LENNOX

Catalogue **2009/2010**

• • • Providing indoor climate comfort

LENNOX Catalogue 2009/2010

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

- 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

Unlike any others ...

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.

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.

General Product Catalogue · 01-2009 · Non contractual photos

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.

- The Lennox laboratory created in **PRAGUE** on a 250 m^2 platform is able to measure airflow up to 12 m^3/s and is also able to test extreme fan speeds and perform destructive fan 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

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

NEOSYS™

200 ➔ 1000 kW

- 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*

Rooftop - Water cooled

Rooftop Water Source Heat Pump

47 ➔ 196 kW

- 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

Vertical packaged air conditioners

COMPACTAIR™

20 → 106 kW

- R410A
- Freecooling
- Very Compact
- Dynamic Defrost
- CLIMATIC™ 40 & CLIMATIC™ 50 control
- Low Noise by Inverter control

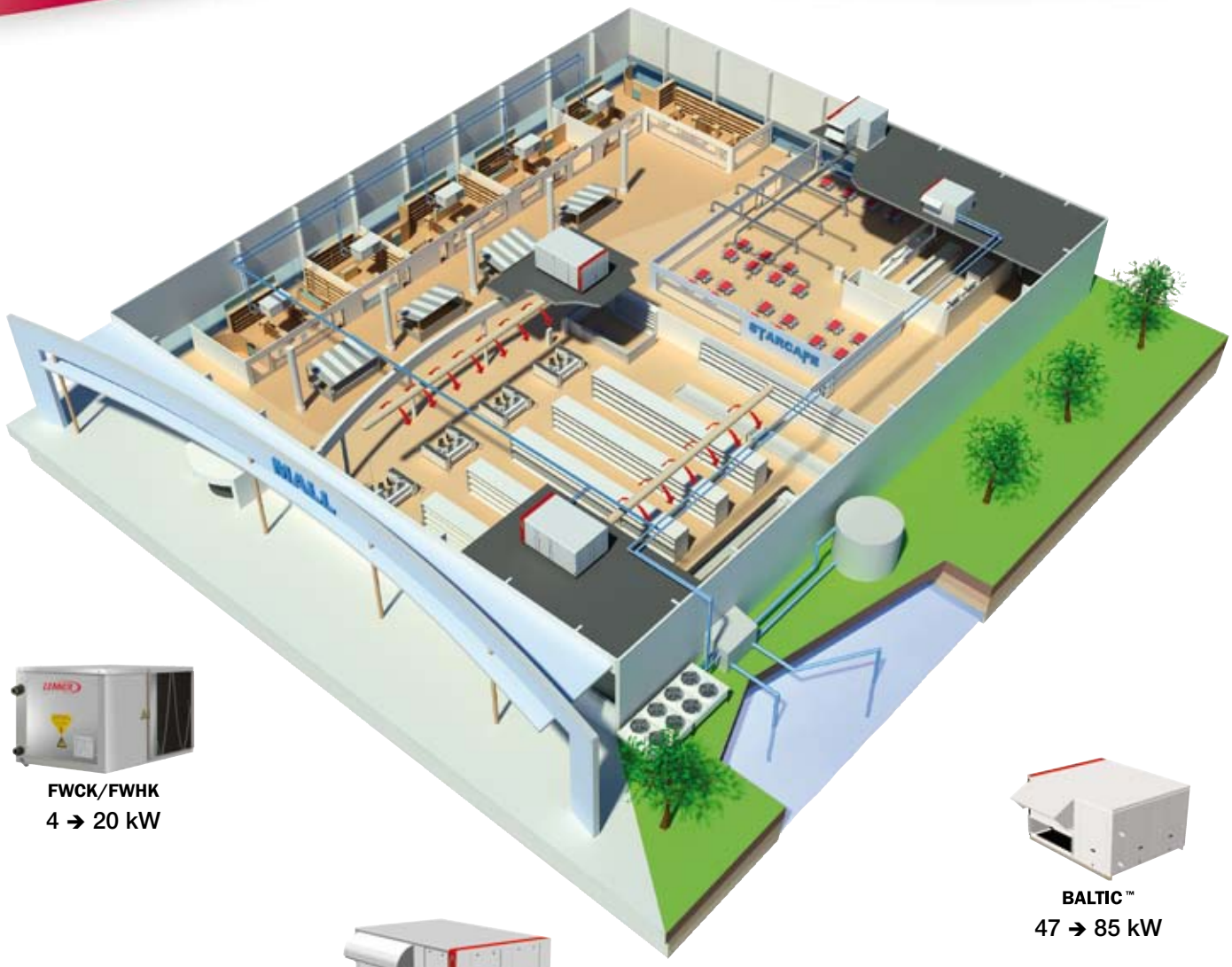
Split units - Centrifugal condenser

INNOV@™ Energy Inverter

3 → 63 kW

- Modulating cooling capacity (30 – 110 Hz)
- Energy Efficiency
- R410A
- Precise temperature control

Leadership in Retail Solutions



FWCK/FWHK
4 ➔ 20 kW

BALTIC™
47 ➔ 85 kW

FLEXY™II
95 ➔ 196 kW

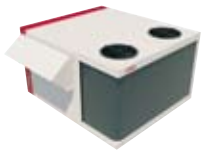
Ikea
(Portugal)

Weldom
(France)

Asda
(UK)

Géant Casino
(France)

Competences in Light Commercial Solutions



BALTIC™
22 ➔ 76 kW

ECOLEAN™
9 ➔ 174 kW

COMFAIR™
1 ➔ 51 kW

FLATAIR™
10 ➔ 28 kW

COMPACTAIR™
20 ➔ 100 kW

AIRCOOLAIR™
19 ➔ 134 kW

Zara
(Spain)

Esso
(Germany)

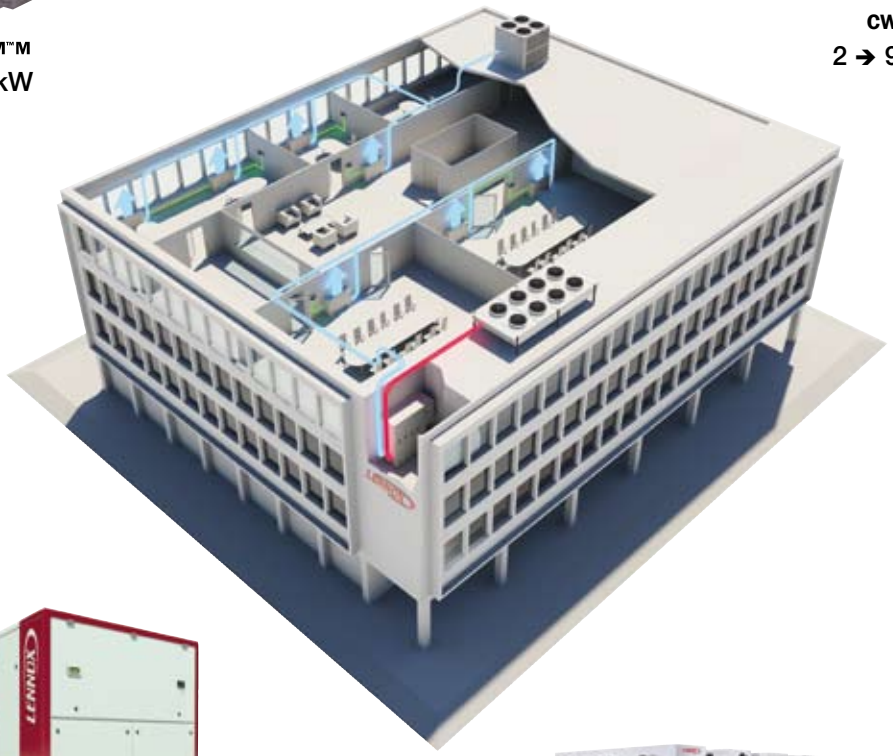
Quick
(France)

Maxi Dia
(Spain)

Innovations for Applied Solutions

QUANTUM™M
2 ➔ 7 kW

CWC
2 ➔ 9 kW



COANDAIR ™
2 ➔ 4 kW

COMFAIR™
1 ➔ 51 kW

CHILLERS & HEAT PUMPS
100 ➔ 1000 kW

MINIAIR™ - MINIAIR™+
2 ➔ 42 kW

Torre Mutua
(Spain)

Holmes Place
(Portugal)

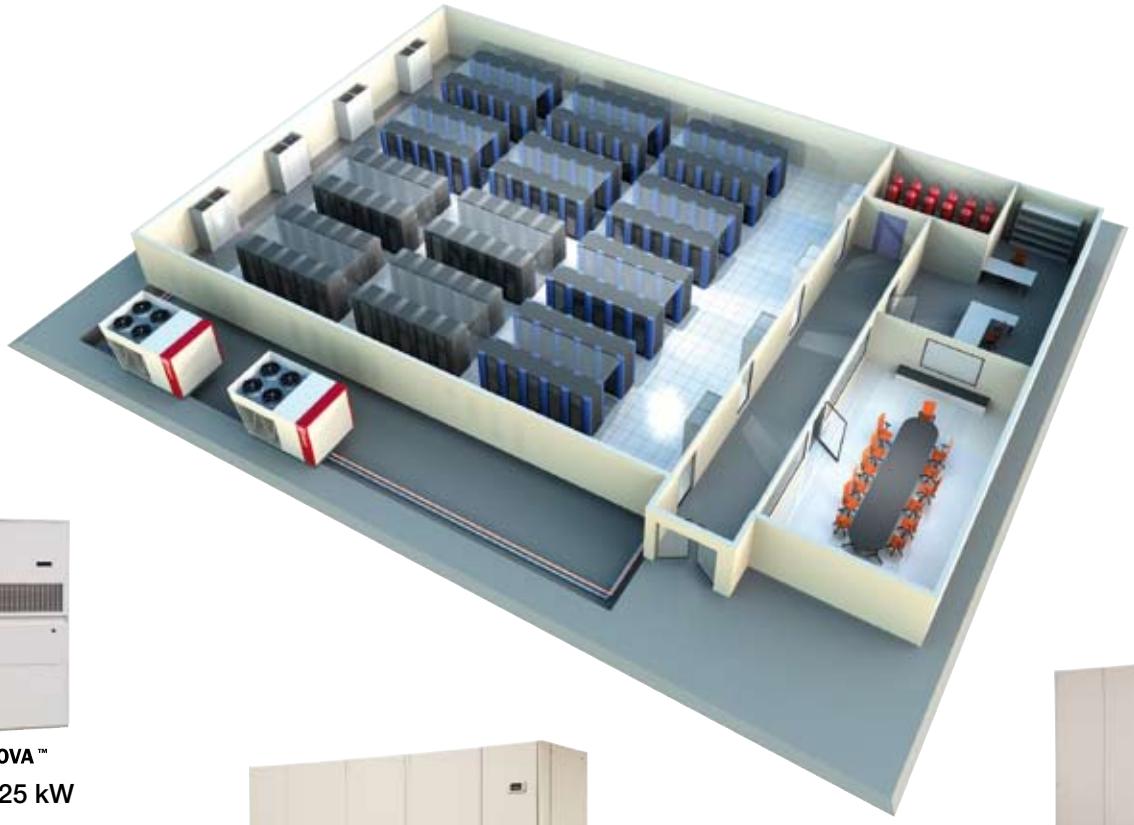
Tour de Lille
(France)

RBS
(UK)

Technopark
(Russia)

Monsanto
(Portugal)

Know-how in Tele/Data Communication Solutions



@DNOVA™

2,5 ➔ 25 kW

INNOV@™
CHILLED WATER

8 ➔ 249 kW

INNOV@™
DIRECT EXPANSION

6 ➔ 78 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:

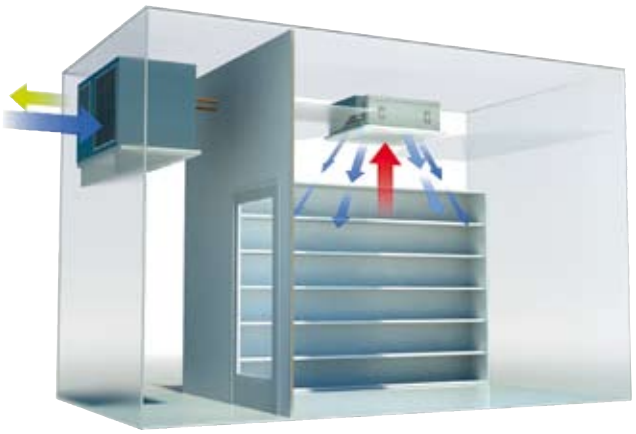
- Alcatel
- Auchan
- Axima
- Carrefour
- Cegelec
- City Facilities
- Cofacthec
- Dalkia
- Elyo Suez
- Ikea
- Johnson Control
- Jtek
- Mc Donald’s
- Veolia

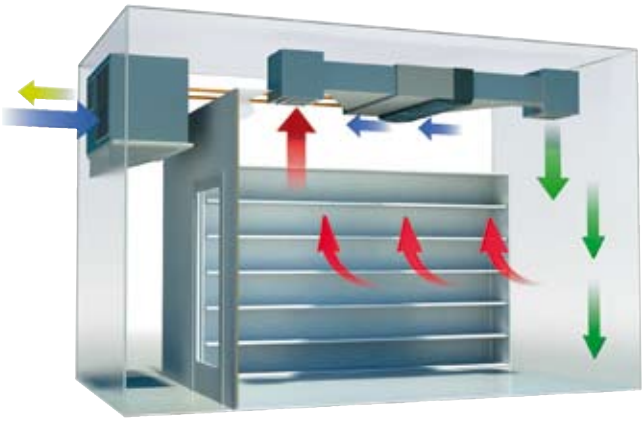
Air Packaged

Providing indoor climate comfort

Comfort™ + & Ductair™ + • 5 ➔ 18 kW

Centrifugal split units





Main applications

- Small stores with low cooling needs
- Low regulation constraint
- Urban or Suburban situation
- Premise with suspended ceiling

Why this choice?

- Small investment
- Multispeed ventilation
- Lasting performance

General description

COMFORT™ + and **DUCTAIR™ +** are Air to Air Split that are connected to a centrifugal condenser **for top integration in local architectur.**

One **COMFORT™ +** or **DUCTAIR™ +** set is composed of :

- 1 cassette or ductable treatment section
- 1 centrifugal condenser section
- Heat pump version for **COMFORT™ +**
- Cooling only and heat pump for **DUCTAIR™ +**

Main components

Ductair™

- Wired display
- Air filter
- Horizontal discharge
- Horizontal or vertical air inlet
- High static pressure
- 2 or 3 speed fans
- Low profile : 235, 287, 315 & 415 mm
- Ceiling fixtures

Comfort™

- Wired display
- Core Indoor unit
- Plastic diffusion grill
- Air filter
- Permanent fresh air inlet

Capacity Range

CAPACITY SIZE		18	24	30	36	48	60	70	80
DUCTAIR™ +	NCCK/NCHK								
COMFORT™ +	CXHK								

General data - Air treatment sections

DUCTAIR™ +		NCCK/HK	18	24	30	36	36	48	60	70	80
Cooling mode											
Cooling capacity (1)		kW	5,10	6,6	7,7	9		11	13,5	16,1	18,3
EER			2,52	2,54	2,33	2,33		2,34	2,33	2,40	2,33
Heating mode											
Heating capacity (5)		kW	5,4	6,85	8,4	9,2		11,4	14,4	16,5	19
COP			2,62	2,70	2,60	2,63		2,71	2,55	2,74	2,60
INDOOR UNIT		**LNXO**	**18**	**24**	**30**	**36**	**36**	**48**	**60**	**70**	**80**
Airflow	Max	m^3/h	915	1200	1350	1725		2150	2450	3400	4450
	Min	m^3/h	600	740	920	1000		1630	2060	2250	3050
Available static pressure		Pa	60	60	100	120		100		140	160
Voltage		V/Ph/Hz	230/1/50								
Acoustic											
Indoor unit sound power level (Lw) (1)		dB(A)	64	66		68		66	72	74	77

COMFORT™ +		CXHK	018	024	036	036	048
Cooling mode							
Cooling capacity		kW	5,50	6,50	9,60		11,30
EER		kW	2,75	2,6	2,53		2,57
Outdoor operating limits		°C	+19 (0 (1), -10 (2)) / +45				
Heating mode							
Heating capacity		kIW	5,30	6,80	9,00		11,10
COP		kW	2,83	2,66	2,84		2,71
Outdoor operating limits			-10 / +18				
INDOOR UNIT		**LCXO**	**024**		**048**		
Airflow	Max	m^3/h	920		1650		
	Min	m^3/h	650		1200		
Voltage		V/Ph/Hz	230/1/50				
Condensate drain pan diameter		mm	16		16		
Acoustic							
Indoor unit sound power (3)		dB(A)	51		64		

Operating limits

Cooling mode	Outdoor air temperature	Indoor air temperature
	°C	°C
Maximum	45	32
Minimum	19	21
Minimum with ON/OFF CPC (1)	0	-
Minimum with proportional CPC (1)	-10	-

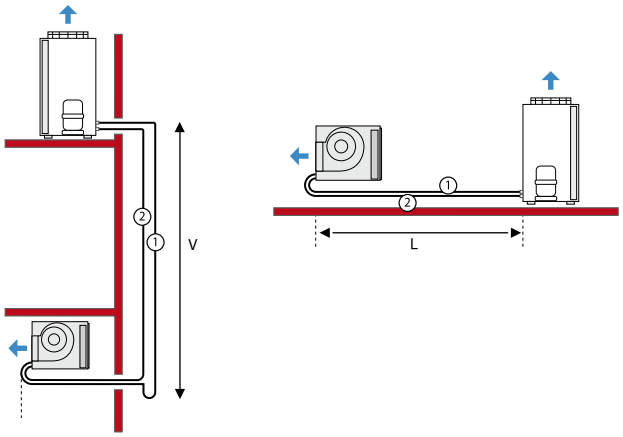
Heating mode	Outdoor air temperature	Indoor air temperature
	°C	°C
Maximum	18	27
Minimum	-10	15

(1) CPC: Low ambient kit (ON/OFF or proportional)

General data - Condensing units

CONDENSING UNIT		KCCK/HK	18	24	30	36	36	48	60	70	80
Airflow	Max	m^3/h	2 600	2 500	3 150	3 100		3 400	4 950		5 900
	Min	m^3/h	1 800	1 750	2 000			2 400	3 750		4 350
Available static pressure		Pa	70	90	100			90	120		150
Voltage		V/Ph/Hz	230/1/50				400/3/50				
Compressor		Type	Scroll								
Connection		Type	Flared							Soldered	
Acoustic											
Sound power level (Lw) (1)		dB(A)	68		69				73		80

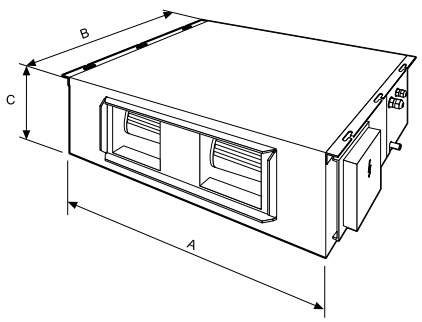
Refrigerant connections



CONDENSING UNIT		KCCK/HK	18	24	30	36	36	48	60	70	80
Connection		Type	Flared							Soldered	
Shut-off valve diameter	Liquid		1/4"		3/8"					1/2"	
	Gas		1/2"	5/8"		3/4"				7/8"	
Refrigerant charge		kg	1,37	2	2,64	2,95		3,72	4	5,6	5,6
Refrigerant pipework	Max. vertical	m	15								
	Total	m	25								

Physical Data

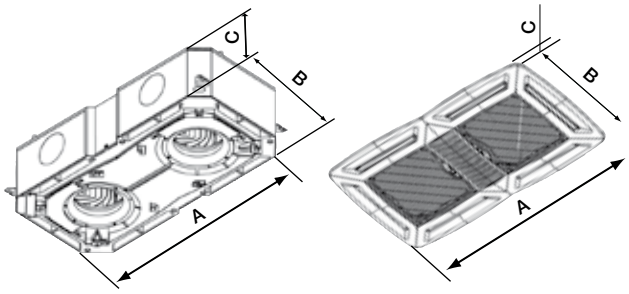
Air treatment section DUCTAIR™



DUCTAIR™	LNXO	018	024	030	036	048	060	070	080
A	mm	1000				1195		1300	
B	mm	535		700		750		850	
C	mm	235	235	287		315		415	
Weight	kg	35		43	44	57	58	85	86

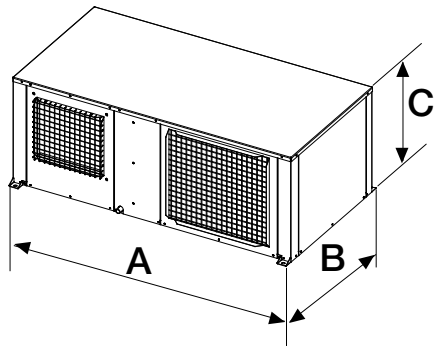
Physical Data

Air treatment section - COMFORT™



COMFORT™ +	CXHK	018	024	036	036	048
INDOOR UNIT	**LCXO**	**024**		**048**		
A	mm	575		1175		
B	mm	575		575		
C	mm	298		298		
Weight	kg	24		45		
DIFFUSER	**LCXO**	**024**		**048**		
A	mm	720		1320		
B	mm	720		720		
C	mm	48		48		
Weight	kg	3		5		

Condensing unit



OUTDOOR UNIT	KCHK	018	024	036	048	060	070	080
A	mm	975		1050	1250	830		900
B	mm	625		750	820	1300		1450
C	mm	485		505	495	595		595
Weight	kg	78	81	92	140	185	190	200

DUCTAIR™ II • 5 ➔ 17 kW

Ductable split for installation in false ceiling

Main applications

- Small stores with low cooling needs
- Low regulation constraint
- Urban or Suburban situation
- Premise with suspended ceiling

Why this choice?

- Low investment
- 24-48h delivery
- Winter cooling operation
- Multispeed ventilation

General description

DUCTAIR™ II is an Air to Air Split that is connected to a classic Axial condenser.
One **DUCTAIR™ II** set is composed of :

- 1 ductable treatment section
- 1 axial condenser section
- Heat pump version

Main components

- Infrared display
- Wired display
- Air filter
- Horizontal
- Winter Cooling operation down -7°C
- 3 speed fans
- Low profile : 210, 298 & 320 mm
- Ceiling fixtures

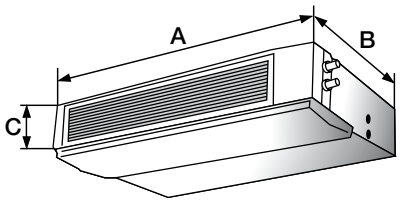
General Data

DUCTAIR™ II		NHM	012	018	024	030	036	048	060
Cooling mode									
Cooling capacity		kW	3,5	5,4	7,1	9,2	10,5	14	17
EER			3	2,84	2,83	2,83	2,84	2,98	2,83
Heating mode									
Heating capacity		kW	3,8	6	8	9,5	11,4	15,2	20
COP			3,17	3,16	3,2	2,92	3,4	3,10	3,33
Specifications - Indoor unit									
Airflow		m^3/h	580	1160	1460	2070	2070	2400	2800
Available static pressure		Pa	40	40	40	70	70	70	96
Voltage		V/Ph/Hz	220/1/50			220/1/50 380/3/50		380/3/50	
Specifications - Outdoor Unit									
Maximum Airflow		m^3/h	2100	2400	3000	5000	5000	6000	6000
Voltage		V/Ph/Hz	220/1/50			220/1/50 380/3/50		380/3/50	
Pipe diameter	Liquid		1/4"	1/4"	3/8"	1/2"	1/2"	1/2"	1/2"
	Gas		1/2"	1/2"	5/8"	3/4"	3/4"	3/4"	3/4"
Refrigerant charge		kg	1,12	2,05	2,6	3,10	3,10	40	42
Refrigerant pipework	Max pipe lenght	mm	25	25	30	30	30	50	50
	Max vertical difference	mm	15	15	20	15	20	30	30
Acoustic									
Outdoor unit sound level (1)		dB(A)	43	48	55	57	57	58	58
Indoor unit sound level (1)		dB(A)	41	45	49	49	49	51	52

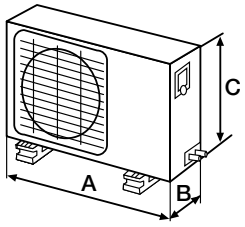
(1) Sound pressure level measured at 1m - Indoor unit ducted

Physical Data

Indoor unit



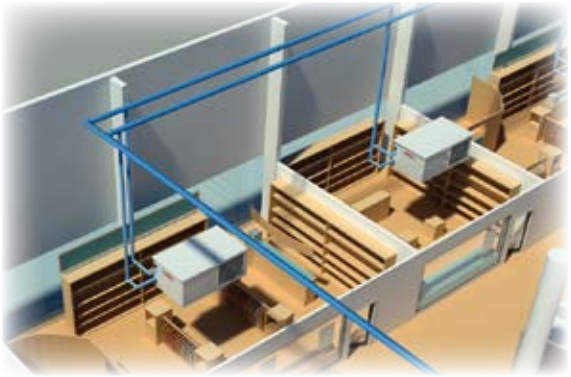
Outdoor unit

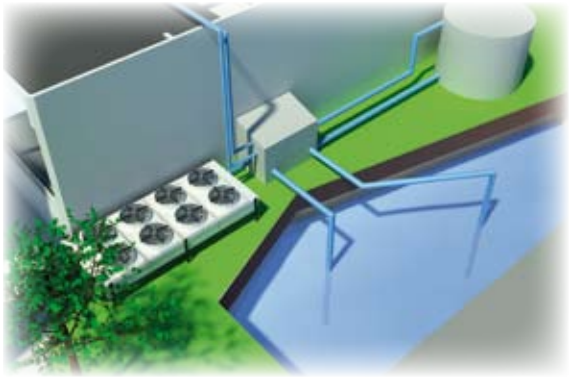


DUCTAIR™ II	NHM	012	018	024	030	036	048	060
Indoor Unit								
A	mm	955	1000	1000	1350	1350	1350	1350
B	mm	385	800	800	800	800	800	800
C	mm	210	298	298	298	298	298	320
Net weight	kg	15	36	38	48	48	50	70
Outdoor unit								
A	mm	760	845	895	990	990	940	940
B	mm	285	335	330	360	360	340	340
C	mm	590	695	860	960	960	1245	1245
Net weight	kg	44	57	68	90	90	112	112

FWCK/FWHK • 4 ➔ 20 kW

Horizontal water cooled packaged air conditioners



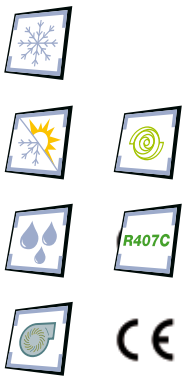


Main applications

- 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

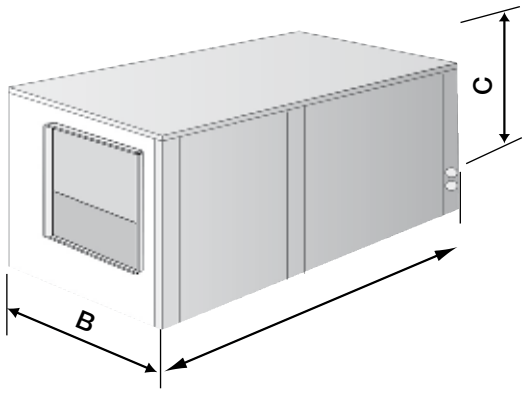
- Auxiliary heating
- Electrical heater
- Hot water coil
- Hydraulic options
- Flow switch
- Water filter
- Water regulating valves
- Comfort
- Low noise compressor jacket
- Installation, service and security
- Main switch (up size 08)
- Return lock for the three phases models

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		3,54	3,77	3,76	3,51	3,72		3,74	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	4,04	3,86	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	Nb	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

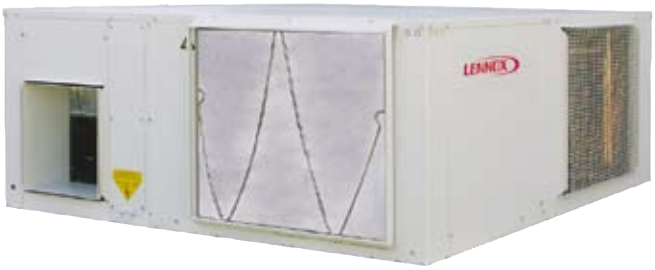
Physical data

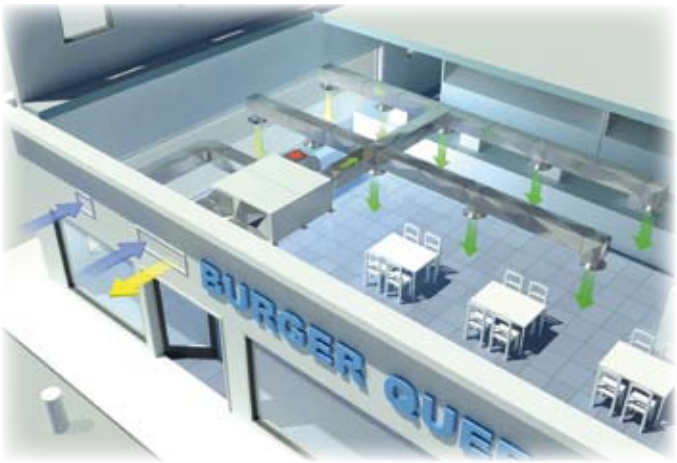


FWCK/FWHK		4	6	7	8	10	12	16	22
A	mm	792	792	792	1083	1083	1503	1503	1503
B	mm	492	492	492	623	623	703	703	703
C	mm	440	440	440	465	465	505	505	505
Weight	kg	56	77	80	103	106	150	158	171

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

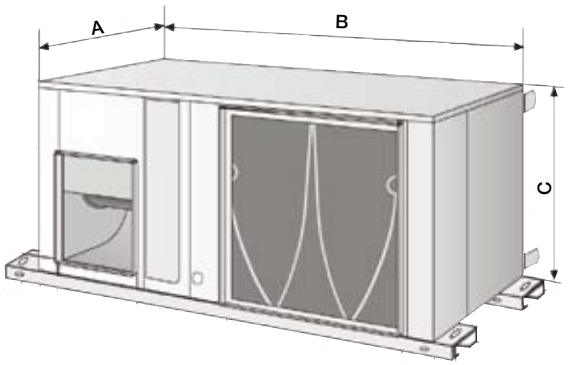
FLATAIR™	FLCK / FLHK	10	10	12	16	22	24	28	30
Cooling mode									
Gross Cooling capacity (1)	kW	10,2		12,2	16,2	20,8	23,4	27,4	29,5
Gross EER		2,77		2,67	2,53	2,57	2,59	2,63	2,41
Power input	kW	3,68		4,57	6,4	8,1	9,0	10,4	12,2
Heating mode									
Net Heating capacity (2)	kW	10		12	15,6	20	22,8	27	29,8
Net COP		3,16		2,92	3,16	3,03	2,92	3,20	3,16
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	Nb	1							
Number of compressors	Nb	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	84	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	83	80
Operating limits (cooling only / heat pump)									
Maximum inside temperature	°C	32 / 23							
Minimum inside temperature	°C	21 / 15							
Maximum outside temperature	°C	45 / 24							
Minimum outside temperature (4)	°C	19/-8				0/-8			

(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)

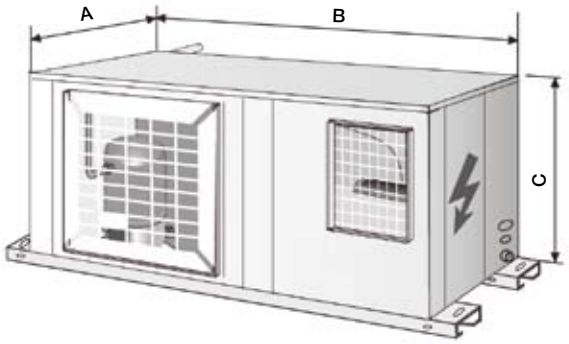
Physical data

Air treatment section



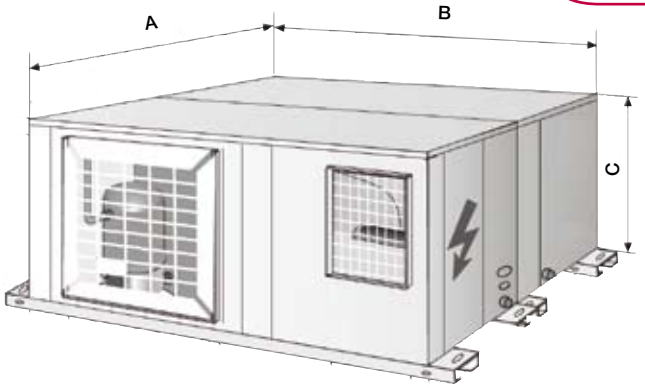
AIR TREATMENT SECTION	LFXO / LFCK / LFHK	10	12	16	22	24	28	30
A	mm	430	430	500	620	775	775	775
B	mm	1250	1250	1300	1450	1500	1500	1500
C	mm	495	495	595	595	645	645	645
Weight	kg	70	70	100	130	140	150	150

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	kg	130	135	180	195	265	275	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	kg	200	205	280	325	405	425	430

