Operating weight approx. (1)	kg	108	111	115	150	160	170	242	259	276	470

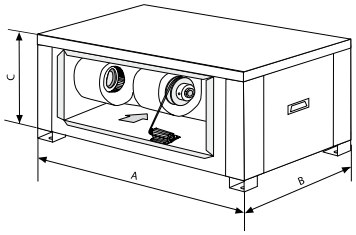


Sizes 20S to 45D



Sizes 55D to 100D

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



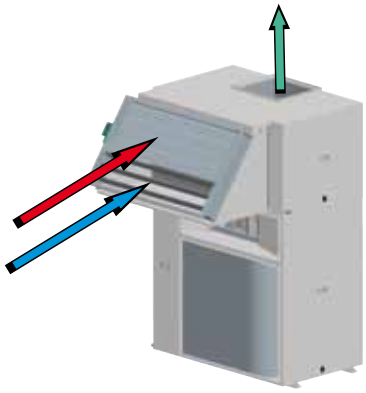
COMPACTAIR™	CMC/CMH	55D	70D	85D	100D
RETURN FAN	**CIC/CIH**	**55D**	**70D**	**85D**	**100D**
A	mm	2250			2900
B	mm	650			700
C	mm	735			1140
Operating weight approx.	kg	310	310	310	420

Operating limits

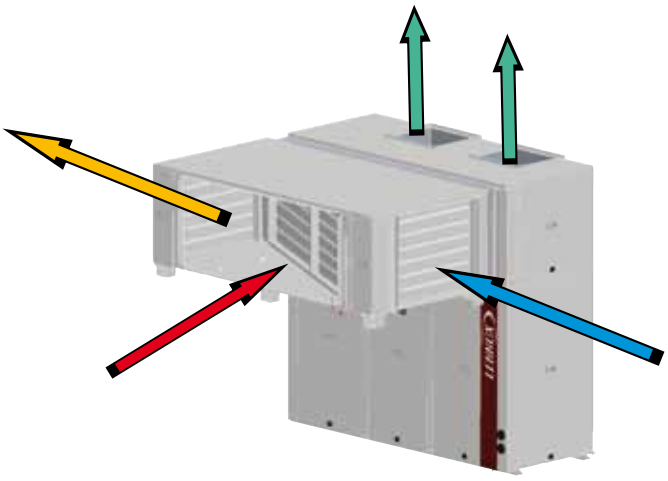
OPERATING LIMITS		
Maximum Outdoor temperature in cooling mode	°C	+45 °C (020-025-030-045-055) ; 47°C (035-040-070-085-100)
Minimum Outdoor temperature in cooling mode	°C	+15°C / down -15°C with Winter Cooling operation options
Minimum Outdoor temperature in heating mode	°C	-12°C with in 20°C indoor temperature

Principle sketch

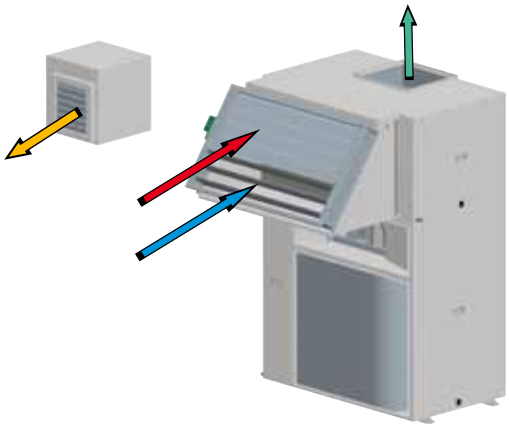
With Economizer Sizes 20S to 45D



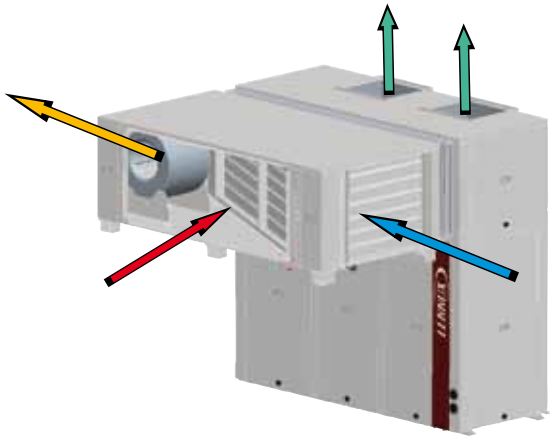
With Economizer Sizes 55D to 100D



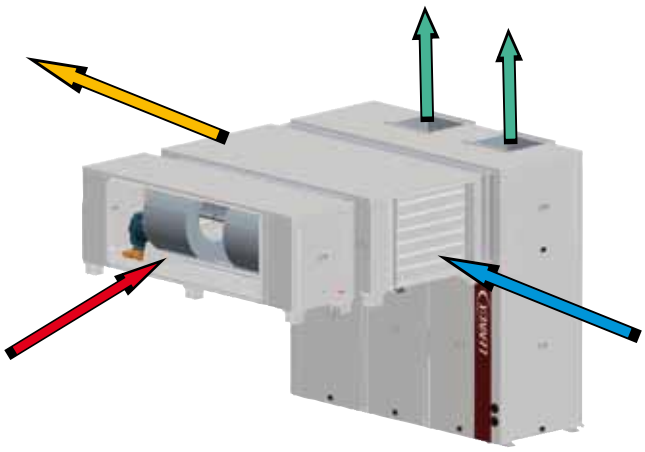
With Exhaust fan Sizes 20S to 45D



With Exhaust fan Sizes 55D to 100D



With Return fan Sizes 55D to 100D



⇨	Fresh air
⇨	Return air
⇨	Exhaust air
⇨	Supply air

Options

Fresh air

- **Free cooling:** The use of an economiser is the most efficient way to reduce ruining costs by using «Free cooling» when appropriate.
- **Fresh Air Management:** The Economiser 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 CO_2 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™ 50 advanced control.

Control

- **Air sock control:** Soft start control of supply fan allows the air socks to be progressively filled with air on start up.
- **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:** 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 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.

Control & Communcation

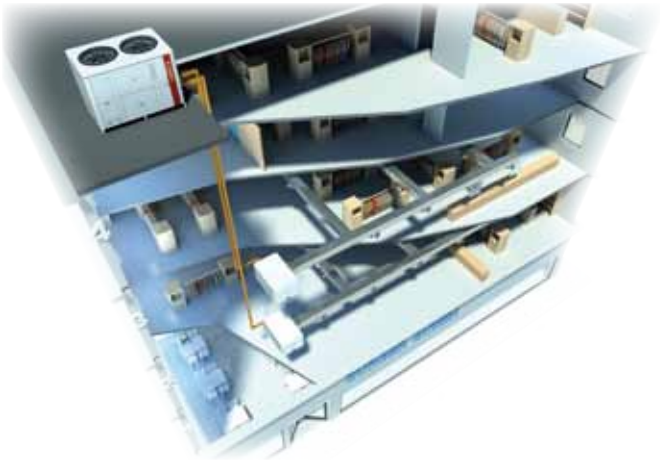
- **Advanced control pack:** thanks to specific CLIMATIC™ 50 algorithm and sensors, this pack provides two advanced control features: Enthalpy control on economiser and humidity control.
- **Modbus Communication:** This board is a Modbus interface, which is needed for anyone who would like a BMS system 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.
- **TCB Thermostat Control Board:** It provides various logical dry contact inputs to be able to take over the control of the unit. The CLIMATIC™ 50 will stay in charge of all safety algorithms, defrost and free cooling operation.
- **ADALINK™ Distant monitoring:** ADALINK™ is LENNOX answer to HVAC installation monitoring. It can control up to 32 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™ can be used locally, via LAN network or remotely via modem.
- **DC 50 Comfort display:** remote control for non-technical users. It was designed to fit aesthetically in the room and be very easy to use. With DC50, 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 50 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 50 Multi unit display:** this has the exact same features of the DC50 and can it can handle up to 12 units on a single Bus.
- **BE 50 extension board:** additional analogic and digital input and output for the CLIMATIC™ 50.

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 salin or polluted environment.

AIRCOOLAIR™ · 19 ➔ 134 kW

Large ducted split / dual split units



Main applications

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

Why this choice?

- Can be installed when the roof access is complicated
- Freecooling operation & Fresh Air management
- Packaged unit, integrating HVAC equipment and control
- Dual split on large capacity requirements reduce ventilation power input
- Low noise

General description

AIRCOOLAIR™ 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:

- Monosplit
- Dual Split with Supply sections operating independently
- Cooling only & Heat Pump
- Freecooling

Main components

- Centrifugal fans in supply section with up to 550 Pa ESP
- Axial fans in Outdoor section
- Scroll Compressors
- Galvanized Sheet steel casing
- Filtration G4 and G4/F7
- Voltage 400 / 3 + N / 50
- RAL 9002 white colour

Control

All units are equipped with:

- Dynamic Defrost control
- Dynamic Set Point
- Time Schedule programmer

2 control platform with exclusive LENNOX Air-to-Air software are used ont he whole range:

- **CLIMATIC™ 40:** integrated service display and remote comfort display
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- Advanced default analyse, enthalpy and humidity control (optional), CO_2 level control (optional), Stepped and Modulating auxiliary heaters

General data

AIRCOOLAIR™		20S	25S	30S	35S	40S	45D	55D	70D	85D	100D	120D	140D
Split	ASC/ASH - CIC/CIH												
Dual Split	ADC / ADH - 2x CIC/CIH						2x25S	2x30S	2x35S	2x40S	80+40/42	70+40/42	

AIRCOOLAIR™		20S	25S	30S	35S	40S	45D
Cooling ASC + CIC - ASH + CIH							
Gross Cooling capacity	kW	19,9	24,2	27,9	36,5	41,9	48,7
Gross EER		2,96	2,86	2,84	2,94	2,85	2,86
Power input	kW	6,72	8,45	9,82	12,4	14,7	17
Heating ASH + CIH							
Net heating capacity	kW	19,5	25	28,5	36	40	49,5
Net COP		3	3	2,95	3,03	3	2,89
Net power input	kW	6,5	8,33	9,66	11,9	13,3	17,1
Electrical heater capacity - Standard	kW	10	10	10	15	15	15
Electrical heater capacity - Medium	kW	15	15	15	20	20	20
Electrical heater capacity - High	kW	20	20	20	27	27	27
Hot Water Coil capacity (1)	kW	31	38	40	56	61	66
Refrigerant circuit							
Nr of compressors - Nr 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	m^3/h	3150	4250	4650	6200	6950	7950
Maximum airflow	m^3/h	4100	5500	6000	8050	9050	9750
Maximum available static pressure	Pa	483	550	535	548	602	589
Condensing unit ventilation							
Nominal airflow	m^3/h	6800	9750	11500	11300	11000	2 x 9750
Acoustic							
Outdoor blower outlet sound power on standard unit (Lw) (2)	dB(A)	76	78	83	82	83	81
Outdoor blower outlet sound power on Low Noise unit (Lw) (2)	dB(A)	75	76	81	81	81	79
Indoor blower outlet sound power level (Lw)	dB(A)	74	78	80	80	83	86

AIRCOOLAIR™		55D	70D	85D	100D	120D	140D
Cooling ASC + CIC - ASH + CIH							
Gross Cooling capacity	kW	57,3	72,4	86	104	116	140
Gross EER		2,89	2,92	2,88	2,91	2,97	2,90
Power input	kW	19,8	24,8	29,8	35,7	39	48,2
Heating ASH + CIH							
Net heating capacity	kW	56,5	72,5	80	108	118	137
Net COP		3	3	3	3,13	3,05	2,82
Net power input	kW	18,8	24,2	26,7	34,5	38,7	48,6
Electrical heater capacity - Standard	kW	20	20	20	27	27	27
Electrical heater capacity - Medium	kW	27	27	27	40	40	40
Electrical heater capacity - High	kW	40	40	40	50	50	50
Hot Water Coil capacity (1)	kW	91	105	113	171	183	192
Refrigerant circuit							
Nr of compressors - Nr 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	m^3/h	9950	12450	14000	17350	19300	21000
Maximum airflow	m^3/h	12850	15090	16725	22450	24950	24750
Maximum available static pressure	Pa	689	662	636	606	587	620
Condensing unit ventilation							
Nominal airflow	m^3/h	2 x 11500	2 x 11300	2 x 11000	22700 + 18100	22700 + 18100	2 x 22700
Acoustic							
Outdoor blower outlet sound power on standard unit (Lw) (2)	dB(A)	84	83	84	87	87	90
Outdoor blower outlet sound power on Low Noise unit (Lw) (2)	dB(A)	82	82	82	86	86	88
Indoor blower outlet sound power level (Lw)	dB(A)	80	85	87	85	87	89

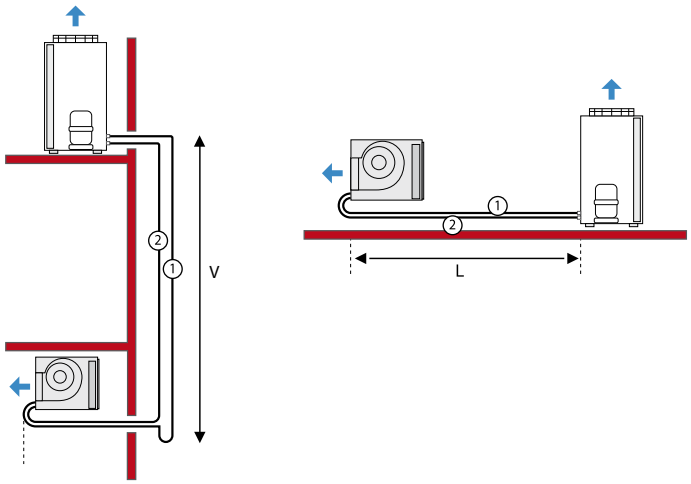
(1) 20°C air inlet, Water temperature – 90-70°C
(2) Eurovent conditions

General data

AIRCOOLAIR™		45D	55D	70D	85D	100D	120D
Cooling ASC + 2 x CIC - ASH + 2 x CIH							
Gross Cooling capacity	kW	2 x 24,2	2 x 27,9	2 x 36,5	2 x 41,9	58,5 + 42,8	70,7 + 42,3
Gross EER		2,86	2,84	2,94	2,85	2,8 / 3,1	2,89 / 3,09
Power input	kW	2 x 8,45	2 x 9,82	2 x 12,4	2 x 14,7	20,9 + 13,8	24,5 + 13,7
Heating ASH + 2 x CIH							
Net heating capacity	kW	2 x 25	2 x 28,5	2 x 36	2 x 40	61,6 + 46,4	72,5 + 45,5
Net COP		3	2,95	3,03	3	3,03 / 3,2	2,98 / 3,18
Net power input	kW	2 x 8,33	2 x 9,66	2 x 11,9	2 x 13,3	20,3 + 14,5	24,3 + 14,3
Electrical heater capacity - Standard	kW	10	10	15	15	20 / 15	20 / 15
Electrical heater capacity - Medium	kW	15	15	20	20	27 / 20	27 / 20
Electrical heater capacity - High	kW	20	20	27	27	40 / 27	40 / 27
Hot Water Coil capacity (1)	kW	38	40	56	61	91 / 61	105 / 61
Refrigerant circuit							
Nr of compressors - Nr of circuits		2 / 2	2 / 2	2 / 2	2 / 2	3 / 2	3 / 2
Refrigerant charge per circuit (approximate)	kg	6,94+6,94	6,42+6,42	8,74+8,74	10,9+10,9	13,48+11,6	17,3+11,16
Air treatment ventilation							
Minimum airflow	m^3/h	4250	4650	6200	6950	9950/6950	12450/6950
Maximum airflow	m^3/h	5500	6000	8050	9050	12850/9050	15090/9050
Maximum available static pressure	Pa	550	535	548	602	689/602	662/602
Condensing unit ventilation							
Nominal airflow	m^3/h	2 x 9750	2 x 11500	2 x 11300	2 x 11000	22700 + 18100	22700 + 18100
Acoustic							
Outdoor blower outlet sound power on standard unit (Lw) (2)	dB(A)	81	84	83	84	87	87
Outdoor blower outlet sound power on Low Noise unit (Lw) (2)	dB(A)	79	82	82	82	86	86
Indoor blower outlet sound power level (Lw)	dB(A)	2 x 78	2 x 80	2 x 80	2 x 83	80 / 83	85 / 83

(1) 20°C air inlet, Water temperature – 90-70°C
(2) Eurovent conditions

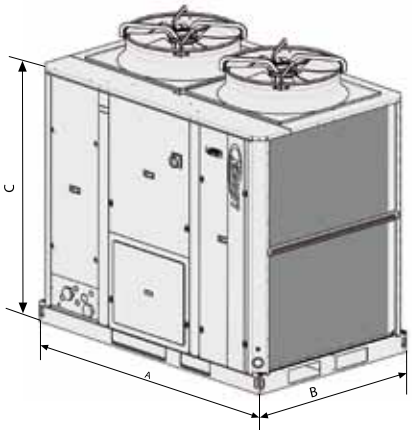
Refrigerant connections



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

Physical data

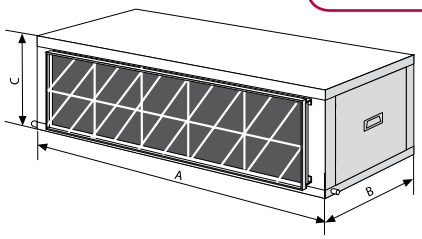
Condensing unit



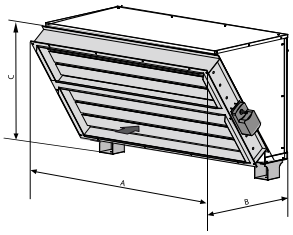
AIRCOOLAIR™ - CONDENSING UNIT	ASC/ADH ADC/ADH	20S	25S	30S	35S	40S	45D	55D	70D	85D	100D	120D	140D
A	mm	1195	1195				1960				2250		
B	mm	660	980				1195				1420		
C	mm	1375	1375				1375				2155		
Operating weight approx. (1)	kg	168	219	221	239	258	452	463	499	537	748	828	932

(1) Heat pump

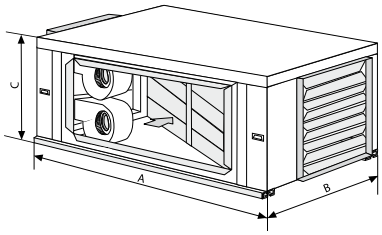
Air treatment section



AIRCOOLAIR™	CIC/CIH	20S	25S	30S	35S	40S 42S	45D	55D 60E	70D 70S	85D	100D	120D	140D
A	mm	1195			1445			2250			2900		
B	mm	645			960			956			1135		
C	mm	645			740			740			1140		
Operating weight approx. (1)	kg	108	111	115	150	160	170	242	259	276	470	480	490



Sizes 20S to 45D



Sizes 55D to 140D

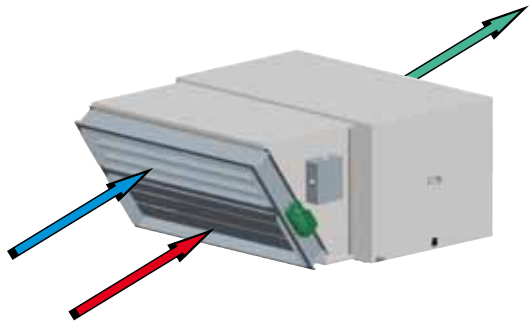
COMPACTAIR™	CMC/CMH	20S	25S	30S	35S	40S	45D	55D	70D	85D	100D	120D	140D
FREECOOLING MODULE	CIC/CIH	20S	25S	30S	35S	40S	45D	55D	70D	85D	100D	120D	140D
A	mm	1195			1445			2250			2900		
B	mm	674			697			1150			1150		
C	mm	645			740			740			1140		
Operating weight approx. (1)	kg	50	50	50	75	75	75	165	165	165	190	190	190

Operating limits

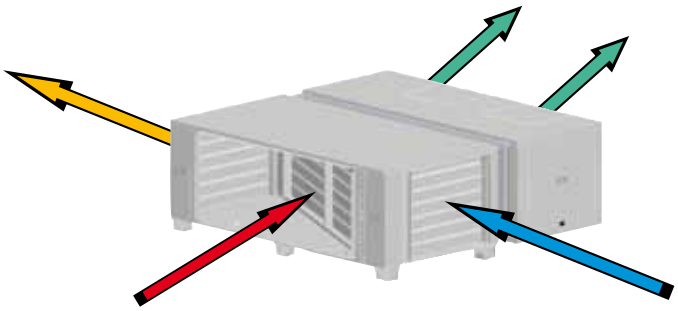
OPERATING LIMITS		
Maximum Outdoor temperature in cooling mode	°C	+45 °C (020-025-030-045-055) ; 47°C (035-040-070-085-100-120-140)
Minimum Outdoor temperature in cooling mode	°C	+10°C (cooling only) / 0°C (heat pump)
Minimum Outdoor temperature in heating mode	°C	-10°C

Principle sketches

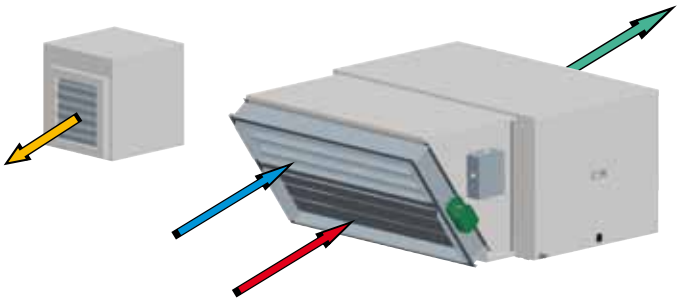
With Economizer Sizes 22E to 52D



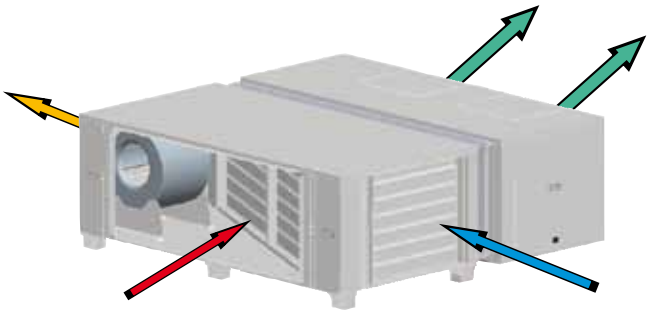
With Economizer Sizes 64D to 152D



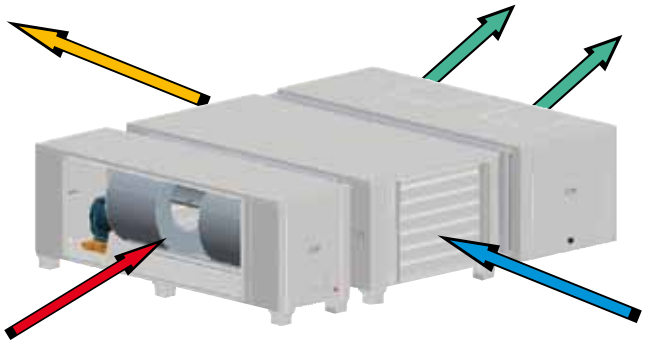
With Exhaust fan Sizes 22E to 52D



With Exhaust fan Sizes 64D to 152D



With Return fan Sizes 64D to 152D



⇨	Fresh air
⇨	Return air
⇨	Exhaust air
⇨	Supply air

Options

Fresh air

- **Free cooling:** The use of an economiser is the most efficient way to reduce ruining costs by using «Free cooling» when appropriate.
- **Fresh Air Management:** The Economiser 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 CO_2 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™ 50 advanced control.

Control

- **Air sock control:** Soft start control of supply fan allows the air socks to be progressively filled with air on start up.
- **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™ 50 algorithm and sensors, this pack provides two advanced control features: Enthalpy control on economiser 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.
- **TCB Thermostat Control Board:** It provides various logical dry contact inputs to be able to take over the control of the unit. The CLIMATIC™ 50 will stay in charge of all safety algorithms, defrost and free cooling operation.
- **Adalink Distant monitoring:** Adalink is LENNOX answer to HVAC installation monitoring. It can control up to 32 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 can be used locally, via LAN network or remotely via modem.
- **DC 50 Comfort display:** remote control for non-technical users. It was designed to fit aesthetically in the room and be very easy to use. With DC50, 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 50 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 50 Multi unit display:** this has the exact same features of the DC50 and can it can handle up to 12 units on a single Bus.
- **BE 50 extension board:** additional analogic and digital input and output for the CLIMATIC™ 50.

Other options

- **Inverter Low Noise & Winter operation with Inverter control:** Reduce radiated noise level. Cooling operations are also possible down to -15°C.
- **Low noise:** Reduce radiated noise and noise in duct at condenser.
- **Precoated coil:** outdoor or indoor coils anticorrosion treatment. Particularly recommended in salin 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.

BALTIC™

20-85 kW air to air rooftop package unit

BALTIC™ provides the best life cycle cost thanks to high energy efficiency and reduced set up time and maintenance costs

Low energy consumption

Reduced maintenance costs

Better recycling management

- Class “A” efficiency on most models: EER up to 3.4 full load / 5.7 part load and COP up to 3.9
- Advanced refrigeration circuit, multiscroll R410A compressors, electronic expansion valves, dynamic & alternate defrost cycles
- eDrive™ variable speed direct transmission fan controlled by Intelligent CLIMATIC™ 60 with full communication integration
- Precise fresh air management and free cooling with optional heat recovery solutions
- Gas, electric or hot water auxiliary heating solutions

eComfort™ efficiency • environment

eComfort™ ,
LENNOX commitment towards energy efficiency and environmentally friendly solutions.

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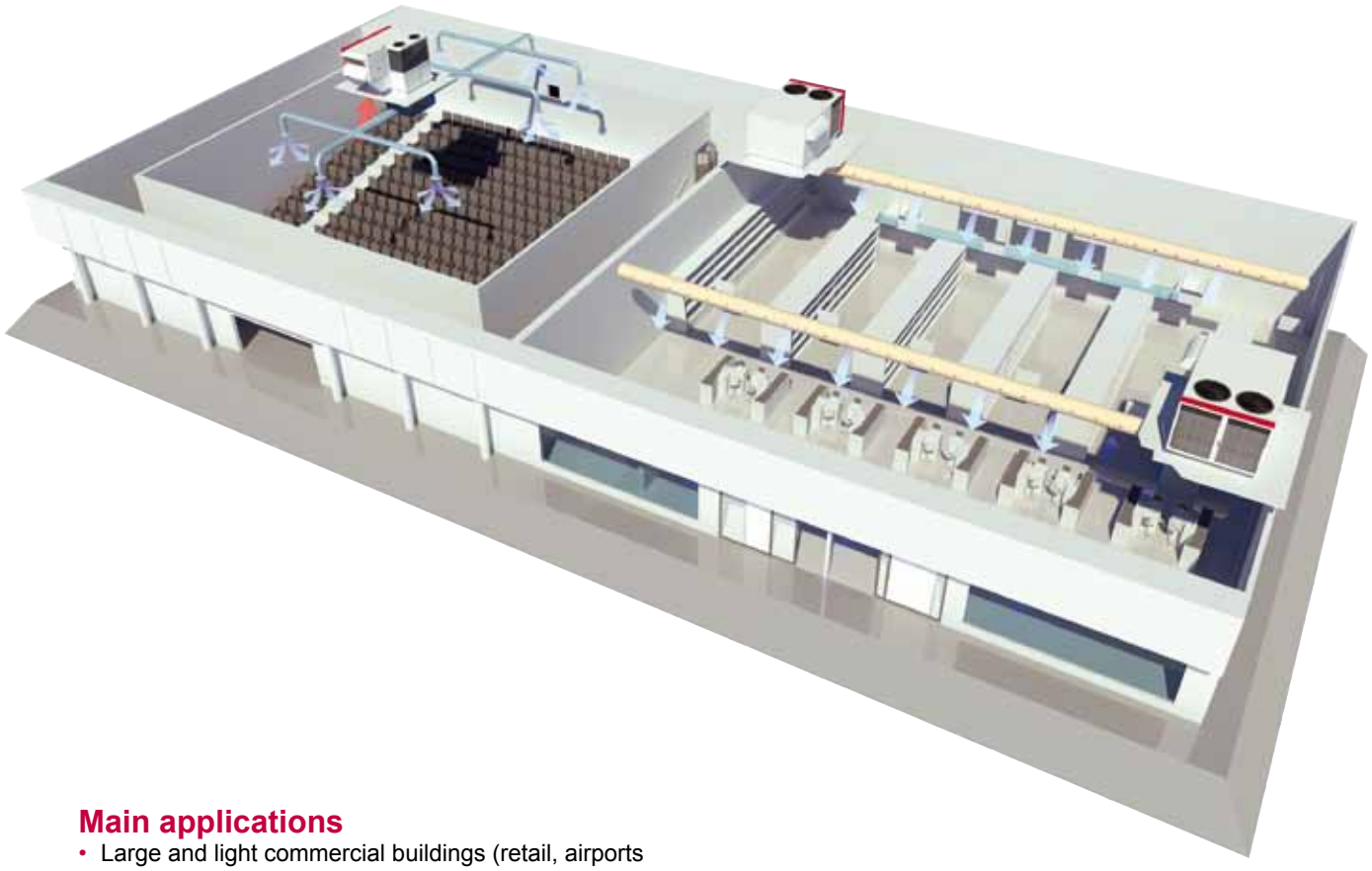
Rooftop

Providing indoor climate comfort

ROOFTOP UNITS AIR COOLED

BALTIC™ • 20 → 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

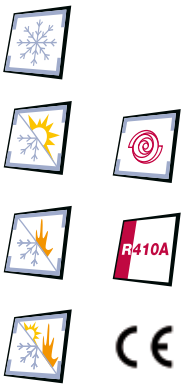
Why this choice?

- Energy efficient solution
- Cost effective package for fast and easy installation
- Multiple heating options available
- Fresh air control and free cooling management
- Wide choice of communication interfaces

FLEXY™

BALTIC™

FLEXY™ EC



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 new BALTIC™and FLEXY™ EC.
- Advance CLIMATIC™ 60 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.
- Fresh air control and free cooling management for healthy and comfortable environments.
- 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

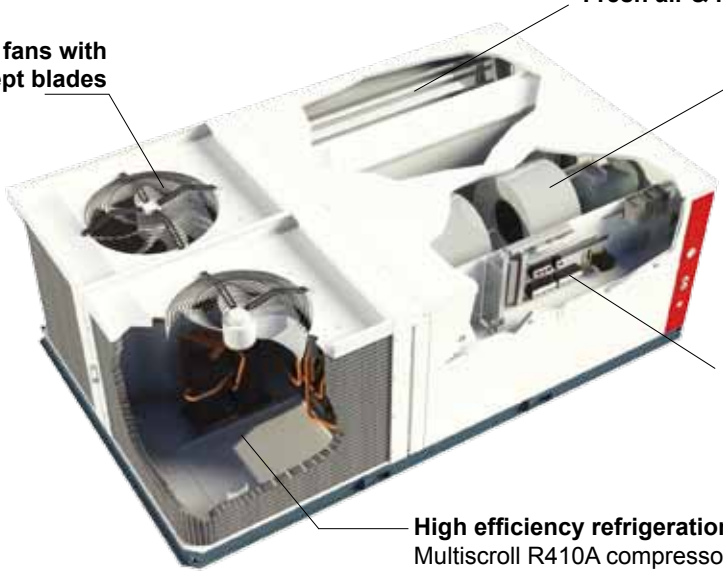
Main components

- R410A Scroll Compressors
- EN 60204-1 electrical cabinet with circuit breaker protection, numbered wires and connectors
- Fire proof M0 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.
- Aluminum removable and washable drain pan and siphon.
- Corrosion resistant casing (galvanized steel or aluminum) with stainless steel fixings.

CLIMATIC™ controller

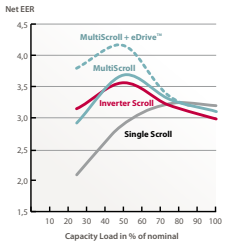
- Full text fault display and history.
- Many settings and readings available for customization and diagnostic.
- Advanced control features: advanced compressor management; dynamic defrost; intelligent fresh air management; automatic summer/winter change, variable speed drive fan management with airflow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

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 ΔP compensation

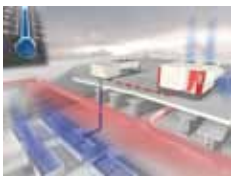
eDrive™, direct transmission, variable speed fan is a standard feature of LENNOX BALTIC™ units that saves energy and reduces maintenance costs.

