Küba Green Line
simple reliable fresh

Suitable for CO_2

Küba Green Line
Aircoolers

Welcome to the world of Küba!

Spring 2006 saw the introduction of the next Economy Line to the market – our Green World. Four completely reworked series of simple refrigeration appliances replaced the previous models, with worldwide success beyond all expectations.

We were also surprised how quickly the clear colour branding of the line of products was adopted by customers. Nationally and internationally, the talk is now of the Green World from Küba. You, dear customers, have convinced us. We are therefore now also changing the name: the Economy Line will become the Küba Green Line.

The range of applications for our Green World line will now carry the motto „simply stay cool“. When precision of temperature is important, the Küba Green Line is the right choice.

The future also holds an even wider range of products in store for you, as the „family“ of the Green World has been expanded. Our smallest, the *gastro* FM, has been fitted with the latest technology and has allowed the Green Line to expand into refrigerated counters for the catering trade.

For investors and users alike, the proven quality of Küba products (P. 8 ➢ Quality) is sure to offer the maximum operating safety and energy efficiency of our air coolers. This lowers the operating costs and ensures the long-term success of the business.

For Küba, quality always means maximum value to the customer, and so we give you the optimum technology for the appliance, and not just for technology‘s sake. The constant optimisation of the in-house processes and manufacturing techniques as well as our products are at the core of our business concept.

We work hand in hand with our partners in the refrigeration wholesale trade and refrigeration equipment installation so that these advantages get passed on to the customer. The result: expertise during use, planning and installation.

In order to give our partners an orientation for the choice of the optimum air cooler, the palette of products is arranged in order of application. With two seamless product lines, we can offer you the right high-performance air cooler for highly complex and very simple cooling requirements, from commercial through to industrial refrigeration technology.

Editorial

The Küba Blue Line is the best technical solution for complex refrigeration requirements. The Blue World stands for maximum goods protection, optimum ripening and improvement processes and universal operation, even in difficult conditions.

The Küba Green Line is the right product line for simple refrigeration requirements. By clearly focusing on standardised refrigeration functions, the Küba Green Line combines low investment and operating costs with proven Küba quality.

The *gastro* FM is most at home in refrigerated catering displays. With our smallest air cooler, every drink becomes a refreshing pleasure.

For small refrigeration cells, the *junior* DF is really big – for packaged goods and to cool open goods. From keeping things fresh to freeze storage, its complete hygiene coating means it can be used universally.

The *compact* DF lives up to its name and is a power package in a small space. In the service station, in catering or trade, it is the space-saving helper for packaged goods in plus or minus degrees.

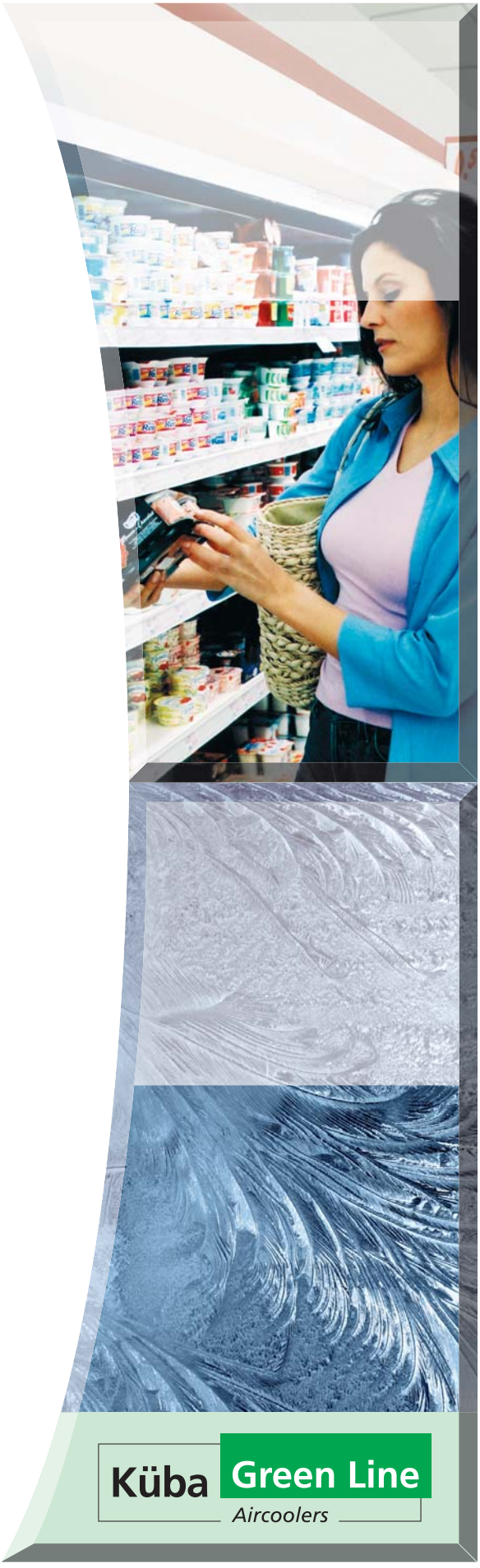
Do you have a large cool storage room or hall?
The *market plus* SP offers great performance and precision for standard refrigeration and deep freezing.