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

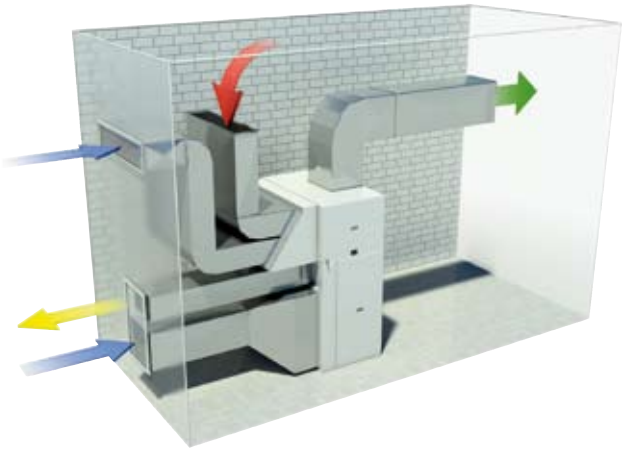
- Three phase protection: Electrical circuit protection to avoid wrong wiring of 400 volts power supply. This protects the compressor on 1st start.
- Crankcase heater (cooling only): The crankcase heater heats the Compressor oil when the Outdoor temperature is low and the unit is not operating. This 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 400 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								
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	19,5	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	6,72	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	30
Electrical heater capacity - High (3)	kW	20	20	20	30	30	30	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	m^3/h	3150	4250	4650	6200	6950	7950	9950
Maximum airflow	m^3/h	4100	5500	6000	8050	9050	9750	12850
Maximum available static pressure	Pa	322	320	326	327	327	210	386
Condensing unit ventilation								
Nominal airflow	m^3/h	7600	8500	10000	12000	11700	14000	10000
Maximum available static pressure	Pa	170	209	256	195	192	218	265
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	76	79	77	78	78	82
Radiated sound power level in Room on Low Noise unit (Lw)	dB(A)	71	72	75	73	73	74	76
Indoor blower outlet sound power level (Lw)	dB(A)	73	78	80	80	83	86	80

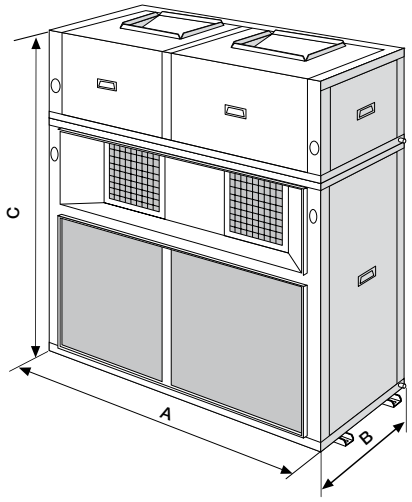
COMPACTAIR™		70D	85D	100D	55D	70D	85D
Cooling		CMC/ CSC + CIC			CDC + 2 x CIC		
Gross Cooling capacity	kW	72	87	105	58	72	87
Gross EER		2,6	2,7	2,6	2,7	2,6	2,7
Power input	kW	27,8	32,5	40,4	21,5	27,8	32,5
Heating		CMH/ CSH + CIH			CDH + 2 x CIH		
Net heating capacity	kW	69,5	81	101	59	69,5	81
Net COP		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 (1)	kW	20	20	30	20	20	20
Electrical heater capacity - Medium (2)	kW	30	30	40	30	30	30
Electrical heater capacity - High (3)	kW	40	40	50	40	40	40
Hot Water Coil capacity (4)	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	m^3/h	12450	14000	17350	2 x 4650	2 x 6200	2 x 6950
Maximum airflow	m^3/h	15090	16725	22450	2 x 6000	2 x 8050	2 x 9050
Maximum available static pressure	Pa	354	346	358	2 x 326	2 x 327	2 x 327
Condensing unit ventilation							
Nominal airflow	m^3/h	10500	11000	15500 + 11700	10000	10500	11000
Maximum available static pressure	Pa	255	333	301+194	265	255	333
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)	80	81	83	-	-	-
Radiated sound power level in Room on Low Noise unit (Lw)	dB(A)	77	78	79	-	-	-
Indoor blower outlet sound power level (Lw)	dB(A)	85	87	85	2 x 80	2 x 80	2 x 83

(1) Standard elec : 1 capacity step
(2) Medium elec : 2 capacity steps
(3) High elec: 2 step or modulating capacity
(4) 20°C air inlet, Water temperature – 90-80°C

COMPACTAIR™ is part of AC2/AC3 Eurovent Certification Programs (www.eurovent-certification.com)

Physical data

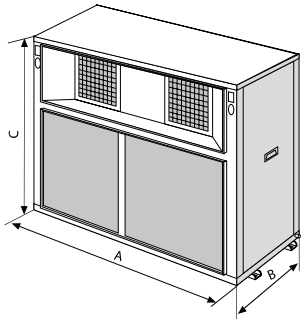
Monobloc unit



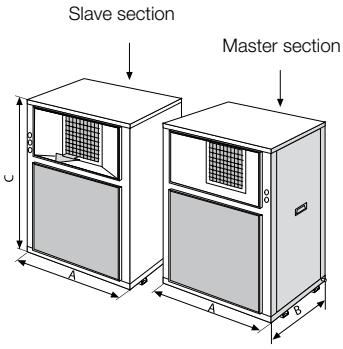
COMPACTAIR™	CMC/CMH	20S	25S	30S	35S	40S	45D	55D	70D	85D
A	mm	1195			1450			2250		
B	mm	803			923			923		
C	mm	2050			2150			2150		
Operating weight (standard unit)	kg	376	412	424	516	539	630	785	831	883

Condensing unit

Sizes 20S to 85D



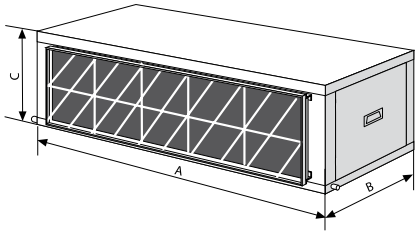
Sizes 100D



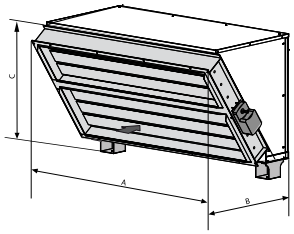
CONDENSING UNIT	CSC/CSH CDC/CDH	20S	25S	30S	35S	40S	45D	55D	70D	85D	100D
A	mm	1195			1445			2250			2900
B	mm	750			870			870			895
C	mm	1410			1410			1410			1470
Operating weight approx.	kg	262	295	302	357	370	448	529	554	586	870

Physical data (Cont'd)

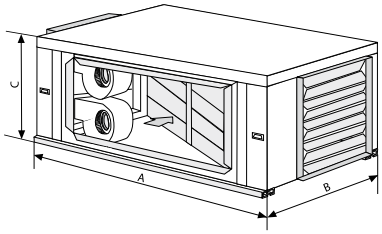
Air treatment section



AIR TREATMENT SECTION	CIC/CIH	20S	25S	30S	35S	40S	45D	55D	70D	85D	100D
A	mm	1195			1445			2250			2900
B	mm	803			923			923			1103
C	mm	645			740			740			1140
Operating weight approx.	kg	108	111	115	150	160	170	242	259	276	470

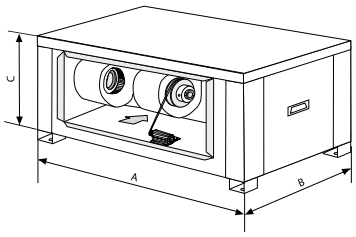


Sizes 20S to 45D



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.	kg	50	50	50	75	75	75	165	165	165	190



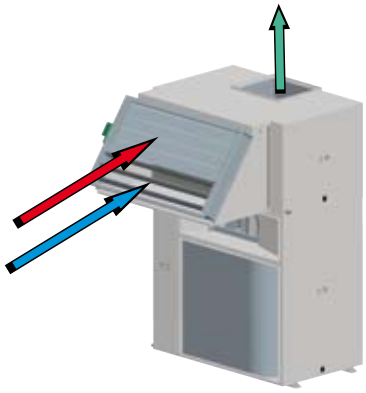
COMPACTAIR™	CMC/CMH	55D	70D	85D	100D
RETURN FAN	**CIC/CIH**	**55D**	**70D**	**85D**	**100D**
A	mm	2250			2900
B	mm	650			700
C	mm	735			1140
Operating weight approx.	kg	310	310	310	420

Operating limits

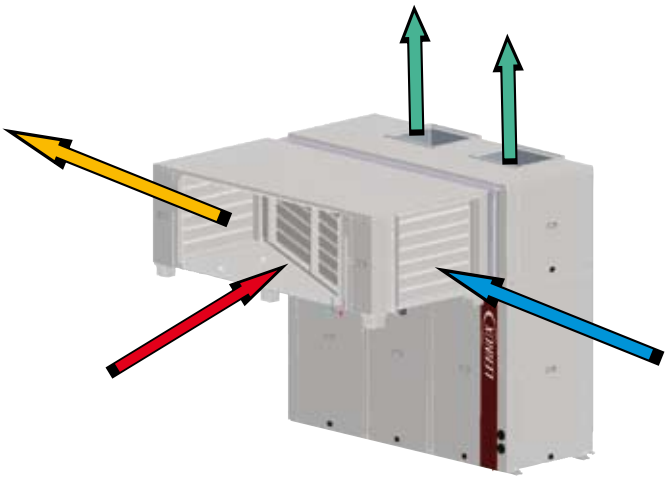
OPERATING LIMITS		
Maximum Outdoor temperature in cooling mode	°C	+46°C
Minimum Outdoor temperature in cooling mode	°C	+15°C / down -15°C with Winter Cooling operation options
Minimum Outdoor temperature in heating mode	°C	-12°C with in 20°C indoor temperature

Principle sketch

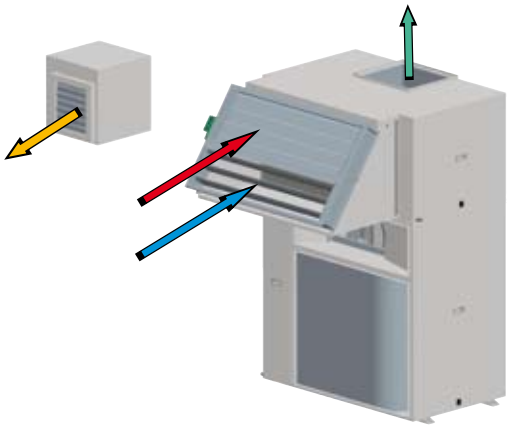
With Economizer Sizes 20S to 45D



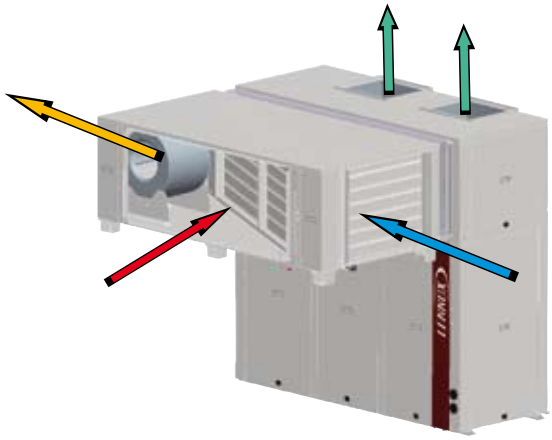
With Economizer Sizes 55D to 100D



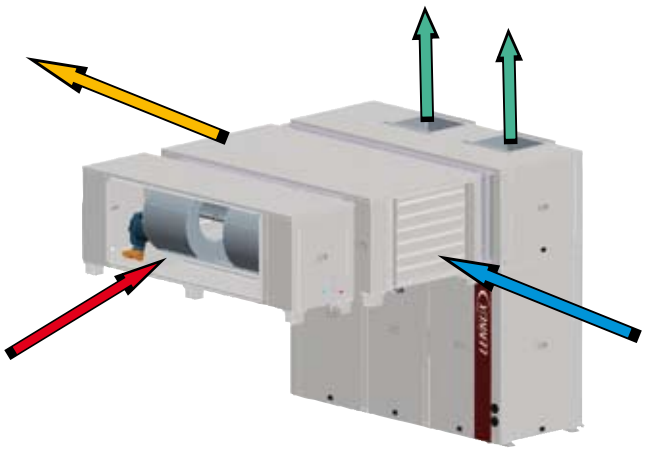
With Exhaust fan Sizes 20S to 45D



With Exhaust fan Sizes 55D to 100D



With Return fan Sizes 55D to 100D



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

Options

Comfort and energy efficient accessories

- **Free cooling:** The use of an economiser is the most efficient way to reduce ruining costs by using «Free cooling» when appropriate.
- **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.
- **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.

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.
- **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 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.

Artchitectural Integration

- **Long refrigerant piping:** allows up to 65m piping between the internal and external units.
- **Air sock control:** Soft start control of supply fan allows the air socks to be progressively filled with air on start up.

Safety & Extended Lifecycle

- **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
- **Main switch:** situated on the Electrical panel of the condensing unit. The unit is shut off when the board panel is opened.
- **Precoated coil:** outdoor or indoor coils anticorrosion treatment. Particularly recommended in salin or polluted environment.
- **Phase sequencer:** this prevents the compressor from starting if the phases are reversed.

Service

- **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.

Communcation & Supervision

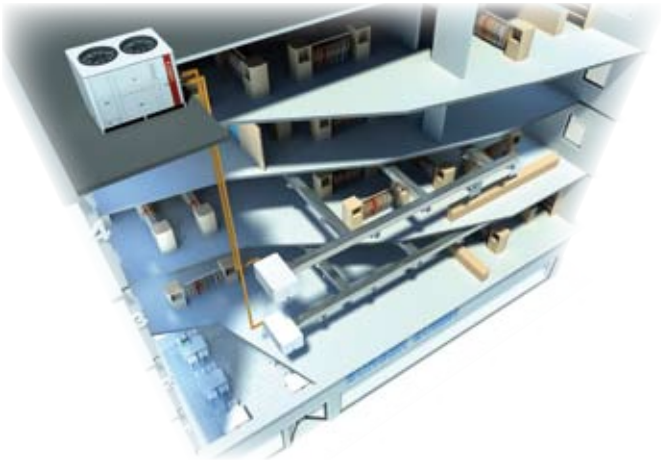
- **Modbus Communication:** This board is a Modbus interface, which is needed for anyone who would like a BMS system to talk to the unit using «Modbus protocol». No other hardware than this board is required to have Modbus dialog. One board required per unit.
- **Lonworks Communication:** this board 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.

CLIMATIC™ 50 options

- **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.

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 400 Pa ESP
- Axial fans in Outdoor section
- Scroll Compressors
- Galvanized Sheet steel casing
- Washable filter G2 to F8
- 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

General data

AIRCOOLAIR™	ANCM/HM	22E	26E	32E	38E	43E
Cooling mode						
Gross cooling capacity (1)	kW	19,8	24,2	27,8	36,5	41,8
Gross EER		2,95	2,86	2,83	2,95	2,84
Power input	kW	6,72	8,45	9,82	12,4	14,7
Heating mode						
Net Heating capacity (2)	kW	19,5	25	28,5	36	40
Net COP		3	3	2,95	3,03	3,03
Power input	kW	6,5	8,33	9,66	11,9	13,3
Refrigeration circuit						
Number of circuits (cooling mode)	Nr	1 / 1				
Capacity steps	Nr	1				
Acoustic						
Sound power level (Lw) (4) - Air treatment section	dB(A)	74	78	80	80	83
Sound power level (Lw) (4) - Condensing unit	dB(A)	76	78	81	80	81
AIR TREATMENT SECTION	**LECM/HM**	**22E**	**26E**	**32E**	**38E**	**43E**
Maximum absorbed power	kW	0,74	1,45	1,45	1,89	2,69
Electrical data						
Voltage	V/Ph/Hz	400/3/50				
Air treatment ventilation						
Minimum airflow	m^3/h	3150	4250	4650	6200	6950
Maximum airflow	m^3/h	4100	5500	6000	8050	9050
Maximum available static pressure (3)	Pa	322	320	326	327	327
CONDENSING UNIT	**KNCM/HM**	**22E**	**26E**	**32E**	**38E**	**43E**
Maximum absorbed power	kW	8,55	10,79	12,49	16,39	17,74
Electrical data						
Voltage	V/Ph/Hz	400-N/3/50				
Operating limits						
Maximum outdoor temperature in cooling mode	°C	+ 46°C				
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				

AIRCOOLAIR™	ANCM/HM	52D	64D	76D	86D	112D	128D	152D
Cooling mode								
Gross cooling capacity (1)	kW	48,4	57,0	72,2	85,9	104	116	140
Gross EER		2,85	2,88	2,91	2,88	2,90	2,96	2,91
Power input	kW	17	19,8	24,8	29,8	35,7	39	48,2
Heating mode								
Net Heating capacity (2)	kW	49,5	56,5	72,5	80	108	118	137
Net COP		2,9	3	3	3,01	3,13	3,05	2,82
Power input	kW	17,1	18,8	24,2	26,7	34,5	38,7	48,6
Refrigeration circuit								
Number of circuits (cooling mode)	Nr	2 / 2				2 / 3		
Capacity steps	Nr	2	2	2	2	2	2	2
Acoustic								
Sound power level (Lw) (4) - Air treatment section	dB(A)	86	80	85	87	85	87	89
Sound power level (Lw) (4) - Condensing unit	dB(A)	81	84	83	84	87	87	90
AIR TREATMENT SECTION	**LECM/HM**	**52D**	**64D**	**76D**	**86D**	**112D**	**128D**	**152D**
Maximum absorbed power	kW	2,69	2,69	3,63	5,06	5,06	6,38	6,38
Electrical data								
Voltage	V/Ph/Hz	400/3/50						
Air treatment ventilation								
Minimum airflow	m^3/h	7950	9950	12450	14000	17350	19300	21000
Maximum airflow	m^3/h	9750	12850	15090	16725	22450	24950	24750
Maximum available static pressure (3)	Pa	320	386	354	346	358	356	346
CONDENSING UNIT	**KNCM/HM**	**52D**	**64D**	**76D**	**86D**	**112D**	**128D**	**152D**
Maximum absorbed power	kW	21,6	25	32,8	35,5	45,6	48,7	59,9
Electrical data								
Voltage	V/Ph/Hz	400-N/3/50						
Operating limits								
Maximum outdoor temperature in cooling mode	°C	+ 46°C						
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						

(1) Inside temperature: 27ºC DB,19ºC WB-Outside temperature: 35ºC DB, 24ºC WB
(2) Inside temperature: 20ºC DB, 12ºC WB Outside temperature: 7ºC DB 6ºC WB
(3) For minimum airflow
(4) Eurovent conditions

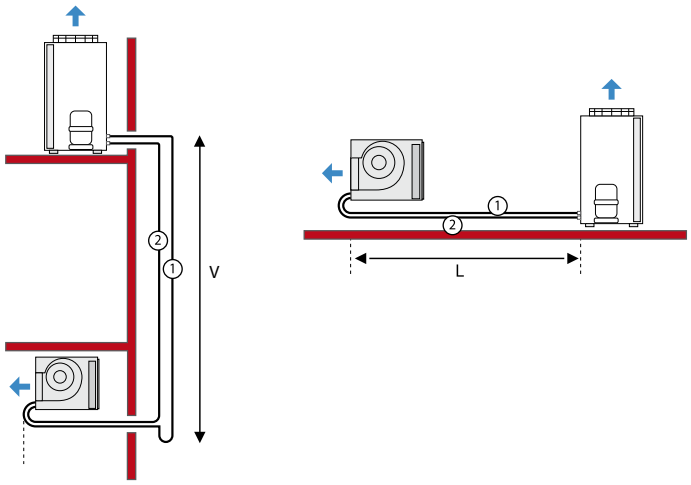
AIRCOOLAIR™ is part of AC2/AC3 Eurovent Certification Programs (www.eurovent-certification.com)

General data

AIRCOOLAIR™	ANCM/HM	52D2	64D2	76D2	86D2	112D2	128D2
Cooling mode							
Gross cooling capacity (1)	kW	48,4	55,5	73,1	83,5	101	113
Gross EER		2,86	2,83	2,95	2,84	2,92	2,96
Power input	kW	16,9	19,6	24,8	29,4	34,7	38,2
Heating mode							
Net Heating capacity (2)	kW	50	57	72	80	108	118
Net COP		3	2,95	3,03	3,01	3,10	3,06
Power input	kW	16,9	19,3	23,8	26,6	34,8	38,6
Refrigeration circuit							
Number of circuits (cooling mode) / Compressor	Nr	2 / 2				2 / 3	
Capacity steps	Nr	1+1	1+1	1+1	1+1	2+1	2+1
AIR TREATMENT SECTION	**LECM**	**26E-26E**	**32E-32E**	**38E-38E**	**43E-43E**	**68E-43E**	**76E-43E**
	LEHM	**26E-26E**	**32E-32E**	**38E-38E**	**43E-43E**	**68E-44E**	**76E-44E**
Maximum absorbed power	kW	1,45-1,45	1,45-1,45	1,89-1,89	2,69-2,69	2,69-2,69	3,63-2,69
Electrical data							
Voltage	V/Ph/Hz	400/3/50					
Air treatment ventilation							
Minimum airflow	m^3/h	4250+4250	4650+4650	6200+6200	6950+6950	9950+6950	12450+6950
Maximum airflow	m^3/h	5500+5500	6000+6000	8050+8050	9050+9050	12850+9050	15090+9050
Maximum available static pressure (3)	Pa	2 x 320	2 x 386	2 x 354	2 x 346	2 x 356	2 x 346
Acoustic							
Sound power level (4)	dB(A)	78/78	80/80	80/80	83/83	80/83	85/83
CONDENSING UNIT	**KNCM/HM**	**52D2**	**64D2**	**76D2**	**86D2**	**112D2**	**128D2**
Maximum absorbed power	kW	21,6	25	32,8	35,5	45,6	48,7
Electrical data							
Voltage	V/Ph/Hz						
Acoustic							
Sound power level (4)	dB(A)	81	84	83	84	87	87
Operating limits							
Maximum Outdoor temperature in cooling mode	°C	+ 46 °C					
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					

(1) Inside temperature: 27°C DB,19°C WB-Outside temperature: 35°C DB, 24°C WB
(2) Inside temperature: 20°C DB, 12°C WB Outside temperature: 7°C DB 6°C WB
(3) For minimum airflow
(4) Eurovent conditions

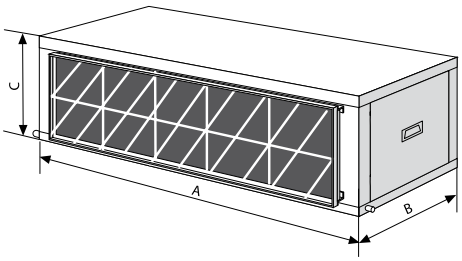
Refrigerant connections



AIRCOOLAIR™	ANCM/HM	22E	26E	32E	38E	43E	52D/D2	64D/D2	76D/D2	86D/D2	112D/D2	128D/D2	152D/D2
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	Nb	12											

Physical data

Air treatment section

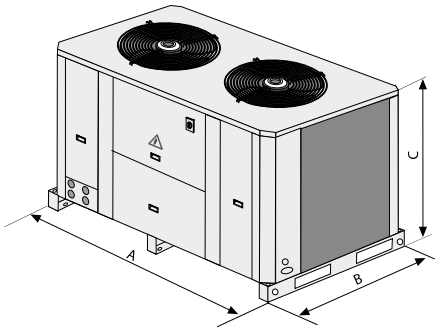


AIRCOOLAIR™	ANCM/HM	22E	26E	32E	38E	43E
AIR TREATMENT SECTION	LECM/HM	22E	26E	32E	38E	43E
A	mm	1195			1445	
B	mm	803			923	
C	mm	645			740	
Operating weight approx.	kg	108	111	115	150	160

AIRCOOLAIR™	ANCM/HM	52D	52D2	64D	64D2	76D	76D2	86D	86D2
AIR TREATMENT SECTION	LECM/HM	52D	26E+26E	64D	32E+32E	76D	38E+38E	86D	43E+43E
A	mm	1445	1195+1195	2250	1195+1195	2250	1445+1445	2250	1445+1445
B	mm	923	803+803	923	803+803	923	923+923	923	923+923
C	mm	740	645+645	740	645+645	740	740+740	740	740+740
Operating weight approx.	kg	170	111+111	242	115+115	259	150+150	276	160+160

AIRCOOLAIR™	ANCM/HM	112D	112D2	128D	128D2	152D
AIR TREATMENT SECTION	LECM	112D	68E+43E	128D	76E+43E	152D
	LEHM	112D	68E+44E	128D	76E+44E	152D
A	mm	2900	2250+1445	2900	2250+1445	2900
B	mm	1103	923+923	1103	923+923	1103
C	mm	1140	740+740	1140	740+740	1140
Operating weight approx.	kg	470	242+160	480	259+160	490

Condensing unit

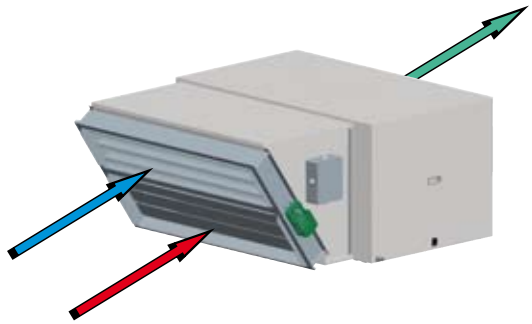


AIRCOOLAIR™ - CONDENSING UNIT	KNCM/HM	22E	26E	32E	38E	43E
A	mm	1195				
B	mm	660	980			
C	mm	1375	1375			
Operating weight approx. KNCM	kg	160	210	216	233	255
Operating weight approx. KNHM	kg	168	219	221	239	258

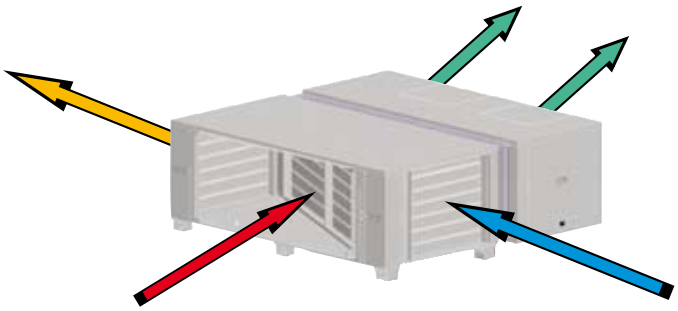
AIRCOOLAIR™ - CONDENSING UNIT	KNCM/HM	52D/D2	64D/D2	76D/D2	86D/D2	112D/D2	128D/D2	152D
A	mm	1960				2250		
B	mm	1195				1420		
C	mm	1375				1875		
Operating weight approx. KNCM	kg	443	452	481	520	632	797	906
Operating weight approx. KNHM	kg	452	463	499	537	748	828	932

Principle sketches

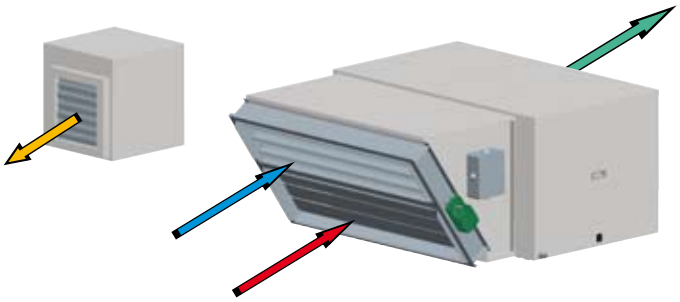
With Economizer Sizes 22E to 52D



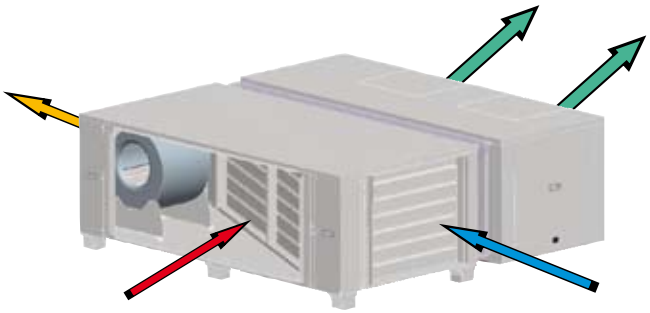
With Economizer Sizes 64D to 152D



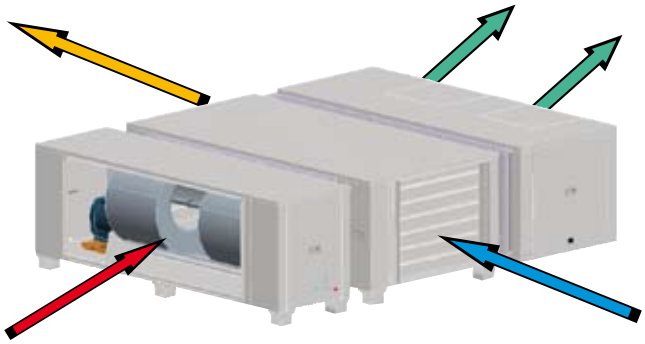
With Exhaust fan Sizes 22E to 52D



With Exhaust fan Sizes 64D to 152D



With Return fan Sizes 64D to 152D



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

Options

Comfort and energy efficient accessories

- **Free cooling:** The use of an economiser is the most efficient way to reduce ruining costs by using «Free cooling» when appropriate.
- **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.
- **Rubber dumps:** these limit the vibration transferred from the unit to the floor using rubber dampers under the external unit.
- **Low ambient kit to -15°C & long distance piping up to 65m:** proportionnal control of the condensing fan's speed. Enable operations in cooling mode down to -15°C with optimization of the service cost. For the compressor's safety, this option includes a long distance kit, to prevent liquid returning into the compressor.
- **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.

Indoor Air Quality

- **Washable G4 filter:** Instead of replacing the whole filter when its media is dirty, the G4 filter can be washed several times.
- **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.
- **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 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.

Architectural integration

- **Long refrigerant piping:** allows up to 65m piping between the internal and external units.
- **Air sock control:** Soft start control of supply fan allows the air socks to be progressively filled with air on start up.

Safety & Extended lifecycle

- **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
- **Coil protection grill:** protect the units during transport and installation
- **Main switch:** situated on the Electrical panel of the condensing unit. The unit is shut off when the board panel is opened.
- **Precoated coil:** outdoor or indoor coils anticorrosion treatment. Particularly recommended in salin or polluted environment.
- **Phase sequencer:** this prevents the compressor from starting if the phases are reversed.

Service

- **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.

Communication & Supervision

- **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.
- **Konnex communication:** this board is a Konnex® interface, which is needed for anyone who would like a BMS system to talk to the unit with "Konnex protocol". No other hardware than this board is required to have Konnex® 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.
-

Climatic™ 50 options

- **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.

Replacement Program

Smarter for Business & Environment

How planned energy retrofit programs can help you save money

- Unplanned emergency replacement can impact your business.
- Planning ahead lets you select the best equipment to suit your needs.
- Avoid spending more money repairing your old equipment
- Replacing multiple units at the same time, spread out installation fixed costs.

Combat rising energy costs with HVAC energy retrofit program

Today's rooftop units are about 40% more efficient than units installed 15years ago. Immediately reduce your operating costs by replacing less efficient rooftop units with high efficiency new equipment

Refrigerant for sustainable design

When it comes to commercial HVAC systems, going green with R410A is a step that pays dividends environmentally as well as financially, for years to come.