CLIMATIC™ 60 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 services
- User friendly interface:
  High /low refrigerant pressure display
  eFlow™ airflow reading
  Energy metering
- Fully integrated communication:
- Master/Slave , ModBus®, BACnet®, LonWorks®

eRecovery™

- Recovers energy wasted by the flow refrigeration system
- Transfer «free» thermal energy to the populated sales area
- It covers 100% heating needs
- Flexible: it can be completed by thermodynamic or auxiliary heating



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

General data

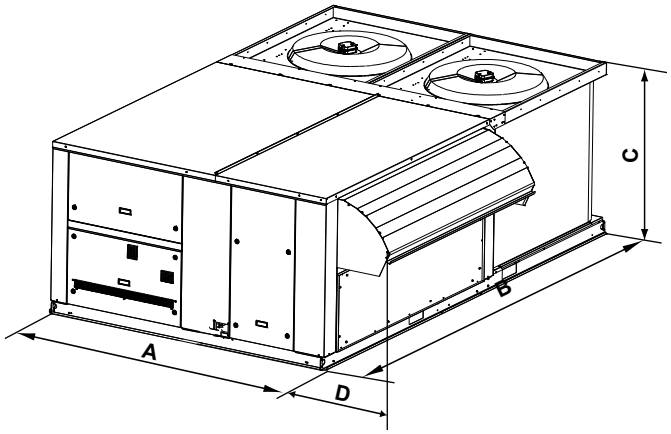
BALTIC™ BAC/BAH/BAG/BAM		024	030	038	042	045
Cooling BAC/BAG						
Gross cooling capacity (1)	kW	23,8	30	38,2	40,7	44,8
Absorbed power BAC	kW	7,1	9,7	12,3	14,1	14,1
Gross EER cooling (3)		3,6	3,5	3,5	3,3	3,46
Net EER cooling		3,3	3,0	3,0	2,8	3,1
Eurvent energy efficiency class in Cooling		A	A	A	B	A
Heating BAH/BAM						
Net heating capacity (1)	kW	20,7	26,3	34,9	38	40,8
Absorbed power BAH	kW	5,6	7,3	10,2	11,5	11,9
Gross COP heating (2)		4,0	4,1	3,8	3,7	3,7
Net COP heating (2)		3,7	3,6	3,4	3,3	3,4
Eurvent energy efficiency class in Heating		A	A	A	B	A
Auxiliary heating						
Gas heat capacity	kW - S/H (5)	19 / 43	19 / 43	19 / 43	19 / 43	31 / 56
Electric heater capacity	kW - S/H (5)	18 / 36	18 / 36	18 / 36	18 / 36	27 / 54
Electric pre-heater capacity	kW - S/H (5)	18 / 36	18 / 36	18 / 36	18 / 36	24 / 48
Hot water coil capacity (air 10°C / water 90-70°C)	kW (5)	50	59	63	66	84
Refrigeration circuit						
Nr of compressors / Nr of circuits		1 / 1	2 / 1	2 / 1	2 / 1	2 / 2
Refrigerant charge per circuit	kg	6,1	6,1	8,1	8,1	11,5
Max. outdoor temp. at indoor 27°C DB/ 19°C WB (4)	°C			48		
Ventilation data						
Nominal airflow	m^3/h	4200	5700	6300	6900	7100
Minimum airflow	m^3/h	3600	4600	5100	5500	5700
Maximum airflow	m^3/h	5600	6800	8400	8400	9700
Acoustic @ 100 Pa						
Outside sound power on standard unit (1)	dB(A)	80	80	81	82	83
Outside sound power on Low noise unit (1)	dB(A)	77	77	78	79	80
Indoor blower outlet sound power on standard unit (1)	dB(A)	71	76	78	80	74

BALTIC™ BAC/BAH/BAG/BAM		052	057	065	075	085
Cooling BAC/BAG						
Gross cooling capacity (1)	kW	51,1	57,1	65,1	76,5	83,5
Absorbed power BAC	kW	16,6	18,2	22,3	24,7	28,8
Gross EER cooling (3)		3,5	3,6	3,5	3,5	3,4
Net EER cooling		3,0	3,0	2,8	3,0	2,8
Eurvent energy efficiency class in Cooling		A	A	B	A	B
Heating BAH/BAM						
Net heating capacity (1)	kW	46,3	54,4	62,3	73,5	80,1
Absorbed power BAH	kW	13,5	15,9	19,3	21,6	25
Gross COP heating (2)		3,8	3,9	3,8	3,9	3,6
Net COP heating (2)		3,4	3,4	3,2	3,4	3,2
Eurvent energy efficiency class in Heating		A	A	B	A	B
Auxiliary heating						
Gas heat capacity	kW - S/H (5)	31 / 56	31 / 56	31 / 56	56 / 112	56 / 112
Electric heater capacity	kW - S/H (5)	27 / 54	27 / 54	27 / 54	27 / 54	37 / 54
Electric pre-heater capacity	kW - S/H (5)	24 / 48	24 / 48	24 / 48	36 / 72	36 / 72
Hot water coil capacity (air 10°C / water 90-70°C)	kW (5)	93	103	109	178	186
Refrigeration circuit						
Nr of compressors / Nr of circuits		2 / 3	2 / 4	2 / 4	2 / 4	2 / 4
Refrigerant charge per circuit	kg	11,6	15	15,2	21	21
Max. outdoor temp. at indoor 27°C DB/ 19°C WB (4)	°C			48		
Ventilation data						
Nominal airflow	m^3/h	8300	9900	11100	13500	14500
Minimum airflow	m^3/h	6700	7900	8100	10500	10500
Maximum airflow	m^3/h	11200	13100	13100	17000	19000
Acoustic @ 100 Pa						
Outside sound power on standard unit (1)	dB(A)	83	84	84	83	84
Outside sound power on Low noise unit (1)	dB(A)	80	81	82	80	81
Indoor blower outlet sound power on standard unit (1)	dB(A)	77	81	83	83	84

(1) All data are at Eurovent condition at 400V/3Ph/50Hz at nominal Airflow, Nominal ESP
(2) including the compressor and outdoor fan (axial) and indoor fan (centrifugal)
(3) COP net = Net Cool Cap./ Pabs total
(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

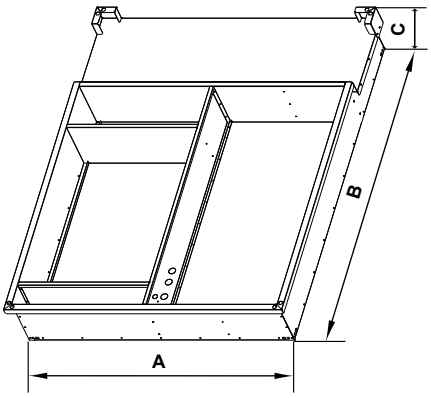
BALTIC™ is part of RT Eurovent Certification Program (www.eurovent-certification.com)

Physical data

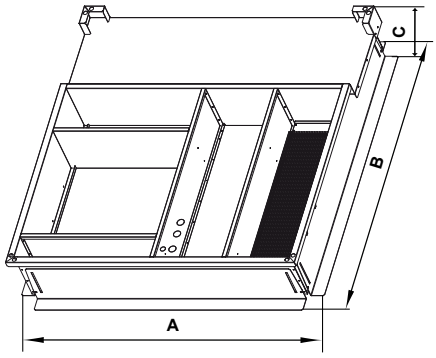


BALTIC™ BAC/BAH/BAG/BAM		024	030	038	042	045	052	057	065	075	085
A	mm	2250				2250				2250	
B	mm	2283				2783				3663	
C	mm	1240				1258				1258	
D	mm	425				425				425	
Weight of standard units											
Base unit BAC	kg	696	711	726	726	937	952	967	982	1150	1150
Weight of gas units											
Base unit BAG Standard Heat	kg	739	754	769	769	970	985	1000	1015	1225	1225
Base unit BAG High Heat	kg	758	773	788	788	992	1007	1022	1037	1285	1285

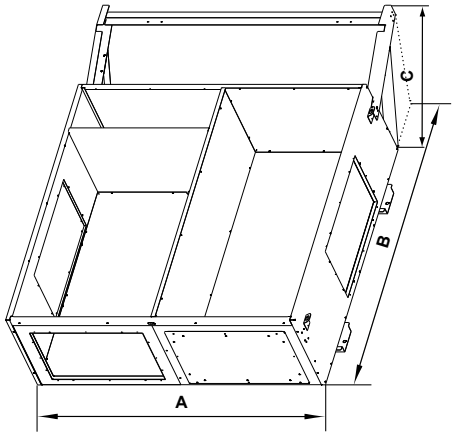
NON ADJUSTABLE, NON ASSEMBLED ROOFCURB



ADJUSTABLE ROOFCURB



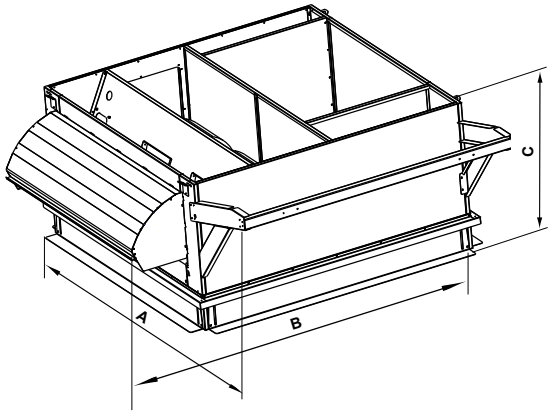
MULTIDIRECTIONAL ROOFCURB



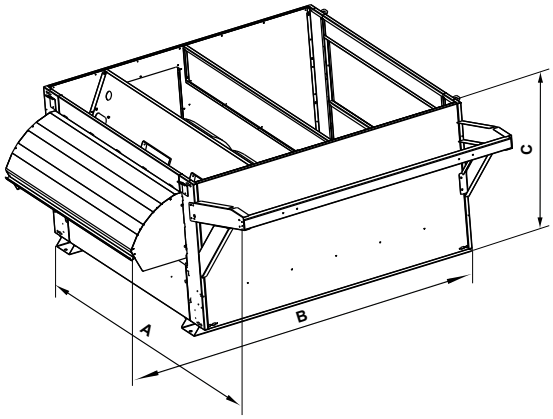
BALTIC™ BAC/BAH/BAG/BAM		024	030	038	042	045	052	057	065	075	085
Non-adjustable, non assembled roofcurb											
A	mm	2123				2123				2123	
B	mm	1718				2218				2719	
C	mm	405				405				405	
Assembled adjustable roofcurb											
A	mm	2223				2223				2223	
B	mm	1818				2318				2818	
C	mm	455				455				455	
Multidirectional roofcurb (External dimensions. No roof opening required)											
A	mm	2128				2193				2193	
B	mm	1741				2240				2744	
C	mm	771				771				771	

Roofcurbs physical data

VERTICAL, EXHAUST ROOFCURB



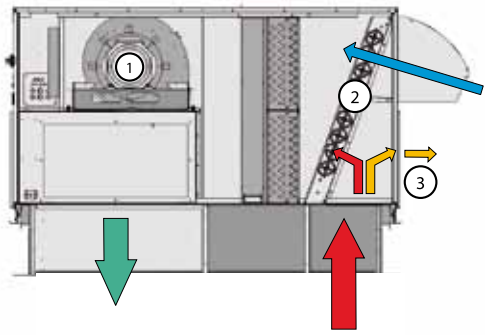
HORIZONTAL, EXHAUST ROOFCURB



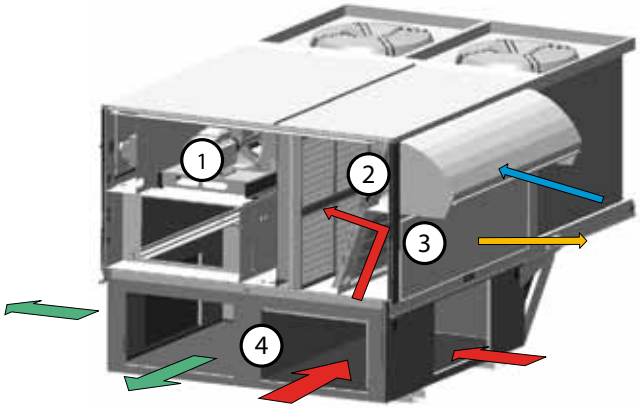
BALTIC™ BAC/BAH/BAG/BAM		024	030	038	042	045	052	057	065	075	085
Exhaust vertical roofcurb											
A	mm	1846				2231				2731	
B	mm	2615				2615				2127	
C	mm	1100				1100				1100	
Exhaust horizontal roofcurb											
A	mm	1847				2246				2731	
B	mm	2610				2612				2613	
C	mm	1165				1165				1165	

Principle sketch

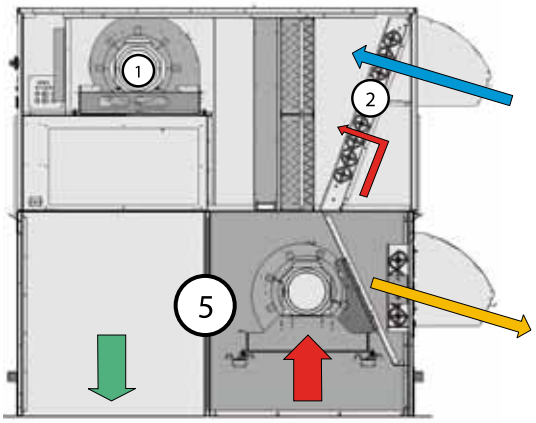
BALTIC™ (vertical flow)



BALTIC™ MULTIDIRECTIONAL ROOFCURB

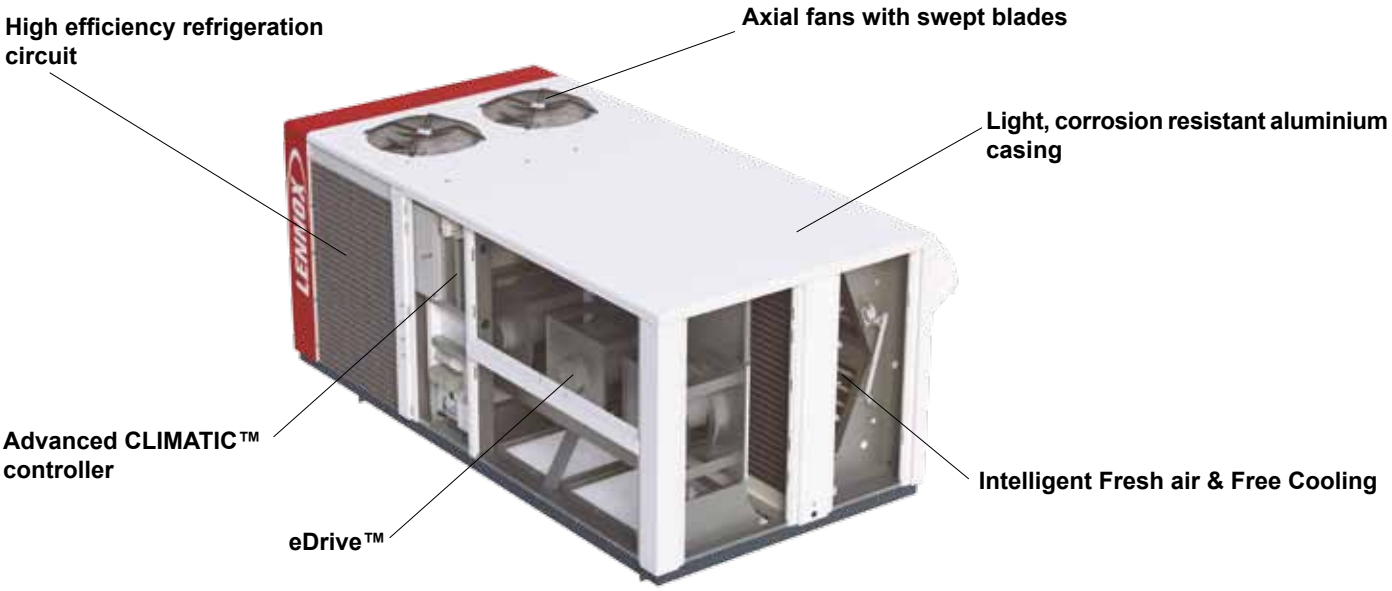


BALTIC™ EXTRACTION ROOFCURB



→	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



Guarantied sustainable performance with eDrive™

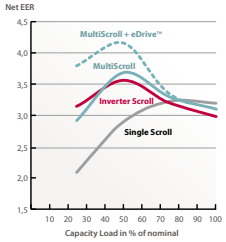
► Variable speed drive

- 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 duting start-up
- Easy airflow adjustement during commissioning

► 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

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 solutions

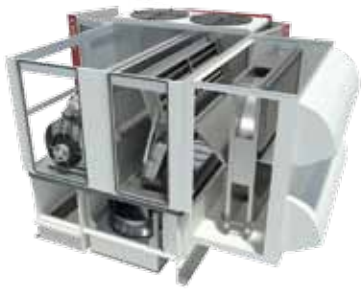
► eRecovery™

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 saled area.
- eRecovery™ can cover 100% of the heating needs.
- The most fexible 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.

► 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

* EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

FLEXY™ & FLEXY™ EC		85	100	120
FLEXY™ Cooling mode FCM/FGM				
Gross cooling capacity	kW	85,2	105	119
Net cooling capacity	kW	82,8	101,2	114,5
Absorbed power net	kW	29,0	38,8	44,8
Gross EER cooling		3,3	3,10	3,06
Net EER cooling		2,86	2,61	2,55
FLEXY™ Heating mode FHM/FDM				
Net heating capacity	kW	83,0	103,4	116,7
Absorbed power net	kW	26,3	33,9	38,0
Gross COP heating	kW	3,48	3,45	3,50
Net COP heating		3,16	3,06	3,07
FLEXY™ EC Cooling mode FCM/FGM EC				
Gross cooling capacity	kW	85,2	105	119
Net cooling capacity	kW	83,6	102,9	116,6
Absorbed power net	kW	27,9	36,5	42,1
Gross EER cooling		3,30	3,10	3,06
Net EER cooling		3,01	2,8,2	2,77
FLEXY™ EC Heating mode FHM/FDM EC				
Net heating capacity	kW	82,1	101,7	114,6
Absorbed power net	kW	25,2	31,6	35,3
Gross COP heating	kW	3,41	3,36	3,40
Net COP heating		3,26	3,22	3,25
Auxiliary heating (All FLEXY™)				
Gas heat capacity	kW - S/H (2)	55,2 / 110,4	55,2 / 110,4	55,2 / 110,4
Electric heater capacity	kW - S/M/H (2)	30 / 54 / 72	30 / 54 / 72	30 / 54 / 72
Hot water coil capacity (20°C in / water 90-70 °C)	kW - S/H (2)	112 / 175	124 / 197	130 / 209
Refrigerant circuit (All FLEXY™)				
Nr of compressors / Number of circuits		2 / 2	2 / 2	2 / 2
Refrigerant charge per circuit	kg	10,5 / 10,5	10,5 / 10,6	10,6 / 10,6
Max. outdoor temp. at indoor 27°C DB/ 19°C WB	°C	46	44	44
Ventilation (All FLEXY™)				
Nominal airflow	m³/h	15000	18500	20500
Minimum airflow	m³/h	12000	14000	15000
Maximum airflow	m³/h	23000	23000	23000
Acoustic @ 150 Pa				
Outdoor sound power (Standard unit) (1)	dB(A)	87	88	87
Outdoor sound power (Low Noise unit) (1)	dB(A)	82	82	82
Indoor blower outlet sound power on standard unit (1)	dB(A)	84	87	89

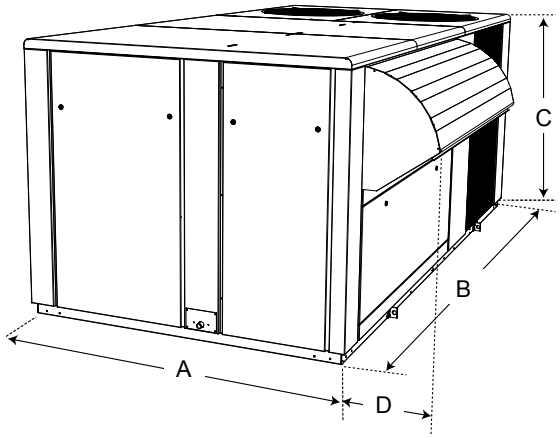
FLEXY™ & FLEXY™ EC		150	170	200	230
FLEXY™ Cooling mode FCM/FGM					
Gross cooling capacity	kW	148	170	197	234
Net cooling capacity	kW	143,3	162,8	190,1	225,3
Absorbed power net	kW	51,0	64,8	65,9	88,1
Gross EER cooling		3,30	3,06	3,46	3,05
Net EER cooling		2,81	2,51	2,89	2,56
FLEXY™ Heating mode FHM/FDM					
Net heating capacity	kW	142,4	168,5	188,4	226
Absorbed power net	kW	44,6	55,3	58,2	74,4
Gross COP heating	kW	3,60	3,49	3,69	3,45
Net COP heating		3,19	3,04	3,24	3,04
FLEXY™ EC Cooling mode FCM/FGM EC					
Gross cooling capacity	kW	148	170	197	234
Net cooling capacity	kW	145,4	166,1	190,5	226,7
Absorbed power net	kW	48,3	60,5	62,6	83,8
Gross EER cooling		3,30	3,06	3,46	3,05
Net EER cooling		3,01	2,74	3,04	2,71
FLEXY™ EC Heating mode FHM/FDM EC					
Net heating capacity	kW	140,4	165,2	187,6	225,2
Absorbed power net	kW	42,0	51,1	57,1	72,8
Gross COP heating	kW	3,51	3,40	3,69	3,45
Net COP heating		3,35	3,24	3,28	3,09
Auxiliary heating (All FLEXY™)					
Gas heat capacity	kW - S/H (2)	110,4/165,6	110,4/165,6	165,6/220,8	165,6/220,8
Electric heater capacity	kW - S/M/H (2)	45/72/108	45/72/108	72/108/162	72/108/162
Hot water coil capacity (20°C in / water 90-70 °C)	kW - S/H (2)	140/251	149/272	177/296	199/313
Refrigerant circuit (All FLEXY™)					
Nr of compressors / Number of circuits		3 / 2	4 / 2	4 / 2	4 / 2
Refrigerant charge per circuit	kg	15,8 / 16	16 / 16	22 / 22	23,5 / 23,5
Max. outdoor temp. at indoor 27°C DB/ 19°C WB	°C	44	46	46	44
Ventilation (All FLEXY™)					
Nominal airflow	m³/h	26000	30000	35000	39000
Minimum airflow	m³/h	18000	21000	24000	27000
Maximum airflow	m³/h	35000	35000	43000	43000
Acoustic @ 150 Pa					
Outdoor sound power (Standard unit) (1)	dB(A)	92	92	88	89
Outdoor sound power (Low Noise unit) (1)	dB(A)	84	86	85	85
Indoor blower outlet sound power on standard unit (1)	dB(A)	88	90	86	88

(1) All data are at Eurovent condition at 400V/3Ph/50Hz at nominal Airflow, Nominal ESP

(2) : S = Standard heat - M = Medium heat - H = High heat

*FLEXY™ is part of RT Eurovent Certification Program up to 85 kW (www.eurovent-certification.com)

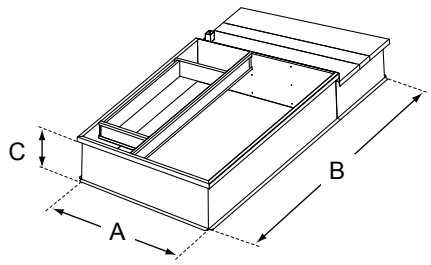
Physical data



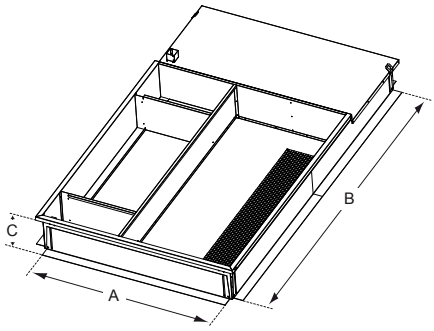
FLEXY™	FC/FH/FG/FD	85	100	120	150	170	200	230
A	mm	2200			2200		2200	
B	mm	3350			4380		5533	
C	mm	1510			1834		2134	
D	mm	360			450		615	
Weight of standard units								
Base unit FCM	kg	934	1009	1085	1367	1430	1650	1950
Weight gas unit								
Base unit FGM (Standard Heat)	kg	1041	1116	1192	1608	1671	1914	2214
Base unit FGM (High Heat)	kg	1111	1186	1262	1631	1694	1954	2254

Roofcurb physical data

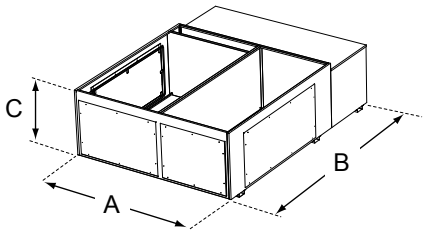
STANDARD ROOFCURB



ADJUSTABLE ROOFCURB

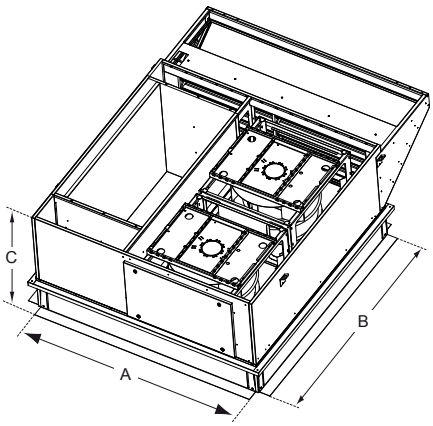


MULTI DIRECTIONAL ROOFCURB



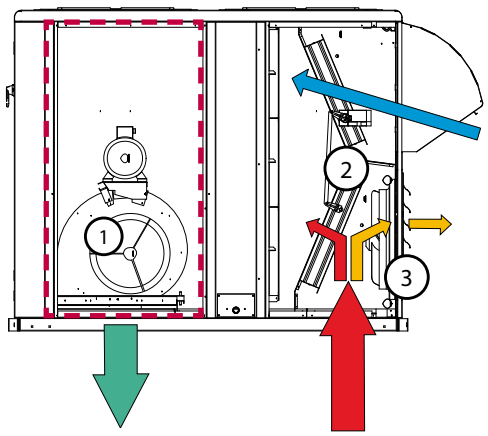
FLEXY™	FC/FH/FG/FD		85	100	120	150	170	200	230
Non-adjustable, non assembled roofcurb	A	mm	2056			2056		2056	
	B	mm	2770			3466		4066	
	C	mm	400			400		425	
Assembled adjustable roofcurb	A	mm	2056			2056		2056	
	B	mm	2770			3466		4100	
	C	mm	400			400		400	
Multidirectional roofcurb	A	mm	2056			2056		2056	
	B	mm	2745			3441		4070	
	C	mm	800			1100		1300	
Transition roofcurb	A	mm	2056			2056		2056	
	B	mm	2770			3466		4100	
	C	mm	660			660		660	
Return vertical roofcurb	A	mm	2156			2156		2156	
	B	mm	2005			2494		2494	
	C	mm	1030			1030		1030	
Return horizontal roofcurb	A	mm	2056			2056		2056	
	B	mm	2004			2493		2493	
	C	mm	1220			1220		1305	

CENTRIFUFAL RETURN ROOFCURB

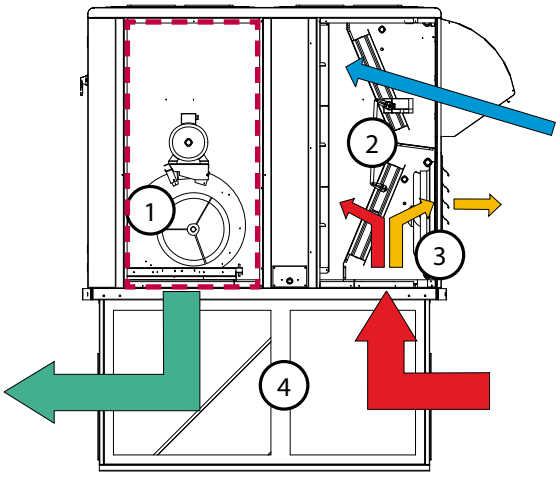


Principle sketches

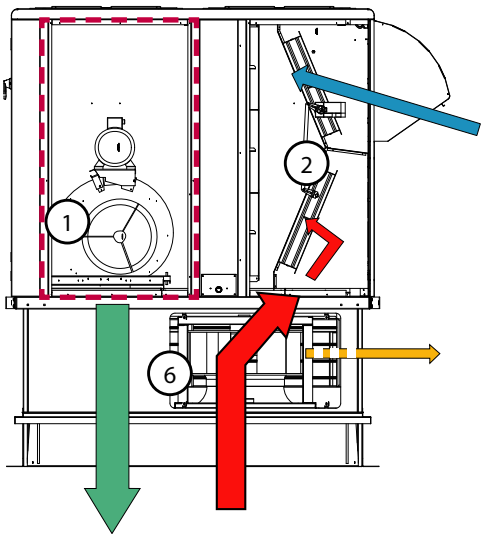
FLEXY™ (vertical flow)*



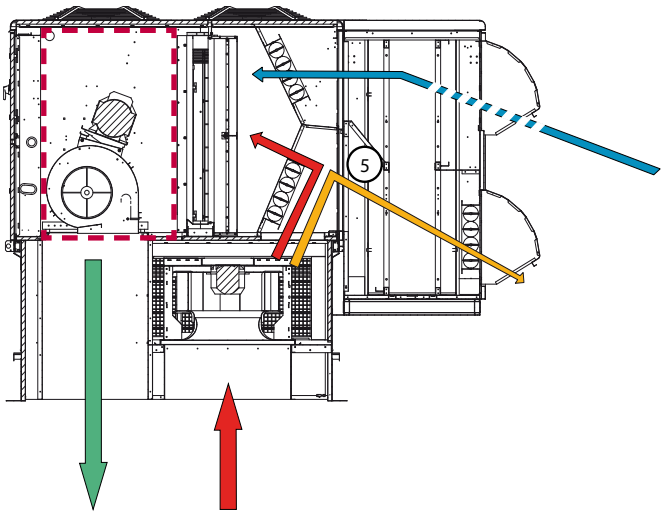
MULTIDIRECTIONAL ROOFCURB*



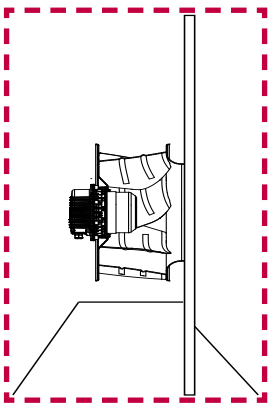
CENTRIFUGAL RETURN ROOFCURB (vertical flow)*



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 new high efficiency, environmentally friendly refrigeration circuits with multiscroll R410A compressors, optimized heat exchange area and electronic expansion valves (EEV only on BALTIC™).
- **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:** Thermodynamic cooling can be replaced by Free Cooling when outdoor temperature is below the building set point saving up to 15% on annual energy consumption.
- **Accurate percentage of fresh air:** Managing fresh air is mandatory in a building to control CO_2 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.
  This feature ensures a better CO_2 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™.
- **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 available on BALTIC™ measures and displays energy consumption current and absorbed power. This data can also be accessed through the bus connection.

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).
- **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:** The new 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.
- **Indoor Air Quality sensor:** This feature gives the possibility to match minimum fresh air requirements with occupancy. It measures CO_2 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 of the unit with a maximum of 300 Pa static pressure available and improves energy and maintenance cost.
- **IAQ kit with UV Light (FLEXY™):** Destruction of micro-organism using UV light that keeps the coil clean and allow constant air pressure drop on the coil, reducing fan energy consumption.
- **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.
  On new ranges the F7 filter is now 100 mm thick to reduce pressure drop.
- **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

- **M0 fire proof insulation:** All LENNOX rooftops feature M0 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.

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- **Communication and unit interlink:** Master/slave or cascade control is a standard feature of the new BALTIC™ units. It can be used to connect up to 24 rooftops. The units can then be programmed to optimize efficiency and improve reliability.