Our *comfort* DP is the gentle one in the Green World and offers sensitive cooling – where people are working. Draft-free ventilation and extremely quiet operation ensure an agreeable climate for staff and for the goods.

We would like to welcome you on an exciting journey through the „Green World“ of Küba.

Welcome!

Christoph Korinth
Technical Manager



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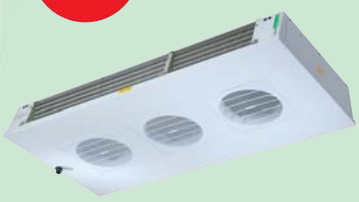


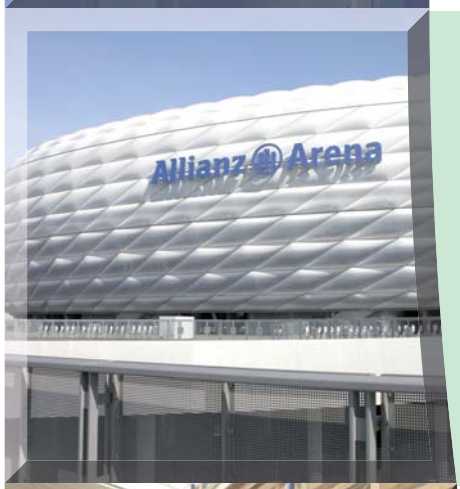
comfort DP

Informationen

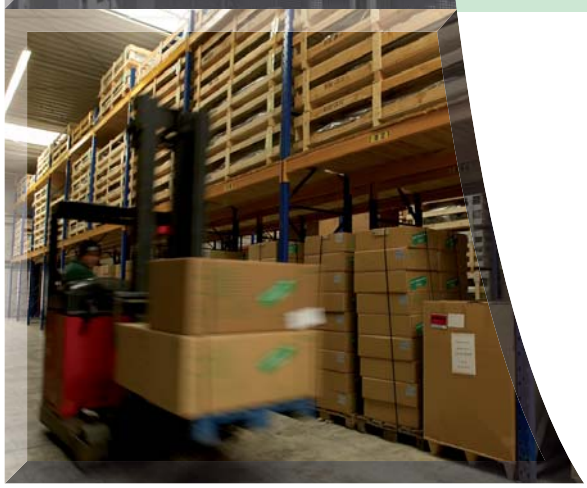
Küba stands for

- Continuity

- Quality



- Optimum solutions



- Service and availability

Küba stands for continuity:

Küba represents tradition and progress – and **8 decades of dedication to refrigeration technology.** Since 1927, Küba has developed and manufactured its products in Germany, **setting worldwide technological standards with quality „Made in Germany".**

Specialisation and continuous investment in research and development (R&D) and optimised production processes make this **consistent top performance** possible.