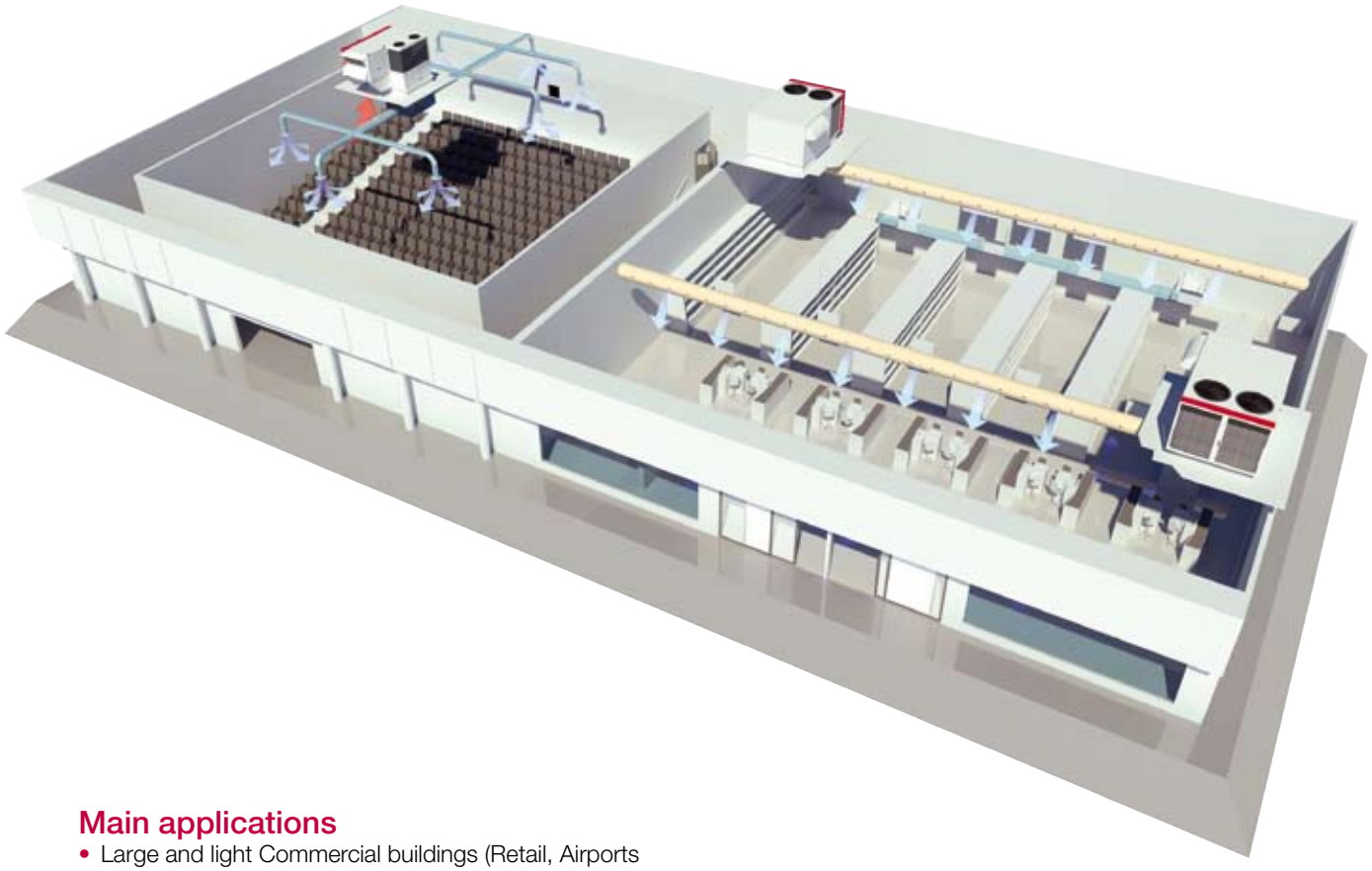
www.rooftop-replacement-program.com

Rooftop

Providing indoor climate comfort

Rooftop unit Air cooled

Baltic™ • 22 → 75 kW
Flexy™ • 85 → 234 kW

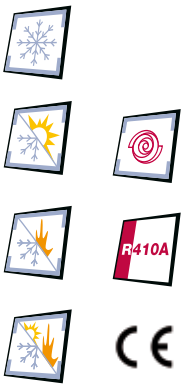


Main applications

- 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



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 scroll compressor technology associated with chlorine free R410a refrigerant. The rooftop unit product line is Lennox most innovative equipment for light commercial application.
- Advance Climatic 50 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 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:
  - 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 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™ 50 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

General data

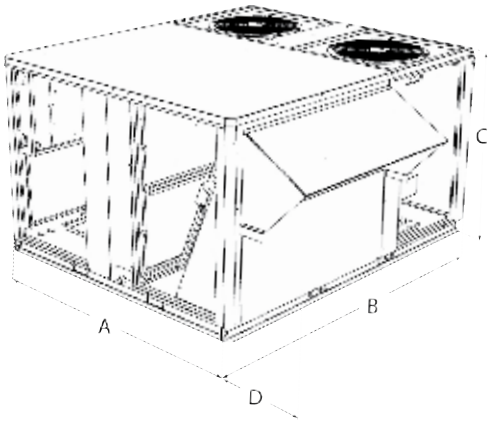
BALTIC™ - BAC/BAH/BAG/BAM		20S	30S	35S	45S
Cooling BAC/BAG					
Gross cooling capacity (1)	KW	21,7	26,8	35,5	44,7
Gross EER cooling (3)		3,32	3,14	3,09	3,42
Net power input BAC	kW	7,2	9,6	12,9	14,8
Heating BAH/BAM					
Net heating capacity (1)	KW	20,5	24,9	35,6	43,3
Gross COP heating (2)		3,83	3,72	3,83	4,08
Net COP heating (2)		3,02	2,95	3,12	3,21
Auxiliary heating					
Gas heat capacity	kW - S (5)	19	19	19	31
Gas heat capacity	kW - H (5)	31	31	43	56
Electric heater capacity	kW - S (5)	12	12	24	27
Electric heater capacity	kW - M (5)	24	24	36	45
Electric heater capacity	kW - H (5)	36	36	48	54
Hot water coil capacity (20°C in / water 90-70°C)	kW - H (5)	33,7	38,4	53,5	71,2
Refrigeration circuit					
Nr of compressors / Nr of circuits	Nb	1/1	1/1	2/1	2/1
Compressor type	Type	ZP83	ZP103	ZP72	ZP83
Refrigerant charge per circuit	kg	6,3	6,3	8,2	12,5
Max. outdoor temp. at indoor 27°C DB/ 19°C WB (4)	°C	46	45	45	46
Ventilation data					
Nominal airflow	m^3/h	3600	4500	6300	8100
Minimum airflow	m^3/h	2900	3600	5000	6500
Maximum airflow	m^3/h	4300	5400	7600	9700
Acoustic @ 100 Pa					
Outside sound power on standard unit (1)	dB(A)	86	87	84	85
Outside sound power on Low noise unit (1)	dB(A)	76	77	81	82
Indoor blower outlet sound power on standard unit (1)	dB(A)	78	83	82	83
Outside sound power on GAS unit - S & H (1)	dB(A)	86	87	85	85
Indoor blower outlet sound power on GAS unit - S & H (1)	dB(A)	81	86	85	85

BALTIC™ - BAC/BAH/BAG/BAM		55S	65D	75D
Cooling BAC/BAG				
Gross cooling capacity (1)	KW	52,6	65,4	75,2
Gross EER cooling (3)		3,21	3,35	3,13
Power input BAC	kW	18,5	21,8	27,4
Heating BAH/BAM				
Net heating capacity (1)	KW	51,8	65,8	76,9
Gross COP heating (2)		3,82	4,04	3,94
Net COP heating (2)		3,09	3,32	3,2
Auxiliary heating				
Gas heat capacity	kW - S (5)	31	56	56
Gas heat capacity	kW - H (6)	56	112	112
Electric heater capacity	kW - S (5)	27	27	27
Electric heater capacity	kW - M (5)	45	45	45
Electric heater capacity	kW - H (5)	54	54	54
Hot water coil capacity (20°C in / water 90-70°C)	kW - H (5)	75,5	107,6	118,1
Refrigeration circuit				
Nr of compressors / Nr of circuits	Nb	2/1	2/2	2/2
Compressor type	Type	ZP103	ZP154 + ZP103	ZP154
Refrigerant charge per circuit	kg	12,5	11	11
Max. outdoor temp. at indoor 27°C DB/ 19°C WB (4)	°C	45	46	45
Ventilation data				
Nominal airflow	m^3/h	9000	11500	14200
Minimum airflow	m^3/h	7200	8600	10000
Maximum airflow	m^3/h	10800	13000	16000
Acoustic @ 100 Pa				
Outside sound power on standard unit (1)	dB(A)	86	85	86
Outside sound power on Low noise unit (1)	dB(A)	82	82	82
Indoor blower outlet sound power on standard unit (1)	dB(A)	84	82	85
Outside sound power on GAS unit - S & H (1)	dB(A)	86	86 / 86	86 / 86
Indoor blower outlet sound power on GAS unit - S & H (1)	dB(A)	87	84 / 85	88 / 89

(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 - M = Medium heat - H = High heat

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

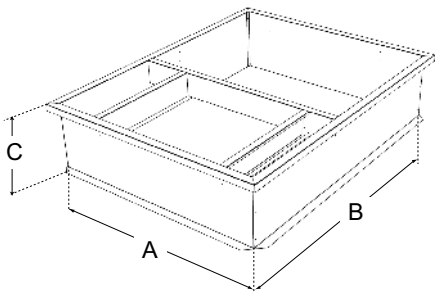
Physical data



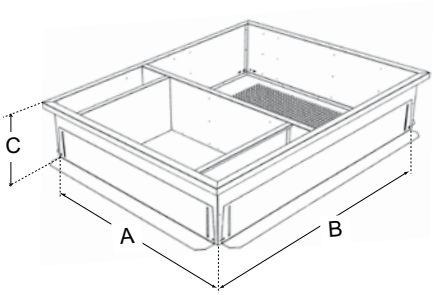
BALTIC™ BAC/BAH/BAG/BAM		20S	30S	35S	45S	55S	65D	75D
A	mm	2017		1890	1910		2260	
B	mm	1418		1915	2235		2873	
C	mm	1220		1221	1221		1225	
D	mm	484		414	418		418	
Weight of standard units								
Base unit BAC	kg	394	414	547	604	619	796	852
Weight of gas units								
Base unit BAG Standard	kg	445	465	608	678	693	904	960
Base unit BAG High Heat	kg	454	474	627	700	715	963	1019

Roofcurbs physical data

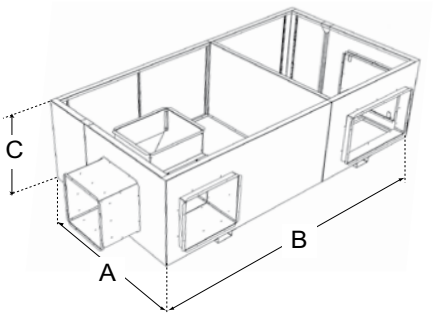
NON ADJUSTABLE, NON ASSEMBLED ROOFCURB



ADJUSTABLE ROOFCURB

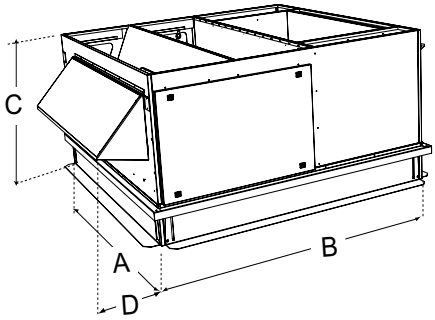


MULTIDIRECTIONAL ROOFCURB



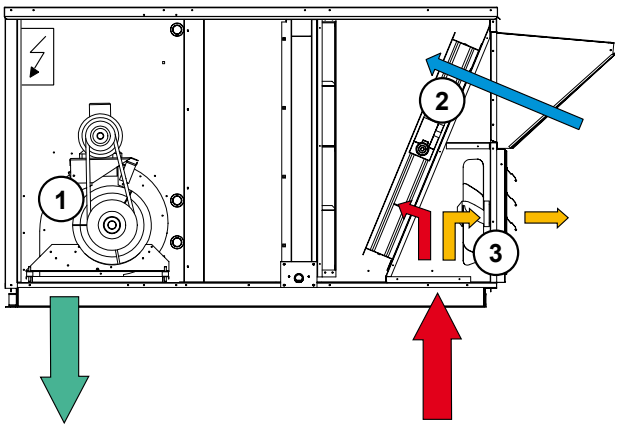
BALTIC™ BAC/BAH/BAG/BAM			20S	30S	35S	45S	55S	65D	75D
Non-adjustable, non assembled roofcurb	A	mm	1183		1380	1630		2080	
	B	mm	1893		1740	1740		2090	
	C	mm	400		400	400		400	
Assembled adjustable roofcurb	A	mm	1186		1383	1633		2082	
	B	mm	1896		1743	1743		2092	
	C	mm	401		401	401		401	
Multidirectional roofcurb (External dimensions. No roof opening required)	A	mm	1236		1433	1683		2080	
	B	mm	1893		1740	1740		2090	
	C	mm	650		650	650		750	
Exhaust vertical roofcurb	A	mm	1390		1587	1837		2287	
	B	mm	2100		1947	1947		2297	
	C	mm	900		900	900		1050	
	D	mm	344		344	344		344	
Exhaust horizontal roofcurb	A	mm	1227		1424	1674		2124	
	B	mm	1942		1789	1789		2138	
	C	mm	740		740	740		890	
	D	mm	344		344	344		344	

CENTRIFUGAL RETURN ROOFCURB (with auxiliary heating)

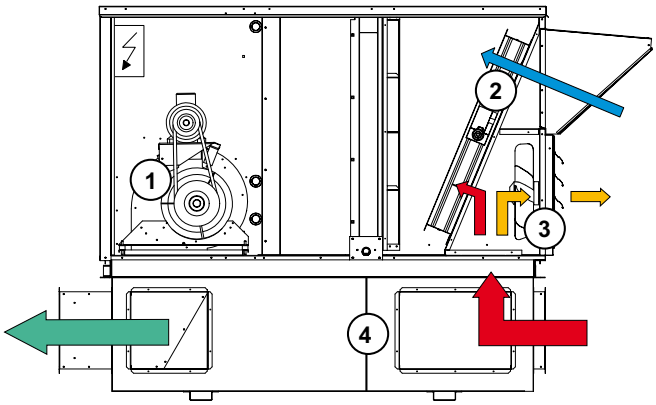


Principle sketch

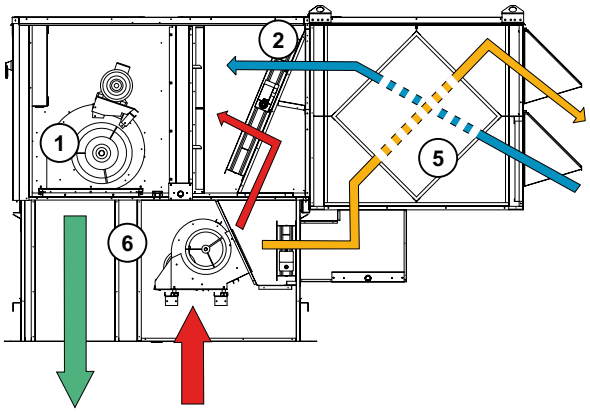
BALTIC™ (vertical flow)



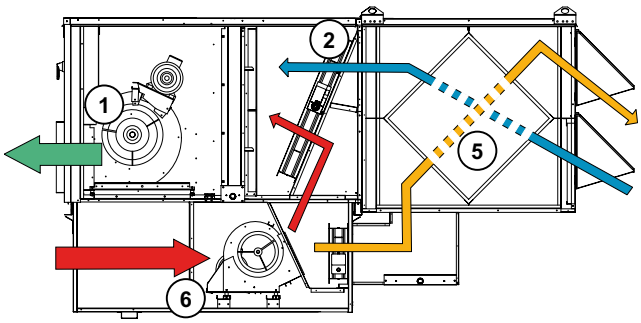
MULTIDIRECTIONAL ROOFCURB



ENERGY RECOVERY MODULE + EXHAUST ROOFCURB (vertical flow)



ENERGY RECOVERY MODULE + EXHAUST ROOFCURB (horizontal flow)



→	Fresh air	1	Supply fan	4	Multidirectional roofcurb
→	Return air	2	Economiser damper	5	Heat recovery module
→	Exhaust air	3	Exhaust damper or Exhaust damper + exhaust fan	6	Exhaust Roofcurb
→	Supply air				

General data

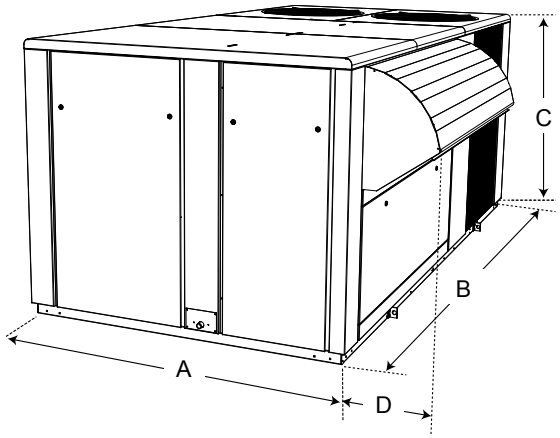
FLEXY™ FC/FH/FG/FD		85	100	120
Cooling mode FCM/FGM				
Gross cooling capacity (35 °C out, 27°C in, 47% HR) Eurovent	kW	85,2	105	119
Gross EER cooling (32°C out, 26°C in, 60% HR)		3,3	3,15	3,09
Net power input FCM	kW	29,0	38,3	44,5
Heating mode FHM/FDM				
Net heating capacity (7°C out, 20°C in)	kW	82,9	103	117
Gross COP heating (7°C out, 20°C in) FHM		3,49	3,51	3,54
Net COP heating (7°C out, 20°C in) FHM		3,16	3,10	3,10
Auxiliary heating				
Gas heat capacity S	kW	55,2	55,2	55,2
Gas heat capacity H	kW	110,4	110,4	110,4
Electric heater capacity S	kW	30	30	30
Electric heater capacity M	kW	54	54	54
Electric heater capacity H	kW	72	72	72
Hot water coil capacity S (20°C in / water 90-70 °C)	kW	112	124	130
Hot water coil capacity H (20°C in / water 90-70 °C)	kW	175	197	209
Refrigerant circuit				
Nr of circuits / Number of compressor per circuit		2 / 1		
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				
Nominal airflow	m^3/h	15000	18500	20500
Minimum airflow	m^3/h	12000	14000	15000
Maximum airflow	m^3/h	23000	23000	23000
Acoustic				
Outdoor sound power (Standard unit)	dB(A)	87	88	87
Outdoor sound power (Low Noise unit)	dB(A)	82	82	82
Indoor blower outlet sound power on standard unit (1)	dB(A)	85	90	89

FLEXY™ FC/FH/FG/FD		150	170	200	230
Cooling mode FCM/FGM/FHM/FDM					
Gross cooling capacity (35 °C out, 27°C in, 47% HR) Eurovent	kW	148	170	197	234
Gross EER cooling (32°C out, 26°C in, 60% HR)		3,22	2,99	3,46	3,05
Net power input FCM	kW	52,4	65,9	65,9	88,1
Heating mode FHM/FDM					
Net heating capacity (7°C out, 20°C in)	kW	142	168	188	226
Gross COP heating (7°C out, 20°C in) FHM		3,47	3,4	3,69	3,45
Net COP heating (7°C out, 20°C in) FHM		3,10	2,98	3,24	3,04
Auxiliary heating					
Gas heat capacity S	kW	110,4	110,4	165,6	165,6
Gas heat capacity H	kW	165,6	165,6	220,8	220,8
Electric heater capacity S	kW	45	45	72	72
Electric heater capacity M	kW	72	72	108	108
Electric heater capacity H	kW	108	108	162	162
Hot water coil capacity S (20°C in / water 90-70 °C)	kW	140	149	177	199
Hot water coil capacity H (20°C in / water 90-70 °C)	kW	251	272	296	313
Refrigerant circuit					
Nr of circuits / Number of compressor per circuit		2 / 1 & 2		2 / 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					
Nominal airflow	m^3/h	26000	30000	35000	39000
Minimum airflow	m^3/h	18000	21000	24000	27000
Maximum airflow	m^3/h	35000	35000	43000	43000
Acoustic					
Outdoor sound power (Standard unit)	dB(A)	92	92	88	89
Outdoor sound power (Low Noise unit)	dB(A)	84	86	85	85
Indoor blower outlet sound power on standard unit (1)	dB(A)	91	94	86	88

(*) S (Standard), M (Medium) and H (High)

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

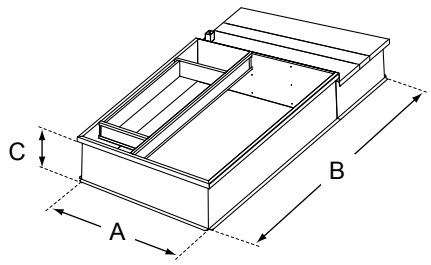
Physical data



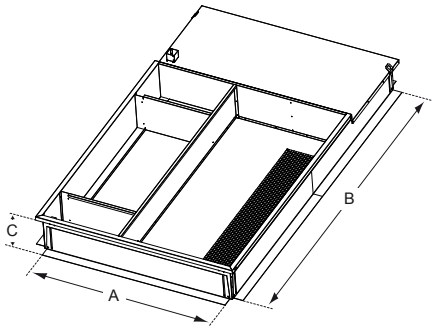
FLEXY™ FC/FH/FG/FD		85	100	120	150	170	200	230
A	mm	2200			2200		2200	
B	mm	3350			4380		5533	
C	mm	1510			1834		2134	
D	mm	360			450		615	
Weight of standard units								
Base unit FCM	kg	934	1009	1085	1367	1430	1650	1950
Weight gas unit								
Base unit FGM (Standard Heat)	kg	1041	1116	1192	1608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

Roofcurb physical data

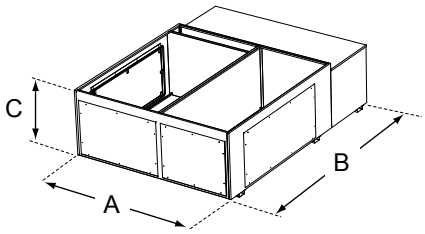
STANDARD ROOFCURB



ADJUSTABLE ROOFCURB

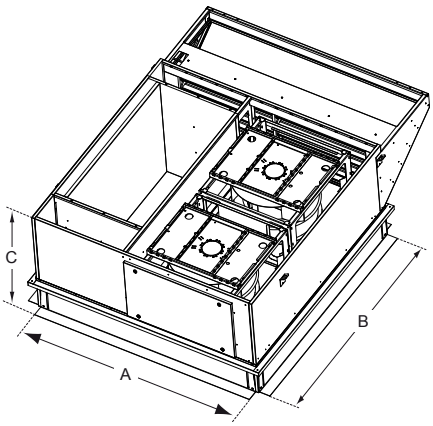


MULTI DIRECTIONAL ROOFCURB



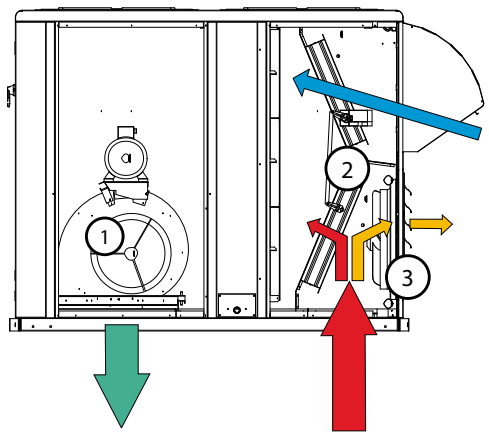
FLEXY™ II FC/FH/FG/FD			85	100	120	150	170	200	230
Non-adjustable, non assembled roofcurb	A	mm	2056			2056		2056	
	B	mm	2770			3466		4066	
	C	mm	400			400		425	
Assembled adjustable roofcurb	A	mm	2056			2056		2056	
	B	mm	2770			3466		4100	
	C	mm	400			400		400	
Multidirectional roofcurb	A	mm	2056			2056		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

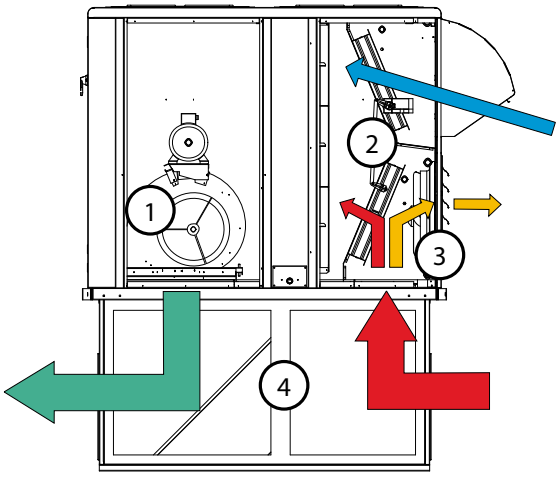


Principle sketches

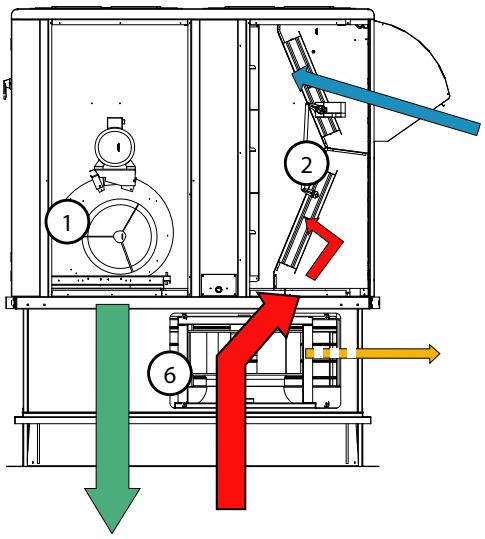
FLEXY™ II (vertical flow)



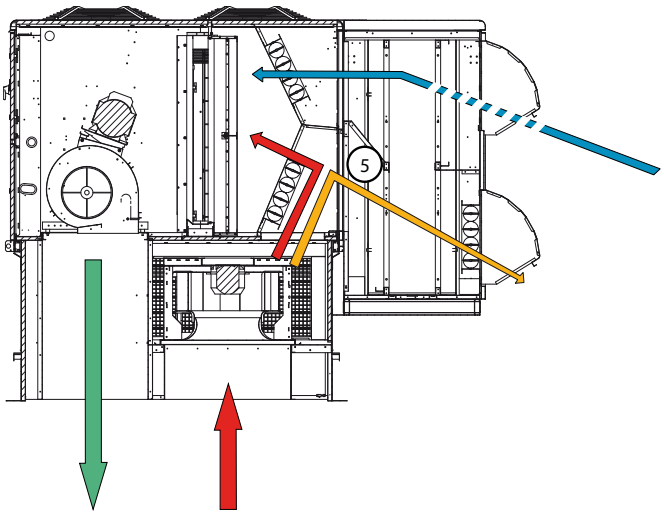
MULTIDIRECTIONAL ROOFCURB



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

Standard features and options

Auxiliary heating

- **Electric heater:** Standard medium and High heat as Option with fully modulating triac control heater for medium and high heat.
- **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 or 20 to 100% modulation control.

Artchitectural 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 II.
- **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 II):** 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

- **Transition Roofcurb:** It answers to the French regulation CH40 (Public buildings), which says, that rooftop can not be directly on a roofcurb installed in France.
- **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.

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™ 50 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™ 50 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.
- **Dynamic Defrost Control:** This feature allows significant energy savings by reducing the numbers of defrost cycles when they are not necessary. CLIMATIC™ 50 detects when coils are frozen and starts defrost cycle only when needed
- **Alternate defrost:** This standard feature available on all dual refrigeration circuit units, allows energy savings by reducing the need for auxiliary heating during defrost cycles. When one circuit is defrosting the other is still running in heat pump maintaining the supply air temperature.
- **Low Noise Option:** To achieve low outside noise level, the rooftop can be equipped with a quieter fan. On FLEXY™ II compressor jackets and acoustic insulation are fitted in the refrigeration section.

CLIMATIC™ 50 general description

The new generation of microprocessor based control, CLIMATIC™ 50 equips the Lennox rooftop range.
CLIMATIC™ 50 integrates innovative PID Control that will guaranty better temperature accuracy, while saving energy. It also ensures compressor running time optimisation.
It is able to control 32 fault signals and manage security algorithms generating various fault signals. It has extended scheduling capability with the possibility to adjust many set points over the 4 time zones.

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

CLIMATIC™ 50 Main Standard Features

- **Step of heating priorities:** Allows the user to choose which heating element should come first.
- **Automatic summer winter change:** CLIMATIC™ 50 integrates an automatic time switch from winter to summer time.
- **Noise reduction feature:** The control will reduce the rooftop capacity during unoccupied zone to limit outdoor noise at night when capacity needed is lower and when noise matters more.
- **Staged start feature:** After a power shortage the units will not restart at the same.
- **Available dry contact (2 Input):** As standard, CLIMATIC™ 50 provides 2 dry contact inputs as well as a general fault output.

CLIMATIC™ 50 Options

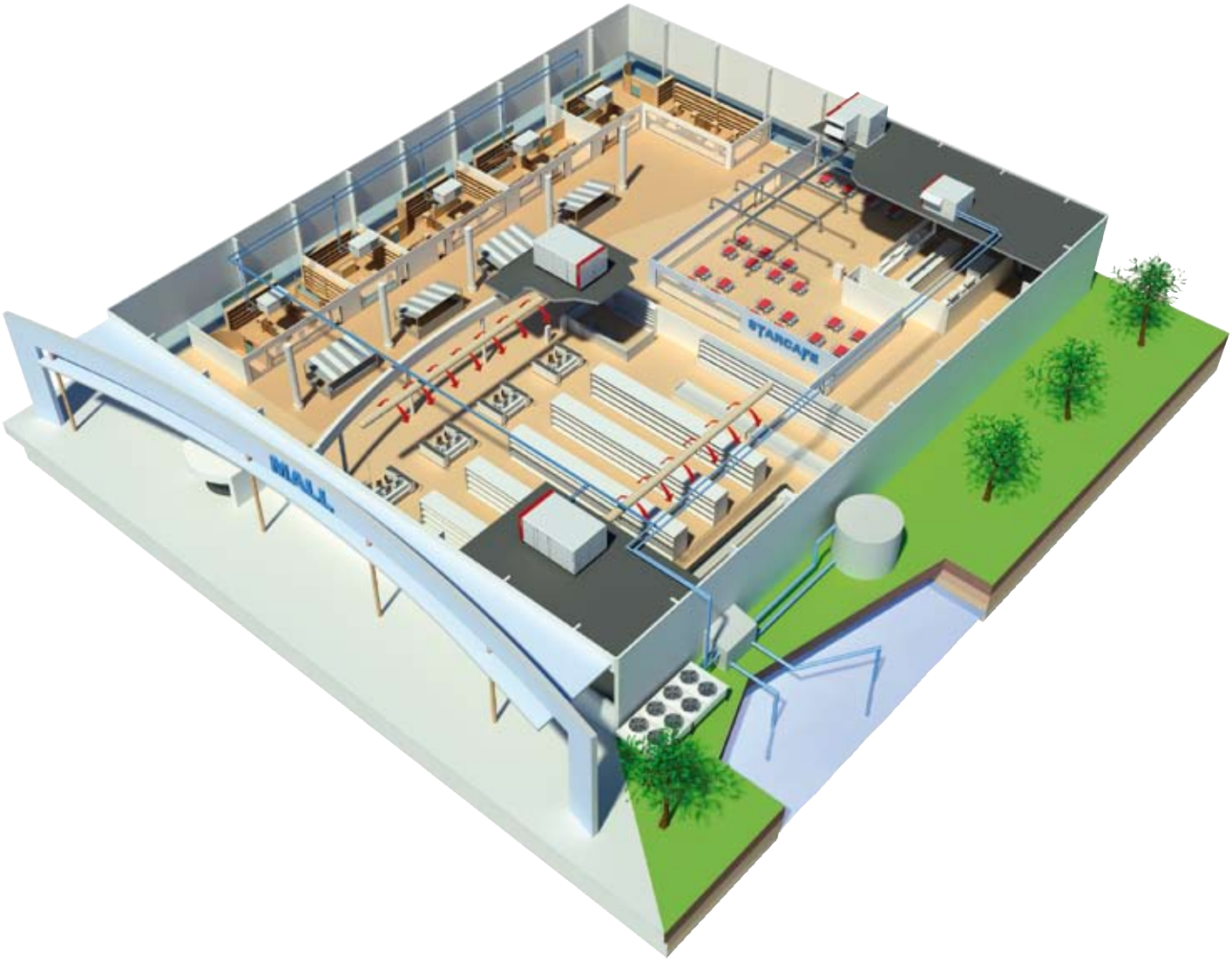
- **Advanced control pack:** Thanks to specific algorithm and sensors, this pack provides two advanced control features: Enthalpy control on economiser and humidity control.
- **DS 50, Service display:** This service display controller is a plug and play feature. This allows service personnel to set, up to 207settings, read up to 188 variables, up to 45 faults and read the history of the last 32 faults.
- **DC50, 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 DC50, the customer can change the scheduling of the different time zones, modify temperature set points and percentage of fresh air in each zone.
- **DM 50, Multi rooftop display:** It has the exact same features of the DC50, but, for a lower cost as a single display can manage up to 12 rooftops on a single Bus.
- **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

CLIMATIC™ 50 Communication

- **Communication interface / Modbus interface:** This board is a Modbus interface, which is needed for anyone who would like a BMS system to talk to the rooftop using «Modbus protocol». No other hardware than this board is required to have Modbus dialog. One board required per rooftop.
- **Lontalk Interface:** This board is a LonTalk® interface, which is needed for anyone who would like a BMS system to talk to the unit using «Lon protocol». No other hardware than this board is required to have LonTalk® dialog. One board required per rooftop.
- **Bacnet Interface:** This board is a Bacnet® interface, which is needed for anyone who would like a BMS system to talk to unit using «Bacnet protocol» RS485.
- **ADALINK™:** ADALINK™k 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.

Rooftop W SHP (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™ 50 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™

ROOFTOOP WSHP

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

General data

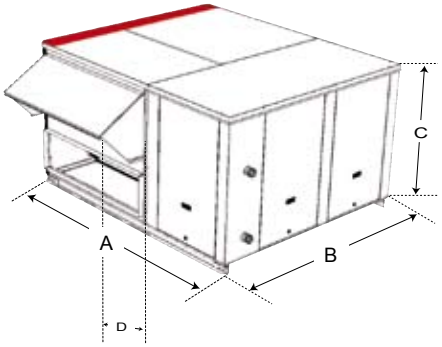
BALTIC™		45	55	65	75
Cooling BWH					
Gross cooling capacity 30-35°C (1)	kW	48	57,8	72,7	85,0
Power input (2)	kW	11,2	13,8	16,3	20,1
Gross EER		5,1	5,0	5,2	5,2
Heating BWM					
Gross heating capacity (1)	kW	53,4	65	85,6	102
Power input (2)	kW	12,1	15,3	18,8	23,2
Gross COP		5,0	4,8	5,1	5,1
Heating - gas 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	Nb	2 / 1	2 / 1	2 / 2	2 / 2
Compressor type	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

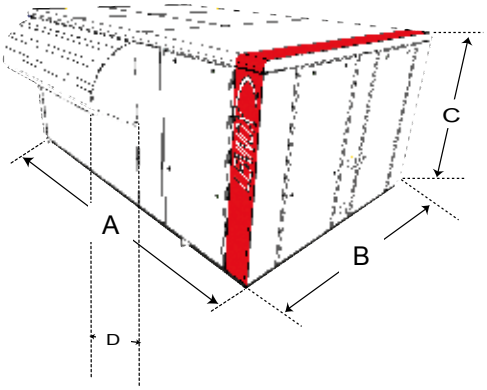
FLEXY™		85	100	120	150	170
Cooling FWH						
Gross cooling capacity (1)	kW	93,2	124	138	165	194
Power input (2)	kW	21,8	29,3	33,3	38,3	47,7
Gross EER		5	5,1	5,1	5,2	5,0
Heating FWM						
Gross heating capacity (1)	kW	111	140	157	186	225
Power input (2)	kW	24,4	32,5	37,7	40,5	52,4
Gross COP		5,1	5,0	4,8	5,3	5,0
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	Nb	2 / 2	2 / 2	2 / 2	3 / 2	4 / 2
Compressor type	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)

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

Physical data

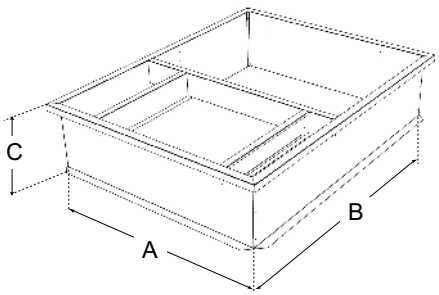




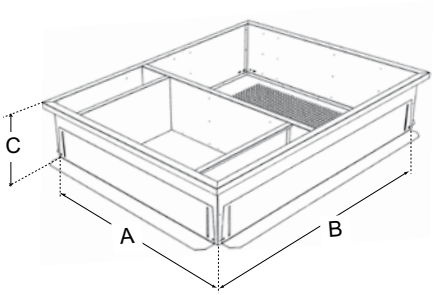
WASHP ROOFTOP		45	55	65	75	85	100	120	150	170
View										
A	mm	190		2260		2200			2200	
B	mm	2235		2873		3350			4380	
C	mm	1221		1225		1510			1384	
D	mm	418		418		360			450	
Weight										
Standard unit	kg	494	515	674	733	790	874	955	1217	1300
Gas unit High	kg	678	693	904	960	1111	1186	1262	1631	1694

Roofcurbs physical data

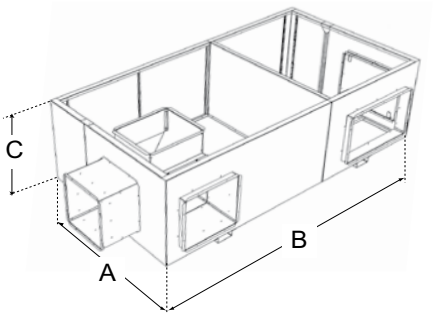
NON ADJUSTABLE, NON ASSEMBLED ROOFCURB



ADJUSTABLE ROOFCURB

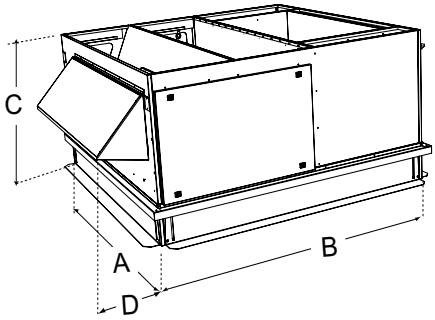


MULTIDIRECTIONAL ROOFCURB



WASHP 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™ 50 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™ 50 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™ II 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.