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 new 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.
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Communication interfaces and supervision

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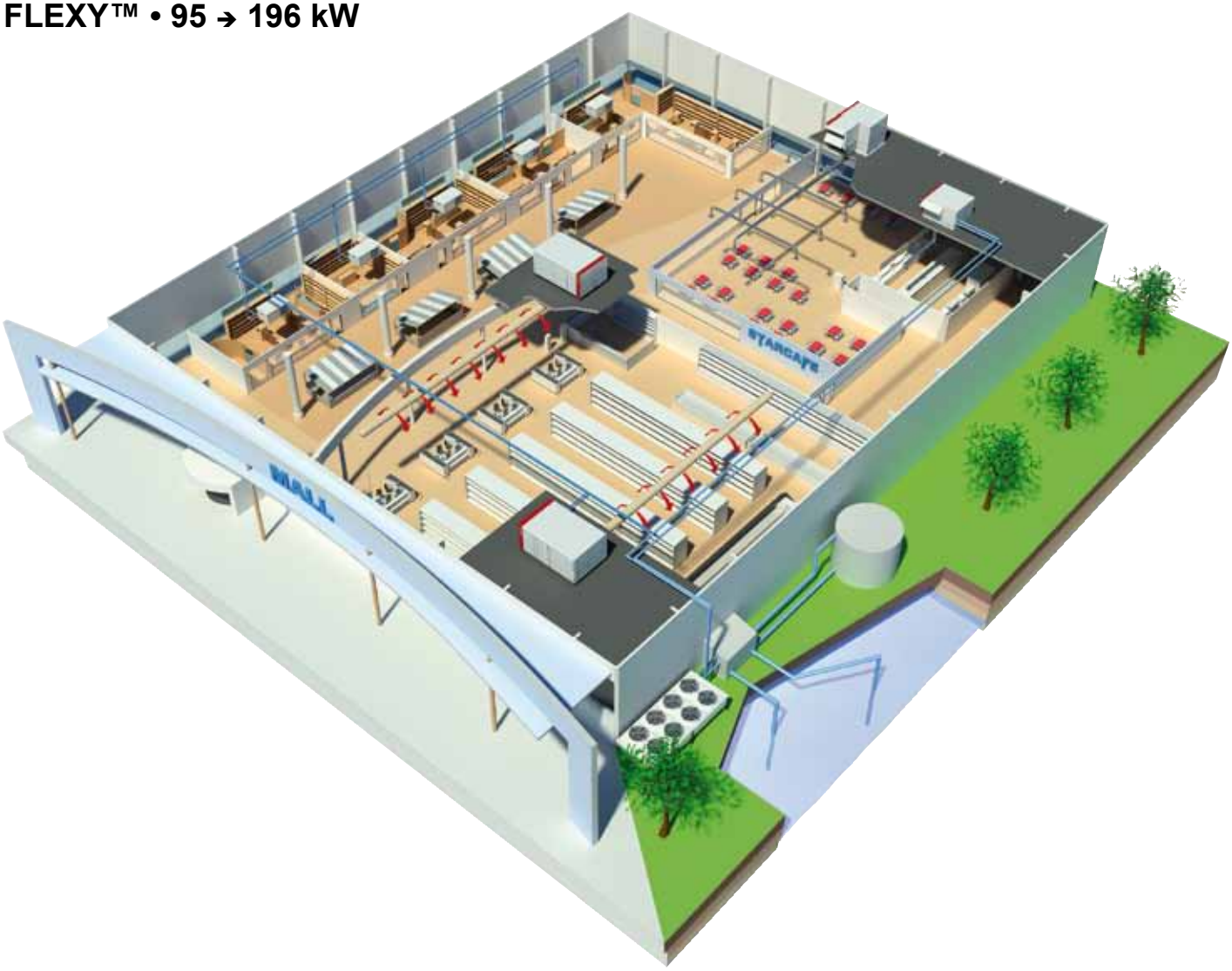
- **Communication Interface / ModBus Interface:** ModBus interface is required to connect the unit to a BMS using «ModBus protocol». No other hardware than this board is required to have ModBus communication. One board required per rooftop. The ModBus interface is available in two versions to be connected 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 the New BALTIC™. No other hardware than this board is required to have LonWorks® dialog. One board required per rooftop. Variable list is available in the control IOM.
- **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:** It is LENNOX’s simplest solution for HVAC installation supervision to better control the system and improve reliability and energy efficiency. One ADALINK™ can control up to 32 LENNOX units on the same site (Chillers, rooftop or any other unit using CLIMATIC™ 50 controller and above). 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.

ROOFTOP UNITS WSHP
(WATER SOURCE HEAT PUMP)

BALTIC™ • 47 → 85 kW
FLEXY™ • 95 → 196 kW



Main applications
- Large Commercial buildings (Retail, Airports, shopping malls)
- Cinemas, Theatres

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

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 boiler/tower combination or earth coupled 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™ 50 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.
- Fresh air control and free cooling 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 M0 insulation
- Wide choice of air filtration and pre-filtration up to F7
- Variable drive pulley as a standard feature
- Aluminum removable and washable drain pan and siphon
- Corrosion resistant casing (galvanized steel or aluminum) with stainless steel fixings

CLIMATIC™ controller

- 16 bits, 21 megabytes flash memory processor
- Can display 50 different faults
- 100 settings and 100 reading 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 solutions, ADALINK™, Lennoxvision™

BWH / FWH = Water cooled Heat Pump rooftop
BWM / FWM = Water cooled Heat Pump rooftop with gas fired heating

General data

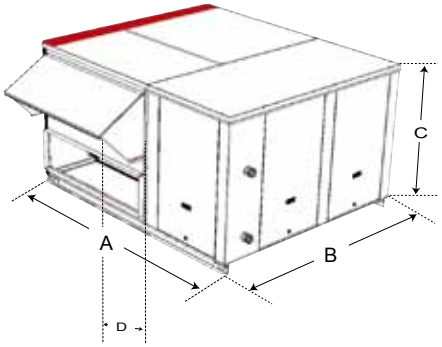
BALTIC™		45	55	65	75
Cooling BWM					
Gross cooling capacity [1]	kW	47	60	72,7	84,8
Power input [2]	kW	11,5	14,3	16,4	20,3
Gross EER		4,8	4,9	5,1	5,1
Heating BWM					
Gross heating capacity [1]	kW	57,6	72	87,5	100
Power input [2]	kW	13,6	16,6	18,6	22,8
Gross COP		4,7	4,9	5,3	5,1
Heating - gas fired					
Gas heating capacity (standard heat / High heat)	kW	30,7 / 55,8	30,7 / 55,8	55,8 / 111,6	55,8 / 111,6
Thermal efficiency	%	93	93	92	92
Refrigeration circuit					
Nr of compressors / Nr of circuits		2 / 1	2 / 1	2 / 2	2 / 2
Compressor type		Scroll Tandem	Scroll Tandem	Scroll	Scroll
Hydraulic circuit					
Pressure drop at nominal airflow rate	kPa	43	43	42	44
Inlet / Outlet connections	DN	50	50	65	65
Ventilation data					
Nominal airflow	m^3/h	8100	9000	11500	14200
Minimum airflow	m^3/h	6500	6500	8600	8600
Maximum airflow	m^3/h	9700	9700	13000	13000
Acoustic					
Outside sound power on standard unit BWH	dB(A)	78	78	78	79
Indoor blower outlet sound power on BWH	dB(A)	83	84	82	85
Indoor blower outlet sound power on BWM	dB(A)	85	87	85	89

FLEXY™		85	100	120	150	170
Cooling FWH						
Gross cooling capacity [1]	kW	94,5	124,1	139,1	164,8	195,8
Power input [2]	kW	22,1	29,3	33,4	39,9	48,8
Gross EER		5	5,1	5,1	4,9	4,9
Heating FWM						
Gross heating capacity [1]	kW	108,7	145,3	161,6	198,7	245,0
Power input [2]	kW	24,5	32,9	38,3	43,0	55,4
Gross COP		5,0	5,1	4,9	5,3	5,1
Heating - gas fired						
Gas heating capacity (standard heat / High heat)	kW	55,2 / 110,4	55,2 / 110,4	55,2 / 110,4	110,4 / 165,6	110,4 / 165,6
Thermal efficiency	%	92	92	92	92	92
Refrigeration circuit						
Nr of compressors / Nr of circuits		2 / 2	2 / 2	2 / 2	3 / 2	4 / 2
Compressor type		Scroll	Scroll	Scroll	Scroll Tandem	Scroll Tandem
Hydraulic circuit						
Pressure drop at nominal airflow rate	kPa	60	58	58	76	64
Inlet / Outlet connections	DN	50	65	65	65	65
Ventilation data						
Nominal airflow	m^3/h	15000	18500	20500	26000	30000
Minimum airflow	m^3/h	12000	12000	15000	18000	21000
Maximum airflow	m^3/h	23000	23000	23000	35000	35000
Acoustic						
Outside sound power on standard unit FWH	dB(A)	77	77	77	82	82
Indoor blower outlet sound power on FWH	dB(A)	85	90	89	91	94
Indoor blower outlet sound power on FWM	dB(A)	84	87	89	88	90

Note:
(1) All data are at the following conditions with 400V/3Ph/50 Hz at nominal airflow, nominal ESP - Summer: inlet water 29°C / ΔT 6°C - Return air 27°C DB / 47%; Winter: inlet water 10°C / ΔT 5°C - Return air 20°C DB
(2) Including the compressor and indoor fan (centrifugal)

Physical data

1



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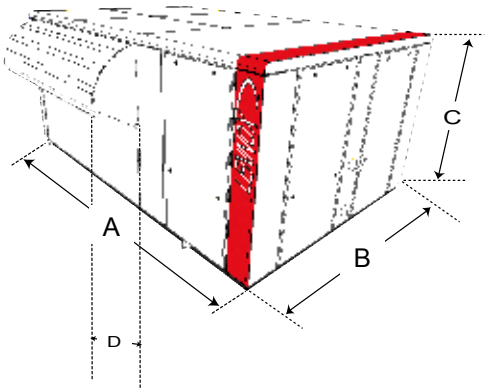
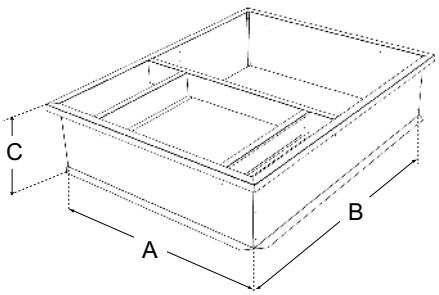


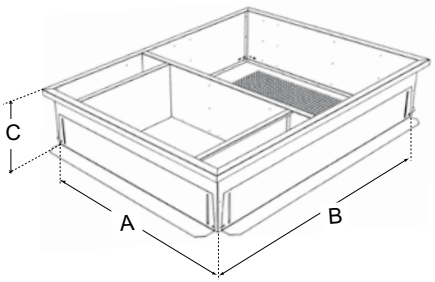
WSHP ROOFTOP		45	55	65	75	85	100	120	150	170
View		1		1		2			2	
A	mm	1910		2260		2200			2200	
B	mm	2235		2873		3350			4380	
C	mm	1221		1225		1510			1384	
D	mm	418		418		360			450	
Weight										
Standard unit	kg	494	515	674	733	790	874	955	1217	1300
Gas unit High	kg	678	693	904	960	1111	1186	1262	1631	1694

Roofcurbs physical data

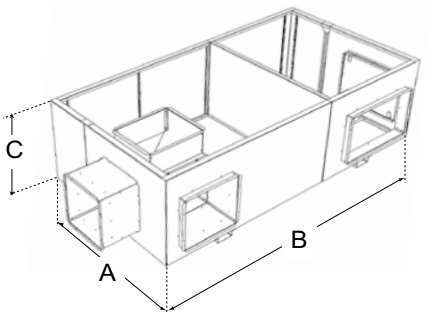
NON ADJUSTABLE, NON ASSEMBLED ROOFCURB



ADJUSTABLE ROOFCURB

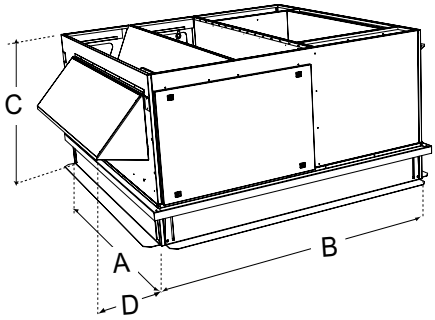


MULTIDIRECTIONAL ROOFCURB



WSHP ROOFTOP			45	55	65	75	85	100	120	150	170
Non-adjustable, non assembled roofcurb	A	mm	1630		2080		2056			2056	
	B	mm	1740		2090		2770			3466	
	C	mm	400		400		400			400	
Assembled adjustable roofcurb	A	mm	1633		2082		2056			2056	
	B	mm	1743		2092		2770			3466	
	C	mm	401		401		400			400	
Multidirectional roofcurb (External dimensions. No roof opening required)	A	mm	1683		2080		2056			2056	
	B	mm	1740		2090		2745			3441	
	C	mm	650		750		800			1100	
Exhaust vertical roofcurb	A	mm	1837		2287		2156			2156	
	B	mm	1947		2297		2740			3437	
	C	mm	900		1050		1030			1030	
Exhaust horizontal roofcurb	A	mm	1674		2124		2056			2056	
	B	mm	1836		2186		2762			3460	
	C	mm	740		890		1220			1220	

CENTRIFUGAL RETURN ROOFCURB (with auxiliary heating)



Standard features and options

Energy efficiency and Comfort

- **Energy recovery module:** Offers the possibility to recover energy in the exhaust air to pre heat or pre cool the fresh air and save energy.
- **High efficiency variable air volume supply fan:** This feature dramatically decreases the energy consumption of the rooftop by associating a high efficiency motor with intelligent direct drive variable air volume supply fan. The CLIMATIC™ controls the supply airflow to match the cooling or heating capacity and to suit the exact building requirement in terms of fresh air.
- **Air sock control:** Soft start control allows the air socks to be progressively filled with air on start up.
- **Modulating gas burner option:** The burner maintains a constant gas/air mixture and a much optimized efficiency to suit any changing conditions.
- **Free cooling:** The use of an economiser is the most efficient way to reduce ruining costs by using «Free cooling» when appropriate.
- **Accurate percentage of fresh air:** The CLIMATIC™ periodically recalibrate the damper position to ensure the real percentage of fresh air is introduced into the building. This feature ensures a better CO_2 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. On FLEXY™ compressor jackets and acoustic insulation are fitted in the refrigeration section.
- **Low water temperature kit:** In order to operate with low entering water temperature in cooling mode (ie: ground source water loops) it is required to control the water flow rate in the heat exchanger to maintain a minimum condensing pressure in the refrigeration circuit. This Option allows an accurate control of the water flow rate to adjust the condensing pressure when operating in cooling mode with low entering water temperature.

Auxiliary heating

- **92% high efficiency gas burner:** The new high efficiency gas burner offers improved space comfort through 2 to 4 capacity stages or 20 to 100% modulation control.

Architectural integration

- **Non adjustable, non assembled roofcurb:** Shipped folded flat for easy transport and handling, it is easily assembled on filed
- **Adjustable roofcurb:** This adjustable roofcurb can be installed on a roof with up to 4 to 5% slope in all directions.
- **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. Upflow return and supply is available on 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
- **Customised colour:** The units can be supplied in various colours.

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.
- **Indoor Air Quality sensor:** This feature gives the possibility to match minimum fresh air requirements with occupancy. It measures CO_2 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 of the unit with a maximum of 300Pa static pressure available and improves energy and maintenance cost.
- **IAQ kit with UV Light (FLEXY™):** Destruction of micro-organism using UV light that keeps the coil clean and allow constant air pressure drop on the coil, reducing fan energy consumption.
- **Refillable G4 filter:** Instead of replacing the whole filter frame, only the media has to be changed. It's a good cost saving solution.
- **EU4 / F7 panel filters:** Set of two 50 mm 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.
- **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

- **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.
- **Electronic flow switch:** The new water cooled rooftop is equipped as standard with the state of the art electronic water flow switch. This all stainless steel component has no moving parts and allows accurate protection against low water flow rate with any type of fluid without any maintenance.

CLIMATIC™ general description

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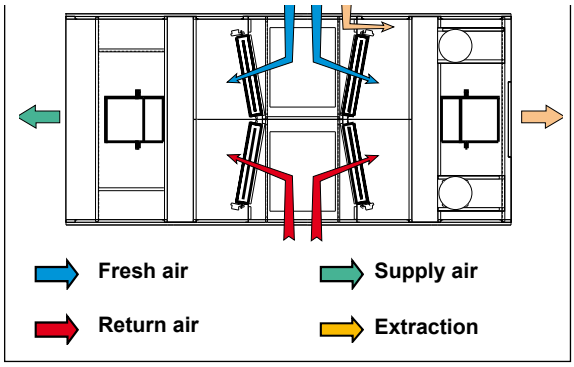
FX . 25 ➔ 165 kW

Rooftop 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™ 50

Introduction to the range

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™ 50 controller, designed to improve energy efficiency and reliability. This controller integrates master slave capability and a wide choice of communication interfaces.

Main Components

- R407C compressors
- EN 60204-1 electrical cabinet with circuit breaker protection and numbered wires and connectors
- Fire proof M0 insulation
- Variable drive pulley on supply and exhaust as a standard feature
- Corrosion resistant casing with stainless steel fixings

CLIMATIC™ 50 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 solutions, ADALINK™ , LennoxVision™

General data

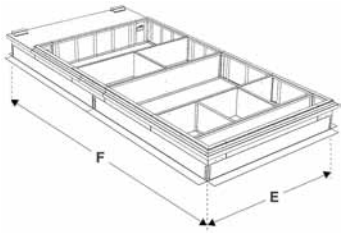
FLEXY™	FX	25	30	35	40	55	70	85	100	110	140	170
Cooling mode												
Gross cooling capacity (35°C out, 27 °C in, 47% HR, 25% fresh air)	kW	24,7	30,3	34,5	41,5	48,2	68,9	82,5	100	112	141	164
Gross cooling capacity (32°C out, 26°C in, 60% HR, 50% fresh air)	kW	27,1	33,2	33,6	44,7	51,9	75,3	90	108	122	154	180
Gross COP cooling (35°C out, 27°C in, 47% HR, 25% fresh air)		2,3	2,2	2,3	2,5	2,5	2,7	2,4	3,1	3,1	3,0	2,7
Gross COP cooling (32°C out, 26°C in, 60% HR, 50% fresh air)		2,6	2,4	2,3	2,7	2,7	3,0	2,7	3,5	3,5	3,4	3,0
Absorbed power at operation limits	kW	13	16	16	22	26	31	42	50	51	66	86
Heating mode												
Net heating capacity (7°C out, 20°C in)	kW	24,2	29,8	32,2	38,4	46	66,3	82,2	88,1	106,3	136,8	166,4
Net COP heating (7°C out, 20°C in)		2,9	2,8	2,8	2,6	2,4	3,1	2,9	3,3	3,4	3,5	3,1
Refrigerant circuit data												
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	4	5	6	6	10	11	12	7	7,5	8,5
Maximum outdoor temperature in cooling mode	°C	40	39	42	41	42	42	42	44	44	43	41
Ventilation												
Nominal airflow at 150 Pa	m^3/h	4000	5000	6000	7200	9000	10800	13500	17300	19000	24000	27000
Minimum airflow	m^3/h	3200	4000	4800	5800	7200	8600	10800	13800	15200	19200	24000
Maximum airflow (1)	m^3/h	4500	5500	6600	8100	9900	12200	15400	18200	21500	25500	30000
Acoustic												
Outside sound power level	dB(A)	85	87	83	85	90	90	94	95	92	96	98
Indoor air discharge sound power level	dB(A)	80	83	78	80	83	82	88	93	87	91	93

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

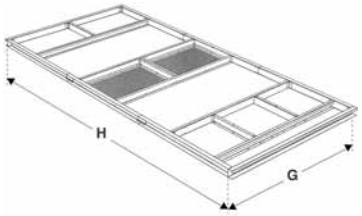
Physical data

1 Unit

2 Roofcurb



3 Supporting frame



FLEXY™	FX	25	30	35	40	55	70	85	100	110	140	170
View 1 - FX unit dimensions												
A	mm	3970	3970	4750	4750	4750	5050	5050	5050	5650	5650	5650
B	mm	1610	1610	2255	2255	2255	2255	2255	2255	2255	2255	2255
C	mm	1055	1055	1340	1340	1340	1725	1725	1725	2150	2150	2150
View 2 - FX roofcurb dimensions												
E	mm	1540	1540	2175	2175	2175	2175	2175	2175	2175	2175	2175
F	mm	3960	3960	4730	4730	4730	5040	5040	5040	5630	5630	5630
View 3 - FX supporting frame dimensions												
G	mm	1540	1540	2175	2175	2175	2175	2175	2175	2175	2175	2175
H	mm	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

Condensing Units
& Dry-coolers

Providing indoor climate comfort

AIRCUBE™ · 19 - 193 kW

Air cooled condensing units

Main applications

- Building air conditioning combined with air handling units

Why this choice?

- Energy efficiency
- Reliability
- High quality

General description

The **AIRCUBE™** is available as Cooling only or as Heat pump outdoor unit. The units are developped from the **ECOLEAN™** liquid chiller.
The **AIRCUBE™** range provides you with a low noise, high efficiency, modern design and almost customised units.
LENNOX has taken into account all the modern requirements of today to have a complete range who gives a maximum comfort to the end user.

Main components

- R410A
- Galvanised sheet steel casing
- Polyester paint finish
- Low speed axial fan
- Easy access to components
- Hermetic Scroll compresor
- Control and protection panel according to EN 60204-1
- 1 or 2 independent cooling circuits according to size
- HP/LP pressure switches
- Standard refrigerant connections: Copper refrigeration tubing for brazing
- To give better and quicker service and maintenance you do not need to access to the electrical board, the control is mounted outside on the outdoor unit, and permit a possible adjustment of some parameters like anti-cycling control time, or defrost cycle for heat pump units.
- Complete user friendly electrical box with circuit breakers instead of fuses for individual protection of each motor.

General data

AIRCUBE™	KSCM/HM	22E	26E	32E	38E	43E
Cooling mode						
Cooling capacity (1)	kW	19,7	24,7	28,4	36,1	42
EER		3,06	3,05	2,95	3,03	2,98
Heating mode						
Heating capacity (2)	kW	19,8	25	28,6	36	40,2
COP		3,20	3,21	3,12	3,24	2,98
Electrical data						
Voltage	V/Ph/Hz	400-N/3/50				
Maximum absorbed power	kW	8,55	10,8	12,5	16,4	17,7
Acoustic						
Sound power level (3)	dB(A)	76	78	81	80	81
Refrigeration circuit						
Number of circuits (cooling mode)		1				
Number of compressors		1				
Capacity steps		1				

AIRCUBE™	KSCM/HM	52D	64D	76D	86D	112D	128D	152D	214D
Cooling mode									
Cooling capacity (1)	kW	49,4	56,7	72,1	83,9	104	115	141	193
EER		3,05	2,94	3,04	2,96	3,03	3,1	3,05	3,11
Heating mode									
Heating capacity (2)	kW	50,1	57,1	71,9	80,3	105	114	137	191
COP		3,21	3,1	3,24	3,1	3,24	3,2	3,13	3,19
Electrical data									
Voltage	V/Ph/Hz	400/3/50							
Maximum absorbed power	kW	21,6	25	32,8	35,5	45,6	48,7	59,9	83,0
Acoustic									
Sound power level (3)	dB(A)	81	84	83	84	87	87	90	89
Refrigeration circuit									
Number of circuits (cooling mode)		2							
Number of compressors		2				3			4
Capacity steps		2							

General data - High static fan option (FP1/FP2)

KSCM/HM+FP1 / FP2 OPTION (OUTDOOR UNIT)	KSCM/HM	112D	128D	152D	214D
Condenser high static fan					
Number		2			4
Voltage	V / Ph / Hz	400/3/50			
FP1 version					
Maximum available static pressure - FP1 version (5)	Pa	125			
Nominal air flow - FP1 version	m^3/h	38000			56000
Total motor power input- FP1 version	kW	5			10
Fan speed-FP1 version	rpm	900			
FP2 version					
Maximum available static pressure - FP2 version (5)	Pa	250			
Nominal air flow - FP2 version	m^3/h	44000			56000
Total motor power input- FP2 version	kW	9,2			18,6
Fan speed-FP2 version	rpm	1450			
Acoustic					
Sound pressure level - FP1 version (4)	dB(A)	59	59	59	62
Sound pressure level - FP2 version (4)	dB(A)	69		69	72

(1) Evaporating temperature : 7ºC Ambient temperature: 35ºC
(2) Condensing temperature: 50ºC Ambient temperature 7ºC DB/6ºC WB
(3) Eurovent conditions
(4) Measured at 10m from the unit, in free field conditions (with compressor jacket)
(5) For minimum airflow

Operating limits

AIRCUBE™	KSCM/HM	22E	26E	32E	38E	43E	52D	64D	76D	86D	112D	128D	152D	214D
Operating limits														
Maximum outside air temperature	°C	45			47		45		47		47			
Minimum outside air temperature (1) (2) (3)	°C	-15/0/+19												
Minimum evaporating temperature (cooling)	°C	-1												
Minimum outside air temperature (heating)	°C	-10												
Maximum condensing temperature	°C	65												
Maximum evaporating temperature	°C	12												
Minimum evaporating temperature	°C	-22												

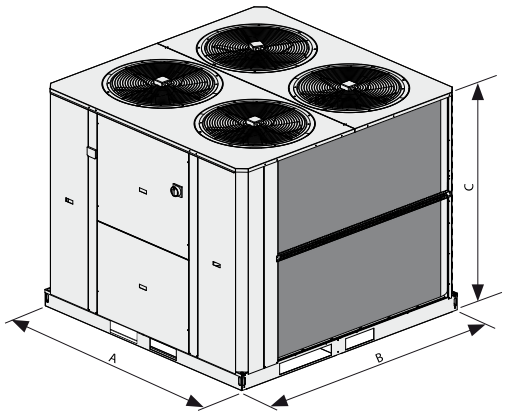
(1) Standard / With low ambient kit 0°C / -15°C
(2) Standard for KSHM
(3) Standard for KSCM

Refrigerant connections

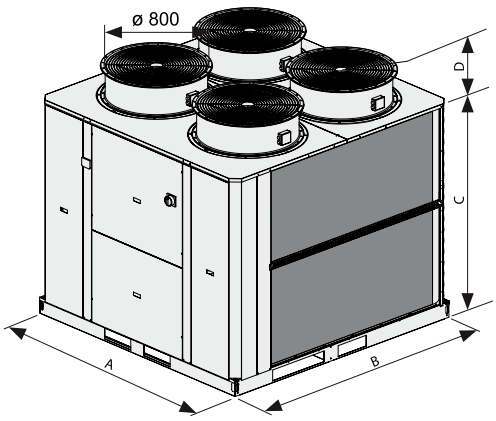
AIRCUBE™	KSCM/HM	22E	26E	32E	38E	43E	52D	64D	76D	86D	112D	128D	152D	214D
Total length 0 to 30m														
Pipe sizes Circuit 1	Liquid	1/2"	5/8"								3/4"			7/8"
	Gas	7/8"	1 1/8"		1 3/8"		1 1/8"		1 3/8"		1 5/8"			
Pipe sizes Circuit 2	Liquid	-	-	-	-	-	5/8"						3/4"	7/8"
	Gas	-	-	-	-	-	1 1/8"		1 3/8"				1 5/8"	
Maximum vertical length														
Vertical length	m	16												
Maximum total length														
Total length	m	65												
Maximum number of bends		12												

Physical data

Standard units



Units with high static fan



OUTDOOR UNIT	KSCM/HM	22E	26E	32E	38E	43E
A	mm	1195				
B	mm	660	980			
C	mm	1375				
Operating weight Approx.	kg	168	219	221	239	258

OUTDOOR UNIT	KSCM/HM	52D	64D	76D	86D	112D	128D	152D	214D
A	mm	1960				2250			
B	mm	1195				1420			2300
C	mm	1375				1875			1975
Operating weight Approx.	kg	452	463	499	537	748	828	932	1684

OUTDOOR UNIT + FP1/FP2 OPTION	KSCM/HM	112D	128D	152D	214D
A	mm	2250			
B	mm	1420			2300
C - FP1 / FP2 version	mm	1875			1975
D - FP1 /FP2 version	mm	280			
Operating weight - KSHM FP1/FP2	kg	788	868	972	1764

Options

- High pressure fan FP1/FP2 (outdoor 112D/128D/152D)
- Inlet plenum for FP1/FP2
- Square discharge duct for FP1/FP2
- Auxiliary drip tray FP1/FP2
- Main ON/OFF switch
- Three phase detector
- Crankcase heater (only cooling - Standard on heat pump units)
- Condenser protection grilles
- Corrosion-proofed coils
- Soft starter (400V/3)
- Drive indoor fan motor by free contact
- Hot gas by-pass
- Unit pre-filled with refrigerant
- Manual valves : liquid and suction
- Anti-vibration mountings
- Compressor jacket
- ModBus

FC NEOSTAR/FI NEOSTAR · 20 - 870 kW

Dry coolers

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.

Description

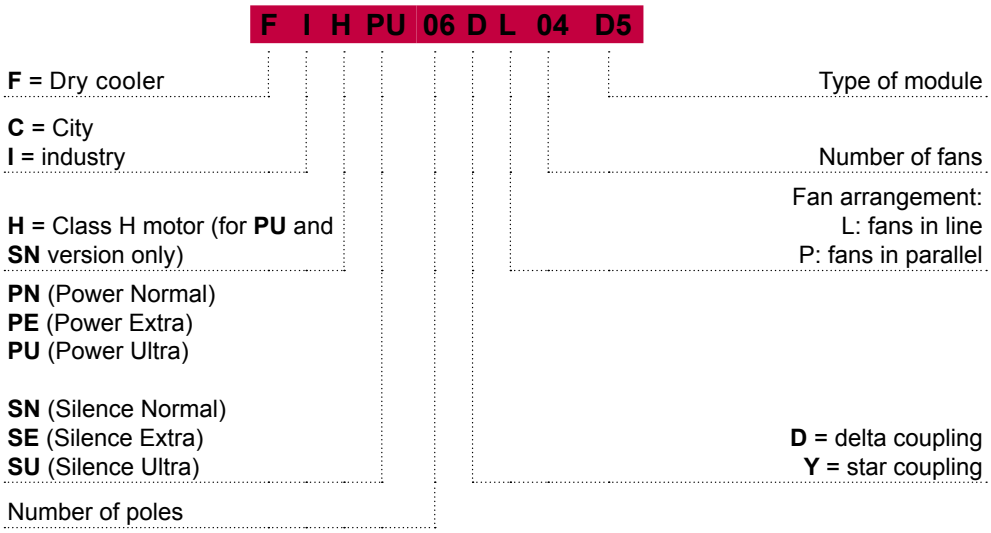
- **Casing:**
  - The casing is composed of galvanised sheet steel and pre-painted galvanized metal, colour grey RAL7035.
  - The use of stainless steel screws guarantees excellent, long-lasting corrosion resistance (standard ISO 7253) and aesthetic quality.
  - All components used have successfully 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



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.

  FOR FC/FI NEOSTAR VERSION ONLY:
  - **M60** Motor fan unit 400 V/3/60Hz (consult us).
  - **M25** Motor fan unit 230 V/3/50Hz (consult us).
  - **M26** Motor fan unit 230 V/3/60Hz (consult us).

- **Coil:**
  - **MCI** Multi-circuiting.
  - **BXT** XT Blygold Polual coating of the fins.
  - **BAE** Coating of the fins.
  - Free draining special circuit when not in operation
  - Flanges, mating flanges, bolts and gaskets,...
  - Steel or brass 1/2” G vents and drains

- **Miscellaneous:**
  - **VEX** Surge tank.
  - **MSK** Floor mounting kit

- **Protection and controls:**
  - **CMP** Motors protection cabinet.
  - **RT1** CMP plus control by fan cycling.
  - **RT2** CMP plus control by speed regulation (voltage variation).
  - **RT3** CMP plus control by speed regulation (frequency variation).
  - **MEC** Condensing pressure control with speed variation using electronic switching (EC) of motor.

NEOSTAR · 18 - 1250 kW

Condenser

NEOSTAR

Main applications

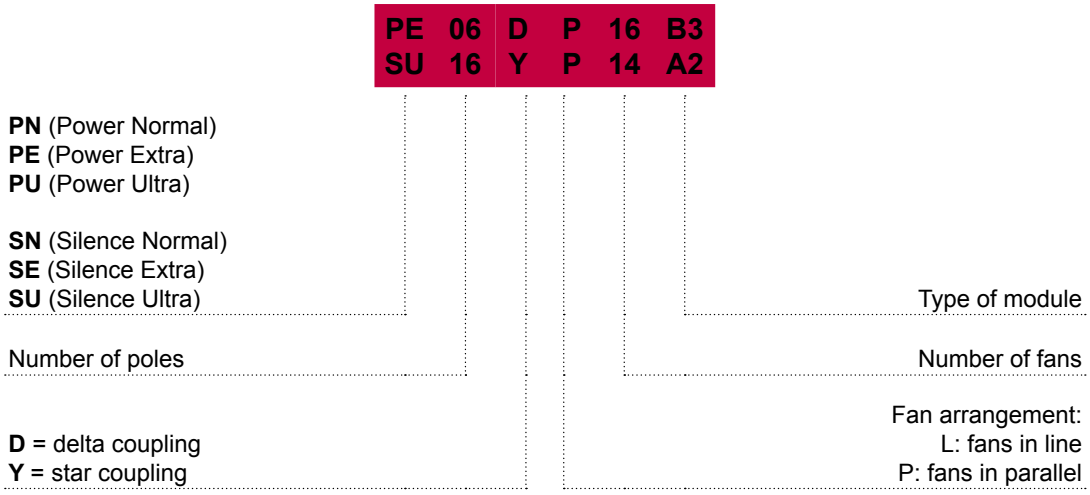
- The air cooled condenser units of the new NEOSTAR range are designed for refrigeration or air conditioning applications and outdoor installation. The 470 basic models cover a capacity range from 18 to 1250 kW.