Küba stands for quality:

Among air cooler manufacturers in Europe, Küba has the largest R&D facility, which provides the driving force for technical advancement and innovation **in both individual components and across all products.**

The acid test of the unrivalled functionality and quality of Küba products, however, is their **daily use in thousands of practical applications.**

The result is **maximum safety** in terms of **installation, use and maintenance** as well as in the long-term **value of the investment.**

Küba stands for optimum solutions:

A consistent focus on our customer's needs is the driving force for **innovative product solutions.**

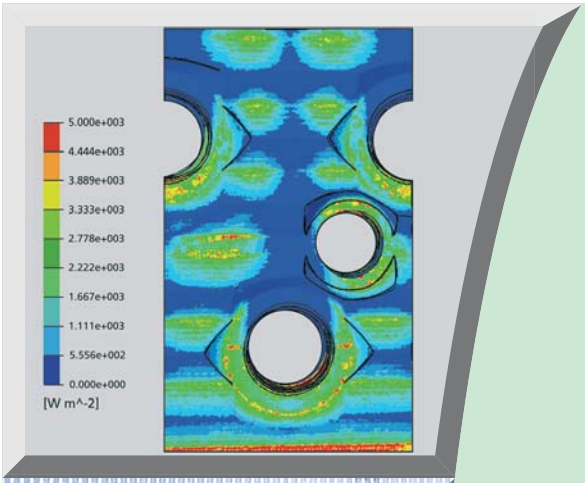
The measuring stick is always achieving the **maximum customer benefit,** not reaching the ultimate pinnacle of technology.

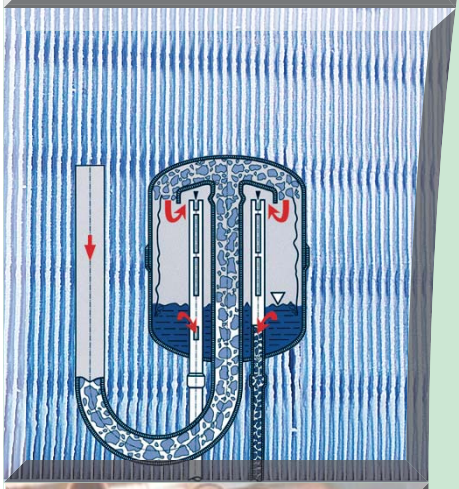
With the **Küba Blue Line** and the **Küba Green Line,** Küba is the only manufacturer to offer **two complete, comprehensive air cooler product lines.**

Küba stands for service and availability:

Of course, customer focus à la Küba also means offering extensive technical and **sales-oriented service whatever the situation.** Above all, this includes **ease and accuracy in selecting** products, accessories and spare parts.

An extensively stocked warehouse at the Baierbrunn site near Munich guarantees **rapid availability** (24 hour delivery) and provides additional **reliability for operation, planning and scheduling.**





The Küba HFE® tube / fin system for maximum energy efficiency

Extensive, ground-breaking research and innovative testing methods have lead to the development of a tube / fin system that offers an optimum combination of maximum heat transfer with minimum loss of pressure.

- Optimised k-value for **high refrigeration capacity**
- Fan requires **low energy input** thanks to low air resistance
- **Long operating periods** due to minimal frost build-up
- **Compact devices** with high capacity

The Küba CAL® distributor for optimum refrigerant distribution

Küba Air Coolers for direct expansion with multiple injection are equipped with the patented Küba CAL® distributor.

- **A consistent performer across the entire application spectrum, the Küba CAL® distributor always works at the optimum capacity**
- **Complete, consistent refrigerating capacity at all times**, regardless of refrigerant and ambient temperature
- **Maximum energy efficiency even in partial-load operation,** thanks to even refrigerant distribution
- **Universal flexibility** from +40 °C bis -55 °C

Optimal defrosting for all applications

Based on the overall concept of the refrigerating plant, any of the established defrosting methods can be used. For brine and hot gas defrosting, the tube circuitry is optimized for the specific application. For electric defrosting, expanded heater tubes achieve the optimum connection to the fin.

- **Energy transfer with almost no loss**
- **Shorter defrosting periods** due to lower final defrosting temperature in the heat exchanger
- **Minimal vapour build-up** due to low surface temperature on the heater tube (< 95 °C)

Best material selection and processing

Küba Air Coolers have lasting corrosion protection and are not overly sensitive to cleaning procedures, thanks to their scratch-resistant surface.

- We use the **best materials and high-quality components** for each application because high product quality starts in purchasing
- **Perfect surface finish**, e.g. with a food safe, non-polluting powder coating that is applied before assembly: corrosion protection even for inaccessible components

Highly cost-effective

Choosing Küba Air Coolers is the right decision for ecologically, economically oriented investors.