Artchitectural 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.
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- **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

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- **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™ 50 general description

The new generation of microprocessor based control, CLIMATIC™ 50 equips the Lennox rooftop range.
CLIMATIC™ 50 integrates innovative PID Control that will guaranty better temperature accuracy, while saving energy. It also ensures compressor running time optimisation.
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- **Automatic summer winter change:** CLIMATIC™ 50 integrates an automatic time switch from winter to summer time.
- **Noise reduction feature:** The control will reduce the rooftop capacity during unoccupied zone to limit outdoor noise at night when capacity needed is lower and when noise matters more.
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- **Communication interface / Modbus interface:** This board is a Modbus interface, which is needed for anyone who would like a BMS system to talk to the rooftop using «Modbus protocol». No other hardware than this board is required to have Modbus dialog. One board required per rooftop.
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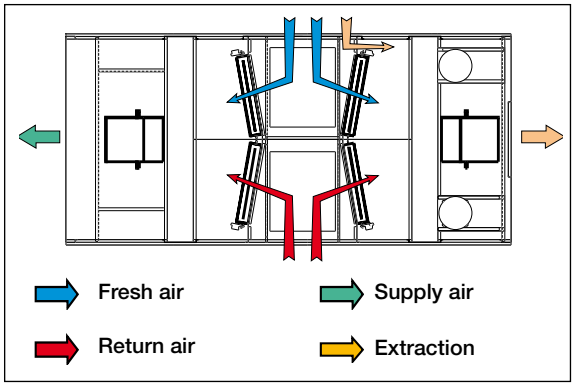
- **ADALINK™:** ADALINK™k is Lennox answer to HVAC installation monitoring. It can control up to 32 units on the same site. It can show the whole site map with the status of the different units. By zooming on each unit the user can graphically change set points, access alarm list, look at trend curves and history. Adalink can be used locally, via LAN network or remotely via modem.

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 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

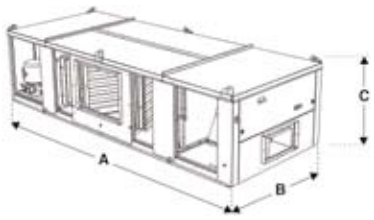
General data

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	Nr	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

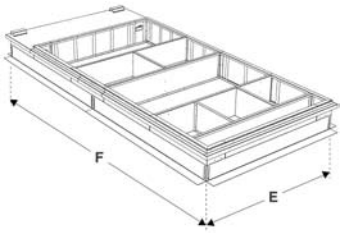
(1) : Cooling capacities at nominal airflow. Please use the multiplier 1,02 to obtain the cooling capacities to maximum airflow.

Physical data

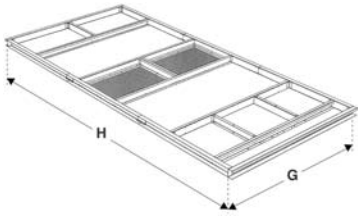
1 Unit



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)	Nr	1				
Compressor	Nr	1				
Capacity steps	Nr	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)	Nr	2							
Compressor	Nr	2				3			4
Capacity steps	Nr	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	Nr	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												

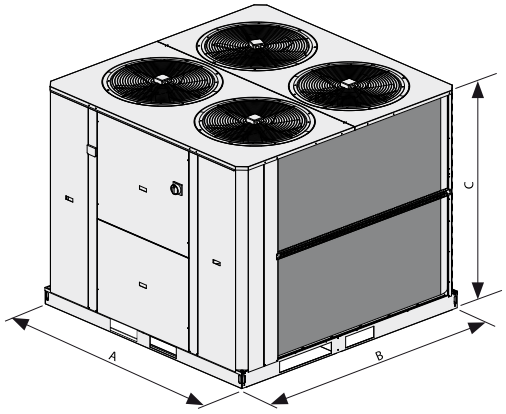
(1) Standard / With low ambient kit 0°C / -15°C
(2) Standard for KSHM
(3) Standard for KSCM

Refrigerant connections

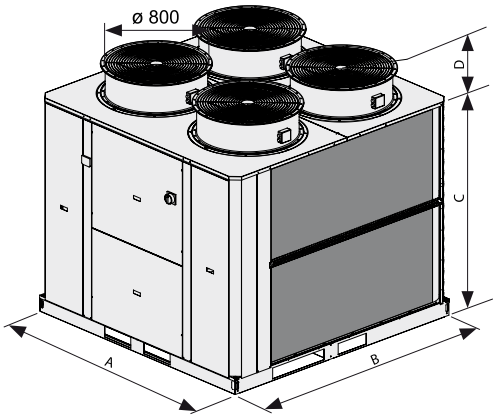
AIRCUBE™	KSCM/HM	22E	26E	32E	38E	43E	52D	64D	76D	86D	112D	128D	152D	214D
Total length 0 to 30m														
Pipe sizes Circuit 1	Liquid	1/2"	5/8"								3/4"			7/8"
	Gas	7/8"	1 1/8"		1 3/8"		1 1/8"		1 3/8"		1 5/8"			
Pipe sizes Circuit 2	Liquid	-	-	-	-	-	5/8"						3/4"	7/8"
	Gas	-	-	-	-	-	1 1/8"		1 3/8"				1 5/8"	
Maximum vertical length														
Vertical length	m	16												
Maximum total length														
Total length	m	65												
Maximum number of bends	Nr	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 ECA/FC CHV • 26 - 850 kW

Dry coolers

FC ECA

FC CHV

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?

- No air and water bacteria contamination
- No water consumption
- Reduced maintenance
- Flexible use in winter time
- Simple and cheap installation
- Limited floor space

General description

The **FC** models are designed for chilling water with water condensers, free cooling, chilling various fluids, industrial processes, etc ...

- 4 fan rotation speeds
- Can be installed with vertical or horizontal airflow

The air-cooled **FC ECA** units are fan-type heat exchangers installed outdoors for closed-circuit chilling of copper-compatible liquids (usually glycol solution) at temperatures up to 100°C. The liquid freezing point must be at least 5°K below the minimum ambient winter temperature of the installation site.

The **FC CHV** models have been designed to suit the applications where the installation space is limited.

Designation

FC ECA 06P 7L03 A1		
FC ECA	Condenser	
06P	Fan rotation speed	**06P** = standard **08P** = average **12P** = quiet **16P** = very quiet
7	Fan diameter	**7** = Ø 762 mm **9** = Ø 900 mm
L03	Fan arrangement and number	**L** = in line **P** = in parallel **03** = 3 fans

Advantages:

These includes : simple and inexpensive installation (steel pipes); flexible application; assured and reliable operation, summer and winter; ease of winter control of fluid outlet temperature; very low maintenance costs; no water consumption; no steam consumption; no scaling; no bacterial contamination of water.

Main components

Casing:

The casing is made from galvanized sheet steel and pre-lacquered galvanized sheet, colour grey RAL7035. The use of 18/10 stainless steel fastenings provides excellent corrosion resistance and durable surface finish.

The FC CHV are deliverd screwed on a woodem frame with full packing.

Coil :

- Copper tube in a staggered arrangement and corrugated aluminium fins for optimal heat transfer
- Headers withair vents and drain plugs
- Connections: NPT steel pipe up to DN 50, flanges of larger sizes

Ventilation:

FC ECA:

- The direct driven fan assemblies are equipped with following motors: 06P=900 rpm, 08P = 700 rpm, 12P = 430 rpm, 16P = 380 rpm
- These motors are of the type 400V/3/50, totally enclosed, IP55, class F, conforming to standard CEI 34-1, permanently lubricated.
- The motors are factory wired in a junction box for the L models and 2 junction boxes for the P models.
- The fan guard comply to NF E51-190 standard

FC CHV:

- The fan assemblies, with external rotor, are equipped with fan guard comply to NF E51.190 standard
- The external mounting allows very easy access for eventual maintenance.
- 3Ph, 400V, 50 Hz, IP 54, class F motors with internal protector

Options

Coil:

- Multi-circuiting (MCI)
- Coating of the fins (BAE)
- Copper fins (BCC) (Please consult us)
- XT Blygold Polual coating of the fins (BXT) (FC ECA only)
- Free draining special circuit when not in operation
- Flanges, mating flanges, bolts and gaskets, ...
- Steel or brass vents and drains

Fans:

- 60 Hz fan assembly (adapted vanes) (M60)
- 3-Phase 230V 50Hz fan assemblies (M25)
- 3-Phase 230V 60Hz fan assemblies (M26) (FC ECA only)
- Motors with overload thermostat. Recommended when the system could start very frequently (more than 30 starts per hour) or when used with a speed controller (MTH) (FC ECA only)
- Ø 900: external rotor fan assembly (height +120 mm) (MVZ) (FC ECA only)
- Rotary proximity switch(es) (IRP)
- Factory wiring in two speed into a common junction box (except 06 models) (C2V)

Casing (FC ECA only):

- Legs extended by 250 mm (REH) or 840 mm (RE2)
- Full crate (ECB)
- Special colour (RAL)

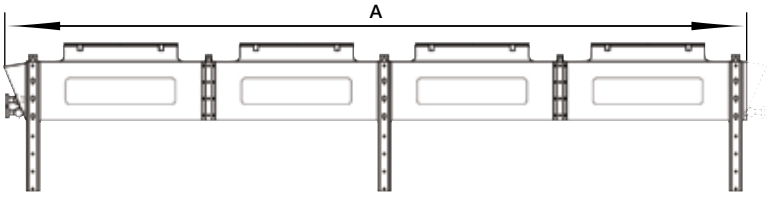
Miscellaneous:

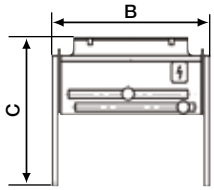
- Surge tank (VEX)

Protection and controls :

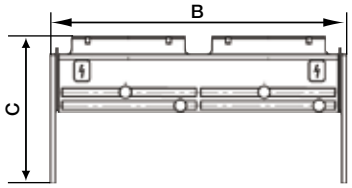
- Please consult us

Physical data - FC ECA





Single fan line



Double fan line

	MODEL	REJECTION CAPACITY (kW) (1)		SOUND LEVEL (dB(A))		INPUT POWER (kW)	DIMENSIONS A/B/C (mm)	WEIGHT (kg)
		+32°C	+35°C	Lw	Lp @10m (2)			
06P (900 rpm)	FC ECA 06P 7L01 A1	24,9	17,9	89	51	2,6	1280/1226/1218	174
	FC ECA 06P 9L01 B1	34,9	22,0	94	56	2,6	1680/1226/1251	193
	FC ECA 06P 9L01 B2	47,3	29,2	94	56	2,6	1680/1226/1251	206
	FC ECA 06P 9L01 C2	51	35,3	94	56	2,6	2030/1226/1251	230
	FC ECA 06P 9L01 C3	58,7	41,0	94	56	2,6	2030/1226/1251	246
	FC ECA 06P 9L01 D3	65,6	45,4	94	56	2,6	2380/1226/1251	276
	FC ECA 06P 9P02 B1	71,13	54,0	97	59	5,2	1680/2310/1251	364
	FC ECA 06P 9L02 B2	93,8	63,1	97	59	5,2	3082/1226/1251	357
	FC ECA 06P 9L02 B3	99,5	68,3	97	59	5,2	3082/1226/1251	382
	FC ECA 06P 9L02 B4	110,1	76,0	97	59	5,2	3082/1226/1251	407
	FC ECA 06P 9L02 C4	126,6	87,9	97	59	5,2	3782/1226/1251	480
	FC ECA 06P 9L02 D4	141	98,5	97	59	5,2	4482/1226/1251	546
	FC ECA 06P 9L03 B3	153,8	108,2	99	61	7,8	4484/1226/1251	556
	FC ECA 06P 9L03 B4	166,3	117,8	99	61	7,8	4484/1226/1251	594
	FC ECA 06P 9L03 C3	179,9	127,6	99	61	7,8	5534/1226/1251	651
	FC ECA 06P 9L04 B3	204,8	146,0	100	62	10,4	5886/1226/1251	720
	FC ECA 06P 9L04 B4	223	154,7	100	62	10,4	5886/1226/1251	770
	FC ECA 06P 9L05 B2	227,3	164,2	101	63	13	7288/1226/1251	832
	FC ECA 06P 9L05 B3	251	180,6	101	63	13	7288/1226/1251	895
	FC ECA 06P 9L05 B4	276,9	191,7	101	63	13	7288/1226/1251	957
	FC ECA 06P 9P06 B3	306,9	222,2	102	64	15,6	4484/2310/1251	1025
	FC ECA 06P 9P06 C4	379,9	263,9	102	64	15,6	5534/2310/1251	1241
	FC ECA 06P 9P08 B3	409,6	291,4	103	65	20,8	5886/2310/1251	1324
	FC ECA 06P 9P08 C3	479,9	330,6	103	65	20,8	7286/2310/1251	1499
	FC ECA 06P 9P10 B3	526,2	361,1	104	66	26	7288/2310/1251	1635
	FC ECA 06P 9P10 B4	554,9	397,8	104	66	26	7288/2310/1251	1760
	FC ECA 06P 9P12 B4	NA	472,4	105	67	31,2	8690/2310/1251	2085

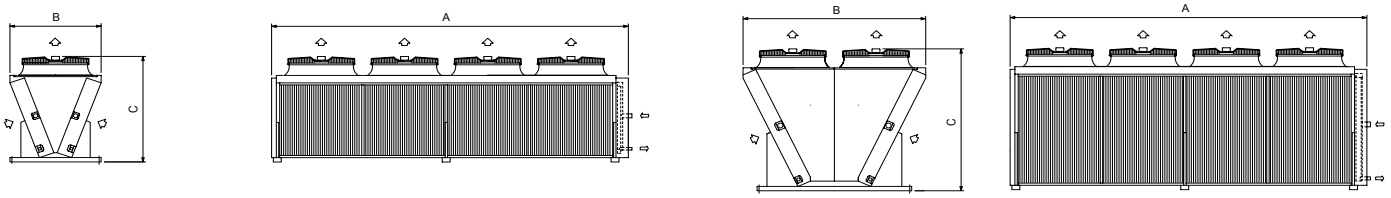
(1) Water conditions: in/out 45°C/40°C, 34% glycol
(2) Sound pressure level in dB(A) measured at 10 meters distance, at fan blade level, in a free field on a reflective plan, given as indicative value. Only the acoustic power and the Lw value, are contractual and usable for the calculation of the sound pressure level data at owner land limits.
For any other condition, please consult your Lennox representative.

Physical data - FC ECA

	MODEL	REJECTION CAPACITY (kW) (1)		SOUND LEVEL (dB(A))		INPUT POWER (kW)	DIMENSIONS A/B/C (mm)	WEIGHT (kg)
		+32°C	+35°C	Lw	Lp @10m (2)			
08P (700 rpm)	FC ECA 08P 7L01 A1	22,9	16,5	81	43	1,35	1280/1226/1218	174
	FC ECA 08P 9L01 C1	36,3	24,3	86	48	1,35	2030/1226/1251	215
	FC ECA 08P 9L01 C2	44,1	30,0	86	48	1,35	2030/1226/1251	230
	FC ECA 08P 9L01 D2	49,5	34,3	86	48	1,35	2380/1226/1251	257
	FC ECA 08P 9L01 D3	54,6	38,4	86	48	1,35	2380/1226/1251	276
	FC ECA 08P 9L02 B1	69,1	46,4	89	51	2,7	3082/1226/1251	332
	FC ECA 08P 9L02 B2	79,3	56,1	89	51	2,7	3082/1226/1251	357
	FC ECA 08P 9L02 B3	84,7	62,5	89	51	2,7	3082/1226/1251	382
	FC ECA 08P 9L02 C3	97,5	69,5	89	51	2,7	3782/1226/1251	448
	FC ECA 08P 9L02 D3	109,1	77,6	89	51	2,7	4482/1226/1251	509
	FC ECA 08P 9L03 B2	118,6	85,8	91	53	4,05	4484/1226/1251	519
	FC ECA 08P 9L04 B1	138,3	98,0	92	54	5,4	5886/1226/1251	620
	FC ECA 08P 9L03 C3	149,4	106,5	91	53	4,05	5534/1226/1251	651
	FC ECA 08P 9P04 B3	175,7	121,9	92	54	5,4	3082/2310/1251	714
	FC ECA 08P 9L04 C2	185,4	132,0	92	54	5,4	7286/1226/1251	791
	FC ECA 08P 9P04 C3	199	143,3	92	54	5,4	3782/2310/1251	796
	FC ECA 08P 9L05 B3	217,9	156,6	93	55	6,75	7288/1226/1251	895
	FC ECA 08P 9P06 B3	261,3	185,4	94	56	8,1	4484/2310/1251	1025
	FC ECA 08P 9P06 C4	309,2	226,6	94	56	8,1	5534/2310/1251	1241
	FC ECA 08P 9P08 C2	370,3	264,0	95	57	10,8	7286/2310/1251	1374
	FC ECA 08P 9P10 B3	435,8	312,5	96	58	13,5	7288/2310/1251	1635
	FC ECA 08P 9P12 B4	549,9	385,7	97	59	16,2	8690/2310/1251	2085
12P (430 rpm)	FC ECA 12P 7L01 A1	17,7	12,6	67	29	0,5	1280/1226/1218	165
	FC ECA 12P 9L01 C2	29,5	18,0	72	34	0,5	2030/1226/1251	215
	FC ECA 12P 9L01 D2	35,6	23,5	72	34	0,5	2380/1226/1251	257
	FC ECA 12P 9L02 B1	50,6	32,4	75	37	1	3082/1226/1251	332
	FC ECA 12P 7L03 A2	57,5	39,1	72	34	1,5	3284/1226/1218	424
	FC ECA 12P 9L02 C2	65,1	45,9	75	37	1	3782/1226/1251	417
	FC ECA 12P 9L03 B1	75,4	54,3	77	39	1,5	4484/1226/1251	481
	FC ECA 12P 9L03 C1	87,9	61,6	77	39	1,5	5534/1226/1251	557
	FC ECA 12P 9L03 C2	95,4	69,7	77	39	1,5	5534/1226/1251	604
	FC ECA 12P 9L04 B2	112,6	80,3	78	40	2	5886/1226/1251	670
	FC ECA 12P 9L05 B1	128,7	91,9	79	41	2,5	7288/1226/1251	770
	FC ECA 12P 9L05 B2	140,2	100,6	79	41	2,5	7288/1226/1251	832
	FC ECA 12P 9P06 B2	170,9	119,6	42	4,73	3	4484/2310/1251	950
	FC ECA 12P 9P06 C2	190,8	139,5	42	7,65	3	5534/2310/1251	1054
	FC ECA 12P 9P08 C1	234,1	167,1	81	43	4	7286/2310/1251	1250
	FC ECA 12P 9P10 B1	257,4	183,2	82	44	5	7288/2310/1251	1385
	FC ECA 12P 9P10 C1	286,6	207,3	82	44	5	9038/2310/1251	1539
	FC ECA 12P 9P12 B2	341,3	238,7	83	45	6	8690/2310/1251	1785
16P (320 rpm)	FC ECA 16P 7L01 A1	15,3	11,0	57	19	0,28	1280/1226/1218	165
	FC ECA 16P 9L01 C1	23,2	14,3	62	24	0,28	2030/1226/1251	215
	FC ECA 16P 7L02 A1	29	20,0	60	22	0,56	2282/1226/1218	275
	FC ECA 16P 9L02 B1	40,6	27,1	65	27	0,56	3082/1226/1251	332
	FC ECA 16P 9L02 C1	46,3	31,4	65	27	0,56	3782/1226/1251	386
	FC ECA 16P 9L02 D1	51,6	36,4	65	27	0,56	4482/1226/1251	434
	FC ECA 16P 9L03 B1	61,4	43,4	67	29	0,84	4484/1226/1251	481
	FC ECA 16P 9L03 C1	69,1	50,3	67	29	0,84	5534/1226/1251	557
	FC ECA 16P 9L04 B1	81,1	57,9	68	30	1,12	5886/1226/1251	620
	FC ECA 16P 9L04 C1	94,3	66,8	68	30	1,12	7286/1226/1251	729
	FC ECA 16P 9L05 B1	100,6	72,4	69	31	1,4	7288/1226/1251	770
	FC ECA 16P 9P06 B1	122,7	86,7	70	32	1,68	4484/2310/1251	875
	FC ECA 16P 9P06 C1	137,9	100,3	70	32	1,68	5534/2310/1251	960
	FC ECA 16P 9P08 B1	161,9	117,6	71	33	2,24	5886/2310/1251	1125
	FC ECA 16P 9P08 C1	188,3	133,6	71	33	2,24	7286/2310/1251	1250
	FC ECA 16P 9P08 D1	205,2	149,2	71	33	2,24	8686/2310/1251	1324
	FC ECA 16P 9P12 B1	245,4	176,3	73	35	3,36	8690/2310/1251	1635

(1) Water conditions: in/out 45°C/40°C, 34% glycol
(2) Sound pressure level in dB(A) measured at 10 meters distance, at fan blade level, in a free field on a reflective plan, given as indicative value. Only the acoustic power and the Lw value, are contractual and usable for the calculation of the sound pressure level data at owner land limits.
For any other condition, please consult your Lennox representative.

Physical data - FC CHV



	MODEL	REJECTION CAPACITY (kW) (1)		SOUND LEVEL (dB(A))		INPUT POWER (kW)	DIMENSIONS A/B/C (mm)	WEIGHT (kg)
		+32°C	+35°C	Lw	Lp @10m (2)			
06P (880 rpm)	FC CHV 06P 8L01 A1	47	32,0	83,0	45	2	1350/1150/1450	280
	FC CHV 06P 8L01 A2	51,1	38,6	83,0	45	2	1350/1150/1450	300
	FC CHV 06P 8L02 A1	93,9	67,3	86,0	48	4	2400/1150/1450	490
	FC CHV 06P 8L02 A2	107	77,1	86,0	48	4	2400/1150/1450	540
	FC CHV 06P 8L03 A1	140,8	95,9	88,0	50	6	3450/1150/1450	730
	FC CHV 06P 8L03 A2	160,5	112,7	88,0	50	6	3450/1150/1450	770
	FC CHV 06P 8P04 B1	168,8	114,6	89,0	51	8	2400/2300/1950	720
	FC CHV 06P 8L04 A1	178,3	134,5	89,0	51	8	4500/1150/1450	820
	FC CHV 06P 8P04 B2	183,2	138,5	89,0	51	8	2400/2300/1950	940
	FC CHV 06P 8L04 A2	202,7	154,4	89,0	51	8	4500/1150/1450	850
	FC CHV 06P 8P06 B1	253,1	171,8	91,0	53	12	3450/2300/1950	1230
	FC CHV 06P 8L05 A2	260,9	180,7	90,0	52	10	5550/1150/1450	1130
	FC CHV 06P 8P06 B2	288,9	198,7	91,0	53	12	3450/2300/1950	1340
	FC CHV 06P 8P08 B2	365,5	277,3	92,0	54	16	4500/2300/1950	1570
	FC CHV 06P 8P10 B1	410,6	299,4	93,0	55	20	5550/2300/1950	1810
	FC CHV 06P 8P12 B1	507,6	345,2	94,0	56	24	6600/2300/1950	2160
	FC CHV 06P 8P12 B2	578,8	397,4	94,0	56	24	6600/2300/1950	2350
08P (660 rpm)	FC CHV 08P 8L01 A1	38,9	27,4	78,0	40	1,25	1350/1150/1450	280
	FC CHV 08P 8L01 A2	43,3	31,4	78,0	40	1,25	1350/1150/1450	300
	FC CHV 08P 8L02 A1	77,9	55,9	81,0	43	2,5	2400/1150/1450	490
	FC CHV 08P 8L02 A2	86,7	62,7	81,0	43	2,5	2400/1150/1450	540
	FC CHV 08P 8L03 A1	116,8	85,3	83,0	45	3,75	3450/1150/1450	730
	FC CHV 08P 8L03 A2	130	95,5	83,0	45	3,75	3450/1150/1450	770
	FC CHV 08P 8P04 B1	140,36	100,6	84,0	46	5	2400/2300/1950	720
	FC CHV 08P 8L04 A1	147,2	112,0	84,0	46	5	4500/1150/1450	820
	FC CHV 08P 8P04 B2	147,68	112,2	84,0	46	5	2400/2300/1950	940
	FC CHV 08P 8L04 A2	178,8	125,4	84,0	46	5	4500/1150/1450	850
	FC CHV 08P 8L05 A2	214,2	145,7	85,0	47	6,25	5550/1150/1450	1130
	FC CHV 08P 8P06 B1	210,5	147,1	86,0	48	7,5	3450/2300/1950	1230
	FC CHV 08P 8P06 B2	232,7	163,6	86,0	48	7,5	3450/2300/1950	1340
	FC CHV 08P 8P08 B2	292,7	224,3	87,0	49	10	4500/2300/1950	1570
	FC CHV 08P 8P10 B1	341,8	250,1	88,0	50	12,5	5550/2300/1950	1810
	FC CHV 08P 8P12 B2	466,4	327,6	89,0	51	15	6600/2300/1950	2350
12P (440 rpm)	FC CHV 12P 8L01 A1	30,1	20,7	67,0	29	0,37	1350/1150/1450	270
	FC CHV 12P 8L02 A1	61	43,4	70,0	32	0,74	2400/1150/1450	470
	FC CHV 12P 8L03 A1	89,8	65,0	72,0	34	1,11	3450/1150/1450	710
	FC CHV 12P 8P04 B1	110,6	79,4	73,0	35	1,48	2400/2300/1950	690
	FC CHV 12P 8L04 A1	121,9	86,7	73,0	35	1,48	4500/1150/1450	790
	FC CHV 12P 8L05 A1	145,7	109,8	74,0	36	1,85	5550/1150/1450	990
	FC CHV 12P 8P06 B1	155,2	117,5	75,0	37	2,22	3450/2300/1950	1190
	FC CHV 12P 8P08 B1	221,1	154,5	76,0	38	2,96	4500/2300/1950	1390
	FC CHV 12P 8P10 B1	275,3	198,7	77,0	39	3,7	5550/2300/1950	1730
	FC CHV 12P 8P12 B1	321,5	235,5	78,0	40	4,44	6600/2300/1950	2070
16P (330 rpm)	FC CHV 16P 8L01 A1	25,1	17,3	61,0	23	0,2	1350/1150/1450	270
	FC CHV 16P 8L02 A1	51	36,3	63,0	25	0,4	2400/1150/1450	470
	FC CHV 16P 8L03 A1	77,2	55,3	65,0	27	0,6	3450/1150/1450	710
	FC CHV 16P 8P04 B1	91,8	66,1	66,0	28	0,8	2400/2300/1950	690
	FC CHV 16P 8L04 A1	101,9	72,6	66,0	28	0,8	4500/1150/1450	790
	FC CHV 16P 8L05 A1	121,3	92,2	67,0	29	1	5550/1150/1450	990
	FC CHV 16P 8P06 B1	139,2	99,5	68,0	30	1,2	3450/2300/1950	1190
	FC CHV 16P 8P08 B1	183,6	130,7	69,0	31	1,6	4500/2300/1950	1390
	FC CHV 16P 8P10 B1	228,4	165,8	70,0	32	2	5550/2300/1950	1730
	FC CHV 16P 8P12 B1	270,3	196,6	71,0	33	2,4	6600/2300/1950	2070

(1) Water conditions: in/out 45°C/40°C, 34% glycol
(2) Sound pressure level in dB(A) measured at 10 meters distance, at fan blade level, in a free field on a reflective plan, given as indicative value. Only the acoustic power and the Lw value, are contractual and usable for the calculation of the sound pressure level data at owner land limits.
For any other condition, please consult your Lennox representative.

CHV / ECA / NEOSTAR • 21 - 1000 kW

Condenser

ECA

CHV

NEOSTAR

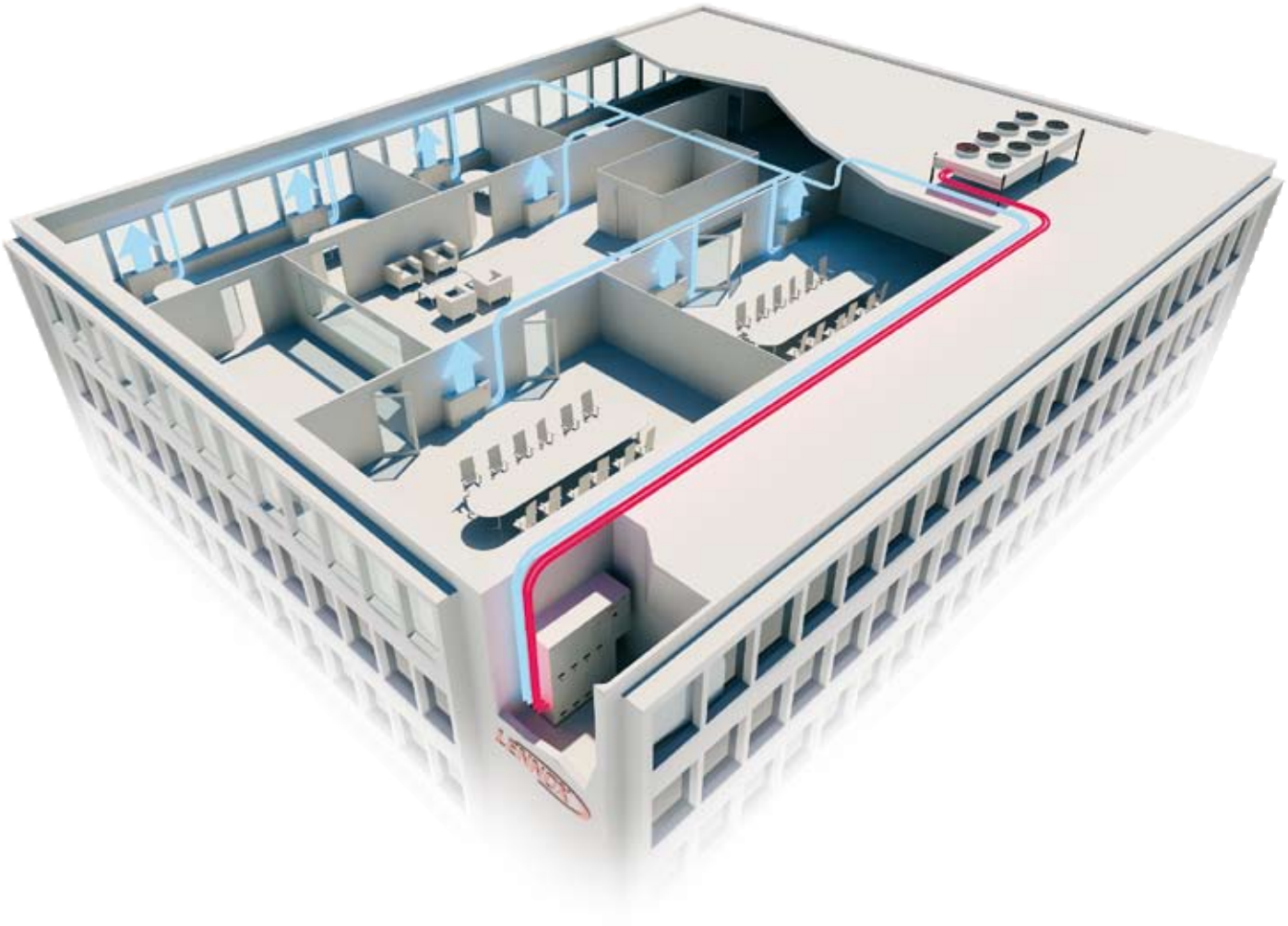
General description

CHV condensers:
- 72 models from 32 to 745 kW
- Ø 800 mm fan assemblies available in 4 fan rotation speeds (06P, 08P, 12P and 16P)
- Small footprint and low noise level
- Eurovent certification

ECA condensers:
- 389 models from 21 to 876 kW
- Ø 762 mm or Ø 900 mm fan assemblies available in 4 fan rotation speeds (06P, 08P, 12P and 16P)
- Several configuration to have an optimized selection
- Eurovent certification

NEOSTAR condensers:
- Several models from 1 to 16 fans
- Even more powerfull (POWER range): more than 1000 kW with one unit
- Even more silent (SILENCE range): 16P fan assemblies with very low speed

For all these ranges, control panels are available as an option, with different choices:
- Fan-cycling
- Voltage variation
- Frequency variation
- EC fans variation



For you.
Future is now.

NEOSYS™

• Sustainable performance • Quiet performance • Start-up and service performance
• Energy performance • Architectural integration

• Extended qualification tests - Aluminium micro channel heat exchanger - Compliant-scroll® compressor design
• Variable speed driven fans - Active acoustic attenuation system™ • Complete hydraulic module - Butterfly electrical panel™
• EER up to 2.9 - ESEER > 4 - COP up to 3.2 - R410A refrigerant • Top of the art design - Very low unit height (< 2 m)

200-1000 kW
air-cooled chiller

3 YEAR WARRANTY*

Quality
*makes the difference**

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

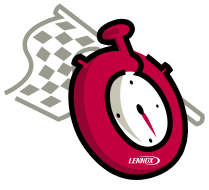
- CLIMATIC™ electronic controller with display
- Timer:
  - Balanced compressor operation
  - Short-cycling prevention
- Display of water inlet/outlet temperatures
- Control and display of faults for each component
- General alarm with report
- Remote start/stop
- Antifreeze protection
- De-frosting 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

ECOLEAN ™
FLASH

Available from stock !