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, the new optimised fins have been specially designed 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 line is equipped with the following motor fan units:
    - Ø 910 mm: 06P (D/Y)= 890/685 rpm,
    - Ø 800 mm: (heavy-duty motor): 06P (D/Y)= 910/730 rpm,
    - Ø 800 mm: 06P (D/Y)= 895/685 rpm.
  - The NEOSTAR Silence line 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, 50Hz, 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 400 V/3/60Hz, IP54, class F, in version 06P Ø800mm
    - M26: Fan motor 230 V/3/60Hz, IP54, class F, in version 06P Ø800mm
    - M25: Fan motor 230 V/3/50Hz, IP54, class F, in version 06P and 12P Ø800mm
- **Casing**
  - The casing is composed of galvanised sheet steel and pre-painted galvanized metal, colour grey RAL7035.
  - • 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



Options

- **Coils:**
  - **MCI** Multi-circuits
  - **BXT** Blygold Polual XT protection of fins: Consult us.
  - **BAE** Vinyl protection of fins.

- **Fans:**
  - **M60** Motor fan unit 400 V/3/60Hz (consult us),
  - **M25** Motor fan unit 230 V/3/50Hz (consult us),
  - **M26** Motor fan unit 230 V/3/60Hz (consult us),
  - **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.

- **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.

- **Protection and controls:**
  - **CMP** Motor protection enclosure.
  - **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.

For you.
Future is now.

3 YEAR WARRANTY

Quality
*makes the difference**

NEOSYS™

Air/water liquid chiller: 200 - 1000 kW
Air/Water Heat pump: 200 - 500 kW

High efficiency micro channel

•

Inverter fans

•

CLIMATIC™ control

•

Multi scroll R410A compressors

www.lennox-neosys.com

* 3-year warranty only applies to compressors, fans, exchanger coils. Subject to LENNOX warranty policy and to maintenance contract by an accredited LENNOX company.

Chillers & Heat pumps

Providing indoor climate comfort

ECOLEAN™ · 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 overal dimensions
- Optimal access to the various components
- Hydraulic modules incorporated in the same cabinet
- Condenser fan with available pressure (FP version - up to 200 Pa)

Main components

- Galvanised sheet steel framework with fork lift pockets for ease maintenance
- Pre-painted galvanised sheet steel casing
- Colour RAL 9002
- Sealed scrolll compressor
- R407C refrigerant
- Insulated stainless steel 316 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 (PAC)
    Failure codes
    Operating stats
  - Selection: Start/stop
    Operating mode: heat/cool

General data

ECOLEAN™ STD	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	19,8
COP		2,66	2,47	2,48	2,55	2,56
Electrical data						
Voltage	V/Ph/Hz	400/3/50				
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	m^3/h	1,51	1,91	2,3	2,99	3,29
Pressure drop without water filter	kPa	25	39	29	47	41
Pressure with optional water filter	kPa	49	66	58	81	78
Hydraulic connection						
Type		Threaded - Female				
Diameter		1"				
Acoustic						
Sound power level (3)	dB(A)	73	75	76	76	79

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	V/Ph/Hz	400/3/50				
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	m^3/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 with optional water filter	kPa	49	66	58	81	78
Hydraulic connection						
Type		Threaded - Female				
Diameter		1"				
Acoustic						
Sound power level (3)	dB(A)	79	82	82	82	83

(1) Water: 12°C/7°C - Air: 35°C
(2) Water: 45°C - Air: 7°C
(3) Eurovent conditions
ECOLEAN™ is part of LCP Eurovent Certification Program (www.eurovent-certification.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	°C	0°C (-15°C as an option)/-10°C (-15°C as an option)				
Maximum inlet water temperature	°C	17/43				
Minimum outlet water temperature	°C	+5°C and -10°C (as an option)/+20°C				

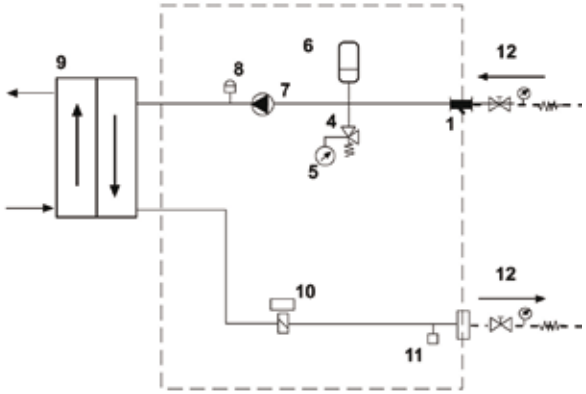
General data - Integrated hydraulic module

ECOLEAN™ HY / HN	EAC/EAR	91	111	151	191	211
Pump module						
Nominal water flow	m^3/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)	kW	6				

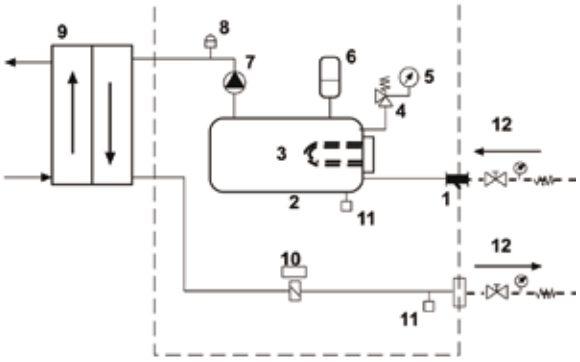
(1) Available only for the "Hydronic" type version

Principle sketch - Integrated hydraulic module

"Hydraulic" module (HY)



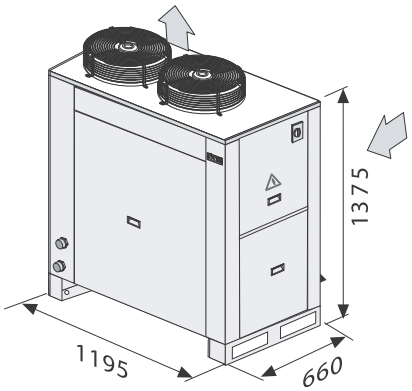
"Hydronic" module (HN)



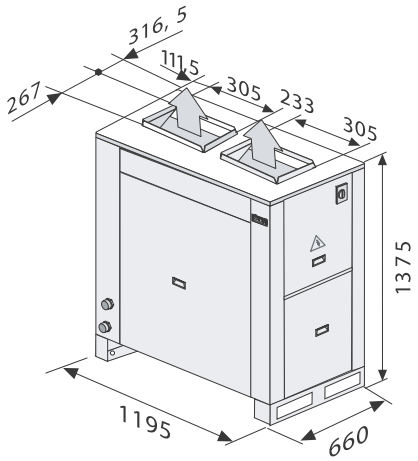
1	Water filter (removable)	**5**	Pressure gauge	**9**	Plate exchanger
2	Tank	**6**	Expansion tank	**10**	Flow switch
3	Immersion heater for tank (optional)	**7**	Pump	**11**	Drain valve
4	Safety valve	**8**	Air bleed valve	**12**	Water isolation valves (optional)

Physical data

Standard version



High static version



ECOLEAN™ STD	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)	kg	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 Al fins coils treated
- Main ON/OFF switch
- Softstarter (1)
- Three phase protection
- Evaporator antifreeze protection
- Tank antifreeze heater (230V-400V)
- Flow switch (3)
- Water filter (supplied loose) (3)
- Coils protection guards:
- Low ambient kit (-15ºC) - EAC only
- Heating Low ambient kit (-15ºC) (2):
- Thermostatic hot gas injection
- Kit low water temperature (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)
- Interface mod-Bus KPO6 (max. 8 units and supplied loose
- Dynamic set point
- Alarm relay
- Adaptor for interface Mod-Bus (1 per unit - supplied loose)
- Remote display (supplied loose)

(1) Available only for 400/3/50 Hz
(2) Heat pump units only
(3) Included on "Hydraulic" and "Hydronic" versions

ECOLEAN™ · 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 pump and optional buffer tank
- Very compact for outdoor or indoor installation

General description

The new generation of **ECOLEAN™** 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 both on new fan blade technologies, 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) is mainly for outdoor installation and the fan pressure version (F) is suited for indoor installation where high available static pressure is required.

Each **ECOLEAN™** standard 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 fan running in low fan speed 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 fan running in low fan speed and compressor noise insulated in a very high performance acoustic cabinet.

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

- single pump (twin pump as option),
- expansion vessel,
- air vent,
- pressure relief valves...

A version with a supplementary buffer tank (HN version) 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 maintenance
- Pre-painted galvanised sheet steel casing
- Colour RAL 9002
- Sealed scroll compressor
- R410A refrigerant
- Insulated stainless steel 316 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/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
- 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 (Performance mode, 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.

General data - Standard version - Sizes 251 to 812

ECOLEAN™ STD		EAC/EAR	251	291	351	431	472	552	672	812
Cooling mode										
Cooling capacity (1)		kW	22,1	25,9	32	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	75,7
COP			3	3	3	2,91	3	2,94	3	2,92
Electrical data										
Voltage		V/Ph/ Hz	400/3/50							
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	09/ 10	11/ 11,4	12,2/ 12,7	16,1/ 16,8	18,5/ 19,3
Pressure drop										
Nominal water flow		m^3/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		kPa	69	78	60	73	50	57	71	87
Hydraulic connection										
Type			Threaded - Female							
Diameter			1 1/2"				2"			
Acoustic										
Sound power level	LN (5)	dB(A)	71	70	71	72	74	73	74	75
	STD	dB(A)	76	76	77	78	79	79	80	81

General data - Standard version - Sizes 1003 to 2104

ECOLEAN™ STD		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	4,06	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		V/ Ph/Hz	400/3/50							
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		m^3/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		kPa	43	47	57	69	76	61	73	95
Hydraulic connection										
Type			Threaded - Female							
Diameter			2 1/2"					3"		
Acoustic										
Sound power level /Sound pressure level (4)	SLN (5)	dB(A)	72/40	75/43	76/44	78/46	72/40	75/43	76/44	78/46
	LN (5)	dB(A)	75/43	76/44	79/47	81/49	75/43	76/44	79/47	81/49
	STD	dB(A)	80/48	82/50	85/53	87/55	80/48	82/50	85/53	87/55

(1) Water: 12°C/7°C - Air: 35°C (2) Water: 45°C - Air: 7°C
(3) Eurovent conditions (4) Sound power level and sound pressure level at 10 m from the unit, in free filed, conformity with ISO3744 norm
(5) Maximum sound power level only if "Quiet++" mode selected. If "Quiet" mode selected, the unit may operate the high fan speed to work at full load and avoid high pressure switch-off in case of very high or very low ambient temperatures.
ECOLEAN™ is part of LCP Eurovent Certification Program (www.eurovent-certification.com)

Operating limits

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

General data - Integrated hydraulic module

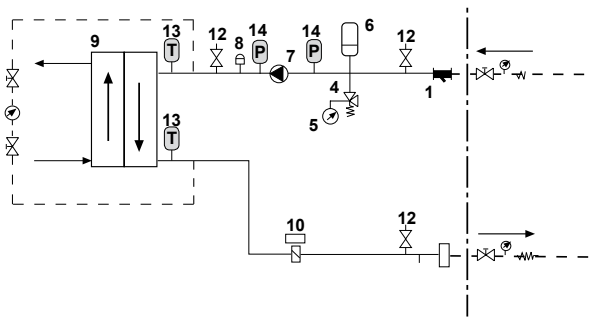
ECOLEAN™ HY / HN	EAC/EAR	251	291	351	431	472	552	672	812
Pump module									
Nominal water flow	m^3/h	3,8	4,45	5,5	6,62	7,59	8,72	10,9	12,98
Available static pressure	kPa	131	106	150	96	128	115	165	107
Voltage	V/Ph/Hz	400/3/50							
Absorbed power	kW	0,72		1,1	1,1	1,17		1,55	
Expansion vessel volume	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 HP units only)	kW	9				12			

ECOLEAN™ HY / HN	EAC/EAR	1003	1103	1203	1303	1403	1604	1804	2104
Pump module									
Nominal water flow	m^3/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	V/Ph/Hz	400/3/50							
Absorbed power	kW	2,45				2,93		3,7	4
Expansion vessel volume	l	35					50		
Maximum pressure - Expansion vessel	Bar	4							
Weight	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 HP units only)	kW	24					36		

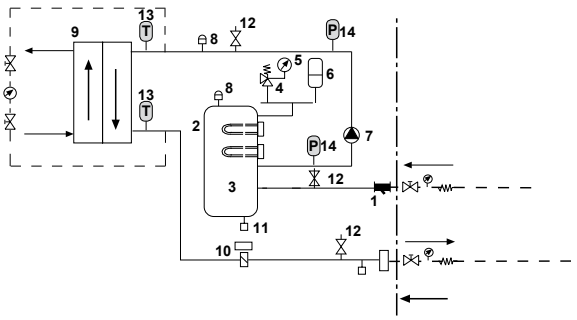
(1) Available only for the "Hydronic" type version

Principle sketch - Integrated hydraulic module

"Hydraulic" module (HY)

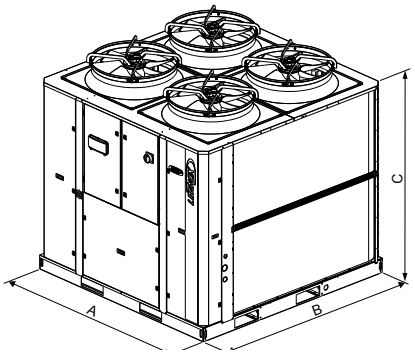


"Hydronic" module (HN)



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		

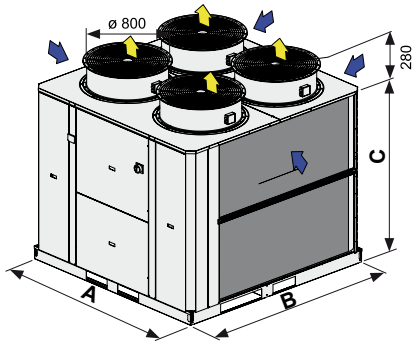
Physical data - Standard version



ECOLEAN™ STD	EAC/EAR	251	291	351	431	472	552	672	812
A	mm	1195	1195	1195	1195	1960	1960	1960	1960
B	mm	980	980	980	980	1195	1195	1195	1195
C	mm	1375	1375	1375	1375	1375	1375	1375	1375
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)	kg	47		48		55		57	

ECOLEAN™ STD	EAC/EAR	1003	1103	1203	1303	1403	1604	1804	2104
A	mm	2250	2250	2250	2250	2250	2250	2250	2250
B	mm	1420	1420	1420	1420	1420	2300	2300	2300
C	mm	2155	2155	2155	2155	2155	2250	2250	2250
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)	kg	81				84	144	162/167	

Physical data - High static version



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

ECOLEAN™ FM	EAC/EAR	1003	1103	1203	1303	1403	1604	1804	2104
A	mm	2250	2250	2250	2250	2250	2250	2250	2250
B	mm	1420	1420	1420	1420	1420	2300	2300	2300
C	mm	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 that of the corresponding machine - 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 operation down to -20°C ambient temperature
- Low leaving water temperature operation (+5 –► -10°C)
- Twin pump
- eDrive™ variable water flow
- Modbus communication interface
- LonWorks® communication interface
- BACnet® communication interface
- Adalink supervision
- 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

DC 60 User Interface

eDrive™ variable water flow option

NEOSYS™ · 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
- Inverter fans
- Advanced CLIMATIC™ control
- Unit with pump & heat recovery (option)
- 3-year warranty*

Introduction to the range

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.

- **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 Owlet™ high performance aluminium fan blades.
- Unit electrical cabinet, 400V, 50 Hz, 3 phase power supply (without neutral) with a single point of power connection.
- Main ON/OFF switch mounted on the front panel.
- DC user interface mounted on the front panel. Low pressure / high pressure refrigerant reading.
- 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).

* 3-year warranty only applies to compressors, fans, exchanger coils. Subject to LENNOX warranty policy and to maintenance contract by an accredited LENNOX company.

General data

NEOSYS™	NAC	200	230	270	300	340	380	420	480
Cooling mode									
Cooling capacity (1)	kW	208	235	273	307	346	387	432	473
EER (2)		2,94	2,76	2,60	2,90	2,80	2,61	2,87	2,75
ESEER (2)		4,24	4,03	3,99	4,04	4,15	3,90	4,19	4,01
Electrical data									
Voltage	V/Ph/Hz	400/3/50							
Refrigeration circuit									
Number of circuit		2							
Number of compressors		4				5		6	
Evaporator type		AISI 316 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	30,3	38,7	39,6	49,9	47,9	40,8	41,4	49,5
Hydraulic connections									
Type		Victaulic							
Diameter In/Out		4"				5"			
Acoustic									
Global sound power level (1)	dB(A)	89	89	90	91	91	91	93	93
Sound pressure level at 10 m	dB(A)	57	57	58	59	59	59	61	61
Operating limits									
Min. outlet water temperature	°C	5							
Max. Intlet water temperature	°C	20							
Min. difference water inlet/outlet	°C	3							
Max. difference water inlet/outlet	°C	8							
Min. outside air temperature	°C	6							
Max. outside air temperature	°C	46	46	46	46	46	43	46	46

NEOSYS™	NAC	540	600	640	680	760	840	960	1080
Cooling mode									
Cooling capacity (1)	kW	531	605	627	692	775	864	946	1062
EER (2)		2,64	2,76	2,77	2,80	2,61	2,87	2,75	2,64
ESEER (2)		4,0	4,15	4,17	4,15	3,91	4,21	4,01	4,0
Electrical data									
Voltage	V/Ph/Hz	400/3/50			2 x 400/3/50				
Refrigeration circuit									
Number of circuit		2			4				
Number of compressors		6			10		12		
Evaporator type		AISI 316 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	56,8	59	58,4	57	51,3	56	66	71
Hydraulic connections									
Type		Victaulic							
Diameter In/Out		6"			8"				
Acoustic									
Global sound power level (1)	dB(A)	93	94	94	94	94	96	96	96
Sound pressure level at 10 m	dB(A)	61	62	62	62	62	64	64	64
Operating limits									
Min. outlet water temperature	°C	5							
Max. Intlet water temperature	°C	20							
Min. difference water inlet/outlet	°C	3							
Max. difference water inlet/outlet	°C	8							
Min. outside air temperature	°C	6							
Max. outside air temperature	°C	43	46	46	46	43	46	46	43

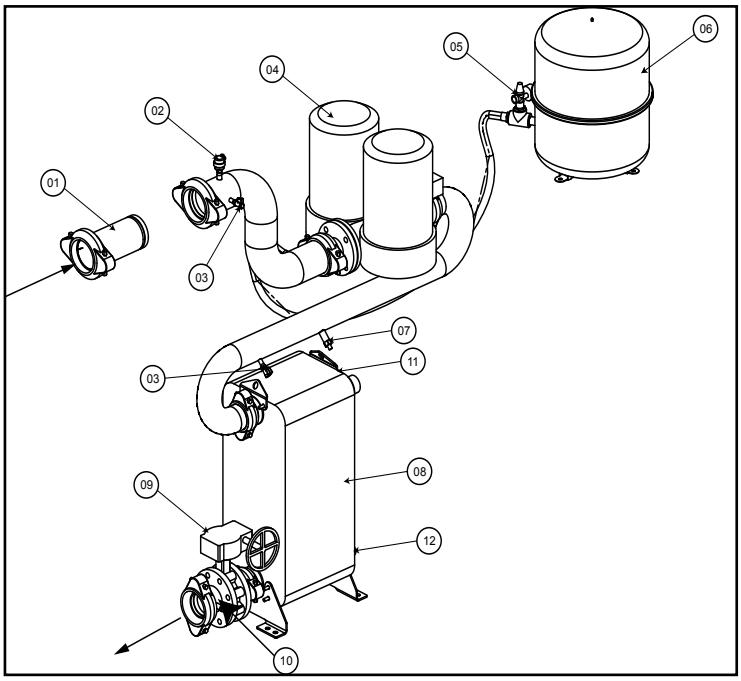
(1) All data are at Eurovent condition.
(2) ESEER according to EN14511 Eurovent calcultaion method
NEOSYS™ is part of LCP Eurovent Certification Program (All models are certified up to 600 kW) (www.eurovent-certification.com)

General data

NEOSYS	NAH	200	230	270	300	340	380	420	480
Cooling mode									
Cooling capacity (1)	kW	191	215	271	295	324	351	397	454
EER (2)		2,75	2,54	2,79	2,65	2,52	2,71	2,56	2,53
ESEER (2)		4,00	3,76	3,99	3,94	4,01	4,08	3,86	4,14
Heating mode									
Heating capacity (1)	kW	219	252	312	346	370	410	429	509
COP		3,21	3,13	3,20	3,12	3,04	3,04	2,99	3,01
Electrical data									
Voltage	V/Ph/Hz	400/3/50							
Refrigeration circuit									
Number of circuit		2							
Number of compressors		4				5	6		
Evaporator type		AISI 316 stainless steel plate brazed with copper heat exchanger							
Capacity steps		6			4	5	6		
Pressure drop									
Pressure drop (1)	kPa	25,7	32,5	38,8	46,2	29,8	36,5	43,6	42,3
Hydraulic connections									
Type		Victaulic							
Diameter In/Out		4"				5"			
Acoustic									
Global sound power level (1)	dB(A)	89	89	91	91	91	92	92	92
Sound pressure level at 10 m	dB(A)	57	57	59	59				
Operating limits									
Min. outlet water temp. cooling	°C	5							
Max. inlet water temperature	°C	20							
Min. outside air temp. cooling	°C	6							
Max. outside air temp. cooling	°C	46							
Max. outlet water temp. heating	°C	50							
Min. outdoor air temp. heating	°C	-12							

(1) All data are at Eurovent condition.
(2) ESEER according to EN14511 Eurovent calcultaion method

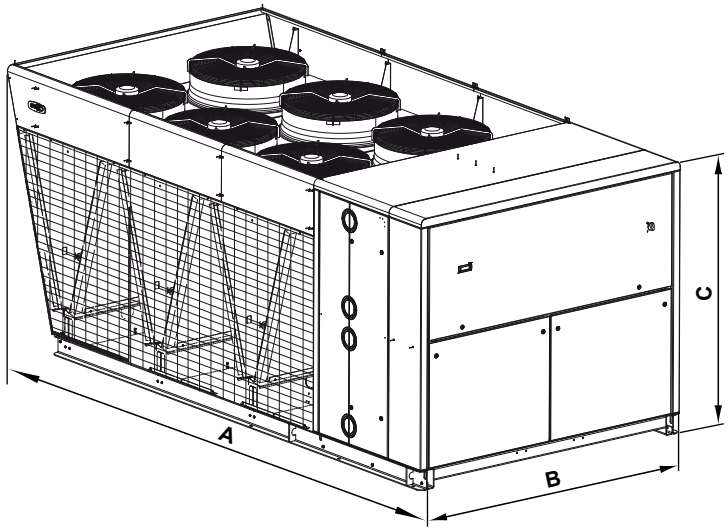
Integrated hydraulic module



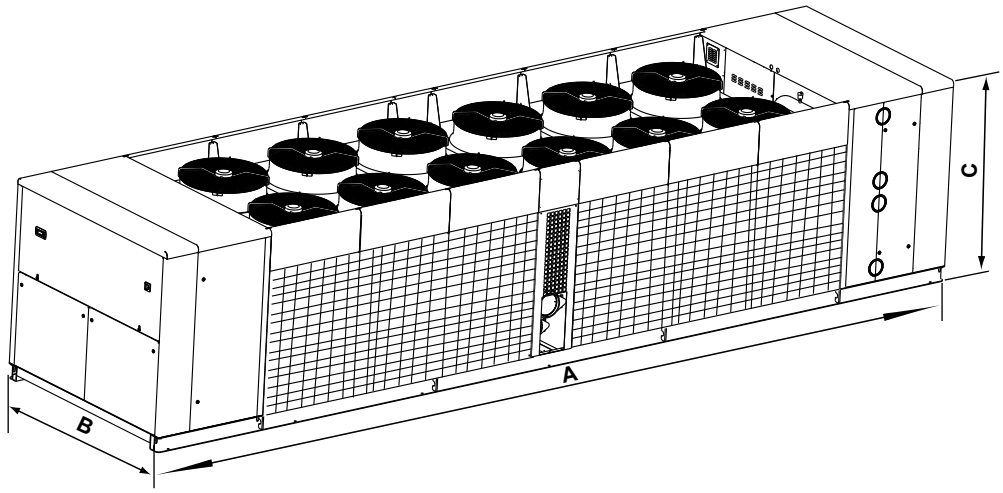
01	Water filter (supplied loose)
02	Air purge
03	Pressure tap
04	Pump
05	Safety valve with manometer
06	Espansion vessel
07	Electronic flow switch
08	Plate heat exchanger
09	Setting valve
10	Pressure tap and drain valve
11	Return temperature sensor
12	Supply temperature sensor

Physical data

Sizes 200 to 640



Sizes 680 to 1080



NEOSYS™	NAC	200	230	270	300	340	380	420	480
A	mm	3590	3590	3590	4620	4620	4620	5650	5650
B	mm	2280	2280	2280	2280	2280	2280	2280	2280
C	mm	1965	1965	1965	1965	1965	1965	1965	1965
Shipping weight	kg	1962	1989	2234	2615	2889	2962	3429	3530

NEOSYS	NAC	540	600	640	680	760	840	960	1080
A	mm	5650	6680	6680	9240	9240	11300	11300	11300
B	mm	2280	2280	2280	2280	2280	2280	2280	2280
C	mm	1965	1965	1965	1965	1965	1965	1965	1965
Shipping weight	kg	3539	3885	3918	6445	6570	7700	7825	7815

NEOSYS™	NAH	200	230	270	300	340	380	420	480
A	mm	3590	3590	4620	4620	4620	5650	5650	5650
B	mm	2280	2280	2280	2280	2280	2280	2280	2280
C	mm	1965	1965	1965	1965	1965	1965	1965	1965
Shipping weight	kg	2088	2114	2769	2795	3184	3708	3878	3958

Options

- Hydraulic module with low or high pressure, single or dual pump (Victaulic 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
- Thermoguard™ 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™
- 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.

HYDROLEAN™ · 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
- Split version with remote condenser
- Advanced CLIMATIC™ control
- Very robust & 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 316 brazed plate evaporator
- Stainless steel 316 brazed plate condenser
- Brazed filter dryer, thermostatic expansion valve, HP / LP pressure switches, 4 way valve for heat pump only and repleacable 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 switch ON/OFF
- 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

HYDROLEAN™	SWC - K	20	25	35	40	50	65	80	90	100	120	135	165
Cooling mode													
Cooling capacity (1)	kW	18,9	24,2	34,6	42,2	49,3	69,6	75,8	86	103	111	140	165
EER (2)		4,14	3,75	3,76	3,85	3,81	3,74	3,67	3,9	3,66	3,72	3,8	3,68
ESEER (2)		4,76	4,34	4,32	4,43	5,31	5,14	5,16	5,24	5,28	5,13	5,12	4,97
Electrical data													
Voltage	V/Ph/Hz	400/3/50											
Refrigeration Circuit													
Number of circuit		1									2		
Number of compressor		1				2					3		
Capacity steps		1				2				3	4		
Refrigerant charge per circuit	kg	1,3	1,5	2	2,5	3,3	4,5	4,5	5,9	5,9	5,3	7,4	
Hydraulic connections													
Hydraulic connections type		Victaulic											
Water inlet / outlet	Inches/DN	1"1/4 / DN32				2" / DN50							
Condenser													
Condenser type		AISI 316 stainless steel plate brazed with copper heat exchanger											
Water flow	m³/h	4	5,3	7,5	9,2	10,7	15,2	16,6	18,6	22,5	24,2	30,4	36,1
Water volume	l	1,6	1,6	2,5	3,1	4,1	5,6	5,6	7,4	7,4	13,4	18,6	18,6
Pressure drop	kPa	46	77	71	69	51	57	67	50	71	65	57	79
Water operating pressure	kPa	600											
Evaporator													
Evaporator type		AISI 316 stainless steel plate brazed with copper heat exchanger											
Water flow	m³/h	3,3	4,2	6	7,3	8,5	12	13,1	14,8	17,7	19,1	24,1	28,4
Water volume	l	1,6	1,6	2,5	3,1	4,1	5,6	5,6	7,4	7,4	13,4	18,6	18,6
Pressure drop	kPa	30	49	45	44	33	36	43	32	45	41	37	50
Water operating pressure	kPa	600											
Acoustic													
Global sound power level (1)	dB(A)	72	78	80	80	81	83	83	83	87	85	88	91

HYDROLEAN™	SWH - K	20	25	35	40	50	65	80	90	100	120	135	165
Cooling mode													
Cooling capacity (1)	kW	17,5	22,6	32,2	39,3	45,9	64,9	70,7	80,1	95,7	103	130	154
EER (2)		3,83	3,48	3,48	3,56	3,53	3,47	3,4	3,61	3,4	3,45	3,53	3,41
ESEER (2)		4,05	4,05	4,02	4,11	4,94	4,79	4,81	4,88	4,91	4,76	4,76	4,61
Heating mode													
Heating capacity (1)	kW	19,4	26	37	45,2	52,4	74,4	81,9	91	110	119	147	177
COP (2)		3,29	3,21	3,19	3,23	3,21	3,18	3,14	3,24	3,13	3,16	3,18	3,12
Electrical data													
Voltage	V/Ph/Hz	400/3/50											
Refrigeration Circuit													
Number of circuit		1									2		
Number of compressor		1				2					3		
Capacity steps		1				2				3	4		
Refrigerant charge per circuit	kg	1,3	1,5	2	2,5	3,3	4,5	4,5	5,9	5,9	5,3	7,4	
Hydraulic connections													
Hydraulic connections type		Victaulic											
Water inlet / outlet	Inches/DN	1"1/4 / DN32				2" / DN50							
Condenser													
Condenser type		AISI 316 stainless steel plate brazed with copper heat exchanger											
Water flow	m³/h	3,8	5	7,1	8,7	10,1	14,4	15,8	17,6	21,3	22,9	28,8	34,2
Water volume	l	1,6	1,6	2,5	3,1	4,1	5,6	5,6	7,4	7,4	13,4	18,6	18,6
Pressure drop	kPa	41	69	64	62	46	51	61	45	64	59	52	71
Water operating pressure	kPa	600											
Evaporator													
Evaporator type		AISI 316 stainless steel plate brazed with copper heat exchanger											
Water flow	m³/h	3	3,9	5,6	6,8	7,9	11,2	12,2	13,8	16,5	17,8	22,4	26,5
Water volume	l	1,6	1,6	2,5	3,1	4,1	5,6	5,6	7,4	7,4	13,4	18,6	18,6
Pressure drop	kPa	26	42	40	38	29	32	37	28	39	36	32	44
Water operating pressure	kPa	600											
Acoustic													
Global sound power level (1)	dB(A)	72	78	80	80	81	83	83	83	87	85	88	91

(1) All data are at Eurovent condition
(2) EER and COP compressors only
HYDROLEAN™ is part of LCP Eurovent Certification Program (www.eurovent-certification.com)

General data

HYDROLEAN™	SWR - K	20	25	35	40	50	65	80	90	100	120	135	165
Cooling mode													
Cooling capacity (1)	kW	17,6	23,1	32,8	40	46,9	66,4	72,8	81,8	98,5	106,1	132,7	158,3
EER (2)		3,33	3,22	3,2	3,26	3,28	3,23	3,23	3,33	3,24	3,26	3,26	3,26
Electrical data													
Voltage	V/Ph/Hz	400/3/50											
Refrigeration Circuit													
Number of circuit		1									2		
Number of compressor		1				2					3		
Capacity steps		1				2				3	4		
Hydraulic connections													
Hydraulic connections type		Victaulic											
Discharge line		7/8"			1" 1/8			1" 3/8			1" 3/8 & 1" 3/8		
Liquid line		5/8"				7/8"							
Evaporator													
Evaporator type		AISI 316 stainless steel plate brazed with copper heat exchanger											
Water flow	m^3/h	3,0	4,0	5,7	6,9	8,1	11,4	12,5	14,1	17,0	18,3	22,9	27,3
Water volume	l	1,6	1,6	2,5	3,1	4,1	5,6	5,6	7,4	7,4	13,4	18,6	18,6
Pressure drop	kPa	26,2	44,3	41,2	39,7	29,9	33,2	39,5	29,3	41,7	38,2	33,6	46,7
Water operating pressure	kPa	600											
Acoustic													
Global sound power level (1)	dB(A)	72	78	80	80	81	83	83	83	87	85	88	91

(1) All data are at Eurovent condition
(2) EER and COP compressors only

Operating limits

HYDROLEAN™	SWH/ SWC	20	25	35	40	50	65	80	90	100	120	135	165
Min. evap outlet water temperature	°C	5											
Max. evap inlet water temperature	°C	20											
Min. difference water inlet/outlet	°C	3											
Max. difference water inlet/outlet	°C	8											
Max. cond outlet water temperature (3)	°C	53											
Min. cond inlet water temperature (4)	°C	25											

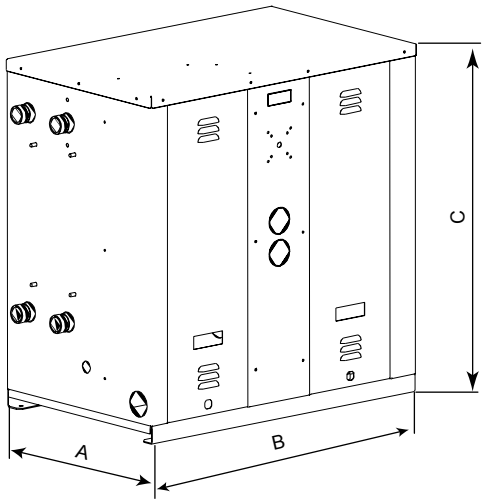
HYDROLEAN™	SWR - K	20	25	35	40	50	65	80	90	100	120	135	165
Min. evap outlet water temperature	°C	5											
Max. evap inlet water temperature	°C	20											
Min. difference water inlet/outlet	°C	3											
Max. difference water inlet/outlet	°C	8											
Min. Discharge temperature (3)	°C	35											
Max. Discharge temperature (4)	°C	60											

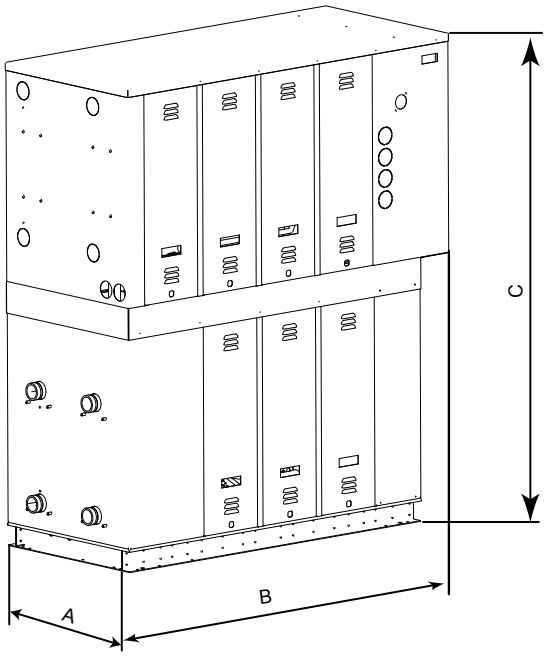
(3) Given for «Cooling Mode» and an evaporator outlet water temperature below 12°C
(4) Can be reduced if a water pressure regulated valve is used.