- Because our components are fine-tuned to coordinate precisely with each other, Küba Air Coolers are highly efficient. We take advantage of all energy saving potential for sustainable **reductions in operating costs**
- Selecting the best materials and high-quality processing are the basis for **long service life** and provide the **best protection for your investment**

Maximum goods protection

All Küba Air Coolers rely on Küba quality to offer optimum goods protection for the respective refrigeration application.

- Absolute security regarding the temperature of the goods and the room
- **Minimal dehumidification** of sensitive cooled goods so the „freshness lasts longer".
- **Perfectly adjusted air distribution** – from a powerful air flow to gentle cooling

Hygienic and operational safety

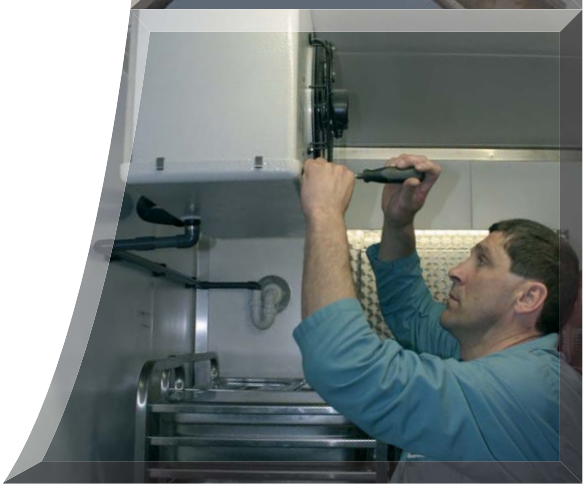
When you're dealing with food, hygiene is essential and for operators, it is legally prescribed, e.g. the HACCP guidelines.

- Material selection and surface finish such as the powder coating **meet the requirements of food and consumer product legislation**
- Of course, **it's simple to clean Küba products. Often drip trays with downward fold-out hinges are standard; hinged fans on request**
- **Long-lasting corrosion protection** facilitates hygiene in the cold storage room

Optimum installation and maintenance

The design of Küba Air Coolers places great emphasis on quick and easy assembly and maintenance.

- All significant component groups are **easily accessible**
- We **prevent injuries** with the powder coating and by avoiding the use of sharp edges
- The smaller Air Coolers **can be installed right out of the package by just one technician**



Küba Green Line

gastro **FM**
Q_0 up to 0,33 kW

gastro FM starting on page 12

junior **DF**
Q_0 up to 2,1 kW

junior DF starting on page 20

compact **DF**
Q_0 up to 10 kW

compact DF starting on page 27

market plus **SP**
Q_0 up to 50 kW

market plus SP starting on page 35

comfort **DP**
Q_0 up to 28 kW

comfort DP starting on page 47

Küba Green Line
simple reliable fresh

The right product line for simple cooling applications.

With a clear focus on standardised refrigeration tasks, the Küba Green Line combines low investment and operating costs with proven Küba quality.

Küba Blue Line

Küba Blue Line
Freshness that lasts longer

The best technical solution for complex cooling applications.

The Küba Blue Line stands for maximum goods protection, optimum ripening or finishing processes and universal use even in difficult environmental conditions.

DE *professional*
Q_0 up to 9,4 kW

SG *commercial*
Q_0 up to 32 kW

SG *industrial*
Q_0 up to 170 kW

SF *blastfreezer*
Q_0 up to 64 kW

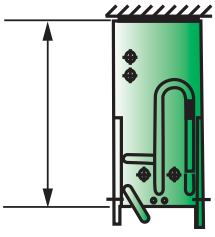
DZ *production*
Q_0 up to 78 kW

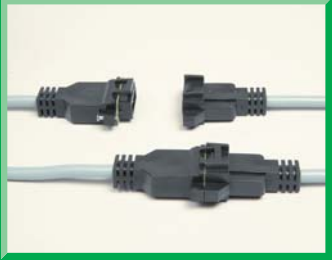
Please also see our separate Blue Line catalogue.