Stock units - Sizes 0091 to 0211 (9 to 19 kW)

- Small cooling only and heat pump units
- HN version (Pump and buffer tank)
- Main switch
- Phase monitor
- Evaporator anti-freeze heater



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	Nr	1				
Compressor	Nr	1				
Evaporator	Type	Brazed plates				
Capacity steps	Nr	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	Inches	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	Nr	1				
Compressor	Nr	1				
Evaporator	Type	Brazed plates				
Capacity steps	Nr	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	Inches	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				

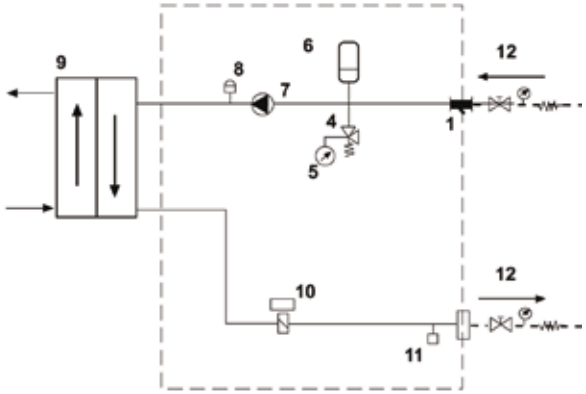
General data - Integrated hydraulic module

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				

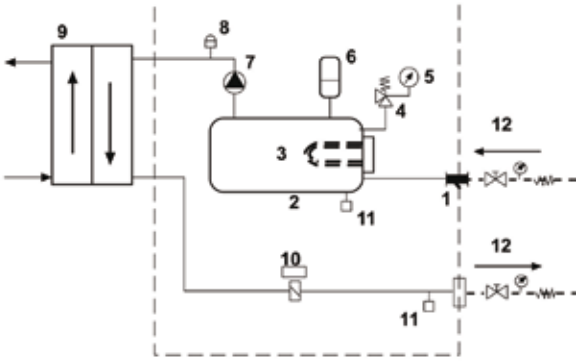
(1) Available only for the "Hydronic" type version

Principle sketch - Integrated hydraulic module

"Hydraulic" module (HY)



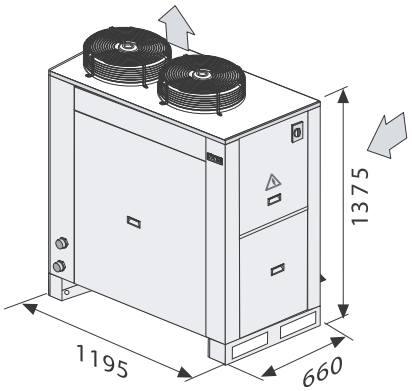
"Hydronic" module (HN)



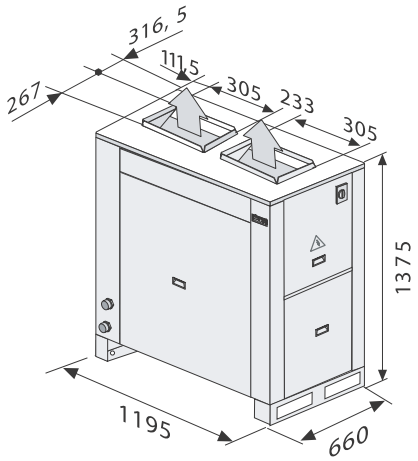
1	Water filter (removable)	5	Pressure gauge	9	Plate exchanger
2	Tank	6	Expansion tank	10	Flow switch
3	Immersion heater for tank (optional)	7	Pump	11	Drain valve
4	Safety valve	8	Air bleed valve	12	Water isolation valves (optional)

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 (-15°C) - EAC only
- Heating Low ambient kit (-15°C) (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 ➔ 175 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

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.
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- Optimal access to various components
- Hydraulic modules incorporated in the same cabinet
- Condenser fan with available pressure (FP version - up to 250 Pa and more, depending on size)

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
- 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 independant 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
- Dynamic set point

Advanced control

- Control module with microprocessor
- 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 - 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)	Nr	1				1/2			
Compressor	Nr	1				2			
Evaporator	Type	Brazed plates							
Capacity steps	Nr	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	Inches	1 1/2"				2"			
Acoustic									
Sound power level (3)	dB(A)	78	81	80	81	81	84	83	84

General data - Standard version - Sizes 1003 to 1804

ECOLEAN™ STD	EAC/EAR	1003	1103	1203	1303	1403	1604	1804
Cooling mode								
Cooling capacity (1)	kW	88,2	102	112	126	139	149	174
EER (3)		2,83	2,9	2,79	2,86	2,87	2,76	2,9
ESEER		4,19	3,97	3,83	3,87	3,98	4,02	4,06
Heating mode								
Heating capacity (2)	kW	95	108	118	130	143	159	180
COP		3,05	3	3	2,92	2,97	3	2,95
Electrical data								
Voltage	V/ Ph/Hz	400/3/50						
Refrigeration circuit								
Refrigerant	Type	R410A						
Number of circuits	Nr	2						
Compressor	Nr	3					4	
Evaporator	Type	Brazed plates						
Capacity steps	Nr	3					4	
Refrigerant charge per circuit (cooling only/heat pump unit)	kg	21,8/ 22,7	25,3/ 26,3	26,7/ 27,9	29,7/ 31	33,7/ 35,1	36,2/ 37,7	42,1/ 43,9
Pressure drop								
Nominal water flow	m^3/h	15,17	17,61	19,23	21,62	23,87	25,66	29,86
Pressure drop without water filter	kPa	32	38	43	48	53	44	52
Pressure drop with optional water filter	kPa	41	50	61	70	80	62	76
Hydraulic connection								
Type		Threaded - Female						
Diameter	Inches	2 1/2"					3"	
Acoustic								
Sound power level (3)	dB(A)	85	87	88	90	90	89	89

(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)

General data - High static version - Sizes 251 to 812

ECOLEAN™ FP1	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		2,56	2,6	2,66	2,65	2,56	2,55	2,64	2,66
Heating mode									
Heating capacity (2)	kW	23,6	27,6	33,6	37,8	47,8	54,7	68	75,7
COP		2,66	2,74	2,80	2,74	2,66	2,7	2,8	2,75
Electrical data									
Voltage	V / Ph / Hz	400/3/50							
Refrigeration circuit									
Refrigerant	Type	R410A							
Number of circuits (cooling/heating mode)	Nr	1				1/2			
Compressor	Nr	1				2			
Evaporator	Type	Brazed plates							
Capacity steps	Nr	1							
Refrigerant charge per circuit (cooling only/heat pump unit)	kg	5,5/ 5,8	6,11/ 6,5	8/ 8,7	9/ 10	11/ 11,4	12,2/ 12,7	16,1/ 16,8	18,5/ 19,3
Pressure drop									
Nominal water flow	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	Inches	1 1/2"				2"			
Acoustic									
Sound power level (3)	dB(A)	86	86	86	86	89	89	89	89

General data - High static version - Sizes 1003 to 1804

ECOLEAN™ FP1 / FP2	EAC/EAR	1003	1103	1203	1303	1403	1604	1804
Cooling mode								
Cooling capacity (1)	kW	88,2	102	112	126	139	149	174
EER		2,59	2,75	2,66	2,8	2,82	2,71	2,64
Heating mode								
Heating capacity (2)	kW	95	107,8	118,2	130,4	142,5	158,7	179,6
COP		2,79	2,85	2,86	2,86	2,91	2,94	2,34
Electrical data								
Voltage	V / Ph / Hz	400/3/50						
Refrigeration circuit								
Refrigerant	Type	R410A						
Number of circuits (cooling/heating mode)	Nr	2						
Compressor	Nr	3					4	
Evaporator	Type	Brazed plates						
Capacity steps	Nr	3					4	
Refrigerant charge per circuit (cooling only/heat pump unit)	kg	21,8/ 22,7	25,3/ 26,3	26,7/ 27,9	29,7/ 31	33,7/ 35,1	36,2/ 37,7	42,1/ 43,9
Pressure drop								
Nominal water flow	m^3/h	15,17	17,61	19,23	21,62	23,87	25,66	29,86
Pressure drop without water filter	kPa	32	38	43	48	53	44	52
Pressure drop with optional water filter	kPa	41	50	61	70	80	62	76
Hydraulic connection								
Type		Threaded - Female						
Diameter	Inches	2 1/2"					3"	
Acoustic								
Sound power level (3)	dB(A)	88	88	89	90	90	88	91

(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™ & ECOLEAN™ FP1	EAC/ EAR	ALL SIZES
Operating limits (cooling only / heat pump unit)		
Maximum outside air temperature - Standard & FP1 version	°C	48/23
Minimum outside air temperature	°C	-15°C in cooling / -12°C in heating
Maximum inlet water temperature - Standard version	°C	22/43
Maximum inlet water temperature - High static version	°C	19/43
Minimum outlet water temperature - Standard version	°C	5/20
Minimum outlet water temperature - High static version	°C	+5°C and -10°C (as an option)/ +20°C

General data - Integrated hydraulic module

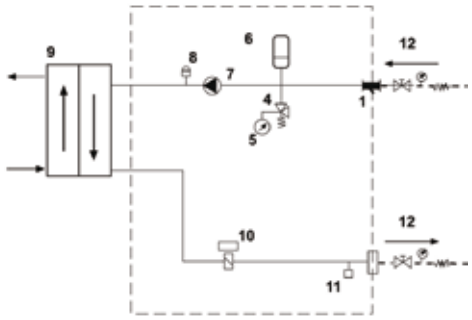
ECOLEAN™ HY / HN	EAC/EAR	251	291	351	431	472	552	672	812
Pump module									
Nominal water flow	m^3/h	3,8	4,45	5,5	6,62	7,59	8,72	10,9	12,98
Available static pressure	kPa	131	106	150	96	128	115	165	107
Voltage	V/Ph/Hz	400/3/50							
Absorbed power	kW	0,72		1,1	1,1	1,17		1,55	
Expansion vessel volume	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
Pump module								
Nominal water flow	m^3/h	15,17	17,61	19,23	21,62	23,87	25,66	29,93
Available static pressure	kPa	189	172	151	131	115	115	137
Voltage	V/Ph/Hz	400/3/50						
Absorbed power	kW	1,55	1,6	1,7	1,8	2,93		3,7
Expansion vessel volume	l	35					50	
Maximum pressure - Expansion vessel	Bar	4						
Weight	kg	26				29	27	45
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	

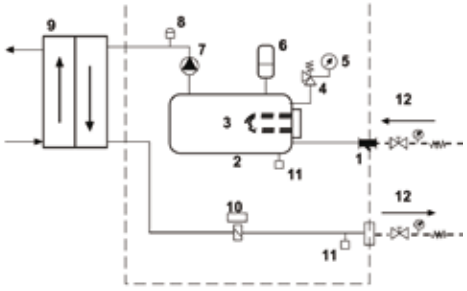
(1) Available only for the "Hydronic" type version

Principle sketch - Integrated hydraulic module

"Hydraulic" module (HY)

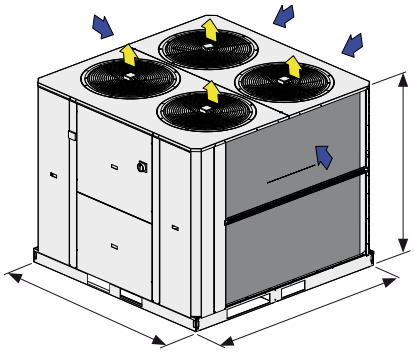


"Hydronic" module (HN)



1	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)

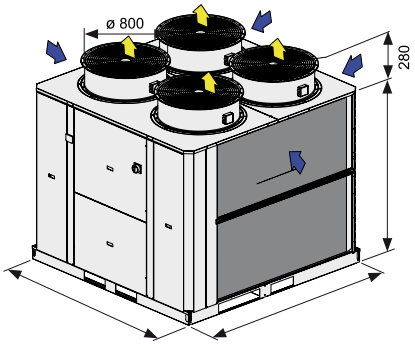
Physical data - Standard version



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
A	mm	2250	2250	2250	2250	2250	2250	2250
B	mm	1420	1420	1420	1420	1420	2300	2300
C	mm	1875	1875	1875	1875	1875	1975	1975
Operating weight (1)	kg	663	831	964	1016	1045	1167	1503
Additional weight								
«HYDRAULIC» module without water (2)	kg	26				29	27	45
«HYDRONIC» module without water (2)	kg	81				84	97	115

Physical data - High static version



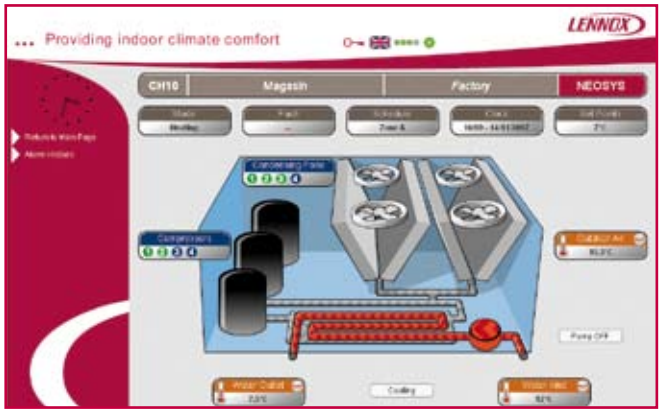
ECOLEAN™ FP1	EAC/EAR	251	291	351	431	472	552	672	812
A	mm	1195	1195	1195	1195	1960	1960	1960	1960
B	mm	980	980	980	980	1195	1195	1195	1195
C	mm	1375	1375	1375	1375	1375	1375	1375	1375
Operating weight (1)	kg	258	266	286	315	510	522	564	608

ECOLEAN™ FP1	EAC/EAR	1003	1103	1203	1303	1403	1604	1804
A	mm	2250	2250	2250	2250	2250	2250	2250
B	mm	1420	1420	1420	1420	1420	2300	2300
C	mm	1875	1875	1875	1875	1875	1975	1975
Operating weight (1)	kg	703	871	1004	1056	1085	1207	1583

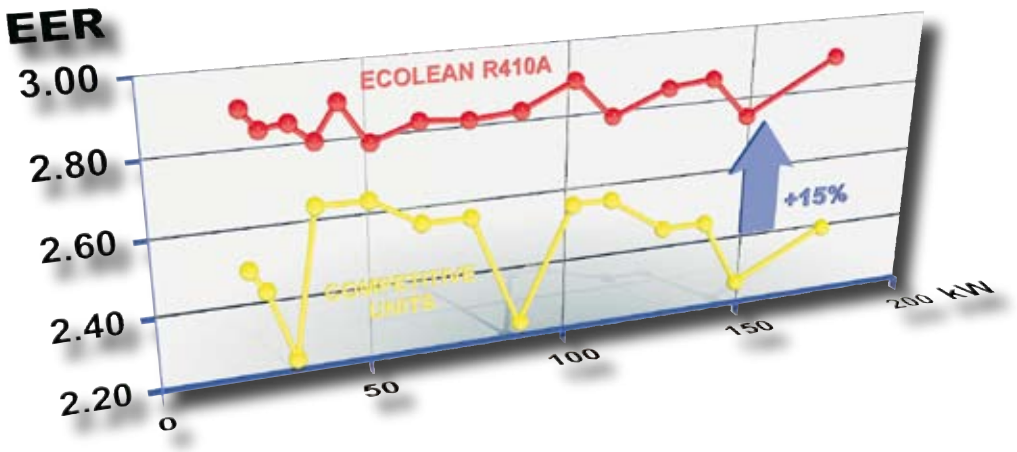
(1) Not including the «HYDRAULIC» or «HYDRONIC» module
(2) Weight to be added to that of the corresponding machine - Warning! Be sure to allow for the volume of the components when calculating the load weight - These data are also available for high static version

Options

- Water tank electrical heater (230V - 400V)
- Inlet Plenum (supplied loose)
- Epoxy coated Al fins coils treated
- Softstarter
- Three phase protection
- Evaporator antifreeze protection
- Tank antifreeze heater (230V-400V
- Coils protection guards
- Twin pump
- Kit low water temperature (-10°C)
- Compressor noise insulation jacket
- Anti-vibration mounts rubber (supplied loose)
- HP & LP refrigerant Gauges
- Mod-Bus interface
- Alarm relay
- Remote display (supplied loose)
- Adalink™ supervision



ADALINK™ supervision



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 350 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 Shark 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
- DC50™ user interface mounted on the front panel. Low pressure / high pressure 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
Electrical data									
Voltage	V/Ph/Hz	400/3/50							
Refrigeration circuit									
Number of circuit	Nb	2							
Compressor	Nb	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	Inches	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							

NEOSYS	NAC	540	600	640	680	760	840	960	1080
Cooling mode									
Cooling capacity (1)	kW	531	597	626	692	775	864	946	1062
EER (2)		2,64	2,74	2,74	2,80	2,61	2,87	2,75	2,64
Electrical data									
Voltage	V/Ph/Hz	400/3/50			2 x 400/3/50				
Refrigeration circuit									
Number of circuit	Nb	2			4				
Compressor	Nb	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	52	52	52	57	51,3	56	66	71
Hydraulic connections									
Type		Victaulic							
Diameter In/Out	Inches	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	46							

(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)

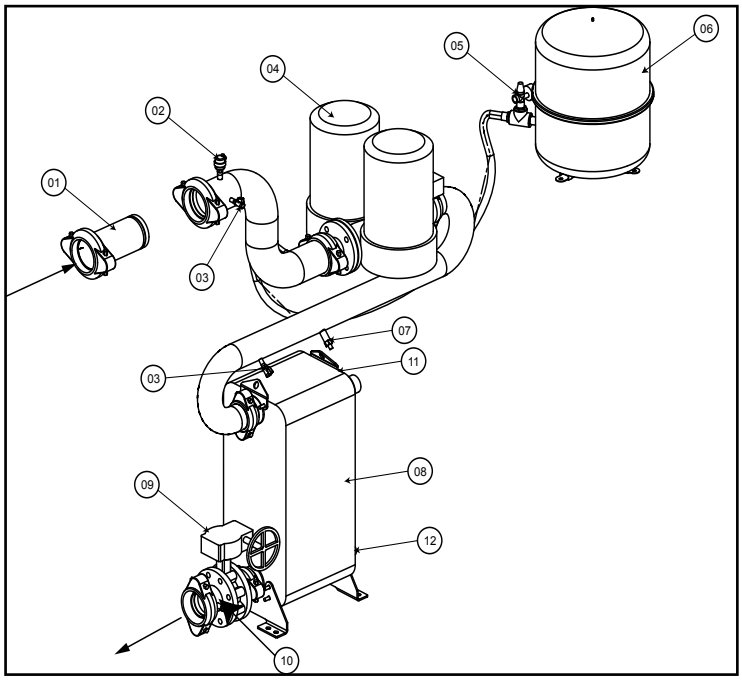
General data

NEOSYS	NAH	200	230	270	300	NEOSYS EXTENSION
Cooling mode						
Cooling capacity (1)	kW	191	215	271	295	
EER (2)		2,75	2,54	2,79	2,65	
ESEER (2)		4,00	3,76	3,99	3,94	
Heating mode						
Heating capacity (1)	kW	219	252	312	346	
COP		3,21	3,13	3,20	3,12	
Electrical data						
Voltage	V/Ph/Hz	400/3/50				
Refrigeration circuit						
Number of circuit	Nb	2				
Compressor	Nb	4				
Evaporator	Type	AISI 316 stainless steel plate brazed with				
Capacity steps		6			4	
Pressure drop						
Pressure drop (1)	kPa	25,7	32,5	38,8	46,2	
Hydraulic connections						
Type		Victaulic				
Diameter In/Out	Inches	4"				
Acoustic						
Global sound power level (1)	dB(A)	89	89	91	91	
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				
Max. Outdoor air Temp Heating	°C	-12				

AVAILABLE YEAR END 2009

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

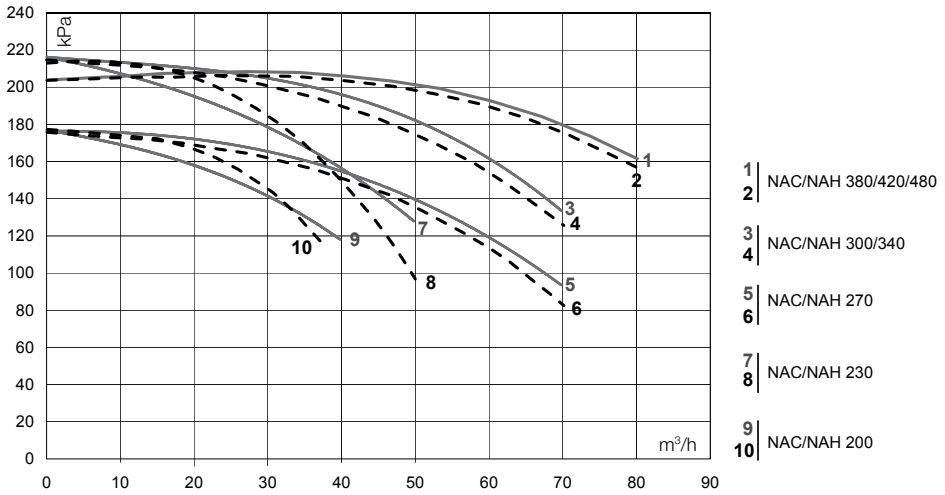
Integrated hydraulic module



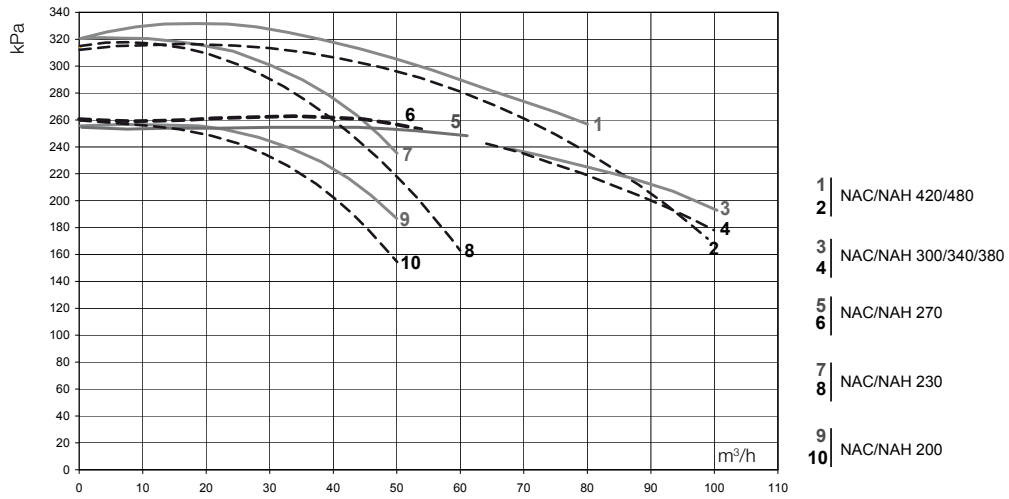
01	Water filter (supplied loose)
02	Air purge
03	Pressure tap
04	Pump
05	Safety valve with manometer
06	Espansion vessel
07	Electronic flow switch
08	Plate heat exchanger
09	Setting valve
10	Pressure tap and drain valve
11	Return temperature sensor
12	Supply temperature sensor

Pump pressure curves

Single / Double pump - Low pressure

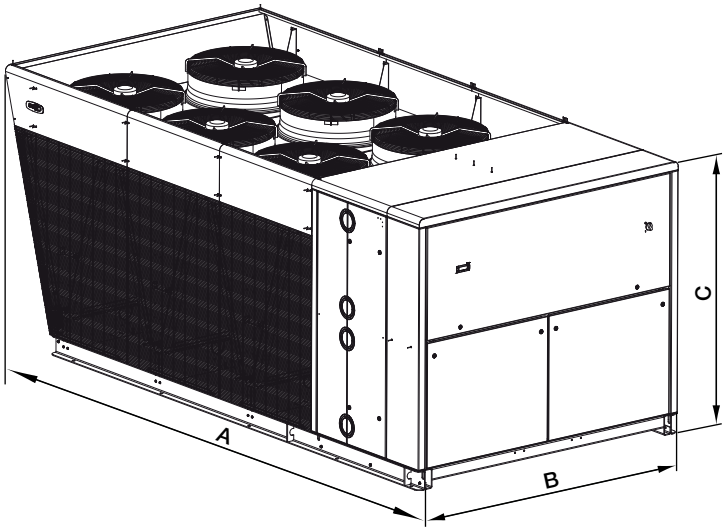


Single / Double pump - High pressure

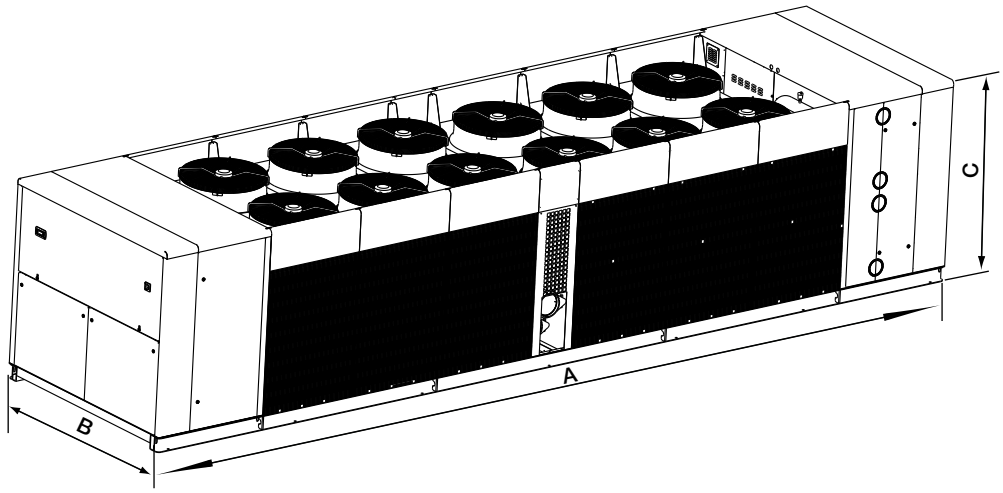


Physical data

Sizes 200 to 640



Sizes 680 to 1080



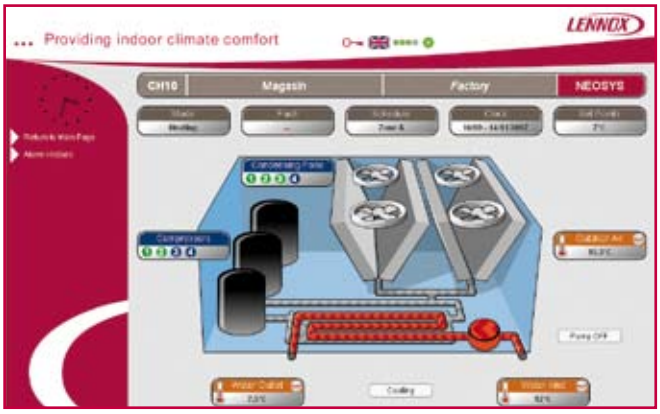
NEOSYS™	NAC	200	230	270	300	340	380	420	480
A	mm	3590	3590	3590	4620	4620	4620	5650	5650
B	mm	2280	2280	2280	2280	2280	2280	2280	2280
C	mm	1965	1965	1965	1965	1965	1965	1965	1965
Shipping weight	kg	1928	1955	2200	2564	2838	2911	3395	3496

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	3497	3858	3858	6343	6468	7404	7689	7679

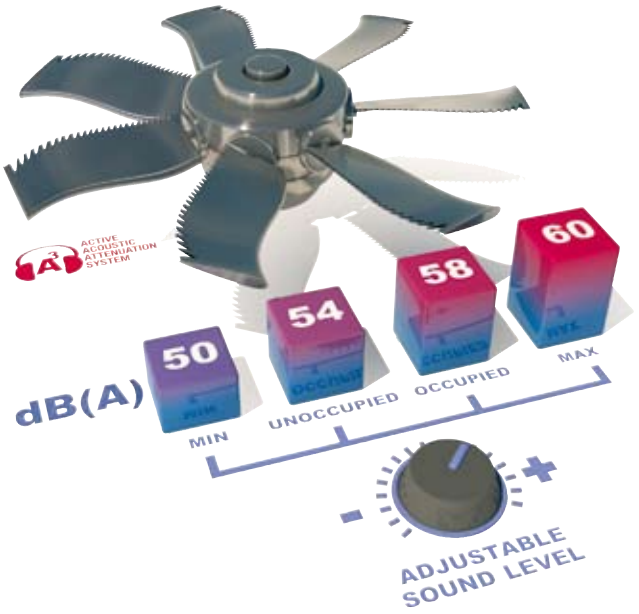
NEOSYS™	NAH	200	230	270	300
A	mm	3590	3590	4620	4620
B	mm	2280	2280	2280	2280
C	mm	1965	1965	1965	1965
Shipping weight	kg	2088	2114	2769	2795

Options

- Hydraulic module with low or high pressure, single or dual pump (Victaulic connections included)
- Partial heat recovery
- Winter operation down to -20°C ambient temperature / Anti-freeze 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 50 extension board for remote control
- Remote DC50™ comfort display / DS50™ service display
- Modbus, Lon, BacNet communication interfaces / Adalink™ Supervision
- Flange water connection sleeve.
- Anti vibration mounts



ADALINK™ supervision



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 (LFC/LFC-V) or with a remote condenser (ECA).

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	Nr	1									2		
Number of compressor	Nr	1				2					3		
Capacity steps	Nr	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	Nb	1									2		
Number of compressor	Nb	1				2					3		
Capacity steps	Nb	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	Nr	1									2		
Number of compressor	Nr	1				2					3		
Capacity steps	Nr	1				2				3	4		
Hydraulic connections													
Hydraulic connections	Type	Victaulic											
Discharge line	Inches/DN	7/8"			1" 1/8			1" 3/8			1" 3/8 & 1" 3/8		
Liquid line	Inches/DN	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											

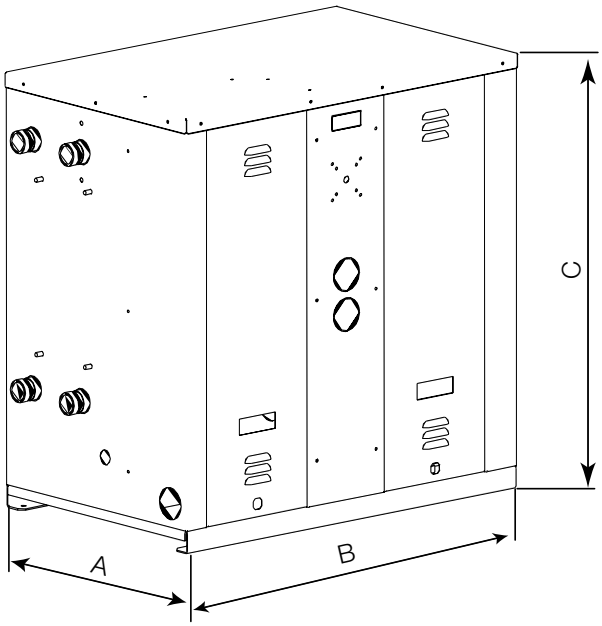
(3) Given for «Cooling Mode» and an evaporator outlet water temperature below 12°C
(4) Can be reduced if a water pressure regulated valve is used.

Options

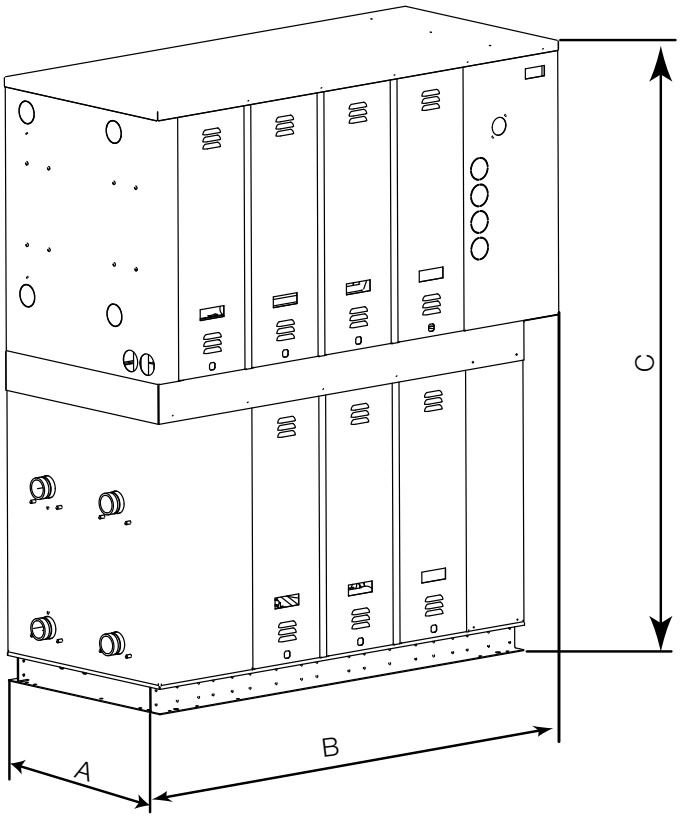
- Electrical equipment + control of outside fans
- Electrical equipment + control of outside pumps
- Pressure regulated water valve
- Water filter for evaporator
- Water filter for condenser
- Hot Gas by-pass
- Flanged external water connections
- Low Noise with compressor jackets
- Anti-vibration mounts 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»

Physical data

Sizes 020 to 100



Sizes 120 to 165



HYDROLEAN™	SWC	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
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

HYDROLEAN™	SWH	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
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

HYDROLEAN™	SWR	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
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

Dry-Cooler

LENNOX can provide you with Dry-coolers. For more details, please refer to page 104 of this general catalogue.