Physical data

Sizes 120 to 165

Sizes 020 to 100





HYDROLEAN™		20	25	35	40	50	65	80	90	100	120	135	165
A	mm	502	502	502	502	645	645	645	645	645	645	645	645
B	mm	802	802	802	802	1470	1470	1470	1470	1470	1470	1470	1470
C	mm	815	815	815	815	854	854	854	854	854	1705	1705	1705
SWC													
Operating weight	kg	124	192	213	239	393	426	444	485	531	690	760	803
Weight without water	kg	121	189	208	233	385	415	433	470	517	663	723	766
SWH													
Operating weight	kg	125	194	215	241	398	432	450	490	539	698	768	813
Weight without water	kg	122	191	210	235	390	421	439	475	524	671	731	776
SWR													
Operating weight	kg	118	188	202	230	380	403	409	438	486	640	693	736
Weight without water	kg	112	180	195	217	361	385	403	431	479	627	674	718

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 KP06
- Remote display
- Dynamic Set Point
- Hot water control
- Communication interface :
- RS485 / «Modbus INTERFACE»

Dry-Cooler & remote air-cooled condensers

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

MWC™/MRC™ · 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
- Very low noise operation
- R410A scroll compressors
- Brazed plate heat exchangers
- Advanced CLIMATIC™ control

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 (Class B efficiency / 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 +50°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.

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/3/50Hz 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.
- DC50 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 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).

General data

MWC™		180	230	280	330	380	450	510	570	650	720
Cooling mode											
Cooling capacity (1)	kW	186	233	281	334	380	443	499	570	642	716
EER (2)		4,74	4,66	4,70	4,70	4,70	4,66	4,59	4,66	4,57	4,44
ESEER (2)		6,74	6,31	6,38	6,25	6,03	6,04	6,04	6,09	5,97	5,67
Heating mode											
Heating capacity (3)	kW	197	246	297	352	402	468	530	603	682	751
COP (2)		4,05	4,00	4,06	4,05	4,05	4,03	3,99	4,03	4,01	3,89
Electrical data											
Voltage	V/Ph/Hz	400/3/50									
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		Victaulic									
Water inlet / outlet		4"					5"				
Condenser		AISI 316 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	kPa	600									
Evaporator		AISI 316 stainless steel plate brazed with copper heat exchanger									
Water flow (1)	m³/h	32,0	40,1	48,3	57,4	65,4	76,2	85,9	98,1	110,5	102,6
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	kPa	600									
Acoustic											
Global sound power level (1)	dB(A)	81	87	89	90	92	92	93	93	96	97

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	V/Ph/Hz	400/3/50									
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 2" 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 316 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	kPa	600									
Acoustic											
Global sound power level (1)	dB(A)	81	87	89	90	92	92	93	93	96	97

All data are at Eurovent conditions :
(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

COOLING ONLY

MWC™		180	230	280	330	380	450	510	570	650	720
Min. evaporator outlet water temperature	°C	5									
Max. evaporator outlet water temperature	°C	20									
Min. difference water inlet/outlet	°C	3									
Max. difference water inlet/outlet	°C	8									
Min. condenser outlet water temperature	°C	20									
Maximum condenser outlet water temperature : Full capacity operation	°C	56									

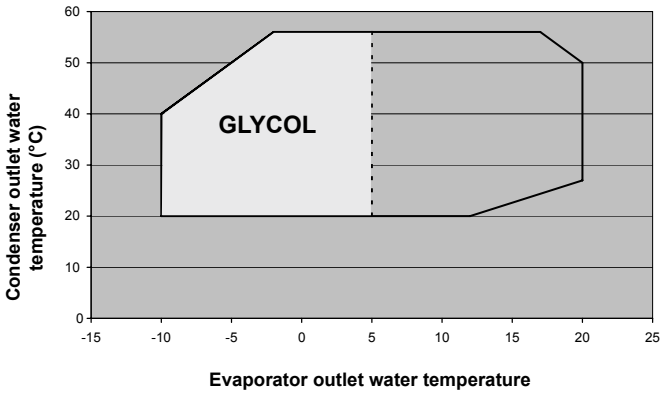
Evaporator and condenser water Delta T = 5°C

REMOTE CONDENSER

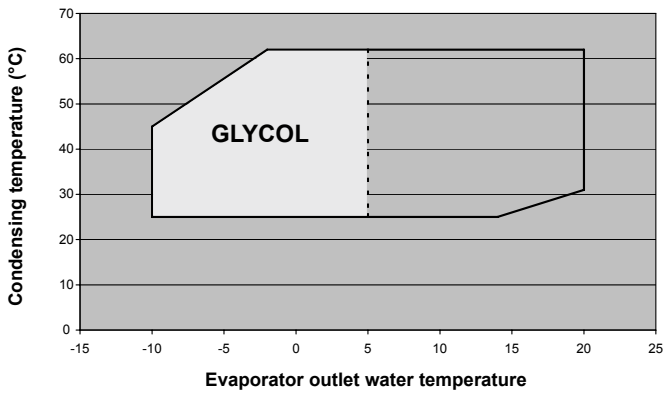
MRC™		180	230	280	330	380	450	510	570	650	720
Min. evaporator outlet water temperature	°C	5									
Max. evaporator outlet water temperature	°C	20									
Min. difference water inlet/outlet	°C	3									
Max. difference water inlet/outlet	°C	8									
Minimum discharge temperature	°C	25									
Maximum discharge temperature : Full capacity operation	°C	62									

Evaporator water Delta T = 5°C

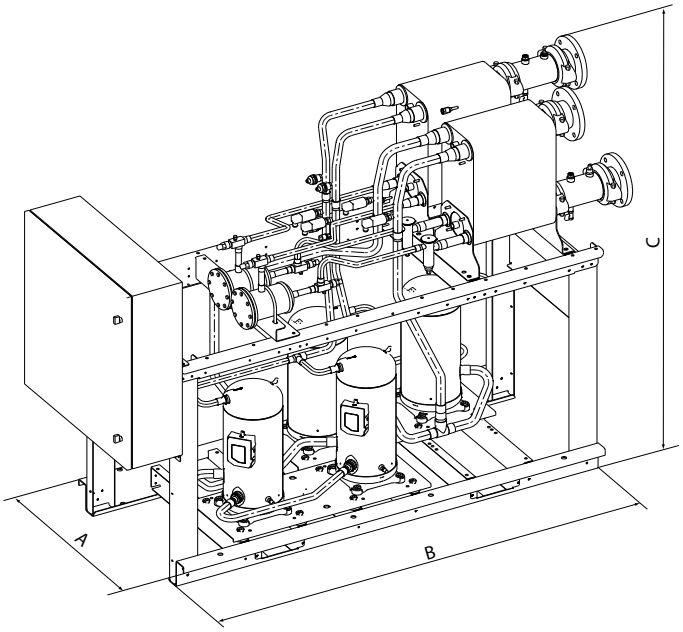
MWC
Operating limits



MRC
Operating limits



Physical data



MWC™ / MRC™		180	230	280	330	380	450	510	570	650	720
A	mm	820					1200				
B	mm	2150					2200				
C	mm	1645	1870								
MWC™											
Footprint	m²	1,8					2,6				
Operating weight	kg	756	974	1158	1328	1534	1984	2100	2240	2440	2480
Wieght without water	kg	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
Wieght without water	kg	620	770	910	1080	1240	1620	1690	1790	1890	1930

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)
- DC50™ remote comfort display (supply loose)
- DS50™ service display (supply loose)
- Modbus communication interface
- LonWorks® communication interface
- BACnet® communication interface
- Adalink™ supervision (Customer friendly web based supervision)
- BE50™ extension board for additional inputs/outputs
- Anti-vibration mounts (supplied loose)
- Panel enclosure (compressors)

Dry-Cooler

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

Airside Products

Providing indoor climate comfort

COMFAIR™ HC · 0,8 ➔ 13 kW · 220 ➔ 2000 m³/h

Centrifugal fan coil units

Main applications
- Any commercial building
- Offices
- Hotels

EC FAN

Why this choice?
- EC FAN for low energy consumption
- Easy and quick to install
- Many available configurations and accessories
- Units built on customer request

General description

Centrifugal fan coils available in 12 capacity sizes, 7 different installation configurations, 2 and 4 pipe systems or 2 pipe system with additional electric heater.
Standard configuration: 3 row coil for the 2 pipe system and 3+1row coil for the 4 pipe system.

Casing: white colour galvanized metal sheet and light grey abs casing diffusers.

Main components

- Galvanized sheet metal main structure, 0,8 mm thickness. Heat exchanger condensate drain pan and drainage fittings supplied as standard
- EU1 washable honeycomb polypropylene filter supplied as standard
- Ventilation group, factory tested, single-phase with centrifugal fans with aluminium impellers. 6 available speeds, 3 wired in the factory
- Heat exchanger with aluminium fins on copper tubes. ¾" gas female connection, left side water connection as standard, right side on request, water connection change on site available

Available accessories - configurations

- EC fan
- Internal or external thermal or/and acoustic insulation
- EU2 or EU3 filtration grade filters
- High pressure centrifugal fans
- Fail and/or running contact fans
- Coils with different row numbers (4R coils, 1R auxiliary coils, 2R coils)
- Direct expansion coils
- Electric heaters
- Different Ral colours for casings
- Different Ral colours for abs casing diffusers
- 2 and 3 way regulation valves, 230 ON/OFF, 24V ON/OFF, 24V 3 points, 24 V 0-10V
- Fresh air dampers
- Condensate drain pumps
- Plenums/Ducts with or without spigots
- Supply or return Abs or Aluminium diffusers
- Decorative wooden or white metal sheet panels for recessed units
- Wide range of controls on board or remote
- Non standard units built on customer request

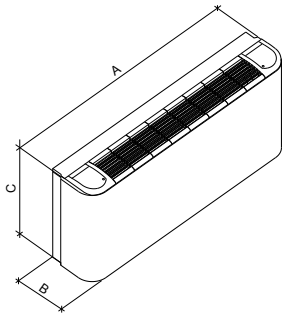
General data

COMFAIR™		HC	10	20	30	40	50	60	70	80	90	100	110	120
2 pipe system (3 rows coil)														
Cooling capacity (1)	Sensible	kW	0,74	1,02	1,76	2,17	2,18	2,82	3,15	3,96	4,82	6,06	7,91	8,47
	Total	kW	0,86	1,28	2,17	2,53	3,11	3,53	4,10	5,59	6,9	7,97	10,00	11,01
Heating capacity (2)		kW	1,25	1,87	2,59	3,28	3,66	4,48	5,14	6,69	8,13	10,10	13,10	14,15
Water flow		l/h	148	220	373	435	535	662	745	961	1187	1376	1727	1898
Water pressure drop	Cooling	kPa	0,9	2	6,3	8,8	16,1	25,9	37,6	27,9	19,1	26,6	21,5	26,8
	Heating	kPa	0,7	1,4	4,9	7,5	13,7	22	34,7	23,7	17,6	23,3	18,8	24,2
Electrical heater		kW	0,6	1	1	1	2	2	2	3	3	4	4	4
		A	2,61	4,35	4,35	4,35	8,7	8,7	8,7	13,04	13,04	17,39	17,39	17,39
Airflow		m^3/h	227	289	404	453	575	685	708	1058	1242	1356	2012	2003
Sound power level (4)		dB(A)	46	45	44	47	47	52	52	58	64	63	67	66
4 pipe system (3 +1 rows coil)														
Cooling capacity (1)	Sensible	kW	0,71	1,12	1,60	1,93	2,22	2,91	3,34	4,11	5,26	5,86	7,66	8,20
	Total	kW	0,84	1,23	2,08	2,38	2,76	3,69	4,47	5,35	6,57	7,71	9,7	10,70
Heating capacity (3)		kW	1,26	1,89	2,73	2,89	3,49	4,14	5,04	5,41	6,72	8,38	10,10	11,40
Water flow	(1) Cooling	l/h	144	212	358	409	509	635	769	920	1130	1330	1673	1837
	(3) Heating	l/h	108	163	235	249	300	356	433	465	578	739	891	1008
Water pressure drop	Cooling	kPa	0,61	2	5,7	8,2	10,7	20	49,8	11,6	37,8	24,9	21,7	25,1
	Heating	kPa	2,1	5,7	13,9	16,4	27,9	35,1	61,5	14,0	20,9	48,4	41,3	47,3
Airflow		m^3/h	216	275	384	430	546	651	673	1005	1180	1291	1916	1908
Sound power level (4)		dB(A)	45	47	44	47	46	53	53	59	65	63	67	67
Maximum external static pressure (50% performance reduction)														
2 pipes system		Pa	25	25	19	27	32	36	44	55	53	75	84	84
4 pipes system		Pa	19	19	15	22	25	28	36	42	44	74	83	83

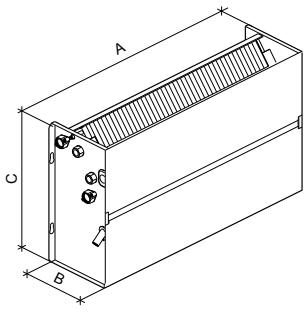
Data given at Maximum speed - 0 Pa available static pressure
(1) Cooling: Water inlet temperature: 7°C; water outlet temperature: 12°C; air inlet temperature: 27°C D.B - 19°C W.B
(2) Heating: Water inlet temperature: 50°C; water flow rate as in cooling mode; air inlet temperature: 20°C
(3) Heating: Water inlet temperature: 70°C; water outlet temperature: 60°C ; air inlet temperature: 20°C
(4) Sound power level: according to ISO 23741
COMFAIR™ HC is part of FC Eurovent Certification Program (www.eurovent-certification.com)

Physical data

Cased units



Chassis units



COMFAIR™		HC	10	20	30	40	50	60	70	80	90	100	110	120
Standard coil	Rows	Nr	3	3	3	3	3	3	3	3	3	3	3	3
	Connections	Ø mm	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
Auxiliary coil	Rows	Nr	1	1	1	1	1	1	1	1	1	1	1	1
	Connections	Ø mm	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Drain connection (out)		Ø mm	20	20	20	20	20	20	20	20	20	20	20	20
Cased units														
A		mm	660	860	1060	1060	1260	1260	1260	1460	1460	1660	1960	1960
B		mm	220	220	220	220	220	220	220	220	220	256	256	256
C		mm	480	480	480	480	480	480	585	585	585	602	602	602
Net weight		kg	14	17	22	23	27	28	30	35	36	46	55	57
Chassis units														
A		mm	420	620	820	820	1020	1020	1020	1220	1220	1380	1680	1680
B		mm	220	220	220	220	220	220	220	220	220	252	252	252
C		mm	460	460	460	460	460	460	565	565	565	585	585	585
Net weight		kg	11	14	19	20	23	24	26	31	32	41	50	52

COMFAIR™ HD · 2 ➔ 4,4 kW · 440 ➔ 860 m³/h

High wall fan coil units

Main applications
- Any commercial or residential building
- Offices and shops
- Hotels

Why this choice?
- Easy and quick to install
- Ideal solution to earn space in the room
- Air quality ionization system

General description

Tangential fan coils for wall installation available in 3 capacity sizes for 2 pipe installation, with infrared remote control (IR) or foreseen for wall remote control (TH).

Main components

- Tangential fan to allow better air distribution in the room
- Steel mounting plate to install the unit on the wall supplied as standard
- Heat exchanger made copper tubes mechanically expanded into aluminium fins. Female fittings and standard air vents. Only Left side water connection with standard flexible connections to make installation operation easier
- Cabinet in white colour with swing motorized air deflectors (35° upwards in cooling mode and 10° downwards in heating mode)
- Standard air filter and ionization system to obtain air purification and microbes neutralization

Available accessories - configurations

- 2 and 3 way regulation valves (to install outside the unit)
- Condensate drain pumps (to install outside the unit)
- Template with condensate drain pan for the installation of 2 or 3 way valves (and condensate drain pump) inside the wall
- Template with condensate drain pan and white painted steel external frame for the installation of 2 or 3 way valves (and condensate drain pump) outside the wall (between the unit and the wall)
- Infrared remote control with display:
  * ON/OFF, night function, timer, functions: automatic, cooling, dry, ventilation, heating, different air flow directions, clock setting, fan speed: automatic, low, medium, high, ionisation function ON/OFF, 24 hours programmable timer, reset
- Wide range of remote controls

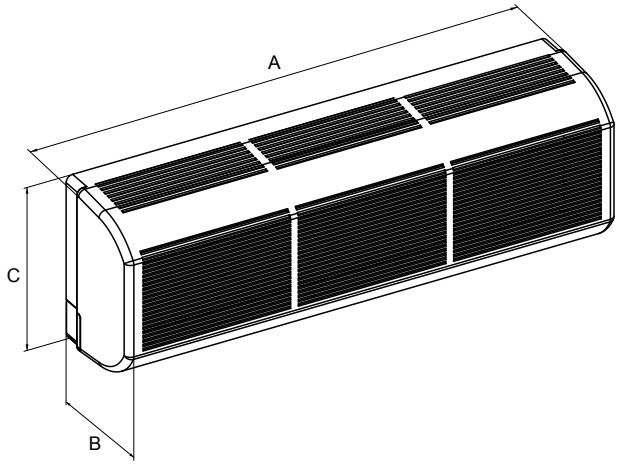
General data

COMFAIR™		HD	1	2	3
Cooling capacity (1)	Sensible	kW	1,70	1,86	3,44
	Total	kW	2,04	2,25	4,42
Heating capacity (2)		kW	2,59	2,89	5,64
Water flow		l/h	351	423	760
Water pressure drop	Cooling	kPa	18	20	68,1
	Heating	kPa	16,7	17	59,8
Heating capacity (3)		kW	4,50	5,61	9,42
Airflow		m^3/h	440	433	860
Sound power level (4)		dB(A)	56	54	61

Data given at Maximum speed - 0 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

COMFAIR™ HD is part of FC Eurovent Certification Program (www.eurovent-certification.com)

Physical data



COMFAIR™	HD	1	2	3
A	mm	795	795	1 200
B	mm	178	178	210
C	mm	270	270	320
Net weight	kg	9	9	21

COMFAIR™ HH / HV

• 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 configuration

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

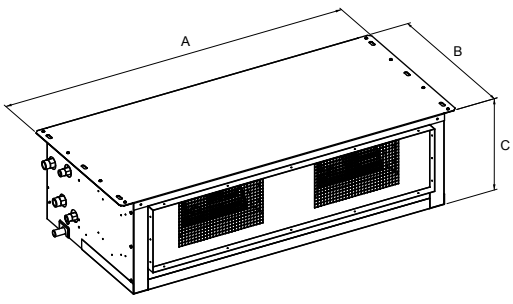
General data

COMFAIR™		Speed	HH/HV	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	kW	2,30	3,97	6,22	7,13	8,40	17,4	32,8
		3	kW	2,40	4,34	,57	7,51	9,60	18,4	34,4
	Total	1	kW	2,83	4,76	7,39	7,40	9,00	20,8	38,4
		2	kW	2,96	5,63	7,80	8,98	11,5	23,3	2,9
		3	kW	3,09	6,11	8,90	9,40	13,1	24,6	44,8
Heating capacity (2)		1	kW	3,60	5,60	6,68	8,80	10,8	24,0	51,9
		2	kW	3,79	6,75	10,4	10,5	14,4	27,2	50,9
		3	kW	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	kPa	14,2	23,2	22,5	25,3	20,8	25,3	27,2
		3	kPa	15,3	26,9	31,4	27,8	26,0	27,7	29,3
	Heating	1	kPa	11,0	14,4	18,5	13,9	11,2	17,4	18,6
		2	kPa	12,0	19,5	19,7	21,2	17,6	20,5	22,4
		3	kPa	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		kW	4,5	9	9	12	12	18	24
Airflow		1	m^3/h	570	737	1293	1262	1480	3102	6193
		2	m^3/h	610	940	1627	1728	2163	3645	7248
		3	m^3/h	650	1064	1764	1780	2650	3946	7731
Sound power level (4)	Inlet + radiated	1	dB(A)	54	51	57	57	57	64	65
		2	dB(A)	57	54	61	61	57	9	70
		3	dB(A)	60	57	63	62	60	74	75
	Outlet	1	dB(A)	58	55	60	60	59	61	62
		2	dB(A)	61	58	65	64	61	66	67
		3	dB(A)	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	kW	2,53	3,94	6,00	6,84	7,54	15,9	30,1
		3	kW	2,60	4,34	6,53	8,72	9,65	17,0	32,0
	Total	1	kW	3,33	5,26	5,50	8,68	8,47	18,3	33,3
		2	kW	3,52	5,07	6,34	9,57	9,97	20,2	37,3
		3	kW	3,60	6,11	7,96	11,9	12,3	21,5	39,5
Heating capacity (3)		1	kW	3,05	4,70	6,73	7,60	8,15	29,4	52,8
		2	kW	3,22	5,90	8,00	8,40	9,50	31,9	58,1
		3	kW	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	kPa	14,8	19,0	22,0	25,9	17,5	18,9	58,1
		3	kPa	15,4	26,9	31,5	37,9	25,8	21,0	61,0
	Heating	1	kPa	17,7	8,00	21,0	9,50	12,4	13,4	14,8
		2	kPa	19,5	11,1	29,0	11,4	16,3	15,6	17,7
		3	kPa	20,3	13,0	23,7	15,9	23,0	17,6	19,6
Airflow		1	m^3/h	580	850	1180	1460	1470	2905	5613
		2	m^3/h	631	1014	1461	1700	1860	3308	6570
		3	m^3/h	654	1065	1750	2400	2640	3623	7143
Sound power level (4)	Inlet + radiated	1	dB(A)	54	52	57	54	58	64	65
		2	dB(A)	56	56	60	56	65	69	70
		3	dB(A)	60	57	63	60	69	74	75
	Outlet	1	dB(A)	58	55	62	58	58	61	62
		2	dB(A)	60	60	64	60	66	66	67
		3	dB(A)	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	Pa	50	50	50	50	50	100	100
		3	Pa	60	60	59	60	60	122	121
4 pipes system		1	Pa	35	35	35	35	25	68	80
		2	Pa	50	50	50	50	50	100	100
		3	Pa	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

COMFAIR™ HH is part of FCP Eurovent Certification Program (www.eurovent-certification.com)

Physical data



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

ARIA™ · 1,6 - 7,2 kW
· 380 ➔ 820 m³/h

High pressure ductable fan coil

Main applications
- Light commercial
- Big and medium size offices

Why this choice?
- High performing fans
- Installation flexibility
- Energy and maintenance economy

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, ½″ 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

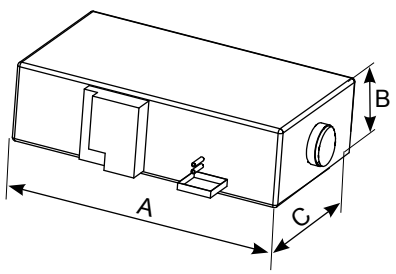
- Internal or external thermal or/and acoustic insulation
- G4 filters
- Auxiliary coils for 4 pipe installations
- Electric heaters (500, 800, 1000, 1500, 2000 and 2300 W)
- 2 and 3 way regulation valves, 230 on/off, 24V on/off, 24V 3 points, 24 V 0-10V
- Fresh air connection 100 and 125 mm with or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

General data

ARIA™	FAN SPEED (4)	ARIA™	10	20	30	40
Airflow Available external static pressure	2	m^3/h	290	270	600	630
		Pa	40	40	30	30
	3	m^3/h	385	360	810	825
		Pa	50	50	50	50
	4	m^3/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						
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 7/12°C
(2) Inlet air conditions 20°C, Water 50/40°C
(3) Inlet air conditions 20°C, Water 70/60°C
(4) Data for 3 speeds factory wired among 5 available one below and one above.

Weight and dimensions (including supply and return plenums)



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

ARIA™ EC · 1,2 - 6 kW

· 300 ➔ 850 m³/h

High pressure ductable fan coil with EC fan

Main applications

- Light commercial
- Big 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 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 a mono-block 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, ½″ connection, tested to 13 bars and provided with air vents. Left or right hand connection
- Primary & auxiliary 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

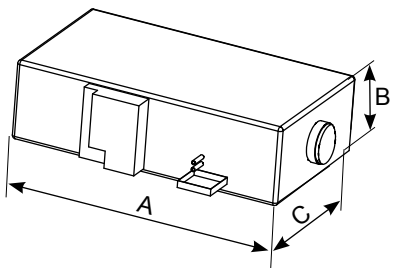
- Internal or external thermal or/and acoustic insulation
- G4 filters
- Auxiliary coils for 4 pipe installations
- 2 and 3 way regulation valves, 230 on/off, 24V on/off, 24V 3 points, 24 V 0-10V
- Fresh air connection 100 and 125 mm with or without damper
- Condensate drain pumps
- Fitting of free issue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

General data

ARIA™ EC	VOLTAGE V (4)	ARIA™ EC	10	20	30	40
Airflow Available external static pressure	6	m^3/h	265	265	500	620
		Pa	19	21	20	20
	8	m^3/h	385	385	680	850
		Pa	40	40	40	40
	10	m^3/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						
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 7/12°C
(2) Inlet air conditions 20°C, Water 50/40°C
(3) Inlet air conditions 20°C, Water 70/60°C
(4) Driving voltage for fan EC motor

Weight and dimensions (including supply and return plenums)



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

ARMONIA™ / ARMONIA™ EC · 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 Basic unit	2 pipes CWC **2** ST 020
	4 pipes CWC **4** ST 040
IR version Basic unit with infrared remote control (*)	2 pipes CWC **2 IR** 020
	4 pipes CWC **4 IR** 040
EH version 2 pipes basic unit with electric heater	2 pipes CWC **2 EH** 120
IREH version 2 pipes basic unit with infrared remote control and electric heater (*)	2 pipes CWC **2 IR EH** 120
EC version Basic unit with EC fan	2 pipes CWC **2 EC** 120
	4 pipes CWC **4 EC** 140
ECEL version 4 pipes basic unit with EC fan and EC fitted electronic board (for remote or infrared control for EC-EL version)	2 pipes CWC **2 EC EL** 120
	4 pipes CWC **4 EC EL** 140

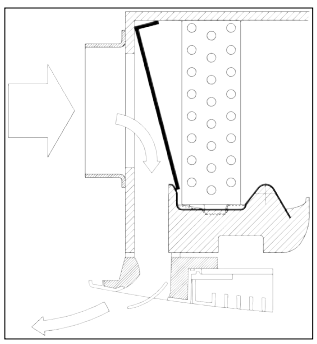
(*) With IR version and metallic diffuser remote receiver for infrared control is mandatory.