Air side Products

Providing indoor climate comfort

COMFAIR™ HC • 0,8 ➔ 13 kW
• 227 ➔ 2010 m³/h

Centrifugal fan coil units

Main applications
- Any commercial building
- Offices
- Hotels

Why this choice?
- 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

- 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

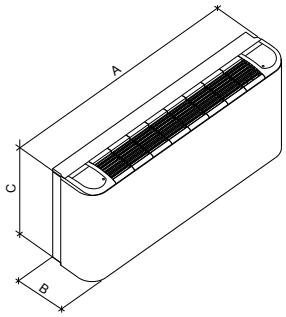
COMFAIR™		HC	10	20	30	40	50	60	70	80	90	100	110	120
2 pipe system (3 rows coil)														
Cooling capacity (1)	Sensible	kW	0,74	1,02	1,76	2,17	2,18	3,08	3,15	3,96	4,82	6,06	7,91	8,47
	Total	kW	0,86	1,28	2,17	2,53	3,11	3,85	4,33	5,59	6,9	7,97	10,00	11,01
Heating capacity (2)		kW	1,25	1,87	2,59	3,28	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	1,69	1,93	2,49	2,91	3,34	4,11	5,26	5,86	7,66	8,20
	Total	kW	0,84	1,23	2,08	2,38	2,96	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

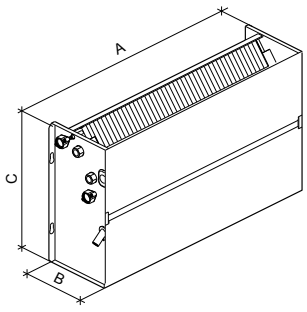
COMFAIR™ HC is part of FC Eurovent Certification Program (www.eurovent-certification.com)

Physical data

Cased units



Chassis units



COMFAIR™		HC	10	20	30	40	50	60	70	80	90	100	110	120
Standard coil	Rows	Nb	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 HH • 3,6 ➔ 61,3 kW
• 837 ➔ 9250 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 or horizontal 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 centrifugal twin-intake 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

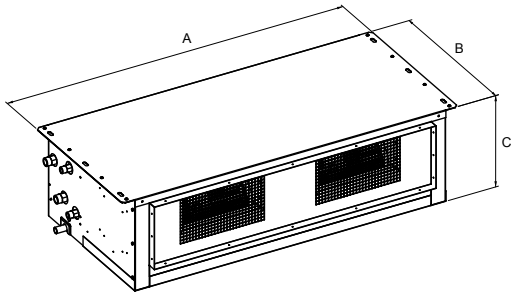
General data

COMFAIR™		HH	10	20	30	40	50	60	70
2 pipe system (3 row coil for HH 10-50 - 4 row coil for HH 60-70)									
Cooling capacity (1)	Sensible	kW	2,87	5,64	7,36	8,63	11	21,10	39,5
	Total	kW	3,64	7,05	9,2	10,6	13,1	27,80	50,60
Heating capacity (2)		kW	4,98	8,51	11,2	12,8	16,9	32,40	60,10
Water flow		l/h	626	1213	1582	1823	2253	4782	8703
Water pressure drop	Cooling	kPa	24	35,9	33,8	31,9	35,9	34	40
	Heating	kPa	22,2	31,7	28,9	27,9	33,2	29	34
Electrical heater	Standard	kW	3	6	6	9	9	12	18
	High	kW	4,5	9	9	12	12	18	24
Airflow		m^3/h	837	1423	1951	2131	3002	4678	9250
Sound power level (4)		dB(A)	68	66	70	69	75	78	81
4 pipe system (3 +1 row coil for HH 10-50 - 4+2 row coil for HH 60-70)									
Cooling capacity (1)	Sensible	kW	3,1	5,63	7,07	8,04	10,6	20,15	37,75
	Total	kW	3,6	7	8,3	9,57	12,3	24,95	45,55
Heating capacity (3)		kW	4,18	7	9,17	10,6	14	38,80	70,15
Water flow	Cooling	l/h (1)	619	1205	1428	1646	2116	4291	7835
	Heating	l/h (3)	360	602	789	912	1204	3337	6033
Water pressure drop	Cooling	kPa	15,9	26,8	28	29,2	30,8	27	32
	Heating	kPa	26,8	22,9	37	21,7	33,8	33	36
Airflow		m^3/h	795	1352	1853	2024	2852	4444	8788
Sound power level (4)		dB(A)	69	66	70	70	73	78	81
Available static pressure / Maximum external static pressure (50% performance reduction)									
2 pipes system	Min speed	Pa	90	80	115	105	135	220	220
	Med speed	Pa	95	95	130	130	180	240	240
	Max speed	Pa	105	105	135	135	205	260	260
4 pipes system	Min speed	Pa	95	90	120	120	180	220	220
	Med speed	Pa	85	80	115	115	155	210	210
	Max speed	Pa	75	70	95	90	110	180	180

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

Physical data



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

COMFAIR 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

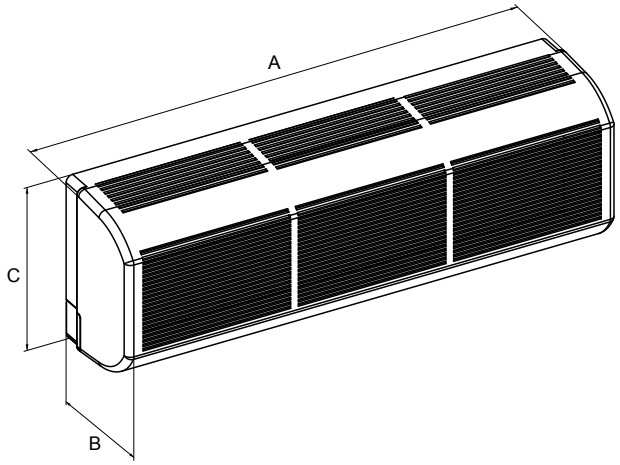
General data

COMFAIR™		HD	1	2	3
Cooling capacity (1)	Sensible	kW	1,70	1,99	3,44
	Total	kW	2,04	2,46	4,42
Heating capacity (2)		kW	2,59	3,32	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

Quantum™ M • 1,4 - 9 kW

• 200 ➔ 1060 m³/h

High pressure monobloc fan coil units

Main applications

- Any light commercial building
- Big and medium size offices
- Shops

Why this choice?

- High static pressure
- Flexibility
- Modular installation
- Air diffuser according to request

General description

- Centrifugal monobloc high-pressure fan coils for air conditioning, filtering and fresh air supply
- Available in 9 capacity sizes, 3,4 or 5 row coils, 2 different installation configurations (U and L configuration)
- 2 and 4 pipe systems or 2 pipe system with additional electric heater

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
- 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 condensate tray made from galvanized steel with a thick coat of bitumous paint
- Centrifugal double intake ventilation group (1, 2 or 3 fans) with aluminium blades. 5 available speeds. All electrical connections in a terminal block positioned on the same side as the hydraulic connections with a plastic box protection.
- G2 Class cleanable filter supplied as standard

Available accessories - configurations

- Internal or external thermal or/and acoustic insulation
- Class MO thermal and acoustic insulation
- G4 filtration grade filters
- Auxiliary coils for 4 pipes operation
- Electric heaters
- 2 and 3 way regulation valves, 230 on/off, 24V on/off, 24V 3 points, 24 V 0-10V
- Fresh air spigots (2 diameters, with or without damper)
- Condensate drain pumps
- Remote controls
- Free issue controls kit
- Wide range of BMS kits

General data

Quantum™ M	Speed	QLMC	103	104	105	203	204
Cooling capacity (1)							
Airflow - 50 Pa - Max speed	5		640	640	640	950	950
Sensible cooling capacity	5	kW	2,33	2,77	3,20	3,56	4,14
	4		2,09	2,47	2,83	3,29	3,81
	3		1,78	2,08	2,35	2,74	3,14
	2		1,44	1,66	1,84	2,22	2,52
	1		0,97	1,09	1,18	1,53	1,69
Total cooling capacity	5	kW	3,12	2,77	4,61	4,84	5,83
	4		2,85	2,47	4,13	4,52	5,42
	3		2,48	2,08	3,49	3,85	4,65
	2		2,05	1,66	2,78	3,19	3,72
	1		1,43	1,09	1,82	2,25	2,56
Water flow - Cooling	5	l/h	537	670	792	831	1002
	4		490	607	710	777	932
	3		426	520	600	661	783
	2		352	421	478	548	640
	1		245	285	313	387	441
Water pressure drop - Cooling	5	kPa	22,5	44,3	23,7	24,1	41,4
	4		19,1	37	19,4	21,3	36
	3		14,8	28	14,3	15,8	26,2
	2		10,5	19,1	9,43	11,2	18,2
	1		5,45	9,4	4,37	5,95	9,21
Heating capacity (2)							
Heating capacity 2 pipes	5	kW	3,66	4,37	5,16	5,60	6,56
	4		3,29	3,90	4,56	5,17	6,04
	3		2,81	3,28	3,78	4,31	4,96
	2		2,27	2,61	2,95	3,50	3,98
	1		1,53	1,72	1,88	2,42	2,68
Water pressure drop - Heating 2 pipes	5	kPa	7,4	13,4	7,2	7,76	12,6
	4		6,12	10,9	5,74	6,72	10,8
	3		4,57	7,99	4,08	4,8	7,57
	2		3,1	5,27	2,59	3,28	5,05
	1		1,41	2,47	1,14	1,67	2,46
Heating capacity 4 pipes	5	kW	2,12		NA	3,37	
	4		1,95		NA	3,16	
	3		1,75		NA	2,78	
	2		1,47		NA	2,34	
	1		1,07		NA	1,72	
Water flow - Heating 4 pipes	5	l/h	185		NA	294	
	4		170		NA	276	
	3		153		NA	243	
	2		128		NA	204	
	1		93		NA	150	
Water pressure drop - Heating 4 pipes	5	kPa	4,4		NA	13,9	
	4		3,77		NA	12,4	
	3		3,1		NA	9,83	
	2		2,25		NA	7,18	
	1		1,26		NA	4,12	
Electrical data							
Voltage		V / Ph / Hz	230/1/50				
Fan absorbed power	1	kW	0,10			,020	
	2		0,102			0,204	
	3		0,103			0,206	
	4		0,104			0,208	
	5		0,105			0,210	
Acoustic							
Sound power level	1	dB(A)	65			72	
	2		61			68	
	3		58			65	
	4		53			58	
	5		50			55	

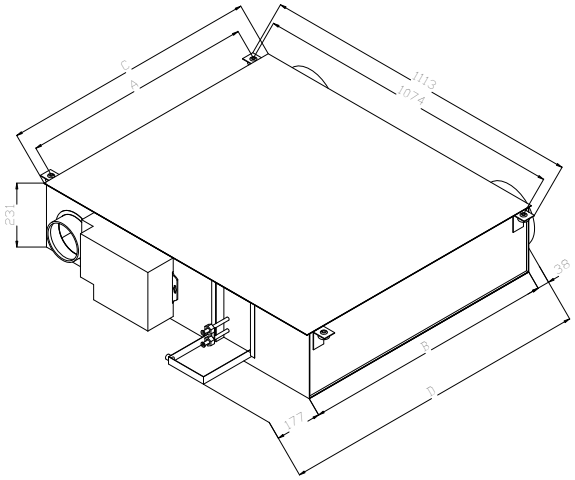
Data given at Maximum speed - 50 Pa available static pressure
(1) Air in 27°C 50% - Water 7/12°C
(2) Heating 2 pipes Air in 20°C, Water in 50°C same water as cooling mode above; Heating 4 pipes Air in 20°C water 70/60°C

General data

Quantum™ M	Speed	QLMC	205	303	304	305
Cooling capacity (1)						
Airflow - 50 Pa - Max speed	5		950	1060	1060	1060
Sensible cooling capacity	5	kW	5,00	4,32	4,97	5,91
	4		4,56	3,96	4,53	5,33
	3		3,69	3,28	3,71	4,27
	2		2,90	2,67	2,98	3,37
	1		1,89	1,82	2,00	2,18
Total cooling capacity	5	kW	7,41	6,10	7,21	8,96
	4		6,81	5,64	6,63	8,13
	3		5,59	4,75	5,51	6,58
	2		4,45	3,93	4,50	5,23
	1		2,94	2,74	3,07	3,43
Water flow - Cooling	5	l/h	1273	1049	1240	1540
	4		1171	969	1140	1397
	3		961	816	948	1131
	2		765	675	773	899
	1		505	472	527	589
Water pressure drop - Cooling	5	kPa	74,8	45,4	75,2	71,8
	4		64,2	39,4	64,5	60,1
	3		44,8	28,8	46,1	40,8
	2		29,6	20,3	31,8	26,8
	1		13,9	10,6	15,9	12,4
Heating capacity (2)						
Heating capacity 2 pipes	5	kW	7,97	6,77	7,83	8,32
	4		7,27	6,20	7,13	8,40
	3		5,85	5,13	5,82	6,71
	2		4,58	4,17	4,67	5,27
	1		2,97	2,86	3,13	3,40
Water pressure drop - Heating 2 pipes	5	kPa	21,1	13,5	21,5	19,1
	4		17,8	11,5	18,1	15,7
	3		12	8,16	12,5	10,4
	2		7,68	5,6	8,42	6,71
	1		3,49	2,82	4,07	3,02
Heating capacity 4 pipes	5	kW	NA	4,26		NA
	4		NA	3,96		NA
	3		NA	3,39		NA
	2		NA	2,86		NA
	1		NA	2,11		NA
Water flow - Heating 4 pipes	5	l/h	NA	372		NA
	4		NA	347		NA
	3		NA	296		NA
	2		NA	250		NA
	1		NA	184		NA
Water pressure drop - Heating 4 pipes	5	kPa	NA	27		NA
	4		NA	23,7		NA
	3		NA	17,8		NA
	2		NA	13,1		NA
	1		NA	7,55		NA
Electrical data						
Voltage		V / Ph / Hz				
Fan absorbed power	1	kW		0,20		
	2			0,204		
	3			0,206		
	4			0,208		
	5			0,210		
Acoustic						
Sound power level	1	dB(A)		67		
	2			63		
	3			61		
	4			55		
	5			52		

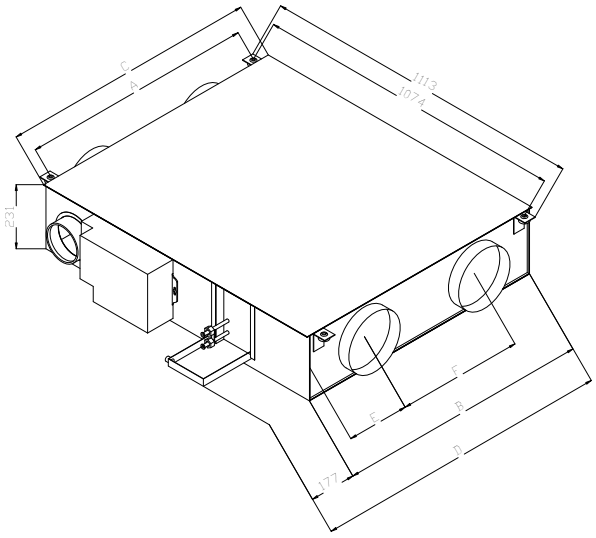
Physical data

QUANTUM™ M «U» type, right connection



QUANTUM™ M	QMLC	10	20	30
A	mm	498	798	1098
B	mm	566	866	1166
C	mm	584	884	1184
D	mm	781	1081	1381
Weight	kg	24	37	45

QUANTUM™ M «L» type, right connection



QUANTUM™ M	QMLC	10	20	30
A	mm	498	798	1098
B	mm	566	866	1166
C	mm	584	884	1184
D	mm	781	1081	1381
E	mm	283	214	294,5
F	mm	-	432	582
Weight	kg	24	37	45

CWC • 2 ➔ 9 kW

Chilled water cassettes

Main applications

- Any light commercial building
- Offices
- Shops

Why this choice?

- Easy and quick to install
- Best aesthetic metallic diffuser
- Electric heater possibility
- Different RAL colours for metallic diffuser

General description

Centrifugal water chilled cassettes in 6 capacity sizes, 2 and 4 pipe systems or 2 pipe system with additional electric heater, with plastic or metal diffuser.

Main components

- Main structure in galvanized sheet casing, fully insulated inside.
- Washable and easily accessible air filter.
- Units are supplied with one or two three speed centrifugal direct drive fans. Motor is protected with internal thermal protection.
- Heat exchangers with copper tubes and aluminium fins to ensure maximum efficiency:
  - 2 pipe cooling or heating: 1R CWC 20, 2R CWC 30/40, 3R CWC 50, 2R CWC 70, 3R CWC 90
  - 4 pipe cooling: 1R CWC 20, 1 or 3R CWC 30, 2R CWC40, 2R CWC 50/70, 2R CWC 90
  - 4 pipe heating: 1R CWC 20, 2R CWC 30, 1R CWC 40, 2R CWC 50/70/90
- Condensate drain pump as standard

Available accessories - configurations

- Electric heater
- Auxiliary drain pan
- 2 and 3 way regulating valves
- Kit floating switch for condensate pump activation (and alarm)
- Fresh air kit (duct connection, fresh air fan, duct supports)
- Water level security kit
- Kit for air supply to an adjacent room (duct connection, duct supports)
- Different RAL colours for metallic diffuser
- Thermostats and controls

General data

COMFAIR™ 2 pipe version	CWC	20	30	40	50	70	90
Cooling capacity (1)							
Cooling capacity	kW	1,87	3,41	4,09	5,33	7,40	8,71
Sensible capacity	kW	1,48	2,73	3,19	3,96	5,76	6,49
Chilled water flow	l/h	329	577	712	930	1343	1513
Pressure drop	kPa	14,2	22	37,9	37,2	26,2	28,7
Heating capacity (2)							
Heating capacity	kW	2,60	4,05	4,61	6,09	8,31	9,79
Hot water flow	l/h	329	595	712	930	1343	1513
Pressure drop	kPa	17	21,8	37,7	44,4	24,9	24,8
Electrical heater							
Capacity	kW	1,5	2	2	-	4	4
Electrical data							
Voltage	V / Ph / Hz	230/1/50					
Motor power input	kW	0,046	0,046	0,069	0,094	0,180	0,220
Nominal current	A	0,2	0,2	0,3	0,5	0,8	0,9
Airflow							
Minimum airflow	m^3/h	445	400	553	650	987	1126
Maximum airflow	m^3/h	650	598	779	920	1342	1569
Sound level							
Sound power level at minimum airflow (4)	dB(A)	44	40	47	53	51	56
Sound power level at maximum airflow (4)	dB(A)	52	50	55	62	60	65

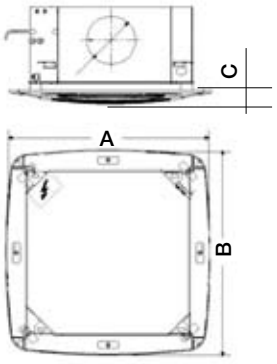
COMFAIR™ 4 pipe version	CWC	20	30	40	50	70	90
Cooling capacity (1)							
Cooling capacity	kW	2,03	2,73	3,27	4,25	6,06	7,89
Sensible capacity	kW	1,77	2,25	2,88	3,45	5,01	6,24
Chilled water flow	l/h	358	489	647	809	1124	1369
Pressure drop	kPa	13,5	33	27	36,5	18,4	25
Heating capacity (3)							
Heating capacity	kW	1,51	2,26	3,25	4,41	6,75	7,65
Hot water flow	l/h	126	213	295	373	575	653
Pressure drop	kPa	2,6	9,4	34,9	38	27	25,6
Electrical data							
Voltage	V / Ph / Hz	230/1/50					
Motor power input	kW	0,046	0,046	0,069	0,094	0,180	0,220
Nominal current	A	0,2	0,2	0,3	0,5	0,8	0,9
Airflow							
Minimum airflow	m^3/h	445	400	553	650	987	1126
Maximum airflow	m^3/h	650	598	779	920	1342	1569
Sound level							
Sound power level at minimum airflow (4)	dB(A)	41	40	47	53	52	56
Sound power level at maximum airflow (4)	dB(A)	51	50	55	62	60	64

Data given at Maximum speed - 0 Pa available static pressure
(1) Max speed : Cooling : Water inlet temperature: 7°C; water outlet temperature: 12°C; air inlet temperature: 27°C D.B - 19°C W.B
(2) Max speed : Heating : Water inlet temperature: 50°C; water flow rate as in cooling mode; air inlet temperature: 20°C
(3) Max speed : Heating : Water inlet temperature: 70°C; water outlet temperature: 60°C; air inlet temperature: 20°C
(4) Sound power level dB(A) ref 10 (-12) W

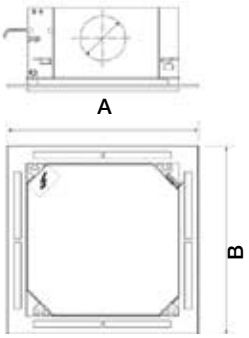
CWC is part of FC Eurovent Certification Program (www.eurovent-certification.com)

Physical data

Sizes 20, 30, 40 and 50

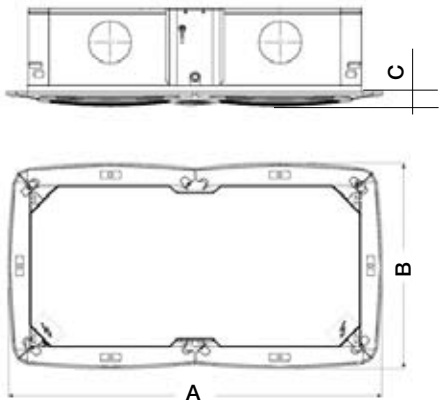


Plastic diffuser

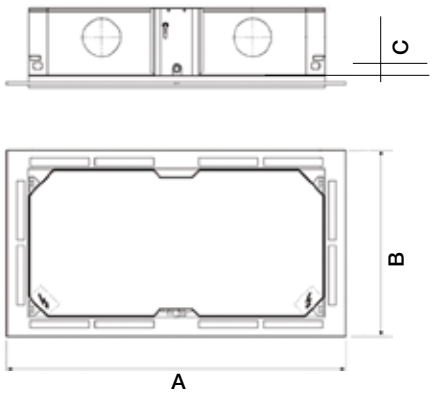


Metallic diffuser

Sizes 70 and 90



Plastic diffuser

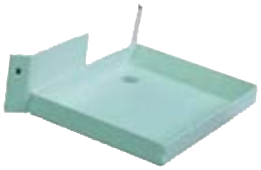


Metallic diffuser

COMFAIR™	CWC	20	30	40	50	70	90
Casing							
A	mm	575	575	575	575	1175	1178
B	mm	575	575	575	575	575	575
C	mm	298	298	298	298	298	298
Weight	kg	21	22	23	24	43	45
Plastic Diffuser							
A	mm	720	720	720	720	1320	1320
B	mm	720	720	720	720	720	720
C	mm	48	48	48	48	48	48
Weight	kg	3	3	3	3	5	5
Metallic Diffuser							
A	mm	619	619	619	619	1219	1219
B	mm	619	619	619	619	619	619
C	mm	27	27	27	27	27	27
Weight	kg	5	5	5	5	11	11

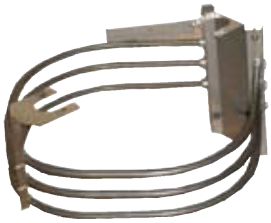
Main accessories and components

Regulating valves



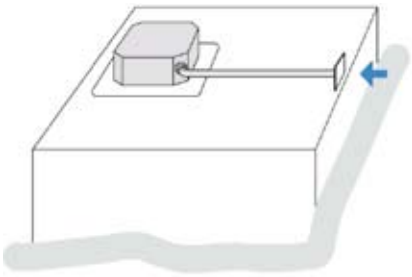
Drain pan

Condensate pump

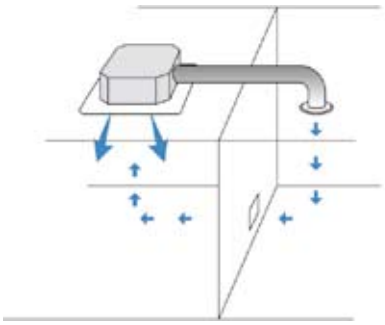


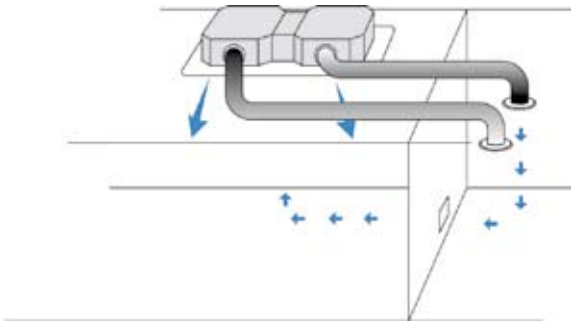
Electric heater

Fresh air supply kit (Coupling flange + antivibrating flange)



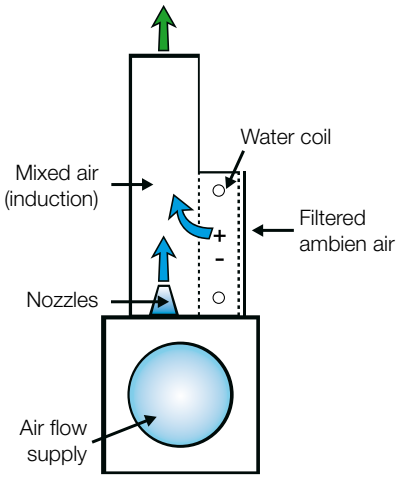
Kit discharge air to an adjacent room (Coupling reduction 125/75 mm + coupling flange Ø 75 mm + antivibrating flange)





Inductair™ • 0,4 ➔ 2,7 kW

Induction unit for 2 or 4 pipes system



Main applications

- Office buildings
- Hospitals
- Residential

Why this choice?

- Low noise level
- Modularity and flexibility
- Low energy consumption

General description

Induction units are suitable for 2 or 4 pipes applications with capacity control on the water or secondary air side. Inducing air through cooling coil and delivery it to the occupied space via nozzles. Induction units contain no moving parts and ca deliver fresh air in a highly energy efficiency way without need for air handling unit plant for fresh air.

Designation

ML 64-2-L-6-580	
ML	TYPE : **ML :** Low height Induction unit for vertical installation with a 2 pipes hot water coil **MLD :** Low height Induction unit for vertical installation with a 4 pipes hot water coil **MG :** Induction unit for vertical installation with a 2 pipes hot water coil **MGD :** Induction unit for vertical installation with a 4 pipes hot water coil **MH :** Induction unit for horizontal installation with a 2 pipes hot water coil **MHD :** Induction unit for horizontal installation with a 4 pipes hot water coil
64	Size : 48/64/88/120
2	Nozzle plate : 1/2/3/4/5/6
L	Optionals : **F :** Filter Scott **L :** Filter Lintscreen **S :** Series connection **W :** Drain connection (14 mm)
6	Air/Water connection : 1/3/4/6
580	Height : 580/440

Options

Optionals F and L : air filters

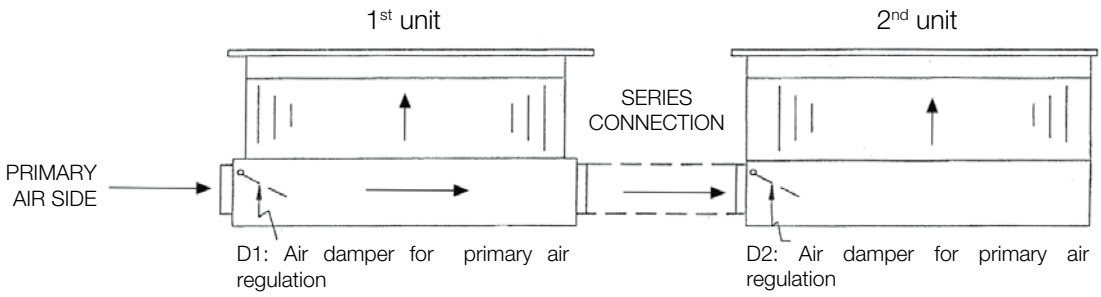
- Air filters F : Filter Scott cleanable polyurethane material of 6mm thickness.
- Air filters L : Filter Lintscreen cleanable woven aluminium

Optional W : drain connection (14mm)

- The standard delivered drain pan, can have as an optional a drip tray with a diameter of 14mm.

Optional S : series connection

- You can connect two units in series as in the drawings below

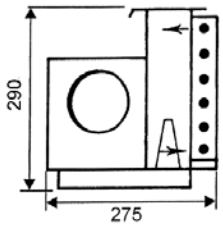


General data

MODELS MG, MH, ML	COOLING CAPACITY (W)				HEATING CAPACITY (W)			
Size	Minimum		Maximum		Minimum		Maximum	
	2 pipes system	4 pipes system	2 pipes system	4 pipes system	2 pipes system	4 pipes system	2 pipes system	4 pipes system
48	425	493	1200	1450	725	1000	2100	2000
64	527	578	1500	1800	890	1200	2600	2400
88	612	646	2000	2125	1000	1500	3450	3100
120	714	731	2400	2700	1100	1900	4200	4250

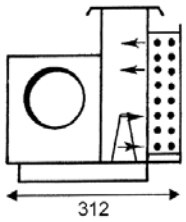
Physical data

ML



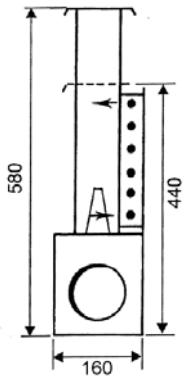
Low vertical
2 pipes

MLD



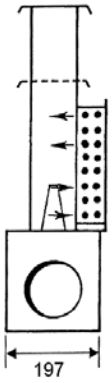
Low vertical
4 pipes

MG



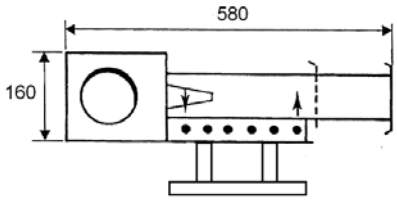
Vertical 2 pipes

MGD



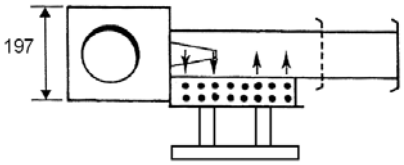
Vertical 4 pipes

MH



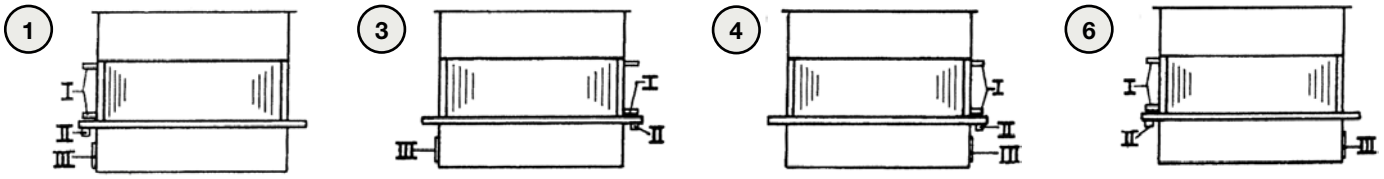
Horizontal 2 pipes

MHD



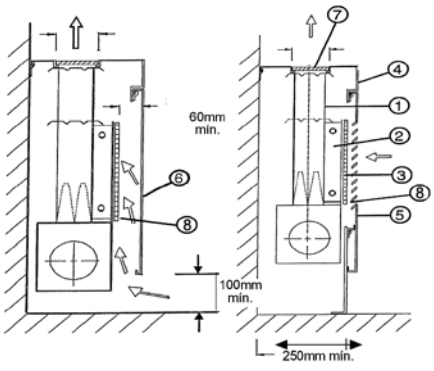
Horizontal 4 pipes

Water/air connection possibilities

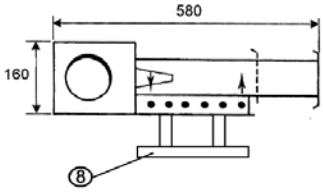


I Water connection / **II** Drain connection / **III** Air connection

Installation possibility



FLOOR MOUNTED



MH Induction unit
HORIZONTAL MOUNTED

	DESCRIPTION
1	Air discharge
2	Coil
3	Filter
4	In build space
5	Removable front panel with grills
6	Removable front panel
7	Air discharge grills
8	Drain pan

Coandair™ • 1,3 ➔ 5,6 kW
• 182 ➔ 750 m³/h

Coanda comfort chilled 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**

EC FAN

General description
- Centrifugal 2 way water cassettes engineered to obtain the best comfort result, supplied with 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 3 or 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 3 row coil for the 2 pipe system and 3+1row coil for the 4 pipe system with air diffuser.
- **Codification example:** CD 06 2P 3 HE SX (Coandair™ size 06 - 2 pipe system - 3 row coil - High version - Left water connection side)

Main components
- Ventilation group, factory tested, single or double wheel, depending 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
- On board or remote controls
- EC fans for low Energy consumption