Construction

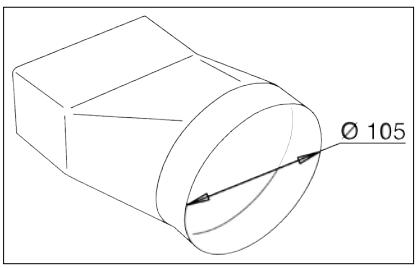
- Main casing is made of galvanised steel with inside closed cell polyethylene 10 mm thick thermal insulation and outside anti-condensate lining.
- Air diffuser available in ABS white colour and metallic white colour (up to size 320)
- Air filter is washable, easily accessible and removable
- Fan-motor 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 (CWC260-360-560-660) or higher heating (CWC040-140-240-340-440-540-640) 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	m^3/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	kW	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	kW	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	kPa	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	dB(A)	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	m^3/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	kW	3,03	3,58	4,59	3,46	4,48	6,48	3,71	6,09	8,25
Heating capacity	kW	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	kPa	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	dB(A)	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	m^3/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	kW	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	l	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	dB(A)	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 m^3 room and a reverberation time of 0.5 seconds.
ARMONIA™ CWC is part of FC Eurovent Certification Program (www.eurovent-certification.com)

General data - STANDARD VERSION

CWC		800 X 800														
4 PIPE VERSION		440			540			560			640			660		
Speed		**min**	**med**	**max**	**min**	**med**	**max**	**min**	**med**	**max**	**min**	**med**	**max**	**min**	**med**	**max**
Airflow	m^3/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	kW	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	l	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	dB(A)	24	31	39	25	31	44	25	31	44	25	39	49	25	39	49

General data - EC VERSION

CWC EC		600 X 600									800 X 800					
2 PIPE VERSION		120			220			320			420			520		
Speed		**min**	**med**	**max**	**min**	**med**	**max**	**min**	**med**	**max**	**min**	**med**	**max**	**min**	**med**	**max**
Airflow	m^3/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	kW	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	kPa	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

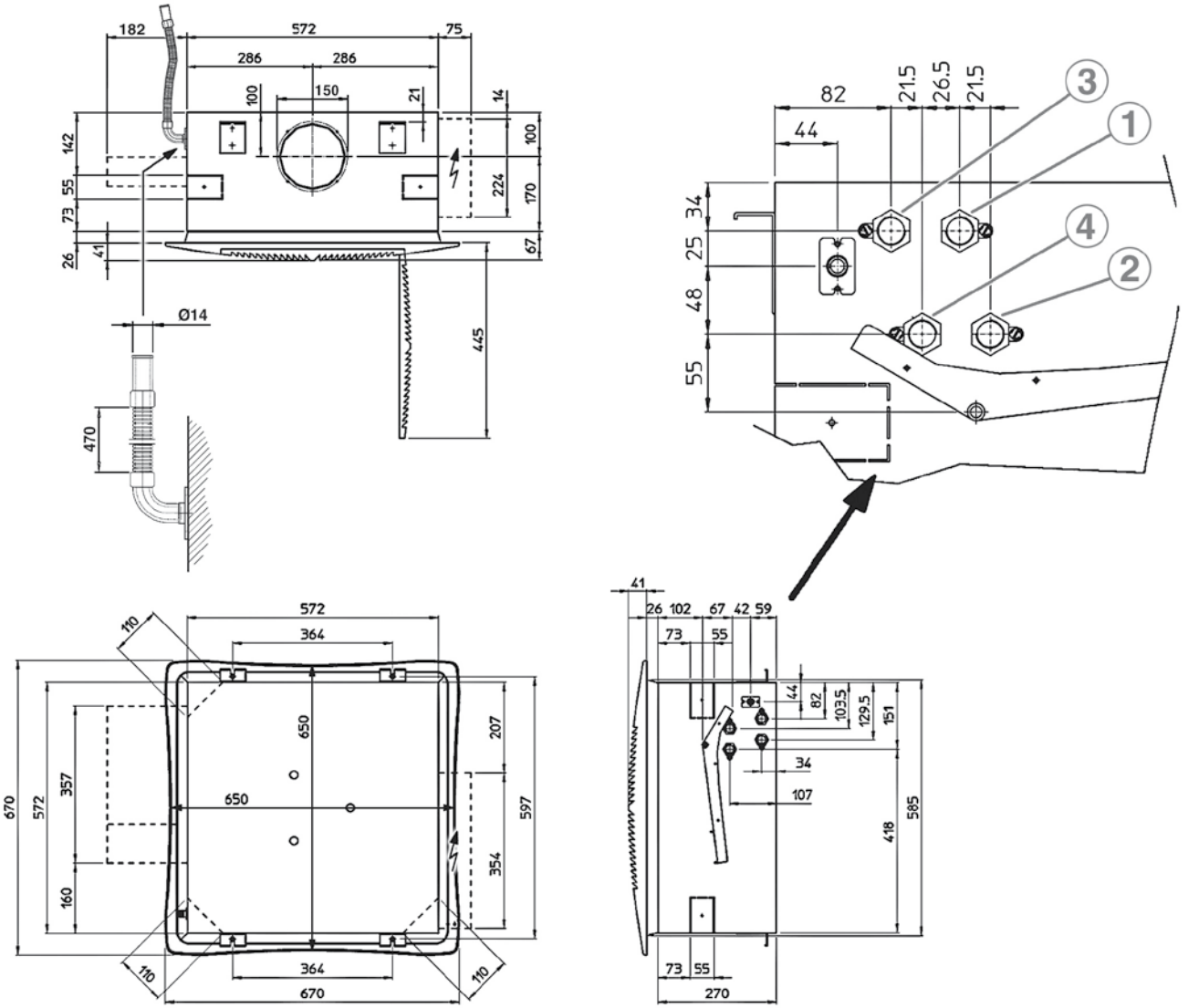
CWC EC		600 X 600									800 X 800					
4 PIPE VERSION		140			260			360			440			560		
Speed		**min**	**med**	**max**	**min**	**med**	**max**	**min**	**med**	**max**	**min**	**med**	**max**	**min**	**med**	**max**
Airflow	m^3/h	310	380	535	310	445	710	360	610	880	630	870	1165	710	1130	1770
Cooling capacity	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	kW	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	l	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	dB(A)	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 m^3 room and a reverberation time of 0.5 seconds.
ARMONIA™ CWC is part of FC Eurovent Certification Program (www.eurovent-certification.com)

Physical data

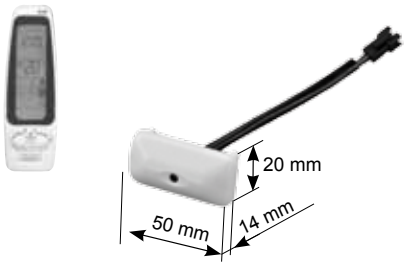
CWC 020 - 040 - 120 - 140 - 220 - 240 - 260 - 320 - 340 - 360

Version 600 x 600

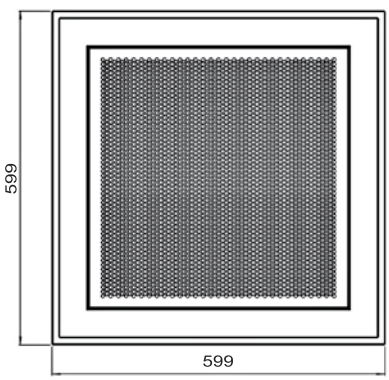


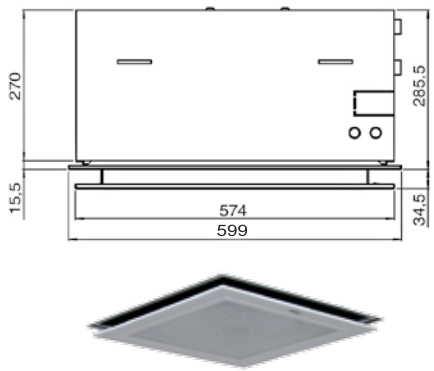
2 PIPES UNITS		4 PIPES UNITS	
3	Inlet, heating/cooling 1/2"	**1**	Heating 1/2"
4	Outlet, heating/cooling 1/2"	**2**	Heating 1/2"
		3	Cooling 1/2"
		4	Cooling 1/2"

Metallic diffuser



Infrared receiver mandatory
With metallic diffuser + infrared remote control

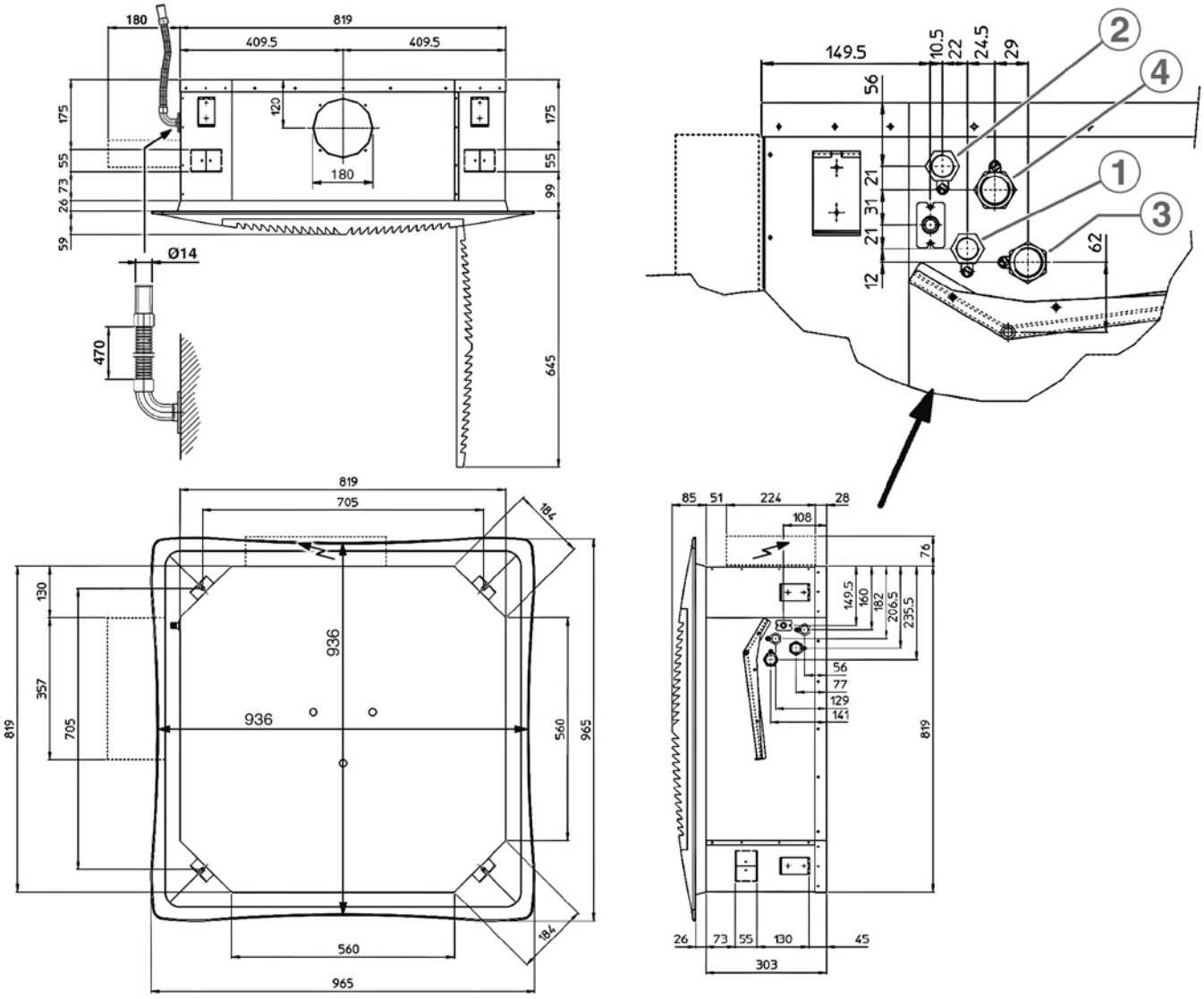




Physical data

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

Version 800 x 800



2 PIPES UNITS		4 PIPES 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"

COANDAIR™ & COANDAIR™ EC· 0,8 ➔ 5,1 kW · 182 ➔ 750 m³/h

Coanda comfort water cassettes

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+1row 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™	SPEED	CD	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								
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

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
COANDAIR™ & COANDAIR™ EC is part of FC Eurovent Certification Program (www.eurovent-certification.com)

General data

COANDAIR™ EC	VOLTS	CD EC	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								
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

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
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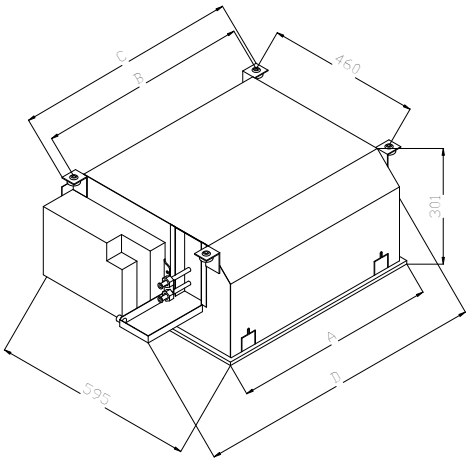
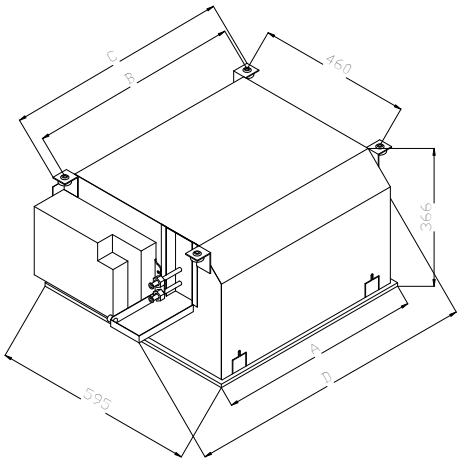
Physical data

Standard (SE)

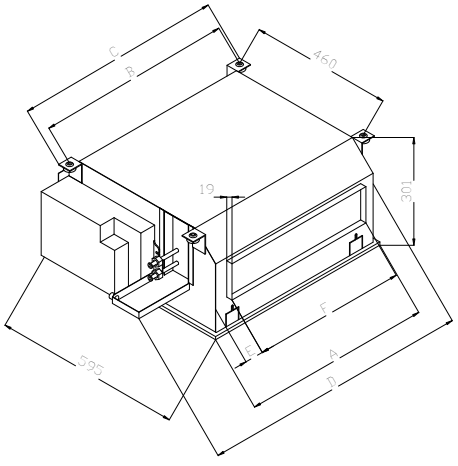


Raised version (HE)



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

Ductable version



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

AXIL™ / EQUITHERM™ · 12 ➔ 105 kW

Unit heaters / Destratifier fans

Main applications
- Any industrial building
- Any big surface

Why this choice?
- High heating perfomances
- 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

- Motor 1 speed 230/1/50Hz
- 3 speed motor 4/6/8 400V/III/50Hz
- 5 speed motor 230/1/50
- 4 or 6 poles motor 230-400V/III/50Hz
- Star/Delta switch
- 3 speed switch
- 5 speed switch
- 5 speed switch with thermostat
- Automatic control
- Automatic control with daily operating schedule
- Automatic control with digital clock
- 2 position manual speed switch
- 2 position manual speed switch with thermostat
- Wall braket
- Multidirection diffuser
- Conic diffuser
- High air stream diffuser
- Air curtain diffuser
- Return air duct
- Return air duct with mixing damper
- Return air plenum
- Return air plenum with damper
- Mixing box with flaps (Manual operation)
- Mixing box with dampers
- Outdoor air intake grill
- Straight duct
- Straight duct for full fresh air inlet
- Rain hood
- Return air duct with filter
- Return air duct with mixing damper and filter
- Return air plenum with filter
- Return air plenum with damper and filter
- Mixing box with flaps with filter (Manual operation)
- Mixing box with dampers and filter
- 90° Diffuser
- Additionnal protection grill

General data

AXIL™		402-4	403-4	502-4	503-4	602-4	603-6	902-6	903-6
Technical information									
Motor poles		4/6	4/6	4/6	4/6	4/6	6/8	6/8	6/8
Fan speed	rpm	1350/950	1350/950	1350/950	1350/950	1350/950	950/700	950/700	950/700
Water connection		1"	1"	1"	1"	1"1/4	1"1/4	1"1/2	1"1/2
Heating capacity									
Heating capacity (1)	kW	15,0/12,1	20,4/16,2	25,2/20,9	34,8/27,2	42,3/34,1	47,3/41,3	73,1/63,1	96,0/82,0
Airflow	m^3/h	2300/1600	2200/1500	3950/2550	3800/2500	6500/4500	4350/3600	9500/7200	9100/6900
Sound pressure level at 5 m	dB(A)	59/51	59/51	64/54	64/54	69/60	60/52	68/62	68/62
Air throat - Horizontal discharge									
Height (high speed)	m	3 - 4	3 - 4	3,5 - 4,5	3,5 - 4,5	4,5 - 6	4 - 5,5	4 - 6	4 - 6
Height (low speed)	m	2,5 - 3,5	2,5 - 3,5	3 - 4	3 - 4	4 - 5,5	3,5 - 5	3,5 - 5,5	3,5 - 5,5
Air throat (high speed)	m	11	10	16	15	25	16	28	25
Air throat (low speed)	m	7,5		12	10	19	13	21	18
Air throat - Vertical discharge									
Maximum height (high speed)	m	4,5	4,5	5,5	5,5	7	6	11	11
Maximum height (low speed)	m	3,5	3,5	4,5	4,5	6	5,5	9	9
Surface (high speed)	m^2	60	58	80	75	145	100	200	180
Surface (low speed)	m^2	45	43	60	55	125	80	160	140

(1) Return air temperature : 12°C, Hot water temperature: 90/70°C

AXIL™F		403-6	503-6	603-6	903-6
Technical information					
Motor poles		6	6	8	8
Fan speed	rpm	950	950	700	700
Total cooling capacity (1)	kW	4,1	7,2	11,1	19,8
Airflow	m^3/h	1600	2500	3600	6900
Sound pressure level at 5 m	dB(A)	51	54	52	62
Air throat - Horizontal discharge					
Height	m	2,5 - 3,5	3 - 4	4 - 5,5	3,5 - 5,5
Air throat	m	7,5	10	13	18

(1) Return air temperature : 26°C, Chilled water temperature : 7/12°C

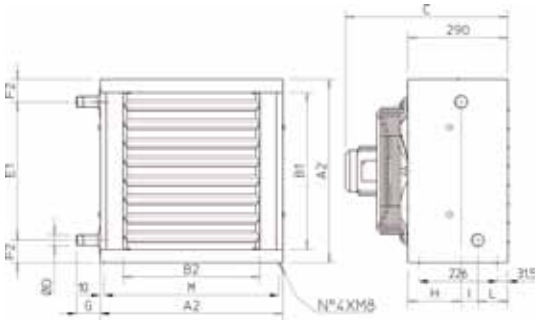
AXIL™ Z		414	524	639
Technical information				
Motor poles		6	6	6
Fan speed	rpm	900	900	900
Heating capacity	kW	14	24	39
Airflow	m^3/h	1600	2550	4500
Motor power	W	50	120	120
Sound pressure level at 5 m	dB(A)	51	54	60

AXIL™ V		402-4	502-4	602-4	902-6
Technical information					
Motor poles		4/6	4/6	4/6	6/8
Fan speed	rpm	1350/950	1350/950	1350/950	950/700
Heating capacity 2 rows coil (1)	kW	32,1/26,2	34,8/30	62,3/47,8	101,7/91,8
Airflow 2 rows coil	m^3/h	2100/1400	3600/2400	6300/4100	9200/7000
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)	m	2,5 - 3,5	3 - 4	4 - 5,5	3,5 - 5
Air throat (high speed)	m	11	16	25	28
Air throat (low speed)	m	7,5	12	18	21

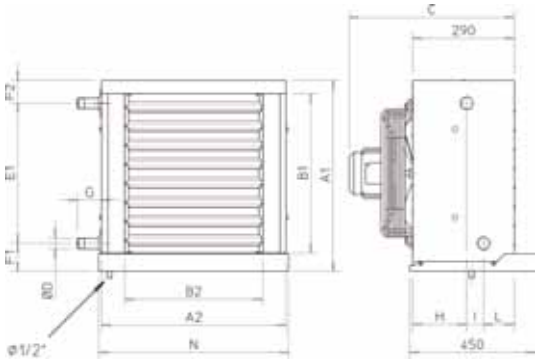
(1) Steam: Pressure 8 Bars / 12°C.

Physical data

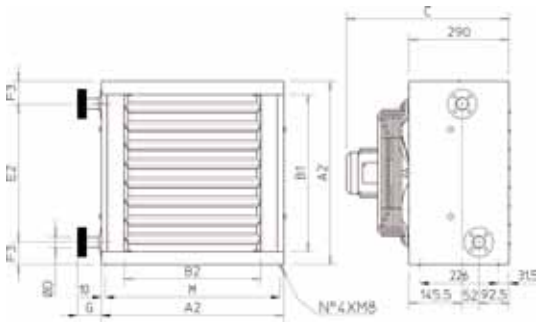
AXIL™



AXIL™ F



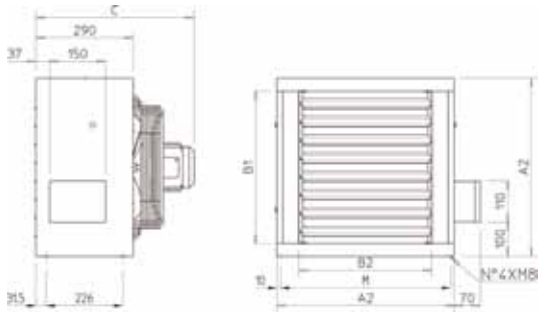
AXIL™ V



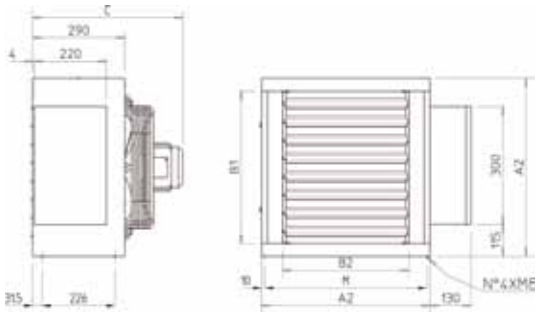
			402 / 403	502 / 503	602 / 603	902 / 903
A1		mm	537	647	754	1022
A2		mm	526	636	743	1011
B1		mm	450	550	641	885
B2		mm	394	500	640	875
C		mm	468	468	468	576
ØD			1"	1"	1" 1/4	1" 1/2
E1		mm	397	467	588	832
E2		mm	330	467	588	832
F1		mm	75,5	80,5	88,5	100,5
F2		mm	64,5	69,5	77,5	89,5
F3		mm	98	69,5	77,5	89,5
G		mm	69	69	60	91,5
H		mm	154	154	154	150
I		mm	48	48	48	50
L		mm	88	88	88	90
M		mm	506	616	723	991
N		mm	542	650	758	1026
Water						
Content	2R	l	1,4	2,1	3,1	6,1
	3R	l	1,9	2,9	4,3	8,4
Weight	2R	kg	22	25	34	81
	3R	kg	23	28	39	90
Steam						
Content		l	2,5	4,5	5,9	12
Weight		kg	30	38	51	92

Physical data (cont'd)

AXIL™ Z



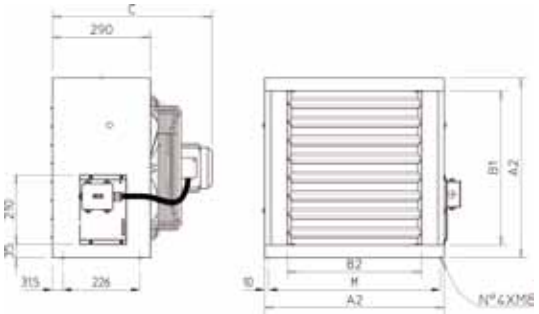
Without control



With control

		414	524	639
A2	mm	526	636	743
B1	mm	450	550	641
B2	mm	394	500	610
C	mm	468	468	468
M	mm	506	616	723
Weight without control	kg	22	30	38
Weight with control	kg	24	32	40

EQUITHERM™



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

MINIAIR™ · 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 humidifing 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

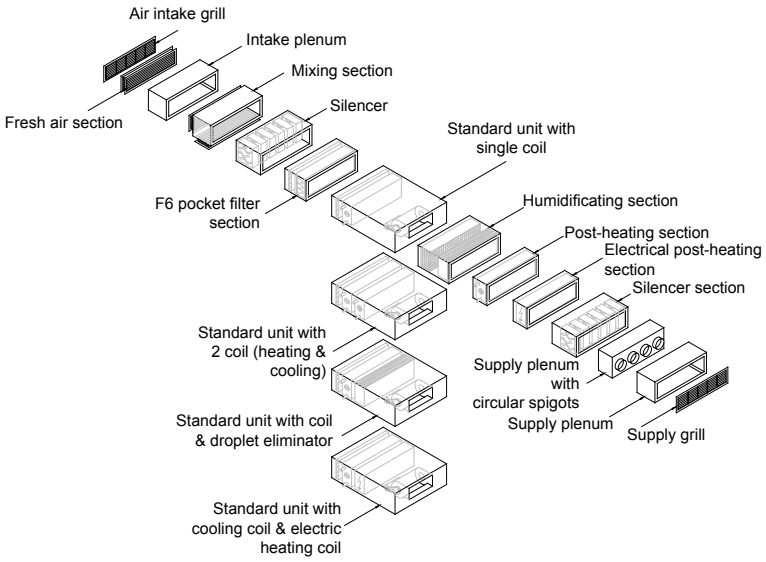
- Pre coated steel frame RAL 9002
- Sandwich panels, galvanized steel sheet metal inside and RAL 9002 pre coated steel sheet metal outside. Mineral wool thermal and sound insulation 10 mm thickness for sizes 10 to 40 and 20 mm for sizes 50 and 60
- Inspection and extraction by lower removable panels 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

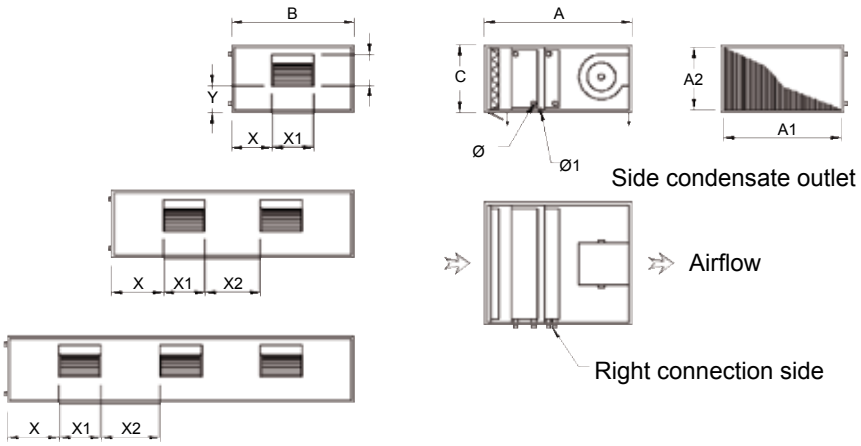


General data

MINIAIR™				10	20	25	30	40	50	60
Airflow rate			m³/h	1040	2150	2740	3360	3950	5070	6450
External static pressure			Pa	150	150	150	150	150	150	150
Cooling (2)	4R	Total capacity	kW	6	12,1	15,7	18,2	21,6	24,1	32,5
		Sensible capacity	kW	4,5	8,9	11,6	13,6	16,1	19,7	25,6
		Water flow	m³/h	1,04	2,07	2,69	3,12	3,69	4,13	5,57
		Water pressure drop	kPa	21	29	23	32	26	19	23
	6R	Total capacity	kW	7,1	14,3	18,5	21,9	26,2	34,3	42,1
		Sensible capacity	kW	5	10,2	13,2	15,7	18,7	24,6	30,6
		Water flow	m³/h	1,21	2,46	3,17	3,76	4,49	5,88	7,21
		Water pressure drop	kPa	26	29	24	33	25	23	24
Heating (3)	2R	Total capacity	kW	9,5	18,5	24,2	27,7	33,3	34,9	41,2
		Water flow	m³/h	0,84	1,63	2,13	2,44	2,93	3,07	3,63
		Water pressure drop	kPa	22	23	21	27	26	26	17
	4R	Total capacity	kW	13,8	27,7	35,8	42,5	50,3	58,1	71,3
		Water flow	m³/h	1,21	2,44	3,15	3,74	4,43	5,12	6,28
		Water pressure drop	kPa	21	29	23	32	26	19	23
	6R	Total capacity	kW	14,9	30,5	39,1	47,1	55,7	67	83,3
		Water flow	m³/h	1,31	2,68	3,44	4,14	4,9	5,89	7,33
		Water pressure drop	kPa	22	26	21	30	23	18	19
Sound level at 1 m (1)			dB(A)	51	55	55	57	58	57	59
Shaft power			W	147	350	2 x 350	2 x 350	2 x 350	2 x 420	3 x 420
Poles				4	4	4	4	4	4	4
Fan speeds				3	3	3	3	3	3	3
Max current			A	1,9	3	2 x 3,0	2 x 3,0	2 x 3,0	2 x 3,8	3 x 3,8
Protection class				min. IP20						
Isolation class				B	F	F	F	F	B	B
Power supply			V/Ph/Hz	230/1/50						

Given data at maximum speed, **150 Pa available static pressure.**
(1) Sound pressure calculated in free field of the fan at 1m from unit.
(2) Air inlet temperature27 °C DB - 19 °C WB, water temperature entrance/exit 7/12 °C - Data given for maximum speed.
(3) Air inlet temperature20 °C, RH 50 %, Water temperature entrance/exit 70/60 °C - Data given for maximum speed.

Physical data



MINIAIR™		10	20	25	30	40	50	60
A	mm	850	850	850	850	850	960	960
B	mm	710	1070	1400	1400	1680	1780	2000
C	mm	390	390	390	390	390	480	480
Ø 2R		3/4"	3/4"	3/4"	3/4"	1"	1"	1"
Ø 4R		3/4"	3/4"	1"	1"	1"	1"	1" 1/4
Ø 6R		3/4"	1"	1"	1"	1" 1/4	1" 1/4	1" 1/4
Ø1	mm	20	20	20	20	20	20	20
X1	mm	240	300	240	240	300	300	300
Y1	mm	215	270	210	270	270	270	270
X2	mm	-	-	330	335	535	580	-
X3	mm	-	-	-	-	-	-	360
A1	mm	675	1035	1365	1365	1645	1720	1940
A2	mm	355	355	355	355	355	420	420
X	mm	235	385	295	295	270	300	185
Y	mm	140	80	140	80	80	160	160
Weight	kg	52 ÷ 60	60 ÷ 70	75 ÷ 88	78 ÷ 90	96 ÷ 110	101 ÷ 120	120 ÷ 140

MINIAIR™ + · 100 ➔ 6000 m³/h

Air to air Heat Recovery units

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

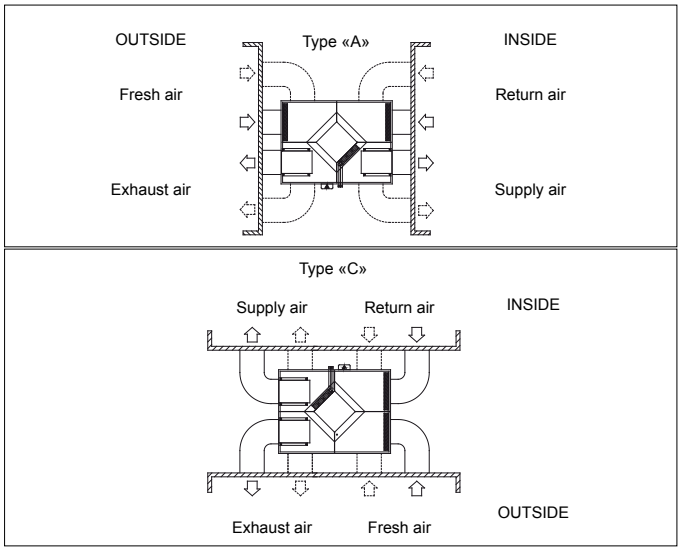
General data

MINIAIR™ +		Speed	MINIAIR™ +	03	06	10	14	19	25	30	40	50	60
Airflow rate		Min	m^3/h	100	150	800	850	1340	1100	1800	3000	4000	5000
		Med	m^3/h	200	300	900	1250	1570	1830	2500	Not available		
		Max	m^3/h	300	500	1000	1400	1900	2500	3200	4000	5000	6000
External static pressure		Min	Pa	167	127	47	113	119	112	144	147	221	226
		Med	Pa	160	129	70	133	121	112	159	Not available		
		Max	Pa	100	100	90	145	120	110	170	170	120	190
Sound level at 1 m (1)		Min	dB(A)	44	41	45	45	42	44	51	55	59	62
		Med	dB(A)	49	47	49	57	53	51	53	Not available		
		Max	dB(A)	51	51	52	62	58	56	59	62	63	64
Shaft power			W	2x60	2x60	2x 147	2x 350	2x 350	2x 350	2x 550	2x 750	2x 1500	2x 1500
Maximum current			A	1,2	1,4	3,0	5,8	6,2	6,0	11,4	6,2	11,2	11,2
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
Protection class - Minimum				IP 20									
Temperature class - Minimum				B									
Power supply			V/Ph/Hz	230/1/50							400/3/50		
Recovery efficiency (2)		Min	%	66,4	71,1	56,3	58,4	56,1	67,7	63,1	59,2	57,3	56,8
		Med	%	57,0	62,5	54,8	53,5	54,1	61,5	59,0	Not available		
		Max	%	52,0	56,1	53,4	52,1	51,8	57,6	56,0	55,7	54,6	54,5
Recovery (2)		Min	kW	0,6	1,0	4,1	4,5	6,9	8,6	10,4	16,2	20,9	25,9
		Med	kW	1,0	1,7	4,5	6,1	7,8	10,3	13,5	Not available		
		Max	kW	1,4	2,6	4,9	6,7	9,0	13,2	16,4	20,3	24,9	29,9
Electrical coil (LXMAPSKE)	Heating capacity		kW	2	4	4,5	6	9	12	12	12	18	24
	Air side ΔT (at max fan speed)		°C	20	24	13	13	14	14	11	9	11	12
	Electrical power supply		V/Ph/Hz	230/1/50		400/3/50							
	Air side pressure drop		kPa	5	5	6	6	8	6	9	13	11	13
Heating coil 3R (3) (LXMAPSKW)	Heating capacity (at max fan speed)		kW	Not available		11,3	16,3	20,4	29,7	35,1	44,3	46,6	53,8
	Supply air temperature		°C			40,5	41,5	39,0	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 (4) (LXMAPSAF)	Total cooling capacity (at max fan speed)		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 (at max fan speed)	F6 compact filter - FC6 pressure drop		Pa	Not available			40	40	40	40	40	40	40
	F6 bag filter - FT6 pressure drop		Pa				140	160	160	160	180	175	160
	F7 bag filter - FT7 pressure drop		Pa				165	185	185	185	215	205	185
	F8 bag filter - FT8 pressure drop		Pa				207	225	225	225	260	248	225

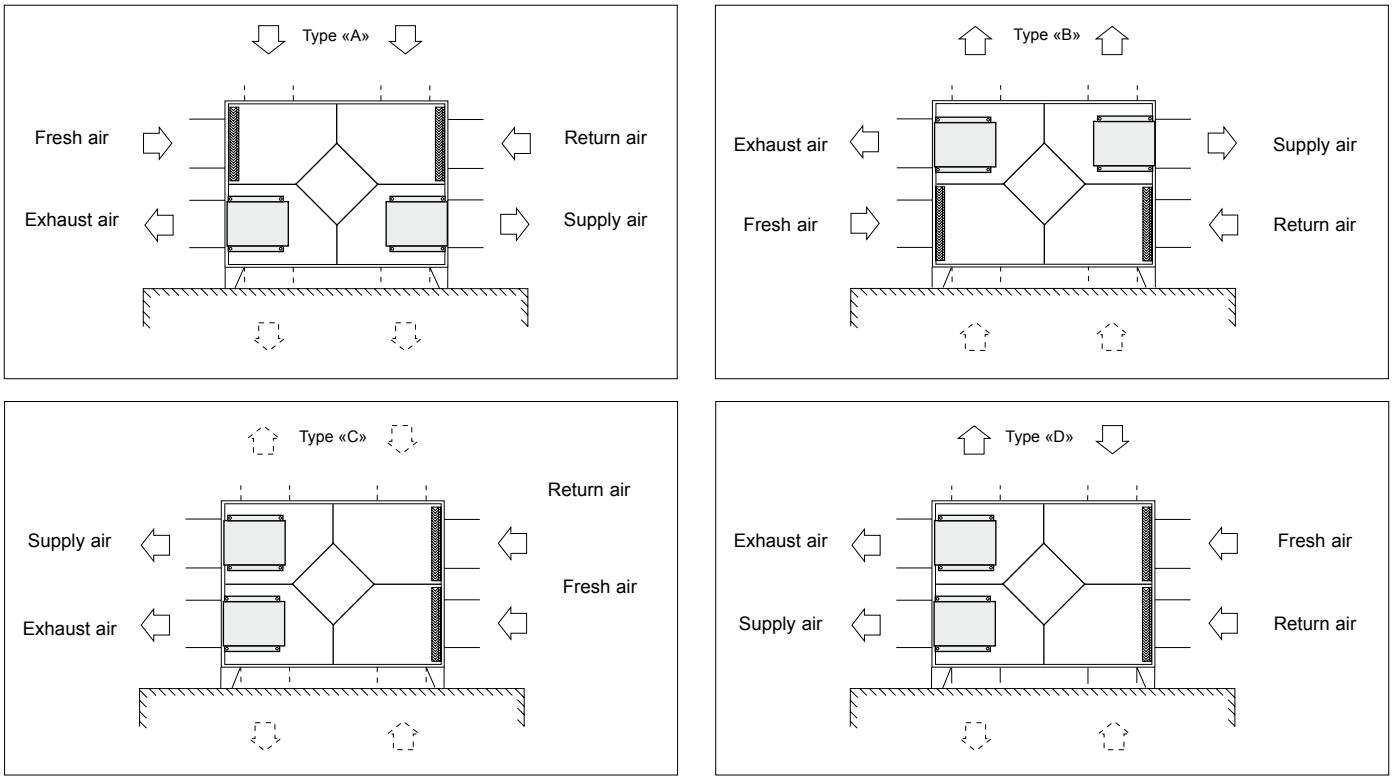
(1) Sound pressure calculated in free field of the fan at 1m from unit.
(2) Room air temperature 20°C D.B., 50% R.H.; fresh air temperature : -5°C.
(3) Air inlet temperature 8°C, water temperature 70/60°C.
(4) Air inlet temperature 29 °C, RH 60 %, in/out water temperature 7/12°C.