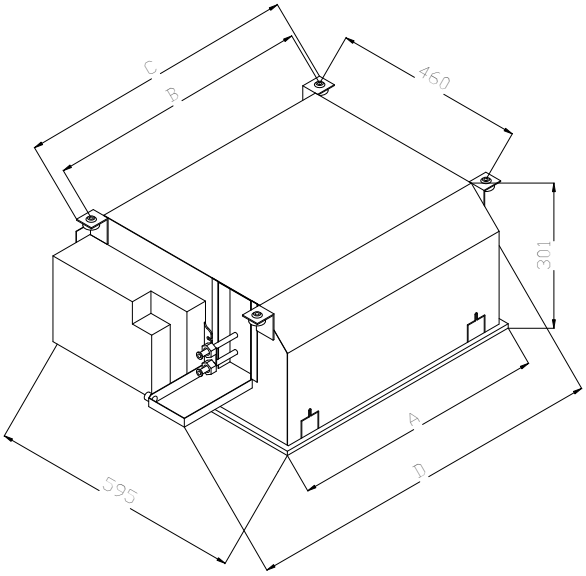
General data

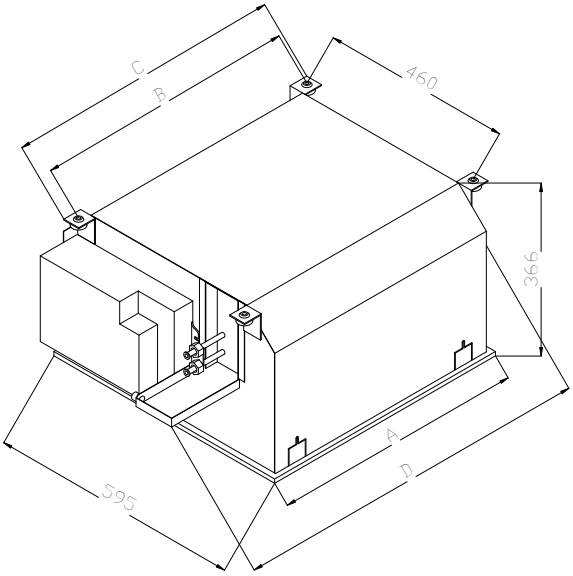
COANDAIR™	Speed	CD	06-3	06-4	09-3	09-4	12-3	12-4
Airflow	1	m^3/h	182	182	210	210	220	220
	2		225	225	240	240	280	280
	3		293	293	350	350	400	400
	4		447	447	480	480	600	600
	5		511	511	550	550	750	750
Cooling capacity (1)								
Sensible cooling capacity	1	kW	0,90	1,01	1,11	1,21	1,23	1,32
	2		1,07	1,21	1,24	1,36	1,51	1,64
	3		1,31	1,5	1,68	1,88	2,04	2,24
	4		1,80	2,11	2,16	2,44	2,82	3,16
	5		1,99	2,34	2,39	2,72	3,35	3,79
Total cooling capacity	1	kW	1,33	1,53	1,66	1,86	1,88	2,05
	2		1,56	1,82	1,85	2,08	2,13	2,54
	3		1,88	2,24	2,47	2,83	3,05	3,43
	4		2,50	3,06	3,10	3,61	4,13	4,75
	5		2,72	3,36	3,40	4,00	4,84	5,63
Water flow - Cooling	1	l/h	229	264	286	319	323	353
	2		268	313	318	357	395	436
	3		324	385	424	486	524	590
	4		430	526	533	621	710	816
	5		468	577	585	687	882	968
Water pressure drop - Cooling	1	kPa	4,79	8,18	3,43	5,12	5,34	7,68
	2		6,38	11,2	4,16	6,28	7,67	11,3
	3		9,01	16,2	7,04	11	12,8	19,5
	4		15,1	28,5	10,7	17,2	22,4	35,2
	5		17,6	33,8	12,7	20,7	29,8	48
Heating capacity								
Heating capacity 2 pipes (2)	1	kW	1,53	1,68	1,85	1,99	2,02	2,13
	2		1,81	2,01	2,08	2,25	2,5	2,67
	3		2,24	2,53	2,85	3,13	3,41	3,7
	4		3,09	3,57	3,67	4,1	4,74	5,25
	5		3,41	3,97	4,08	4,6	5,67	6,33
Water pressure drop - 2 pipes	1	kPa	4,08	6,9	2,94	4,36	4,5	6,5
	2		5,42	9,4	3,57	5,35	6,5	9,5
	3		7,65	13,7	6,03	9,4	11	16,6
	4		12,8	24,2	9,17	14,7	19	30
	5		14,9	28,6	10,9	17,7	28,3	40,9
Heating capacity 4 pipes (3)	1	kW	1	NA	1,33	NA	1,54	NA
	2		1,15	NA	1,45	NA	1,81	NA
	3		1,36	NA	1,86	NA	2,3	NA
	4		1,77	NA	2,28	NA	2,99	NA
	5		1,87	NA	2,48	NA	3,45	NA
Water flow - 4 pipes	1	l/h	87,6	NA	116	NA	134	NA
	2		100	NA	127	NA	159	NA
	3		119	NA	163	NA	201	NA
	4		154	NA	199	NA	261	NA
	5		163	NA	217	NA	301	NA
Water pressure drop - 4 pipes	1	kPa	1,13	NA	2,59	NA	4,29	NA
	2		1,45	NA	3,04	NA	5,78	NA
	3		1,96	NA	4,75	NA	8,87	NA
	4		3,15	NA	6,86	NA	14,3	NA
	5		3,5	NA	8,02	NA	18,5	NA
Electrical data								
Voltage		V / Ph / Hz	230/1/50					
Fan absorbed power	1	kW	41,7		36,8		37	
	2		42,7		39,8		39,6	
	3		43,3		44,4		45,7	
	4		45,2		54,3		58,3	
	5		45,7		67,6		74,5	
Acoustic								
Sound power level	1	dB(A)	35		34		27	
	2		40		39		34	
	3		46		45		38	
	4		54		50		48	
	5		56		54		53	

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

Physical data

Standard (SE) and raised version (HE)

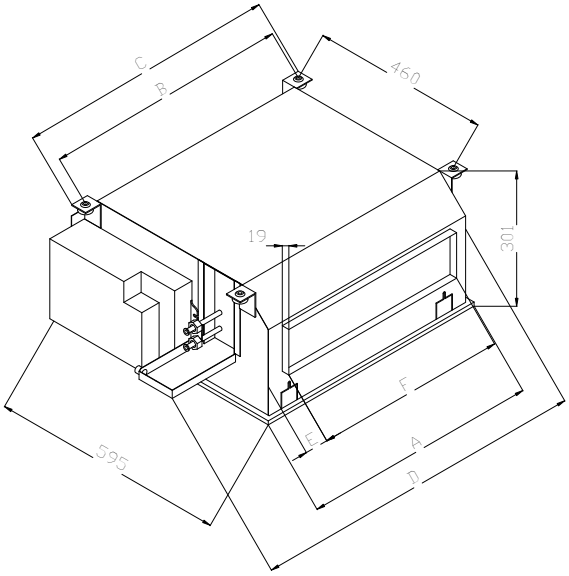




COANDAIR™	CD	06	09	12
Standard (SE)				
A	mm	595	895	1195
B	mm	616	916	1216
C	mm	655	955	1255
D	mm	779	1079	1379
Weight	kg	25	36	47
Raised (HE)				
A	mm	595	895	1195
B	mm	616	916	1216
C	mm	655	955	1255
D	mm	779	1079	1379
Weight	kg	25	36	47

Physical data

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™ • 13 ➔ 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 exchanger in steel or copper tubes. Fins pressed from aluminium sheet, bonded onto the tubes (thickness: 1 mm steel tube, 0,7 copper tube. Diameter 22 mm)

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 control
- 2 position manual control 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 introduction
- 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 pole qty		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 stream - 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 stream (high speed)	m	11	10	16	15	25	16	28	25
Air stream (low speed)	m	7,5		12	10	18	13	21	18
Air stream - 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 pole qty		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 stream - Horizontal discharge					
Height	m	2,5 - 3,5	3 - 4	4 - 5,5	3,5 - 5,5
Air stream	m	7,5	10	13	18

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

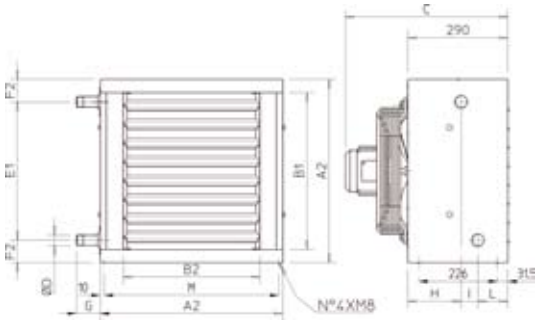
AXIL™ Z		414	524	639
Technical information				
Motor pole qty		6	6	6
Fan speed	rpm	900	900	900
Heating capacity	kW	14	24	39
Airflow	m^3/h	1600	2550	4500
Motor power	W	50	120	120
Sound pressure level at 5 m	dB(A)	51	54	60

AXIL™ V		402-4	502-4	602-4	902-6
Technical information					
Motor pole qty		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	21,4/18,2	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 stream - 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 stream (high speed)	m	11	16	25	28
Air stream (low speed)	m	7,5	12	18	21

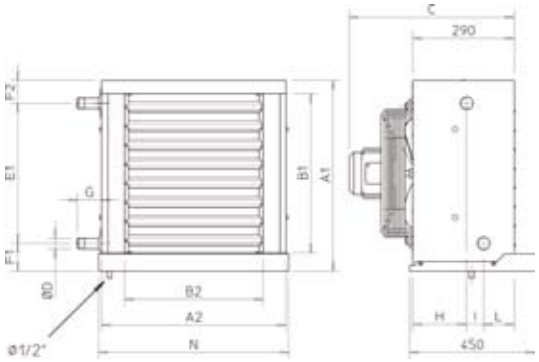
(1) Steam: Pressure 8 Bars

Physical data

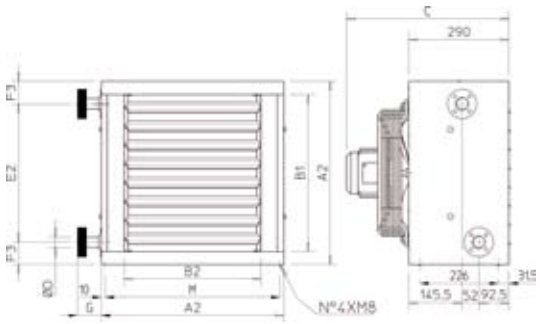
AXIL™



AXIL™ F



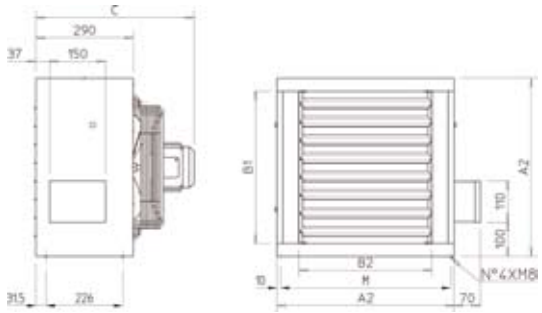
AXIL™ V



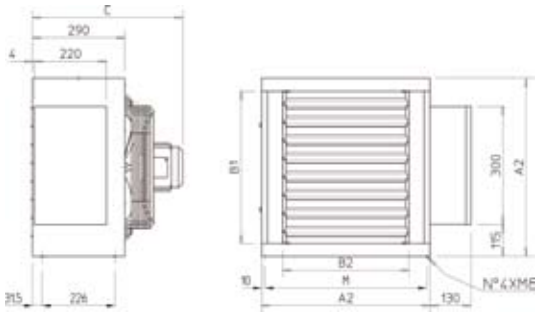
			402 / 403	502 / 503	602 / 603	902 / 903
A1		mm	537	647	754	1022
A2		mm	526	636	743	1011
B1		mm	450	550	641	885
B2		mm	394	500	640	875
C		mm	468	468	468	576
D		mm	1»	1»	1» 1/4	1» 1/2
E1		mm	397	467	588	832
E2		mm	330	467	588	832
F1		mm	75,5	80,5	88,5	100,5
F2		mm	64,5	69,5	77,5	89,5
F3		mm	98	69,5	77,5	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



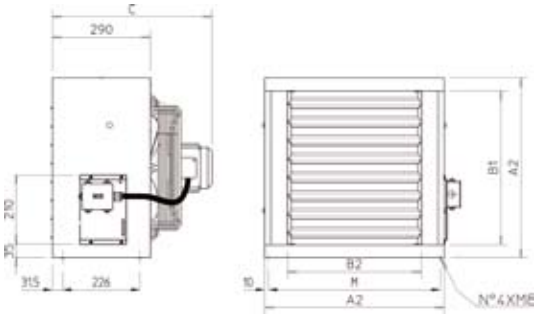
Without control



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 AHU
- 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.

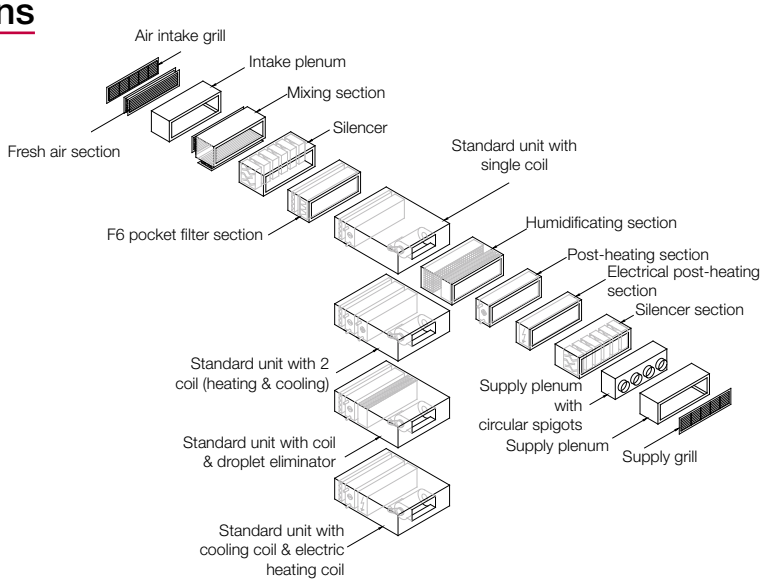
Main components

- Pre coated steel frame RAL 9002
- Sandwich panels, galvanized steel sheet metal inside and RAL 9002 pre coated steel sheet metal outside. Mineral wool 10 mm thickness thermal and acoustic insulation (sizes 10 to 40) or 20 mm (sizes 50 and 60)
- Unit inspection by lower panels which can be removed from the fans and coils sides; hasps for the 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 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
- Flter pressostat
- Anti freeze thermostat
- Damper motor 230V
- Complete modulating electronic control devices
- 3-way valves

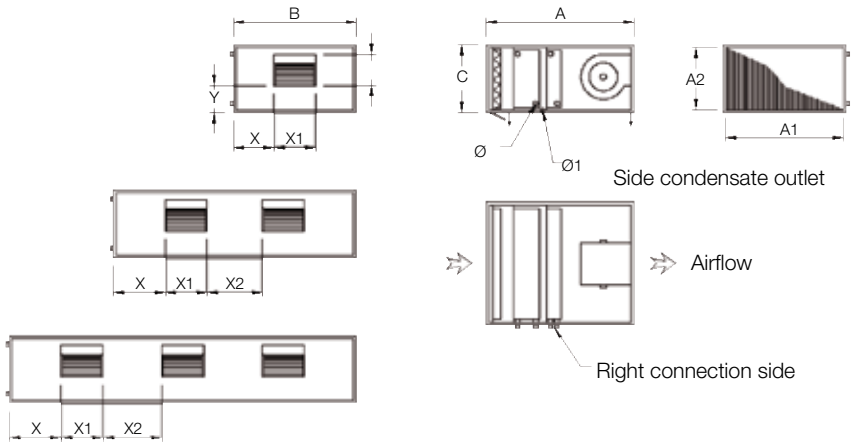


General data

MINIAIR™				10	20	25	30	40	50	60
Airflow rate			m^3/h	1040	2150	2740	3360	3950	5070	6450
E.S.P.			Pa	150	150	150	150	150	150	150
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						
Heating (3)	2R	Total capacity	kW	9,5	18,5	24,2	27,7	33,3	34,9	41,2
		Water flow	m^3/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	m^3/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	m^3/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
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	m^3/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	m^3/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

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) Entrance air temperature 27 °C DB - 19 °C WB, water temperature entrance/exit 7/12 °C - Data given for maximum speed.
(3) Entrance air temperature 20 °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	306	240	240	306	306	306
Y1	mm	216	270	216	270	270	270	270
X2	mm	-	-	318	318	418	435	-
X3	mm	-	-	-	-	-	-	285
A1	mm	670	1030	1360	1360	1640	1720	1940
A2	mm	350	350	350	350	350	420	420
X	mm	235	382	301	301	325	366	256
Y	mm	136	82	136	82	82	160	160
Weight	kg	52 ÷ 60	60 ÷ 70	75 ÷ 88	78 ÷ 90	96 ÷ 110	101 ÷ 120	120 ÷ 140

Miniair™ + • 3 ➔ 28 kW

• 300 ➔ 4000 m³/h

Air to air Heat Recovery units

Main applications

- Any commercial or residential building

Why this choice?

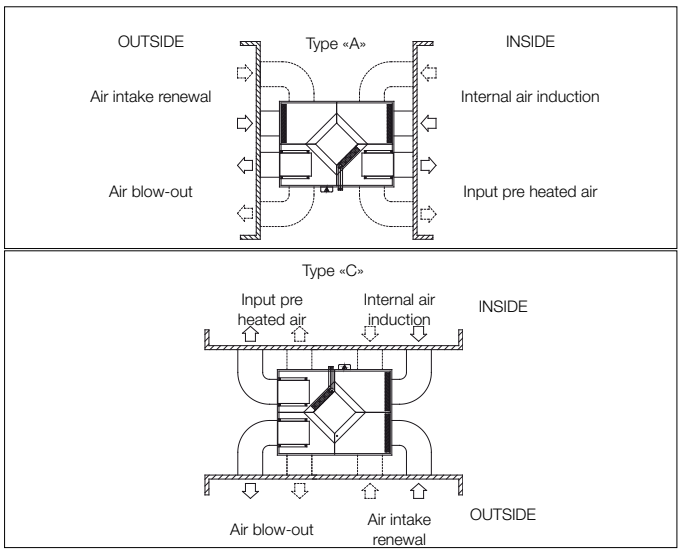
- Energy saving and air renewal
- Easy to install and service
- Integrated with traditional heating
- Or cooling systems or indipendent
- Many available configurations and accessories
- **High efficiency filters, by-pass for free-cooling and built-in control configuration**

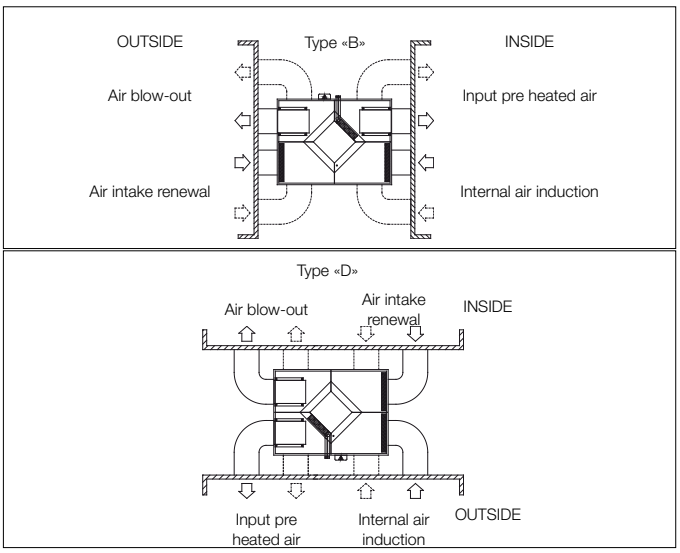
NEW

General description

Compact air to air heat recovery units, verticals or horizontals, in 8 different capacity sizes (from 200 to 4600 m³/h) or 5 different capacity sizes with integrated bypass (from 500 to 3700 m³/h).

Available orientations:





Main components

- Pre coated metal steel frame
- Fully removable pre coated panels
- 10 mm thickness (up to 10 size) or 20 mm thickness (for upper sizes) with mineral wool 10 mm thermal and acoustic insulation
- Stainless steel drain tray extended to all cooling or heating components.
- Multi speed direct driven double inlet forward curved fans, eventually supplied with built-in frequency inverter motors; fan groups installed on anti-vibrators.
- G4 synthetic cell filter
- High efficiency crossflow heat recovery, aluminium heat exchanger plates with additional sealing.

Available accessories - configurations

- **NEW configurations:**
  - * Heat recovery unit with by-pass for free-cooling, high efficiency filters (G4, F6, F7, F8) and built-in control
  - * Heat recovery unit with high efficiency filters (G4, F6, F7, F8) and built-in control
- Internal water heating coil
- 1 stage electric heater
- Water cooling section
- Inlet / exhaust dampers
- Mixing box 3 dampers section
- Circular duct connection and flexible duct joint
- Roof cover for outdoor installation
- F6 soft bag filter section
- Air filter pressure switch
- Antifreeze thermostat
- 230V damper motor
- Built-in inverter motors
- Control panels
- Complete modulating electronic control devices
- 3-way valves

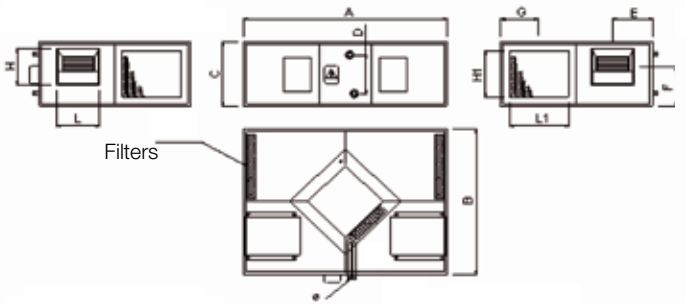
General data

MINIAIR™ +			03	06	10	14	19	25	30	40
Airflow rate		m^3/h	300	500	1000	1400	1900	2500	3200	4000
E.S.P.		Pa	100	100	90	140	120	110	170	170
Sound level at 1 m (1)		dB(A)	51	51	53	60	59	56	59	62
Shaft power		W	2 x 60	2 x 60	2 x 147	2 x 350	2 x 350	2 x 350	2 x 550	2 x 750
Poles			1,2	1,4	3	5,8	6,2	6	11,4	6,2
Fan speeds			3	3	3	3	3	3	3	2
Protection class			Min 20							
Isolation class			Min. B							
Power supply		V/Ph/Hz	230/1/50							400/3/50
Recovery efficiency		%	52,0	56,1	53,4	52,1	51,8	57,6	56	55,6
Recovery capacity		kW	1,4	2,6	4,6	6,2	8,4	12,3	15,3	19,4
Electrical coil	Capacity	kW	2	4	4,5	6	9	12	12	12
	Power supply	V/Ph/Hz	230/1/50		400/3/50					
	Absorb curent	A	8,7	17,4	6,5	8,7	13	17,3	17,3	17,3
	Air pressure drop	Pa	5	5	6	6	8	6	9	13
Heating coil (2)	Max capacity	KW	not available		11,3	16,3	20,4	29,7	35,1	44,3
	Air oulet temperature	°C			40,5	41,5	39	42,2	39,6	39,9
	Water flow	Pa			65	64	85	62	85	92
	Water pressure drop	kPa			13	31	18	20	27	49
Cooling coil (3)	Max capacity	KW	2,5	3,8	6,8	9,6	13,1	19	22	28,1
	Water flow	Pa	23	67	74	82	90	66	100	98
	Water pressure drop	kPa	8	13	13	13	16	21	29	33

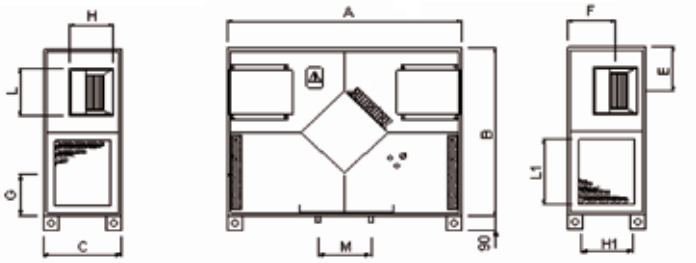
(1) Sound pressure calculated in free field of the fan at 1m from unit.
(2) Entrance air temperature 8°C, water temperature 70/60°C.
(3) Entrance air condition 29 °C, RH 60 %, in/out water temperature 7/12°C.

Physical data

Horizontal configuration

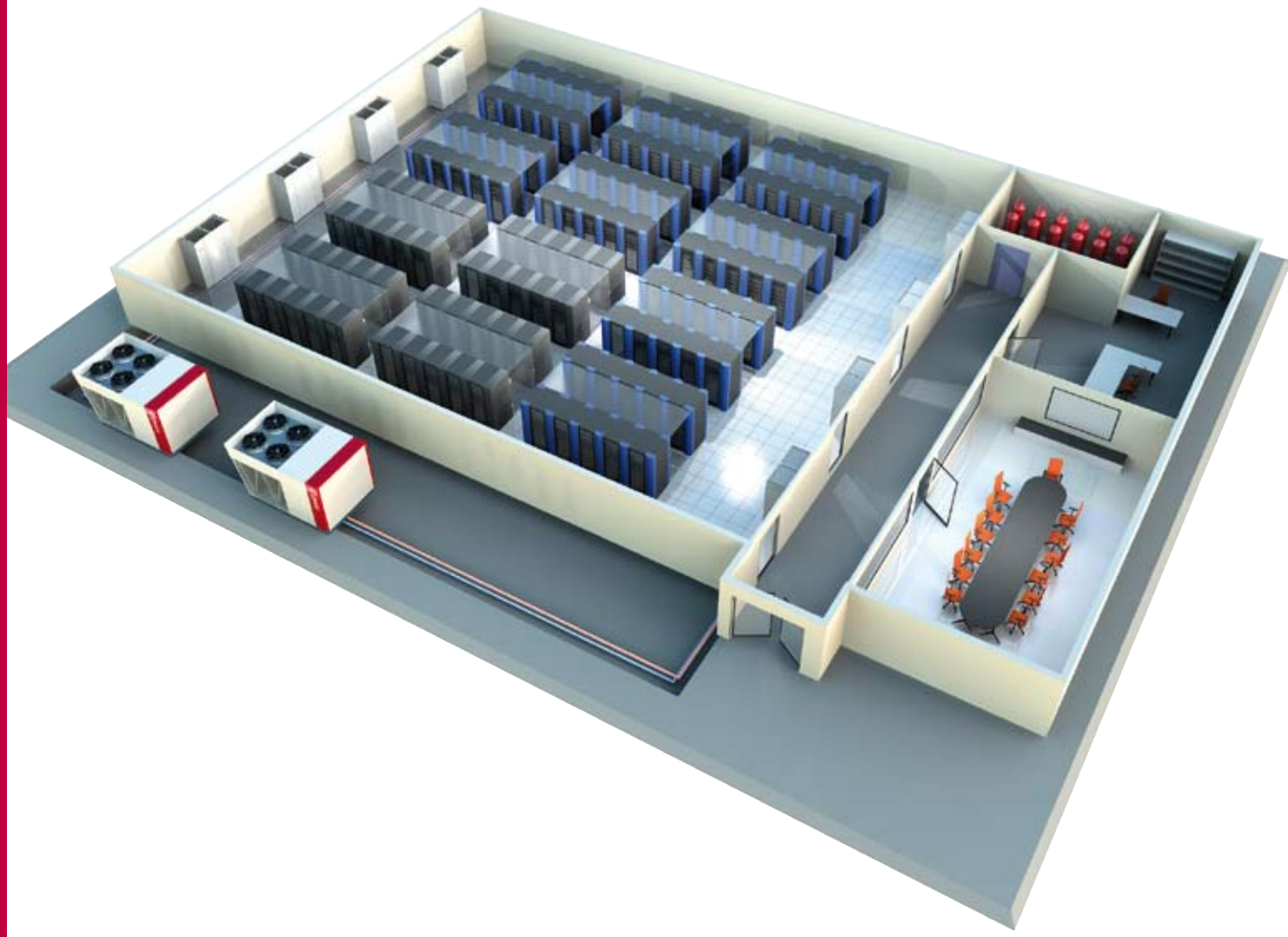


Vertical configuration



MINIAIR™ +		03	06	10	14	19	25	30	40
A	mm	990	990	1150	1300	1450	1700	1700	1700
B	mm	750	750	860	900	900	1230	1230	1230
C	mm	270	270	385	410	470	490	530	630
D	mm	-		230	230	280	305	305	405
L	mm	162	162	240	240	240	306	339	339
H	mm	100	100	218	270	270	270	297	297
L1	mm	275	275	330	337	337	502	502	502
H1	mm	153	153	267	267	327	347	387	487
E	mm	120	197	225	241	230	323	308	308
F	mm	135	171	238	224	284	304	331	431
G	mm	197	197	225	241	241	323	323	323
M	mm	100	100	100	100	145	100	100	100
Ø		-	-	G 3/4"					
Weight	kg	39	41	68	91	99	140	155	179

Close Control Units



Providing IT climate technology

@DNOVA™ • 2,5 ➔ 25 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 configurations

- THX : Wall mounted monobloc outdoor unit
- THN : Wall mounted monobloc indoor unit
- 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 (R407C, R134a).
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, the drip tray in galvanized still is in standard (stainless steel as an option)
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 user interface 4x20 LCD.

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™ AIRCOOLED (PACKAGED INDOOR UNIT) UPFLOW/DOWNFLOW/DISPLACEMENT	THN	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	20,0	22,0	24,5
Sensible Cooling capacity	kW	4,4	5,5	7,1	9,0	10,9	11,9	15,0	16,9	17,1	20,0	22,0	24,5
SHR		1	0,99	1	1	1	1	1	0,98	1	1	1	1
Number of compressors (2)	scroll	1	1	1	1	1	1	1	1	1	1	1	1
Air Flow	m^3/h	1450	2100	2100	3020	3020	3020	3800	3800	6500	6500	6500	6500
Sound Power Level	dB(A)	69	69	69	72	72	72	72	72	80	80	81	82
Sound Pressure (10m free field)	dB(A)	41	41	41	44	44	44	44	44	-	-	-	-
Height	mm	1850	1850	1850	1850	1850	1850	1850	1850	2050	2050	2050	2050
Width	mm	800	800	800	1000	1000	1000	1160	1160	1500	1500	1500	1500
Depth	mm	550	550	550	550	550	550	550	550	800	800	800	800

(1) Indoor conditions 27°C/ 40% relative humidity Outdoor condition: 35 °C

(2) Rotary compressor on model THN0045

@DNOVA™ AIRCOOLED (PACKAGED OUTDOOR UNIT) UPFLOW (1)	THX	0045	0056	0073	0090	0105	0120	0145	0902	1102	1302
Total cooling capacity (2)	kW	4,5	5,6	7,1	8,9	10,2	11,8	14,1	9,1	10,8	13,2
Sensible Cooling capacity	kW	4,5	5,5	6,8	8,9	10,2	11,8	14,1	8,7	9,7	11,7
SHR		1	0,99	0,96	1	1	1	1	0,96	0,9	0,89
Number of compressors (3)	scroll	1	1	1	1	1	1	1	2	2	2
Air Flow	m^3/h	1450	1450	2150	3020	3020	3020	3020	2800	2800	2800
Sound Power Level	dB(A)	69	70	70	71	71	71	74	72	72	72
Sound Pressure (10m free field)	dB(A)	42	43	43	44	44	44	46	45	45	45
Height	mm	1580	1580	1580	1630	1630	1790	1790	1790	1790	1790
Width	mm	804	804	804	1000	1000	1000	1000	1000	1000	1000
Depth	mm	498	498	498	596	596	596	596	596	596	596

(1) Downflow on request for several models

(2) Indoor conditions 27°C/ 40% relative humidity Outdoor condition: 35 °C

(3) Rotary compressor on model THX0045

@DNOVA™ AIRCOOLED (SPLIT SYSTEM) WALL / CEILING MOUNTED	THS	0025	0035	0045	0056	0073	0090	0105	0120	0145
Total cooling capacity (1)	kW	2,6	3,6	4,5	5,6	7,2	9,0	10,4	12,0	14,3
Sensible Cooling capacity	kW	2,6	3,6	4,5	5,5	7,2	8,9	10,1	12,0	13,3
SHR		1	1	1	0,99	1	0,99	0,97	1	0,93
Number of compressors (2)	scroll	1	1	1	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 (10m 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	1268	1268
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% relative humidity Outdoor condition: 35 °C

(2) rotary compressor on model THS0025, 0035, 0045

INNOV@™ • 6 ➔ 249 kW

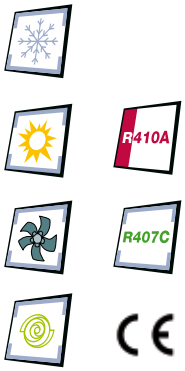
Close Control Units

Main applications

- Computer rooms
- Datacenters

Why this choice?