Possible installations

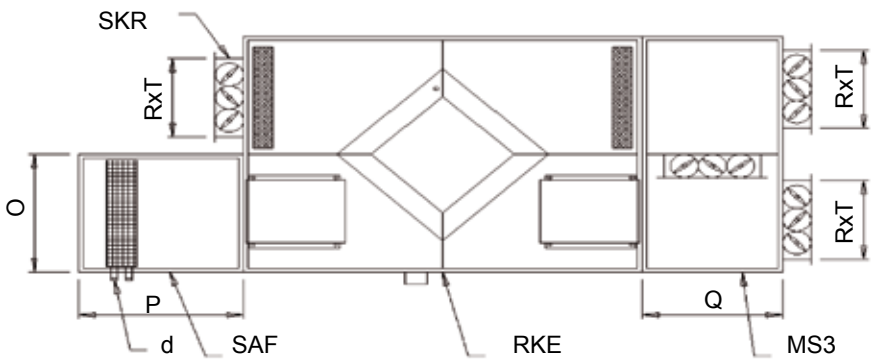
Horizontal configuration



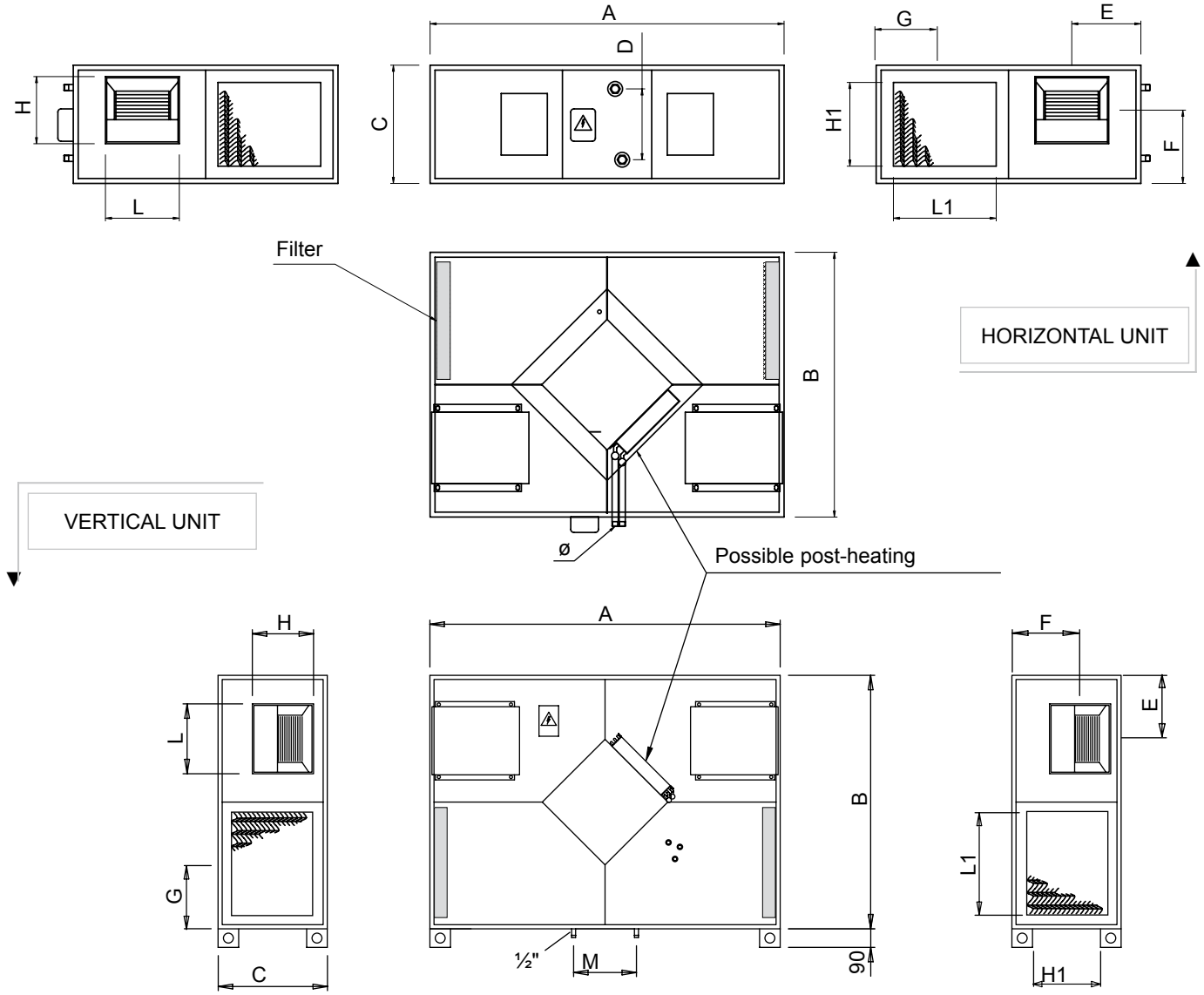
Vertical configuration (with re-heating system - only type B or C)



Physical data



Physical data

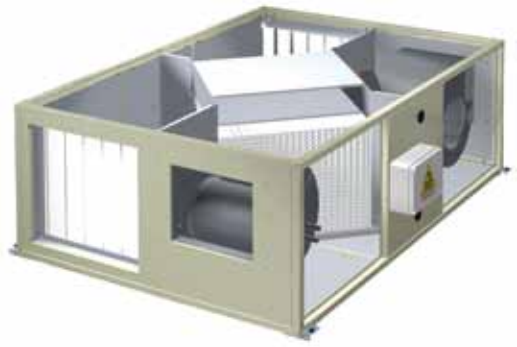


MINIAIR™ +		03	06	10	14	19	25	30	40	50	60
A	mm	990	990	1150	1350	1450	1700	1700	1700	1700	1900
B	mm	750	750	860	900	900	1230	1230	1230	1350	1450
C	mm	270	270	385	410	470	490	530	630	705	755
D	mm	-	-	230	230	280	305	305	405	480	530
Ø		-	-	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	1"	1"
E	mm	195	195	245	241	241	323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

Where different, within brackets, dimensions of vertical version.

MINIAIR™ + BP · 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

MINAIR™ + BP		10	14	19	30	40	60
Airflow rate	m³/h	650	1100	1600	2600	3400	5500
External static pressure	Pa	100	120	120	170	100	170
Sound level at 1 m (1)	dB(A)	52	59	58	58	61	64
Shaft power	W	2x147	2x350	2x350	2x550	2x750	2x1500
Maximum current	A	3,0	5,8	6,2	11,4	6,2	11,2
Number of fan speeds		3	3	3	3	2	2
Number of poles		4	4	4	4	4	4
Protection class - Minimum		IP 20					
Temperature class - Minimum							
Power supply	V/Ph/Hz	230/1/50				400/3/50	
Recovery efficiency (2)	%	54,0	51,6	51,0	55,3	55,3	52,6
Recovery (2)	kW	3,0	4,8	7,0	12,3	16,1	26,4

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

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

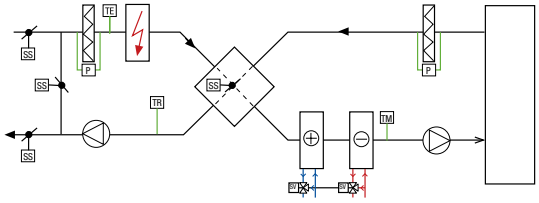
General description

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 F6F+8 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 CO_2 sensor
- Pressure sensor

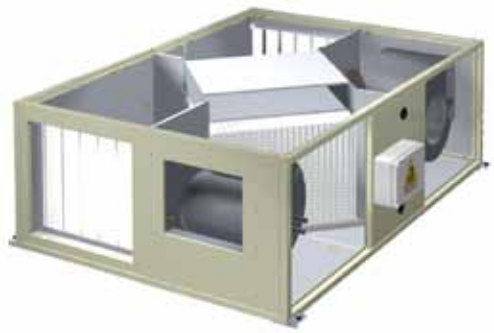
General data

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.

MINIAIR™ + BF · 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

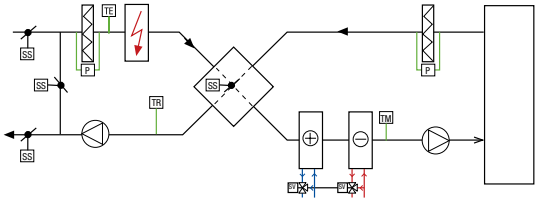
General description

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 F6F+8 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 CO_2 sensor
- Pressure sensor

General data

MINAIR™ + FO		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	160,	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 swithc).

Modulating control (LXMAPRQU)

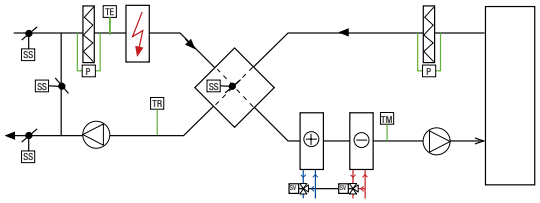
The modulating control LXMAPRQU is composed by an electronic kit, an hydronic kit and a range of accessories used for the control. Fonctioning is optimized thanks to the precise control of air flow and water flow rate. It is standard in MINIAIR™ + FO and MINIAIR™ + BF

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 CO_2 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
- LXMAPPSTD : air filter pressure swithc



Airflow control

LXMAPAQS, ductable CO_2 sensor, must be connected to the LXMAPRQU control.

LXMAPKAQ, air quality control system includes:
- Ductable CO_2 sensor
- Modulating control
- 24V transformer

LXMAPDPS is a sensor for constant pressure working mode.

REMOTE CONTROLS

Range LXRAB, LXRCC, RDF300.02

LXRAB range

LXRCC range

RDF300.02

Main applications

- Commercial buildings
- Residential buildings
- Light industrial buildings

Why this choice?

- Quality & functionnality
- Pleasant design

General description

LENNOX mechanical and electronic remote controls LXRAB, LXRCC and RDF300.021 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.

REFERENCE		APPLICATIONS				
		2 pipes heating only	2 pipes cooling only	2 pipes cooling or heating	2 pipes and electric heater	4 pipes
Electromechanicals						
LX RAB10				■		
LX RAB30						■
Electronics						
LX RCC10		■	■	■		
LX RCC20					■	
LX RCC30						■
Built in electronics						
LX RDF300.02 + ARG71 Plastic box		■	■	■	■	■
ARG71 (RDF300.02)		■	■	■	■	■
Sensors						
QAH11.1 sensor (LXRCC10, LXRCC20, RDF300.02, RDG160)		■	■	■	■	■
LXARG86.3 change over sensor support		■	■	■	■	■

Description

- **LXRAB10**

  - Room mechanical thermostat
  - Operating voltage AC 230V
  - Room thermostat
  - Manual 3 speed fan switch / Off
  - 1 water circuit - 2 pipes - 1 valve control
  - Manual set point adjustment

- **LXRAB30**

  - Room mechanical thermostat
  - Operating voltage AC 230V
  - Room thermostat
  - Manual 3 speed fan switch / Off
  - 2 water circuits - 4 pipes - 2 valves control
  - Manual set point adjustment

- **LXRCC10**

  - Wall electronic control with room thermostat
  - Operating voltage AC 230V
  - Manual 3 speed fan switch / Off
  - Automatic change over with QAH11.1 sensor
  - LEDs for indicating control mode and fan
  - Manual set point adjustment
  - Economy Mode through external contact
  - Frost protection
  - Change over switch
  - Operating mode from normal operation to energy saving

- **LXRCC20**

  - Wall electronic control with room thermostat
  - Operating voltage AC 230V
  - Manual 3 speed fan switch / Off
  - Automatic change over with QAH11.1 sensor
  - LEDs for indicating control mode and fan
  - Manual set point adjustment
  - Neutral zone adjustment
  - Economy Mode through external contact
  - Frost protection
  - Change over switch
  - Operating mode from normal operation to energy saving DIP 2
  - Electrical heater control (Cooling or electric heating or cooling or heating + electric heater)

- **LXRCC30**

  - Wall electronic control with room thermostat
  - Operating voltage AC 230V
  - Manual 3 speed fan switch / Off
  - LEDs for indicating control mode and the fan
  - Manual set point adjustment
  - Neutral zone adjustment
  - Economy Mode through external contact
  - Frost protection
  - Change over switch
  - Operating mode from normal operation to energy saving

- **RDF300.02 + ARG71 INSTALLATION PLASTIC BOX**

  - Semi Flush-mount Room Thermostat with LCD
  - Mounting box ARG71: dimensions 75mmx75mmx 51mm(thickness) (option) with 60,3 mm fixing centers
  - Operating voltage 230V AC
  - Backlit LCD display
  - Automatic or manual fan speed
  - Functioning mode symbols
  - Setpoint setting with mini- maxi limitation
  - Neutral zone adjustment
  - Operating mode change over contact
  - Frost protection
  - 2 multi functional input freely selectable
  - Operating mode, change over sensor, alarm input
  - Thermic valves ou 3 points 230V 5 (2)A

CLEANAIR™ 23LX · 1 000 ➔ 100 000 m³/h

Modular air handling unit

Main applications

- Commercial
- Industrial
- Healthcare

Why this choice?

- Modular unit
- Flexibility
- Certified product

General description

CLEANAIR™ 23LX LENNOX 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™ 23LX 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™ 23LX 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)

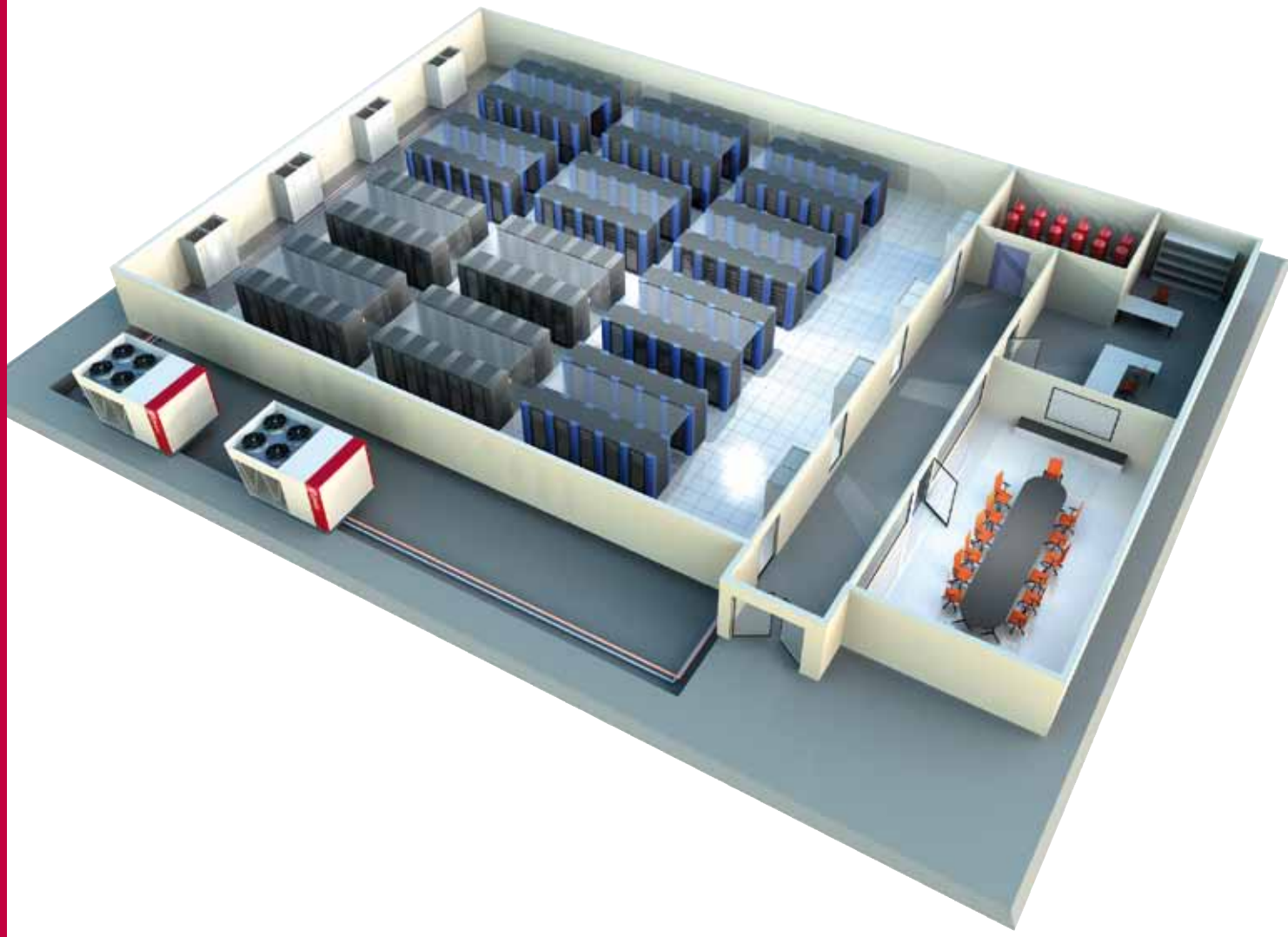
  Fans up to size 400 are mounted on rubber antivibration mounts and all other sizes are fitted with spring mounts.

  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.

Close Control Units



Providing IT climate technology

@DNOVA™ · 2,5 ➔ 26 kW

Telecom Units

Main applications

- Telecom Shelters

Why this choice?

- Energy efficiency
- Reliability
- High quality

General description

The **@DNOVA™** 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 **@DNOVA™** (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 **@DNOVA™** 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
- Side Free-cooling technology
- Microprocessor
- Electronic condenser fans speed control
- Interconnectivity (ModBus, TCP/IP, Bacnet ...)

General Data

@DNOVA™ - 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	kW	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 compressors (2)	scroll	1r	1	1	1	1	1	1	1	1	1	1	1
Airflow rate	m^3/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 (10 m free field)	dB(A)	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	mm	800	800	800	1010	1010	1010	1160	1160	1500	1500	1500	1500
Depth	mm	550	550	550	550	550	550	550	550	800	800	800	800

@DNOVA™ - 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	kW	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 compressors (2)	scroll	1r	1	1	1	1	1	1	2	2	2	2
Airflow rate	m^3/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 (10 m free field)	dB(A)	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	mm	804	804	804	1000	1000	1000	1000	1000	1000	1000	1000
Depth	mm	498	498	498	596	596	596	596	596	596	596	596

@DNOVA™ -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	kW	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 compressors (2)	scroll	1r	1r	1r	1	1	1	1	1	1
Evaporator airflow	m^3/h	950	930	1400	1400	2200	2200	2200	3200	3200
Condensor airflow	m^3/h	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 (10 m free field)	dB(A)	41	41	41	41	42	42	45	43	43
Indoor unit										
Height	mm	350	350	350	350	350	350	350	400	400
Width	mm	590	590	990	990	990	990	990	1090	1090
Depth	mm	1040	1040	1040	1040	1040	1040	1040	1040	1040
Outdoor unit										
Height	mm	580	580	630	630	630	630	630	1128	1128
Width	mm	600	600	990	990	990	990	990	1120	1120
Depth	mm	350	350	360	360	360	360	360	578	578

(1) Indoor conditions 27°C/ 40% / Outdoor condition: 35 °C
(2) 1r means Rotary compressor

INNOV@™ · 6 ➔ 128 kW

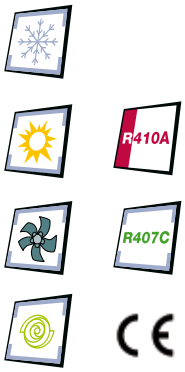
Close Control Units

Main applications

- Computer rooms
- Datacenters

Why this choice?

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



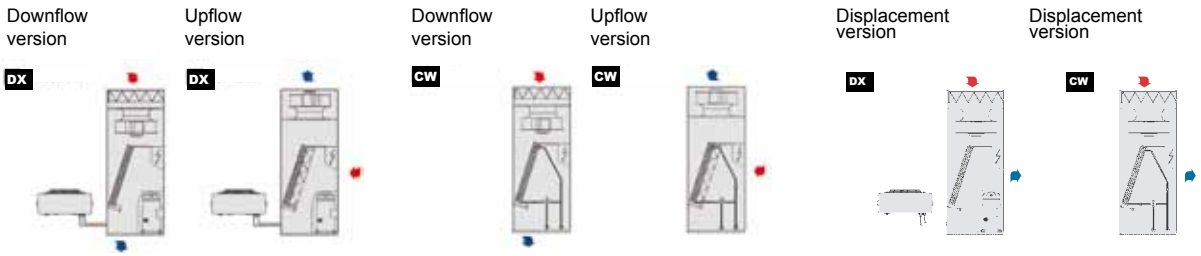
General description

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



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.

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.

General Data

INNOV@™ DX AIRCOOLED - R407C		0060	0080	0100	0110	0130	0160	0190	0205	0201	0251	0281	0311
Total cooling capacity (1)	kW	5,9	7,8	9,3	10,7	12,7	15,8	18,4	20,7	22,5	23,3	27,4	31,3
Sensible cooling capacity	kW	5,8	7,7	9,3	10,7	12,0	15,5	16,7	19,7	21,8	22,6	27,4	29,4
Sensible heat ratio		0,99	0,99	1,00	1,00	0,95	0,98	0,91	0,95	0,97	0,97	1	0,94
Number of compressors	scroll	1	1	1	1	1	1	1	1	1	1	1	1
Airflow rate	m^3/h	1785	2150	3530	3530	3700	5100	5100	5100	6800	6800	7280	7280
Fan type (2)		EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC
Number of fan		1	1	1	1	1	1	1	1	1	1	1	1
Height	mm	1875	1875	1875	1875	1875	1875	1875	1875	1998	1998	1998	1998
Length	mm	600	600	900	900	900	900	900	900	1010	1010	1280	1280
Depth	mm	600	600	600	600	600	600	600	600	795	795	795	795

INNOV@™ DX AIRCOOLED - R407C		0401	0272	0302	0362	0422	0452	0532	0592	0602	0692	0762	1002	1204
Total cooling capacity (1)	kW	41,2	26,9	31,9	35,9	41,9	44,8	53,5	57,9	61,4	68,7	76,2	94,4	124,7
Sensible cooling capacity	kW	40,0	26,9	31,9	35,2	40,6	44,8	49,9	48,6	57,7	61,8	68,6	86,8	113,5
Sensible heat ratio		0,97	1	1	0,98	0,97	1	0,93	0,84	0,94	0,90	0,90	0,92	0,97
Number of compressors	scroll	1	2	2	2	2	2	2	2	2	2	2	2	4
Airflow rate	m^3/h	12950	12950	12950	12950	12950	12950	14150	14150	19415	19415	19415	21500	24000
Fan type (2)		EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC
Number of fan		2	2	2	2	2	2	2	2	3	3	3	2	3
Height	mm	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998
Length	mm	1760	1760	1760	1760	1760	1760	2030	2030	2510	2510	2510	2510	3160
Depth	mm	795	795	795	795	795	795	795	795	795	795	795	950	950

INNOV@™ DX WATERCOOLED - R407C		0060	0080	0100	0110	0130	0160	0190	0205	0201	0251	0281	0311
Total cooling capacity (1)	kW	5,3	7,0	8,9	10,0	11,8	15,5	17,7	19,7	22,0	22,8	26,9	30,5
Sensible cooling capacity	kW	5,2	6,8	8,9	10,0	11,4	15,5	16,1	16,7	21,8	22,3	26,9	27,1
Sensible heat ratio		0,99	0,98	1	1	0,97	1	0,91	0,85	0,99	0,98	1	0,89
Number of compressors	scroll	1	1	1	1	1	1	1	1	1	1	1	1
Airflow rate	m^3/h	1785	2150	3530	3530	3700	5100	5100	5100	6800	6800	7280	7280
Fan type (2)		EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC
Number of fan		1	1	1	1	1	1	1	1	1	1	1	1
Height	mm	1875	1875	1875	1875	1875	1875	1875	1875	1998	1998	1998	1998
Length	mm	600	600	900	900	900	900	900	900	1010	1010	1280	1280
Depth	mm	600	600	600	600	600	600	600	600	795	795	795	795

(1) Indoor conditions 24°C/ 50% / Outdoor condition: 35 °C or Water 40/45°C
Available for city water
Freecooling optional (direct / indirect)

(2) Electronically Commutated fan
Centrifugal fans are an option for the models 0060 - 0205
Dualfluid optional

General data

INNOV@™ DX WATERCOOLED - R407C		0401	0272	0302	0362	0422	0452	0532	0592	0602	0692	0762	1002	1204
Total cooling capacity (1)	kW	39,8	26,7	31,4	35,7	41,3	43,9	53,0	57,4	60,0	68,0	74,9	92,9	122,3
Sensible cooling capacity	kW	38,6	26,7	31,4	35,6	39,2	43,4	50,9	49,4	60,0	65,3	68,2	81,7	102,7
Sensible heat ratio		0,97	1	1	1	0,95	0,99	0,96	0,86	1	0,96	0,91	0,88	0,84
Number of compressors	scroll	1	2	2	2	2	2	2	2	2	2	2	2	4
Airflow rate	m^3/h	12950	12950	12950	12950	12950	12950	14150	14150	19415	19415	19415	21500	24000
Fan type (2)		EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC
Number of fan		2	2	2	2	2	2	2	2	3	3	3	2	3
Height	mm	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998
Length	mm	1760	1760	1760	1760	1760	1760	2030	2030	2510	2510	2510	2510	3160
Depth	mm	795	795	795	795	795	795	795	795	795	795	795	950	950

1) Indoor conditions 24°C/ 50% / Water 40/45°C
Available for city water
Freecooling optional (direct / indirect)

(2) Electronically Commutated fan
Dual fluid optional

INNOV@™ CHILLED WATER		0080	0110	0140	0160	0200	0230	0300	0380
Total cooling capacity (1)	kW	8	11,1	11,4	16,6	17,7	23,5	28,1	42,5
Sensible cooling capacity	kW	7,4	9,3	11,4	14,6	17,2	20,4	25,3	34,9
Sensible heat ratio		0,92	0,84	1	0,88	0,97	0,87	0,9	0,82
Airflow rate	m^3/h	2300	2400	3800	3800	5100	5100	7450	7450
Fan type (2)		EC	EC	EC	EC	EC	EC	EC	EC
Number of fan		1	1	1	1	1	1	1	1
Height	mm	1875	1875	1875	1875	1875	1875	1998	1998
Length	mm	600	600	900	900	900	900	1010	1010
Depth	mm	600	600	600	600	600	600	795	795

INNOV@™ CHILLED WATER		0400	0500	0650	0750	0900	1000	1200
Total cooling capacity (1)	kW	44,6	56,9	74,2	85,7	87,9	112,1	127
Sensible cooling capacity	kW	39,7	50,1	60,8	68,6	76,5	89,7	101,6
Sensible heat ratio		0,89	0,88	0,82	0,80	0,87	0,80	0,80
Airflow rate	m^3/h	14550	14550	14550	14550	21400	21400	21400
Fan type (2)		EC	EC	EC	EC	EC	EC	EC
Number of fan		2	2	2	2	2	3	3
Height	mm	1998	1998	1998	1998	1998	1998	1998
Length	mm	1760	1760	1760	1760	2510	2510	2510
Depth	mm	795	795	795	795	795	795	795

(1) Indoor conditions 24°C/ 50%
Water in - out: 7 - 12 °C
Freecooling optional (direct)

(2) Electronically Commutated fan
Centrifugal fans are an option for the models 0080 - 0230

General data

INNOV@™ CHILLED WATER DOWNFLOW		1500 (3)	1500 (4)	1800 (3)	1800 (4)	2100 (3)	2100 (4)
Total cooling capacity (1)	kW	151,5	77,5	167,1	87,4	236,2	125,3
Sensible cooling capacity	kW	121,2	77,5	130,3	87,4	179,5	125,3
Sensible heat ratio		0,80	1	0,78	1	0,76	1
Airflow rate	m^3/h	26200	26200	26200	26200	36120	36120
Fan type (2)		EC	EC	EC	EC	EC	EC
Number of fan		2		2		3	
Height	mm	1998		1998		1998	
Length	mm	2510		2510		3160	
Depth	mm	950		950		950	

(1) Indoor conditions 24°C/ 50%
(2) Electronically Commutated fan
(3) Water in - out: 7 - 12 °C
(4): Water in - out: 10 - 18°C
Freecooling optional (direct)

Available accessories - configurations

- IDual 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

INNOV@™ ENERGY INVERTER · 3 ➔ 63 kW

Close Control Units

Main applications
- Computer rooms
- Datacenters

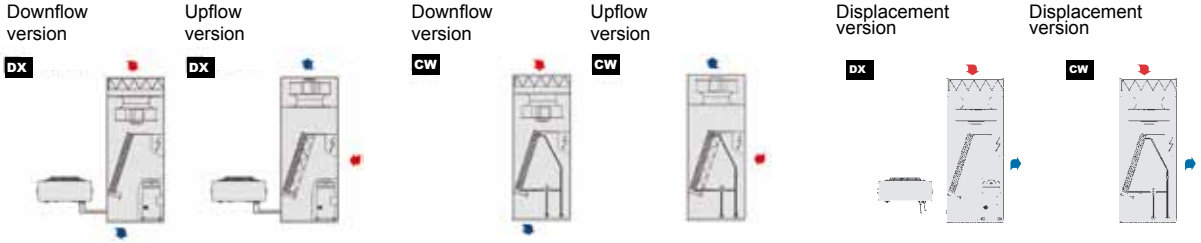
Why this choice?
- Energy efficiency
- Reliability
- High quality

General description

The new series of 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 allow 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 now 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 new **INNOV@™ ENERGY** series, units designed in order to operate 24 hours a day, 365 days a year delivering only cooling which is required.
The reduction of energy consumption in comparison with traditional technologies reaches values up to 45%.