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



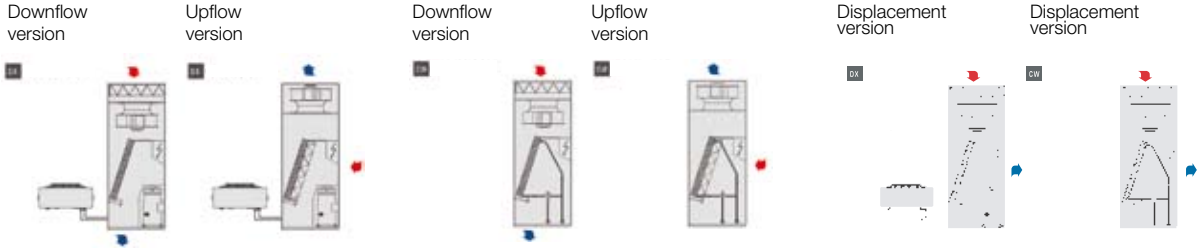
General description

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 UPFLOW/DOWNFLOW/DISPLACEMENT		0060	0080	0100	0110	0130	0160	0190	0205	0201	0251	0281	0311
Total cooling capacity (1)	kW	5,9	7,7	9,3	10,6	12,7	15,8	18,4	20,5	21,2	23,2	27,7	31,6
Sensible Cooling capacity	kW	5,9	7,4	9,3	10,6	12,5	15,6	17,3	18,9	21,2	23,2	25,5	27,2
SHR		1,00	0,96	1,00	1,00	0,98	0,99	0,94	0,92	1	1	0,92	0,86
Number of compressors	scroll	1	1	1	1	1	1	1	1	1	1	1	1
Air Flow	m^3/h	1785	2150	3530	3530	3700	5100	5100	5100	7280	7280	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	2
Height	mm	1875	1875	1875	1875	1875	1875	1875	1875	1998	1998	1998	1998
Length	mm	600	600	900	900	900	900	900	900	1000	1000	1270	1270
Depth	mm	600	600	600	600	600	600	600	600	795	795	795	795

INNOV@™ DX AIRCOOLED UPFLOW/DOWNFLOW/DISPLACEMENT		0401	0272	0302	0362	0422	0452	0532	0592	0602	0692	0762
Total cooling capacity (1)	kW	41,2	26,9	31,9	35,9	41,9	44,3	53,9	59,1	61,4	68,7	76,2
Sensible Cooling capacity	kW	40,0	26,9	31,6	35,9	40,6	43,9	46,9	49,1	58,9	65,3	70,9
SHR		0,97	1	0,99	1	0,97	0,99	0,87	0,83	0,96	0,95	0,93
Number of compressors	scroll	1	2	2	2	2	2	2	2	2	2	2
Air Flow	m^3/h	12950	12950	12950	12950	12950	12950	14150	14150	19415	19415	19415
Fan Type (2)		EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC
Number of fan		2	2	2	2	2	2	3	3	3	3	3
Height	mm	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998
Length	mm	1750	1750	1750	1750	1750	1750	2000	2000	2500	2500	2500
Depth	mm	795	795	795	795	795	795	795	795	795	795	795

INNOV@™ DX WATERCOOLED UPFLOW/DOWNFLOW/DISPLACEMENT		0060	0080	0100	0110	0130	00160	0190	0205	0201	0251	0281	0311
Total cooling capacity (1)	kW	5,3	7,0	8,9	10,0	11,7	15,5	17,8	19,7	20,0	21,1	27,1	30,2
Sensible Cooling capacity	kW	5,2	6,7	8,9	10,0	10,8	15,5	16,6	17,5	20,0	21,1	25,2	26,6
SHR		0,98	0,95	1	1	0,92	1	0,93	0,89	1	1	0,93	0,88
Number of compressors	scroll	1	1	1	1	1	1	1	1	1	1	1	1
Air Flow	m^3/h	1785	2150	3530	3530	3700	5100	5100	5100	7280	7280	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	2
Height	mm	1875	1875	1875	1875	1875	1875	1875	1875	1998	1998	1998	1998
Length	mm	600	600	900	900	900	900	900	900	1000	1000	1270	1270
Depth	mm	600	600	600	600	600	600	600	600	795	795	795	795

(1) Indoor conditions 24°C/ 50% relative humidity / Outdoor condition: 35 °C
Matching drycoolers available
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 UPFLOW/DOWNFLOW/DISPLACEMENT		0401	0272	0302	0362	0422	0452	0532	0592	0602	0692	0762
Total cooling capacity (1)	kW	39,2	23,5	28,9	34,0	39,9	42,1	52,3	598,1	58,9	68,6	78,3
Sensible Cooling capacity	kW	38,8	23,5	28,6	34,0	39,1	42,1	46	48,8	58,9	66,9	73,7
SHR		0,99	1	0,99	1	0,98	1	0,88	0,84	1	0,97	0,94
Number of compressors	scroll	1	2	2	2	2	2	2	2	2	2	2
Air Flow	m³/h	12950	12950	12950	12950	12950	12950	14150	14150	19415	19415	19415
Fan Type (2)		EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC
Number of fan		2	2	2	2	2	2	3	3	3	3	3
Height	mm	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998
Length	mm	1750	1750	1750	1750	1750	1750	2000	2000	2500	2500	2500
Depth	mm	795	795	795	795	795	795	795	795	795	795	795

(1) Indoor conditions 24°C/ 50% relative humidity / Outdoor condition: 35 °C
Matching drycoolers available
FREECOOLING optional (direct / indirect)

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

INNOV@™ CHILLED WATER UPFLOW/DOWNFLOW/DISPLACEMENT		0080	0110	0140	0160	0200	0230	0300	0380
Total cooling capacity (1)	kW	7,7	10,6	13,3	15,8	19,7	23,4	26,8	40,5
Sensible Cooling capacity	kW	6,8	8,9	13,0	13,2	18,5	19,3	23,3	32,7
SHR		0,88	0,84	0,98	0,83	0,94	0,83	0,87	0,81
Air Flow	m³/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	1000	1000
Depth	mm	600	600	600	600	600	600	795	795

INNOV@™ CHILLED WATER UPFLOW/DOWNFLOW/DISPLACEMENT		0400	0500	0650	0750	0900	1000	1200
Total cooling capacity (1)	kW	43,5	57,3	69,1	83,1	88,7	107,6	133,4
Sensible Cooling capacity	kW	36,6	47,7	56,8	66,2	74,1	88,0	102,8
SHR		0,84	0,83	0,82	0,80	0,84	0,82	0,77
Air Flow	m³/h	14550	14550	14550	14550	21400	21400	21400
Fan Type (2)		EC	EC	EC	EC	EC	EC	EC
Number of fan		1	2	2	2	3	3	3
Height	mm	1998	1998	1998	1998	1998	1998	1998
Length	mm	1750	1750	1750	1750	2500	2500	2500
Depth	mm	795	795	795	795	795	795	795

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

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

General data

INNOV@™ CHILLED WATER UPFLOW/DOWNFLOW/DISPLACEMENT		1500 (3)	1500 (4)	1800 (3)	1800 (4)	2100 (3)	2100 (4)
Total cooling capacity (1)	kW	144,2	73	177,7	90	248,5	131,6
Sensible Cooling capacity	kW	109,6	73	127,9	90	176,4	127,7
SHR		0,76	1	0,72	1	0,71	0,98
Air Flow	m^3/h	24800	24800	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	945		945		945	

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

(2) Electronically Commutated fan
(4): Water in - out: 10 - 18°C

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

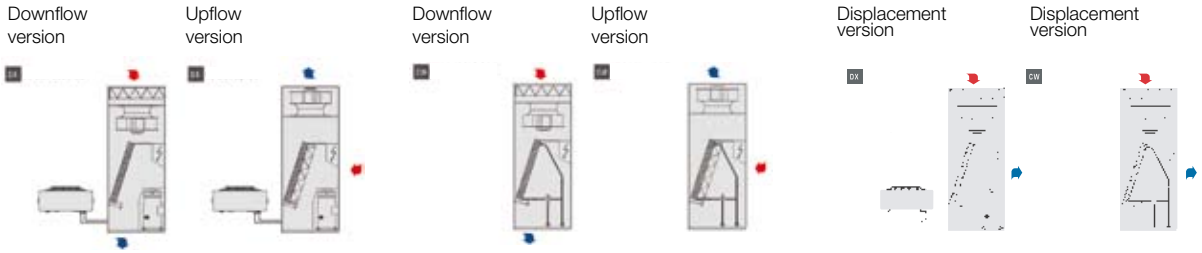
General description

The new series of **INNOV@™ ENERGY** Inverter Close Control Air Conditioning units introduce **modulating cooling capacity for computerroom and datacenter solutions.** Inverter technology integrated in Close Control Air-conditioning provides the optimum cooling capacity required. Modulating cooling capacity from 25 – 100%, varying capacity in steps of 1 Hertz, with a maximum of 6 Hertz pro second **INNOV@™** 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 and savings.

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, radial fans with reverse blades and electronically commutated (EC) DC motors offers various opportunities in energy saving.

Control

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

General Data

NNOV@™ ENERGY INVERTER DX AIRCOOLED UPFLOW/DOWNFLOW/DISPLACEMENT		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
Number off compressors (3)	scroll	1	1	1	2
Air Flow	m^3/h	1785	3700	7280	14150
Fan Type (2)		EC	EC	EC	EC
Number of fan		1	1	1	1
Length	mm	1875	1875	1998	1998
Height	mm	600	900	1270	2020
Depth	mm	600	600	795	795

(1) Indoor conditions 24°C/ 50% relative humidity / Outdoor condition: 35 °C
(3) Electronic Expansion Valve standard
Freecooling optional (direct / indirect)

(2) Electronically Commutated fan
Matching condensors available

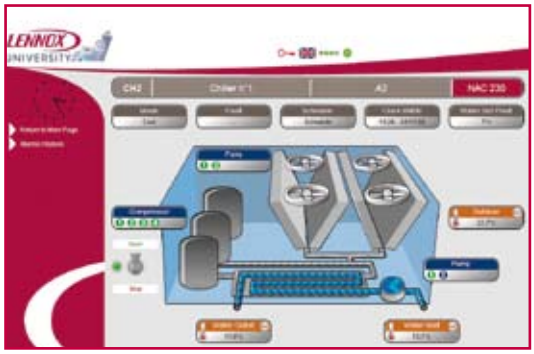
Available accessories - configurations

- 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

Controls & Supervision

Providing indoor climate comfort

Adalink™



Main applications

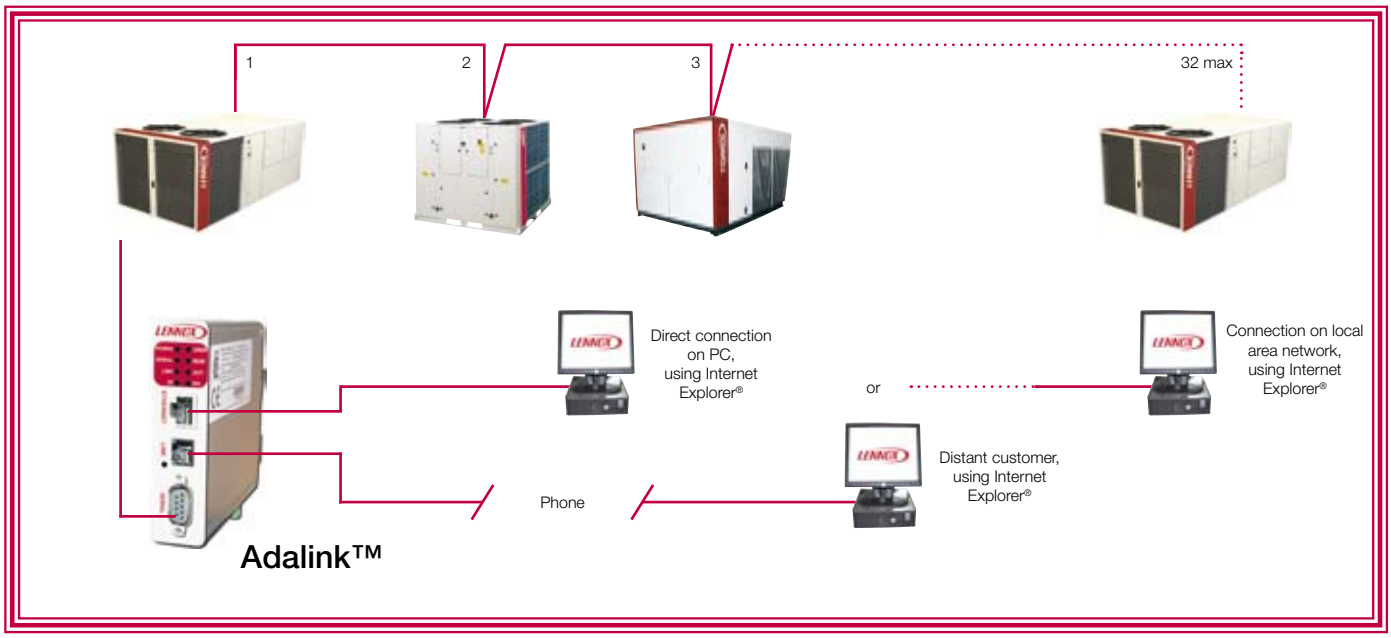
- BMS “light” system
- Small installations: up to 32 units

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 **LennoxVison™** 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.

LennoxVison™ 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.

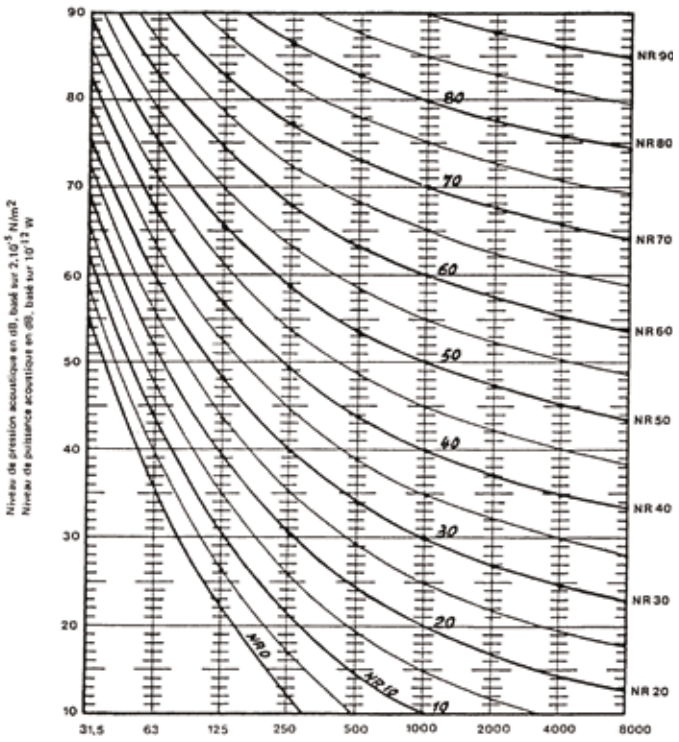


Fig. 3 Indice d'évaluation ISO du niveau de gêne

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:

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

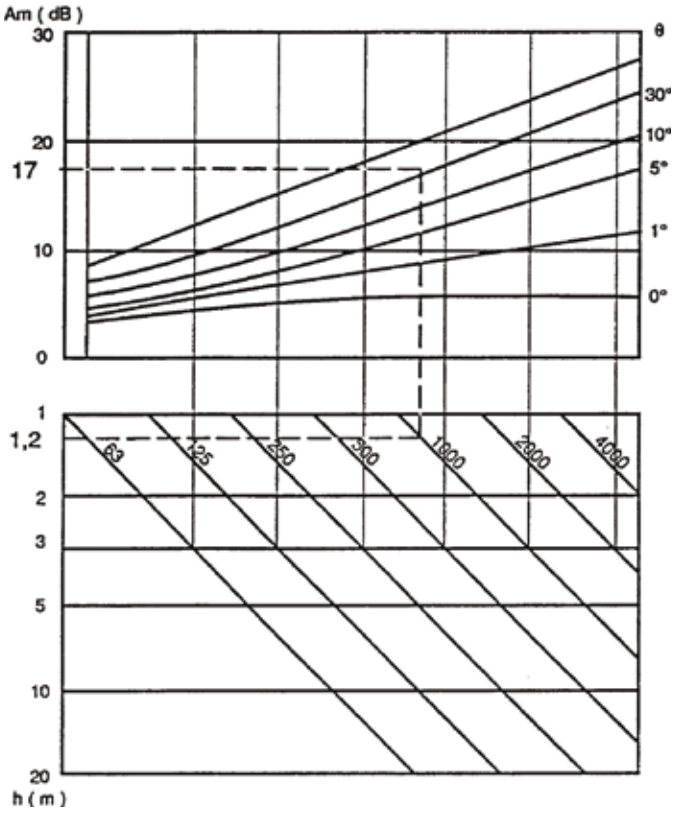
The term **Q** is called the directivity factor.
Its value is:
1 when the source is in space, emitting in a complete sphere
2 for a source on the ground, i.e. emitting in a hemisphere
4 if the source is on a wall, emitting in a quarter of a sphere
8 for a source located in a corner of a wall, emitting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

Free air or noise diffusion with an obstacle

We can use the general diffusion equation shown above:

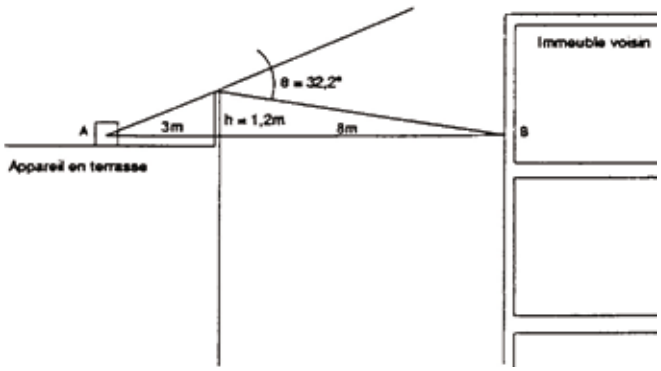
$$Lp = Lw + 10 \times \text{Log } Q / (4 \times \pi \times r^2) - Am$$

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

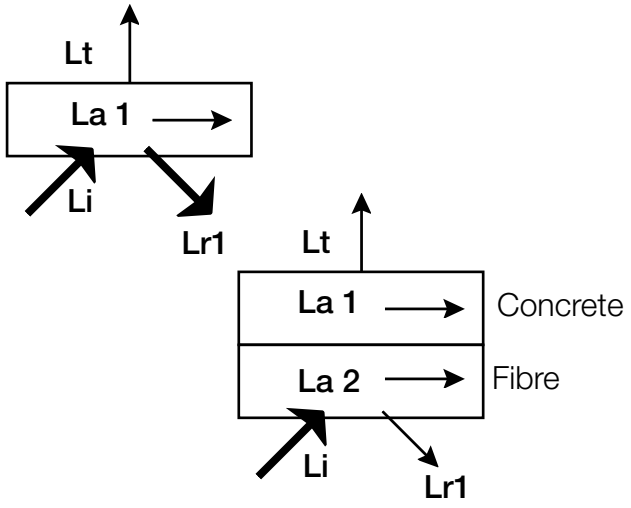
When a noise is emitted in a room, we perceive a pressure wave which comes to us directly from the source as in the free field case, but we also perceive waves reflected by the walls of the room.

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:

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

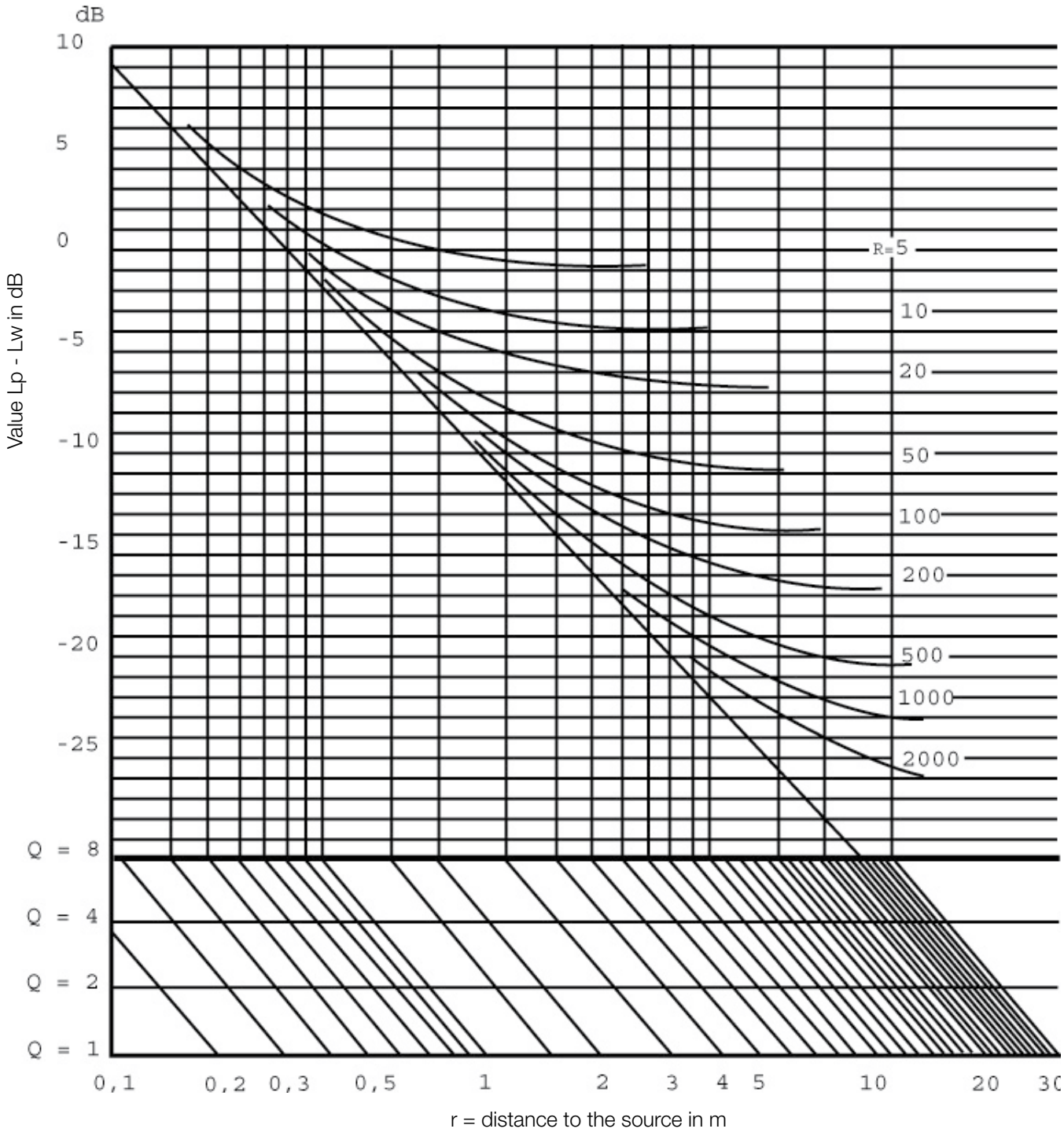
NOTA:

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

Acoustic data

Graphic expression of the equation

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



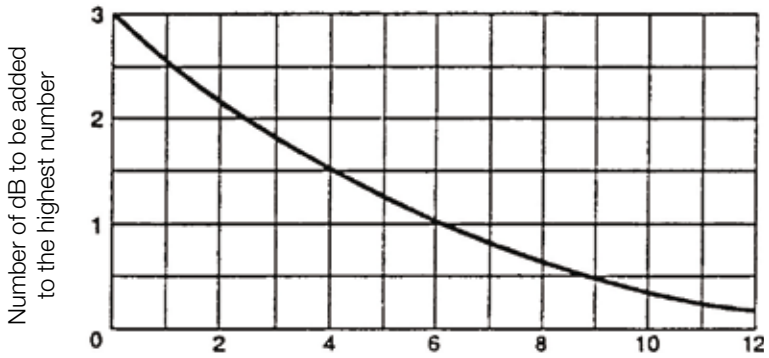
The attenuation decreases with distance in the direct field, but is constant in the reflected field.

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 :

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

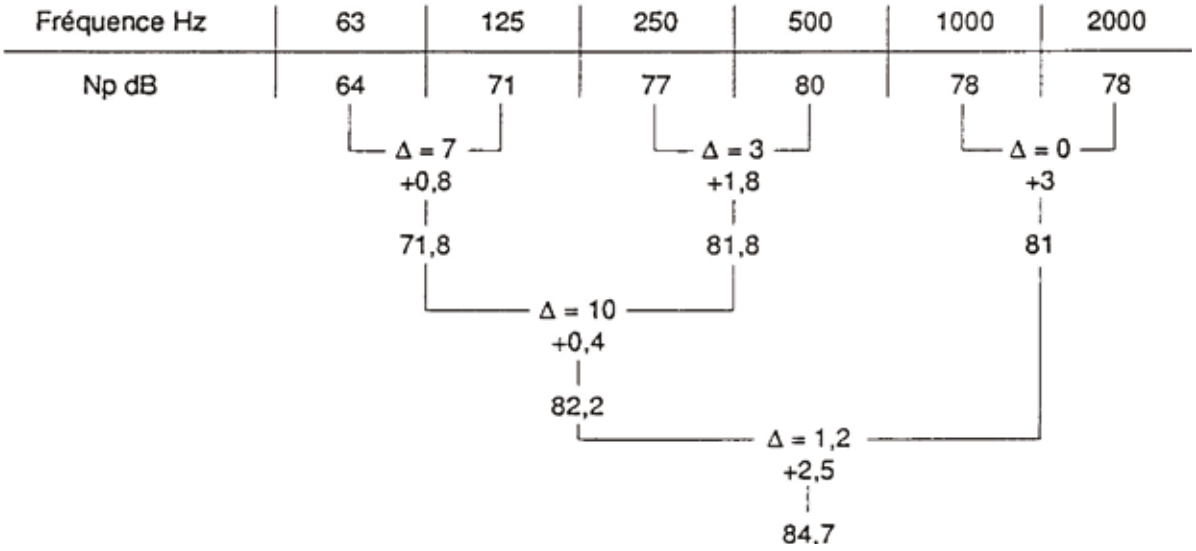
In practice, the following curve is used:



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.

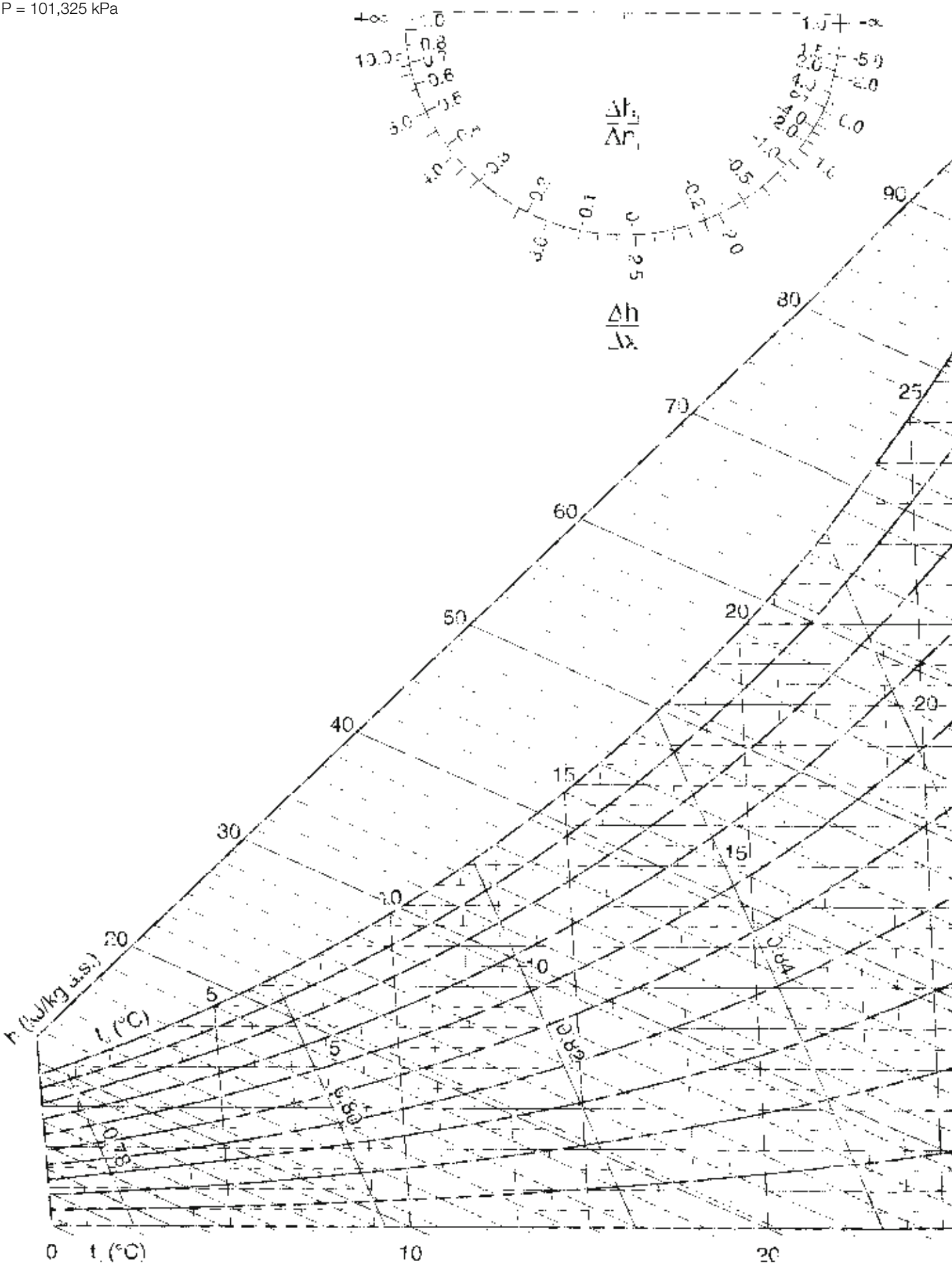
Table 2: Classification of very high efficiency filters according to Eurovent recommendation 4/4.

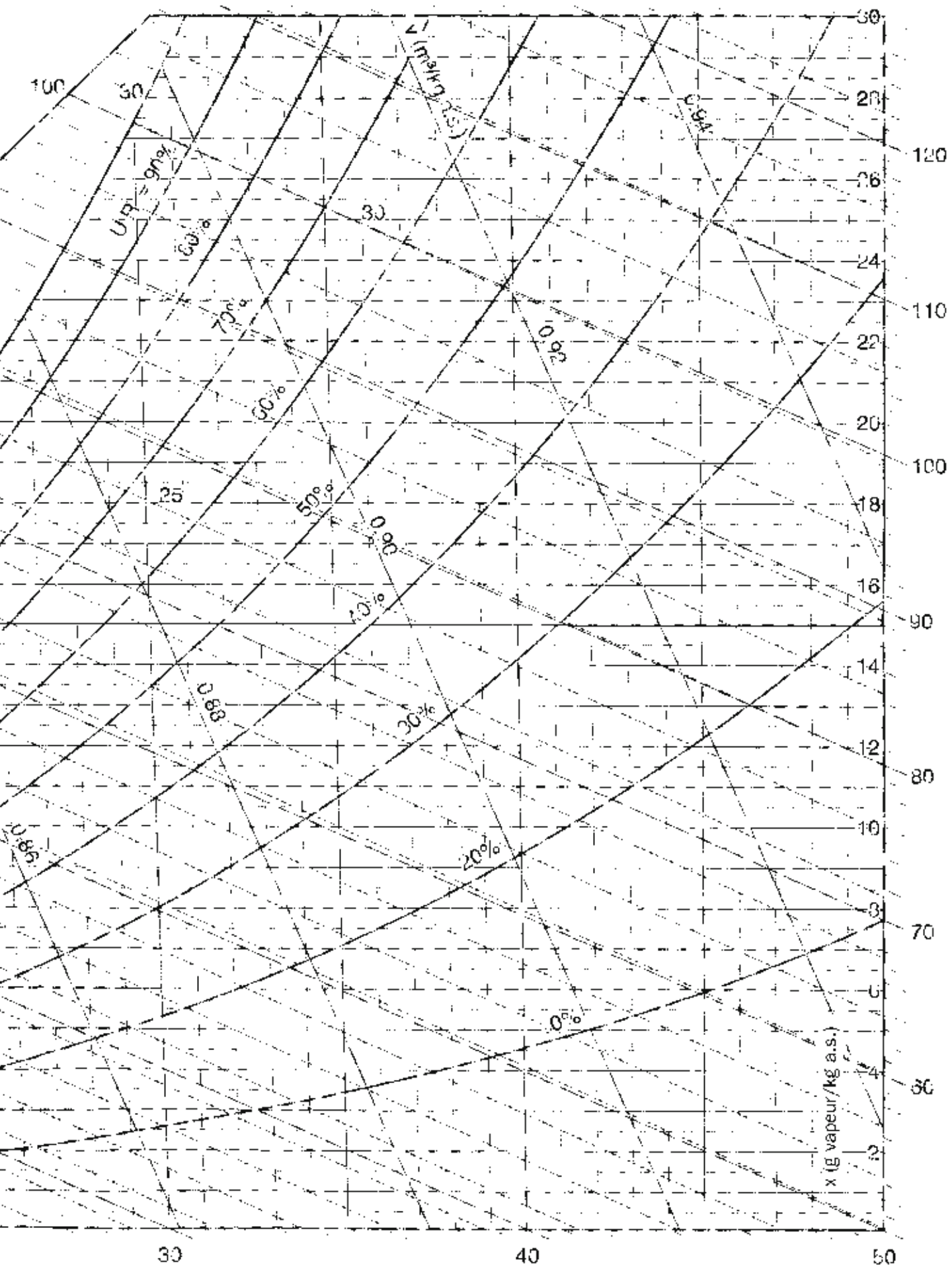
INITIAL EFFICIENCY		
Filter class	**Limits of filter classes**	
EU 10	95 < or = Ei < 99,9	5 > or = Pi > 0,1
EU 11	99,9 < or = < 99,97	0,1 > or = Pi > 0,03
EU 12	99,97 < or = Ei < 99,99	0,03 > or = Pi > 0,01
EU 13	99,99 < or = Ei < 99,999	0,01 > or = Pi > 0,001
EU 14	99,999 < or = Ei	0,001 > = Pi

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%
50%
40%
30%
20%
0%
25
30
40
50
0,94
0,92
0,90
0,88
0,86
x (g vapeur/kg a.s.)
30
20
120
26
24
110
22
20
100
18
16
90
14
12
80
10
8
70
6
4
60
2

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

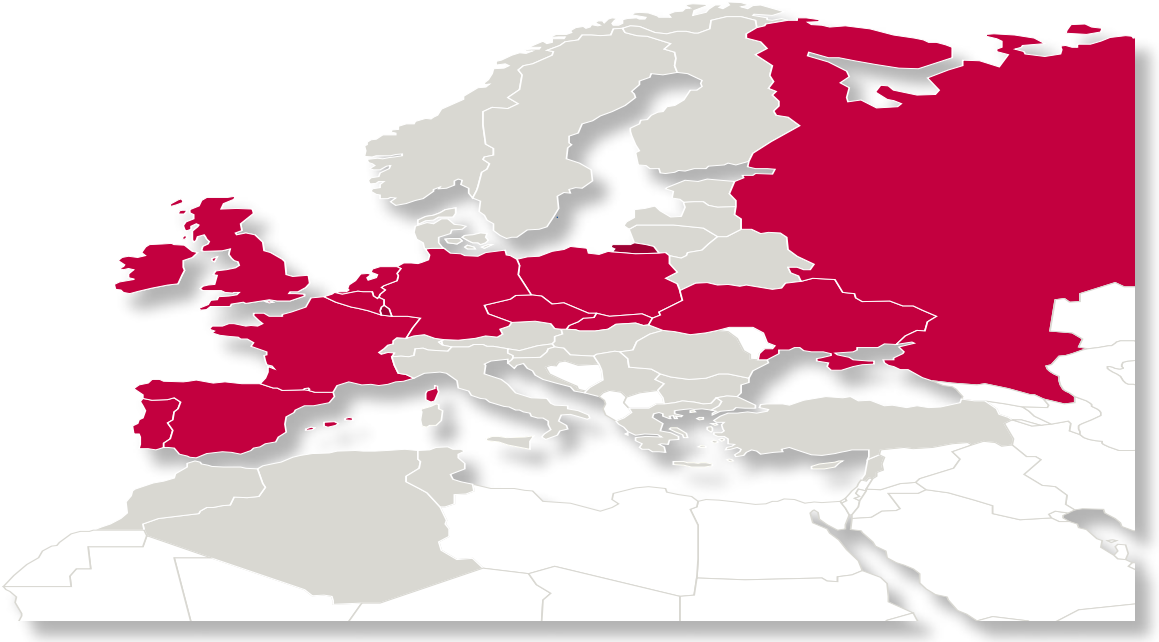
R407C refrigerant

R410A refrigerant

Hermetic scroll compressor (with R407C or R410A)

Axial condenser fan

Centrifugal fan



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