Available configurations



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 micro-processor 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.

General Data

NNOV@™ ENERGY INVERTER - R410A		0060	0130	0281	0592
Compressor speed 30 Hertz					
Total cooling capacity (1)	kW	3,2	6,3	12,3	24,4
Sensible cooling capacity	kW	3,2	6,3	12,3	24,4
SHR		1	1	1	1
Compressor speed 70 Hertz					
Total cooling capacity	kW	6,3	11	21,9	43,9
Sensible cooling capacity	kW	5,9	11	21,9	42,1
SHR		0,94	1	1	0,96
Compressor speed 110 Hertz					
Total cooling capacity	kW	9,5	15,8	31,6	62,9
Sensible cooling capacity	kW	7,6	13,4	27,2	54,7
SHR		0,8	0,85	0,86	0,87
Compressors		1 x EC twin-Rotary	1 x EC scroll	1 x EC scroll	2 x EC scroll
Air flow	m^3/h	1785	3700	7280	14150
Fan		1 x EC fan	1 x EC fan	1 x EC fan	1 x EC fan
Length	mm	1875	1875	1998	1998
Height	mm	600	900	1270	2020
Depth	mm	600	600	795	795

(1) Indoor conditions 24°C/ 50% / Outdoor condition: 35 °C

Available accessories - configurations

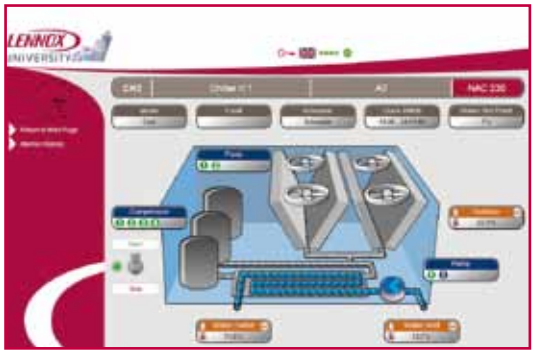
- Freecooling optional (direct / indirect)
- Potential free alarms contacts
- Water detection kit
- Full frontal access
- Flash memory
- Microprocessor
- Electronic condenser fans speed control
- Interconnectivity (ModBus, TCP/IP, Bacnet ...)
- Dataweb
- Touch screen graphic display

eDrive™ Driving Energy Efficiency LENNOX

Controls & Supervision

Providing indoor climate comfort

ADALINK™



Main applications

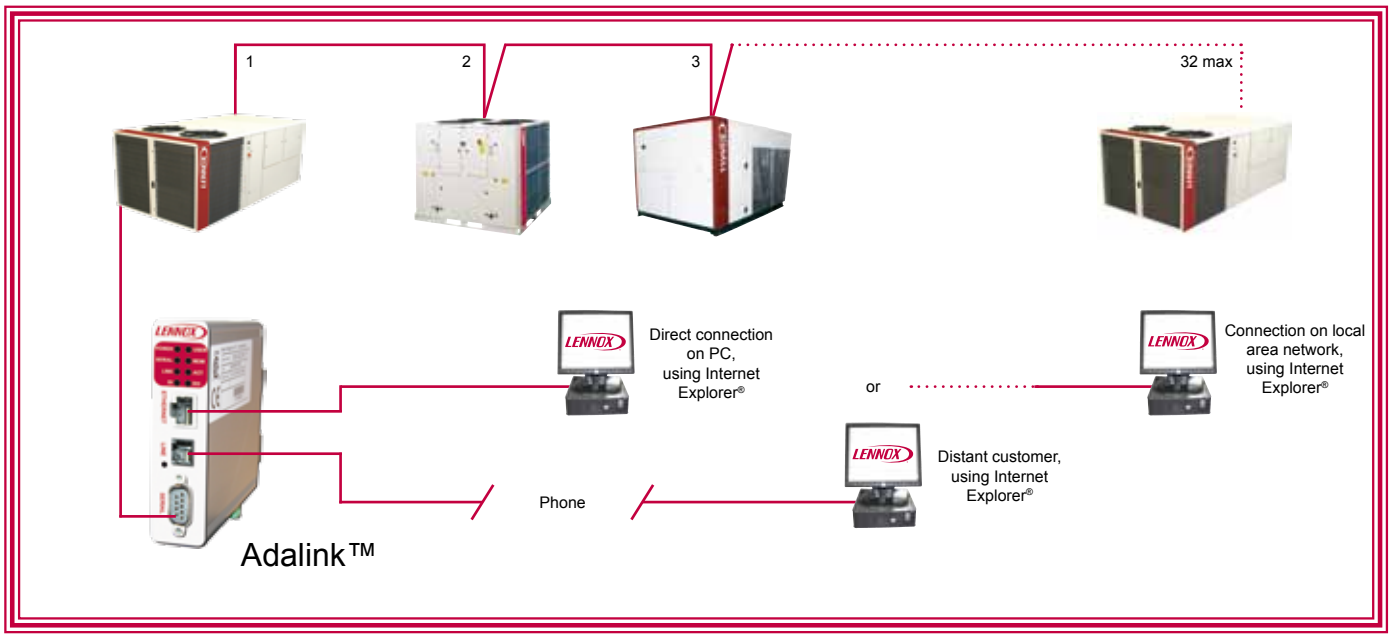
- BMS “light” system
- Small installations: up to 32 units

Why this choice?

- Dedicated to Lennox units
- Plug-and-play system
- No computer issue
- Use Internet Explorer only
- Very easy to use
- Yearly scheduling
- Remote connection via RTC Modem, Ethernet or GPRS
- Language friendly
- Very good price

ADALINK™ is the LENNOX solution for HVAC installation monitoring. It can control up to 32 units on the same site. It can be connected to different units of the Lennox range, rooftops and chillers.

Very easy to install, it can be used on any computer through Internet Explorer® locally and remotely via an internal modem (RTC or GPRS).



ADALINK™ can show the whole site map showing status of the different units, zoom on each unit and allow the user to graphically change set point, access alarm list, look at trend curves.
It is the ideal tools for maintenance specialist with an expert mode giving access to all the parameters and set point of the unit.
Finally, yearly scheduling is possible with a very smart and user-friendly drag and drop system.

LennoxVision™

Main applications

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

Why this choice?

- Communication with all Lennox controllers (including CLII) 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

LENNOX presents **LennoxVision™**, a new solution for supervision and telemaintenance.
LennoxVision™ is the LENNOX supervision system, it can be connected to all the Lennox units and external components without limit. Real BMS system you 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

General information

Providing indoor climate comfort

Acoustic data

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:

Lw = 10 x Log (W emitted / W 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:

Lp = 20 x Log (P emitted / P 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
	1ère	2e	3e	4e	5e	6e	7e	8e	
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.

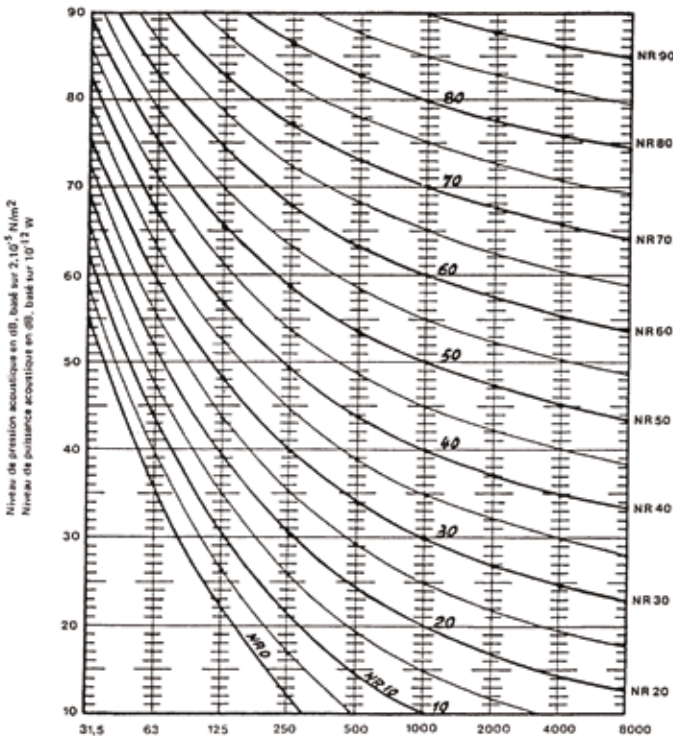


Fig. 3 Indice d'évaluation ISO du niveau de gêne

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:

$$Lp = Lw + 10 \times \text{Log } Q / (4 \times \pi \times r^2)$$

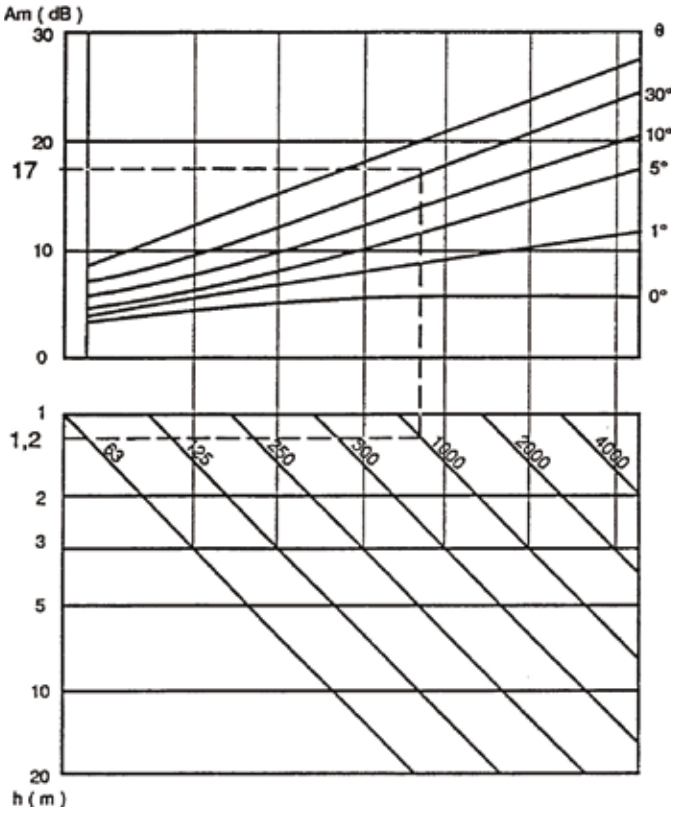
The term **Q** is called the directivity factor.
Its value is:
1 when the source is in space, emitting in a complete sphere
2 for a source on the ground, i.e. emitting in a hemisphere
4 if the source is on a wall, emitting in a quarter of a sphere
8 for a source located in a corner of a wall, emitting in an eighth of a sphere

Free air or noise diffusion with an obstacle

We can use the general diffusion equation shown above:

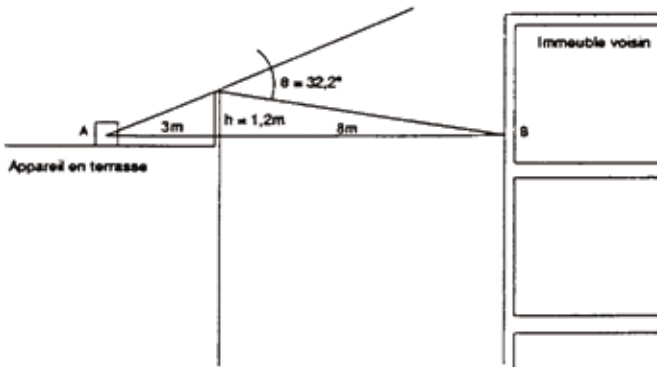
$Lp = Lw + 10 \times \text{Log } Q / (4 \times \pi \times r^2) - Am$

with the addition of the term Am, 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:

Lp = 77 - 8 - 20 Log (3 + 8) = **48 dB**

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

Lp = 77 - 8 - 20 Log (3 + 8) -17 = **31 dB**

Diffusion of noise in an enclosed space

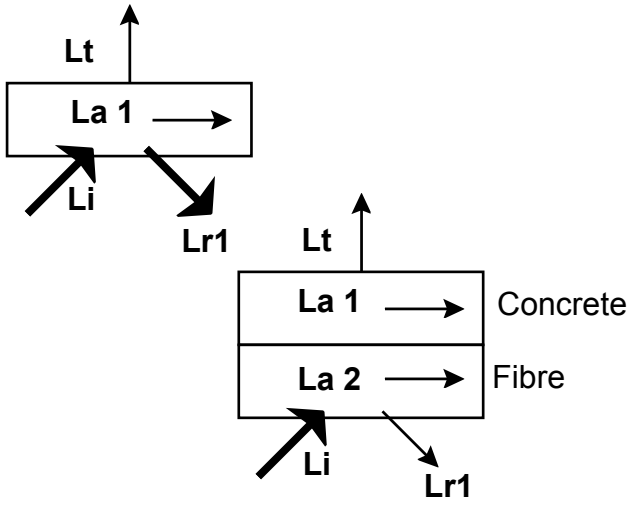
When a noise is emitted in a room, we perceive a pressure wave which comes to us directly from the source as in the free field case, but we also perceive waves reflected by the walls of the room.

Wave reflection

When a wave strikes a wall (Ii), then, in simplified terms, part of the energy is transmitted through the wall (It), 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 Ii, the transmitted It 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:

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

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

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

The absorption capacity of a surface is :

$$A = S \cdot \alpha$$

S in m^2

A in m^2 Sabine

For a room:

$$A = \Sigma Si \cdot \alpha i$$

Constant r of a room

$$\alpha_m = \Sigma Si \cdot \alpha i / \Sigma Si = A / S$$

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

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:

$$Lp = Lw + 10 \text{ Log } (Q / (4 \times \pi \times r^2) + 4 / R)$$

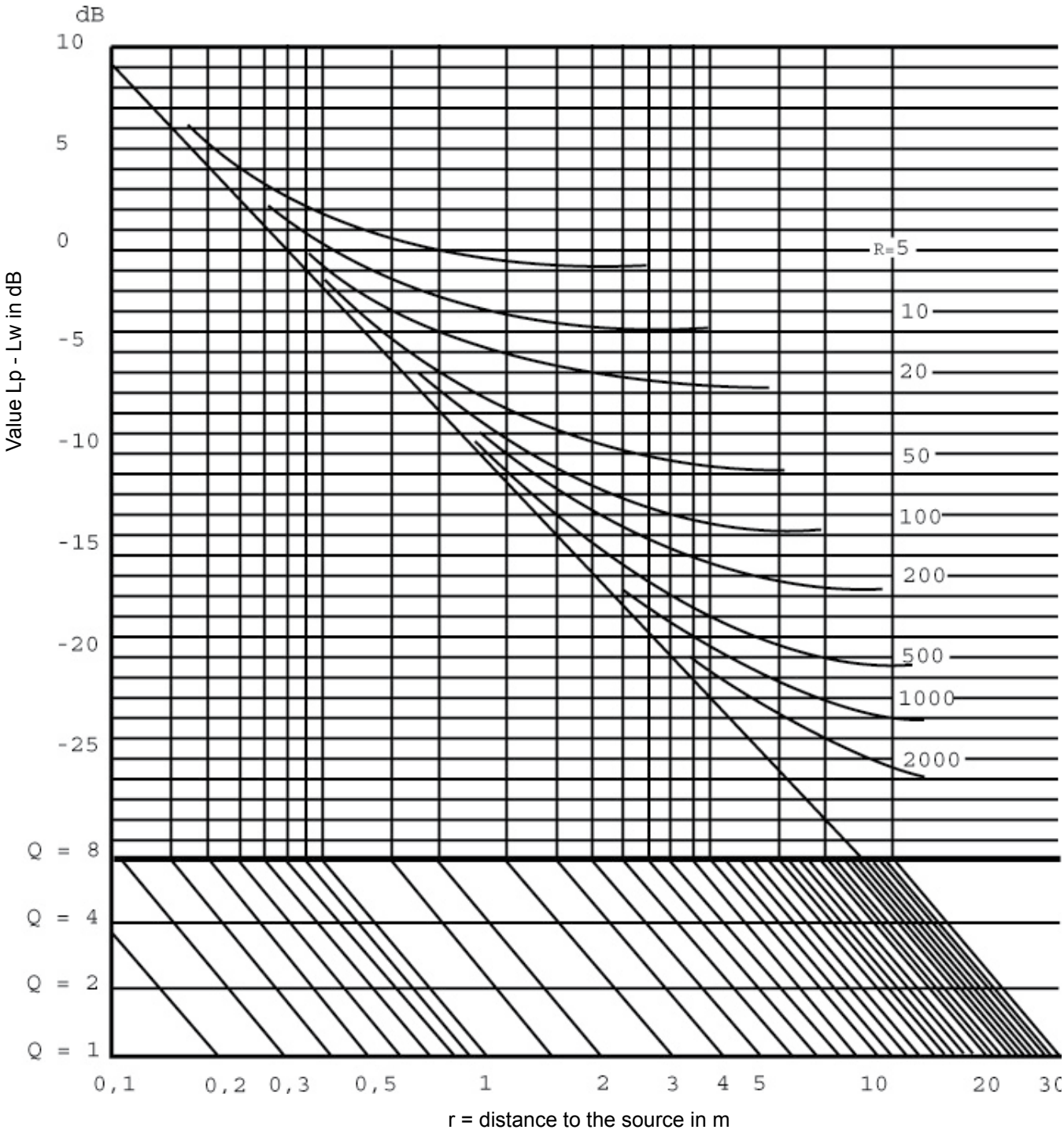
NOTA:

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

Acoustic data

Graphic expression of the equation

Lp = Lw + 10 Log (Q / (4 x π x r²) + 4 / R)



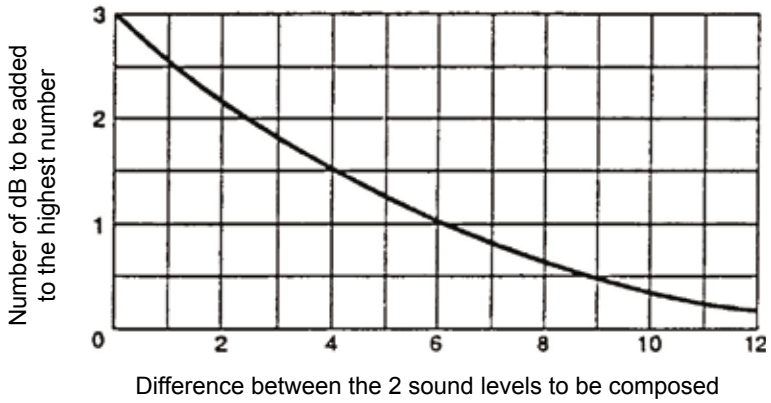
The attenuation decreases with distance in the direct field, but is constant in the reflected field.

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 :

$$Lp = 10 \times \text{Log} \sum 10^{(Lpi / 10)}$$

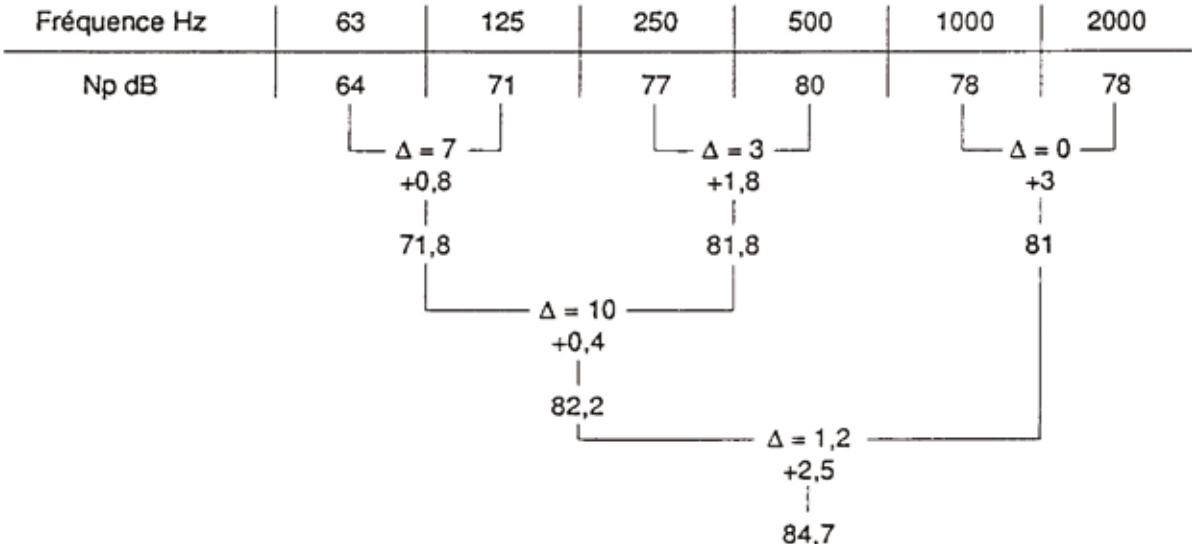
In practice, the following curve is used:



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

$$Lp = Lpi + 10 \times \text{Log (number of sources)}$$

Example :



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

Air filtration

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): Table 1

The test procedure for air filters used in general ventilation is based on the procedure established twenty years ago 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 (Am) 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 (Am) 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 (Em) 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 (Em) is a mean value weighted for clogging, and is therefore greater than the initial efficiency found with a new filter.**

Table 1: Efficiency classification of air filters used in general ventilation according to the measurement method described in Eurovent recommendation 4/5. To permit accurate comparison and choice, the test characteristics (air flow in m^3/h, final pressure drop in Pa) must always be shown with the class of a filter.

LIMITS OF FILTER CLASSES			
Filter class	**Gravimetric efficiency mean Am (%)**	**Opacimetric efficiency mean Em (%)**	**Corresponding to NF EN779 (X 44-012)**
EU1	Am < 65	/	(G1)
EU2	65 < or = Am < 80	/	(G2)
EU3	80 < or = Am < 90	/	(G3)
EU4	90 < or = Am	/	(G4)
EU5	/	40 < or = Em < 60	(F5)
EU6	/	60 < or = Em 80	(F6)
EU7	/	80 < or = Em < 90	(F7)
EU8	/	90 < or = Em < 95	(F8)
EU9	/	95 < or = Em	(F9)

Very high efficiency air filters NF EN 1822 (X 44-014): Table 2

This standard has two essential features:

- The emphasis is placed on the determination of efficiency ratings in the least favourable conditions: in the new filter and for the most penetrating particle size (between 0.1 and 0.2 µm), known as the MPPS.

- The maximum local "leakage" (maximum local penetration) is quantified for filter classes equal to or above H13.
  For classes H13 and H14, the integrity of the filter can be checked by a leakage test of the "smoke test" type.

It should be noted that the references HEPA and ULPA shown here do not correspond to the American definitions used previously.
These classifications are related to standardized test methods and procedures, designed to quantify the purifying capacity of filters to a certain extent.
All these test methods are based on a very simple procedure: the filters to be tested are placed in an airstream set to their operating flow rate (nominal flow); a specified test aerosol is injected upstream; individual counts are carried out upstream and downstream; the quantity retained by the filters is deduced from the results.

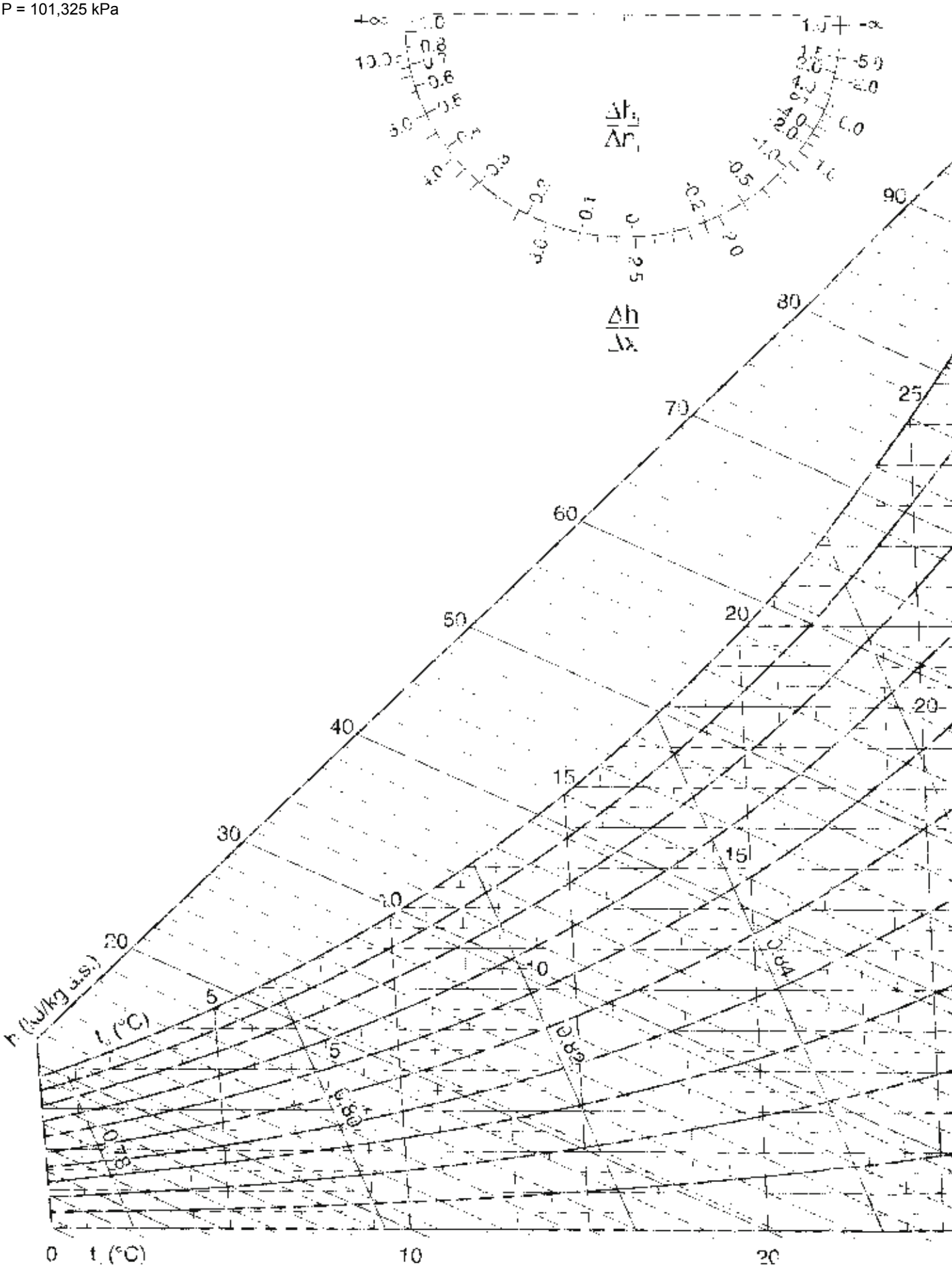
Table 2: Classification of very high efficiency filters according to Eurovent recommendation 4/4.

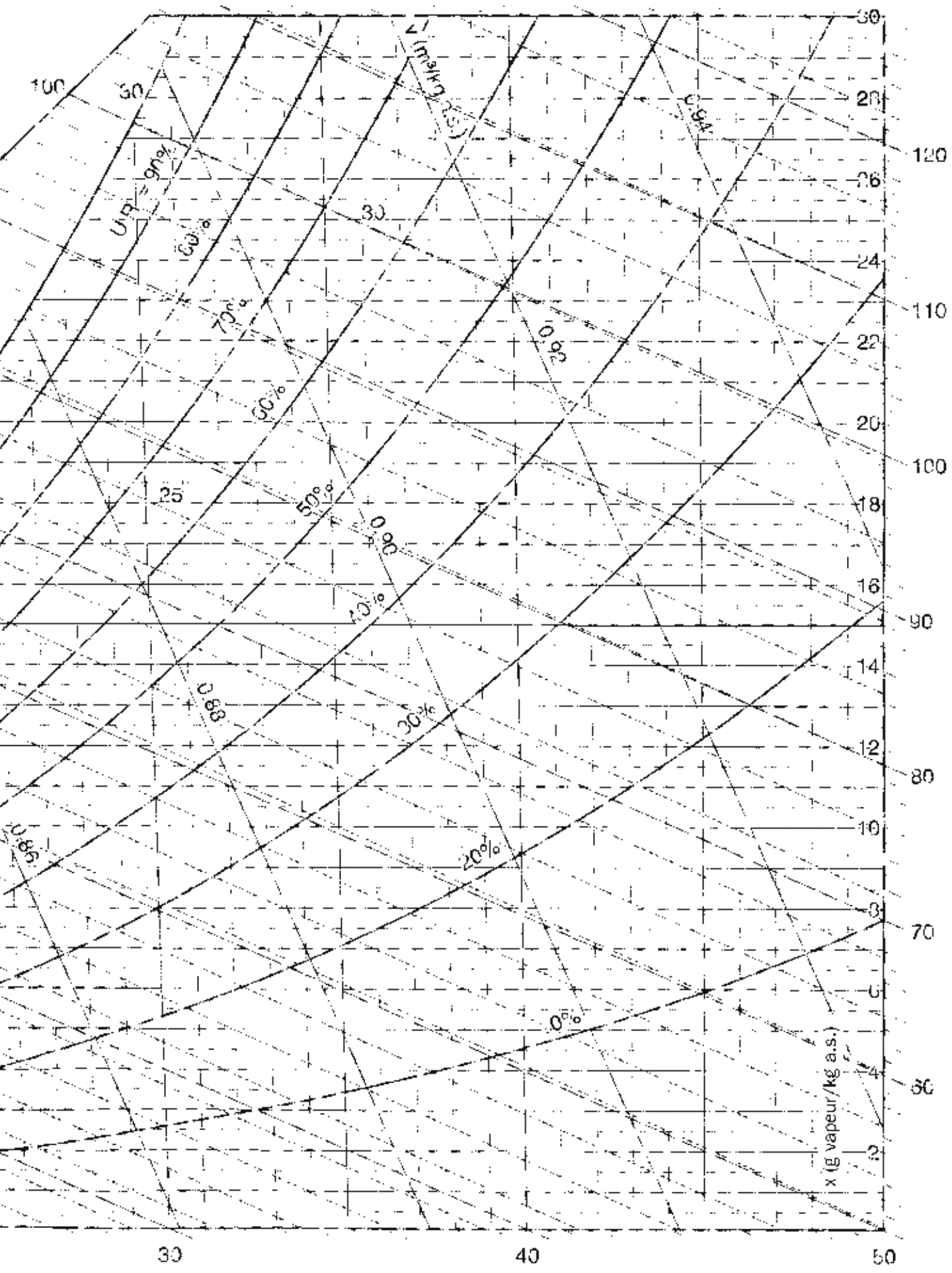
INITIAL EFFICIENCY		
Filter class	**Limits of filter classes**	
EU 10	95 < or = Ei < 99,9	5 > or = Pi > 0,1
EU 11	99,9 < or = < 99,97	0,1 > or = Pi > 0,03
EU 12	99,97 < or = Ei < 99,99	0,03 > or = Pi > 0,01
EU 13	99,99 < or = Ei < 99,999	0,01 > or = Pi > 0,001
EU 14	99,999 < or = Ei	0,001 > = Pi

These two pages on filtration summarize the information available in the guide «Climatisation et santé» [«Air Conditioning and Health»] produced by Uniclima, which has kindly allowed us to use it. For further information, you can obtain this publication from Editions Separ, 92 038 Paris la Défense cedex.

Psychrometric diagram

P = 101,325 kPa




100
30
UR = 90%
60%
70%
80%
90%
25
50%
40%
30%
20%
0%
0,94
0,92
0,90
0,88
0,86
0,84
30
40
50
120
110
100
90
80
70
60
x (g vapeur/kg a.s.)

Notes

Notes

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

R407C refrigerant

R410A refrigerant

Hermetic scroll compressor (with R407C or R410A)

Axial condenser fan

Centrifugal fan

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