Küba *gastro* FM

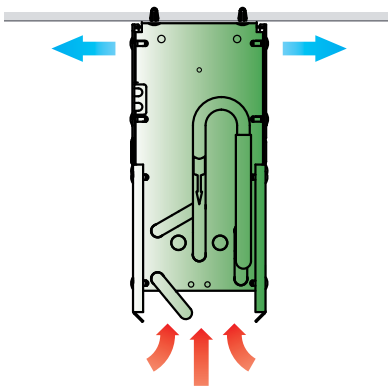
Q_0

0,14 — 0,33 kW





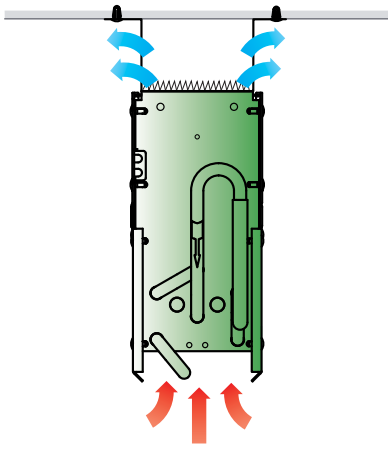
Application Benefits for Contractors and Operators



***gastro* FM: applicable for every counter and cabinet**

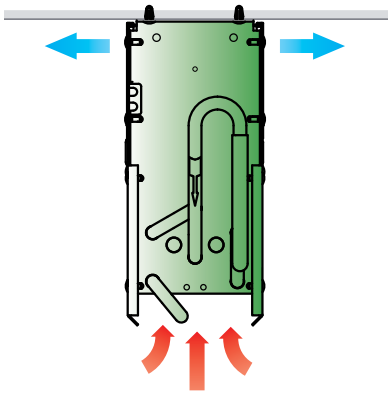
FMA lateral air outlet

- For easy cleaning, the side panels and the air outlet grids can be removed and replaced without tools



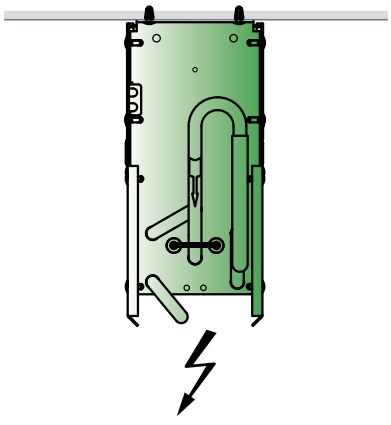
FMA air outlet top

- For easy cleaning, the side panels and the air outlet grids can be removed and replaced without tools



Best airflow

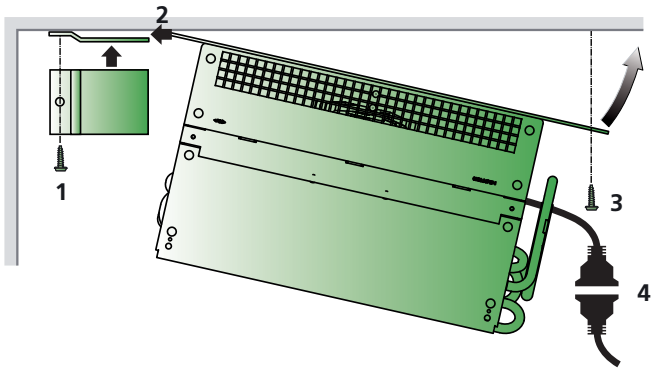
- Optimal airflow through Küba air guide, patented with the FMA
  - wider distribution
  - enhanced air circulation
  - ➧ faster cooling of goods



Extreme applications

- Installation of additional TAS flexible heater possible
- Fans IP 54

Application Benefits for Contractors and Operators, Nomenclature



Straightforward mounting

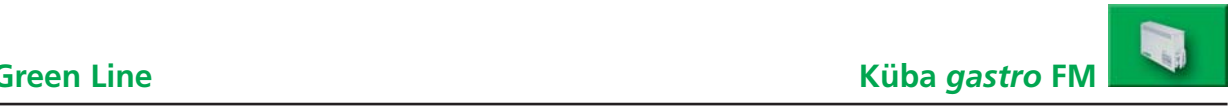
- Improved assembly with hard to access counter fridges through **included mounting bracket** at FMA
- Plug connections for fans, IP54, mounted external to the air cooler
  - No additional wiring required

Nomenclature

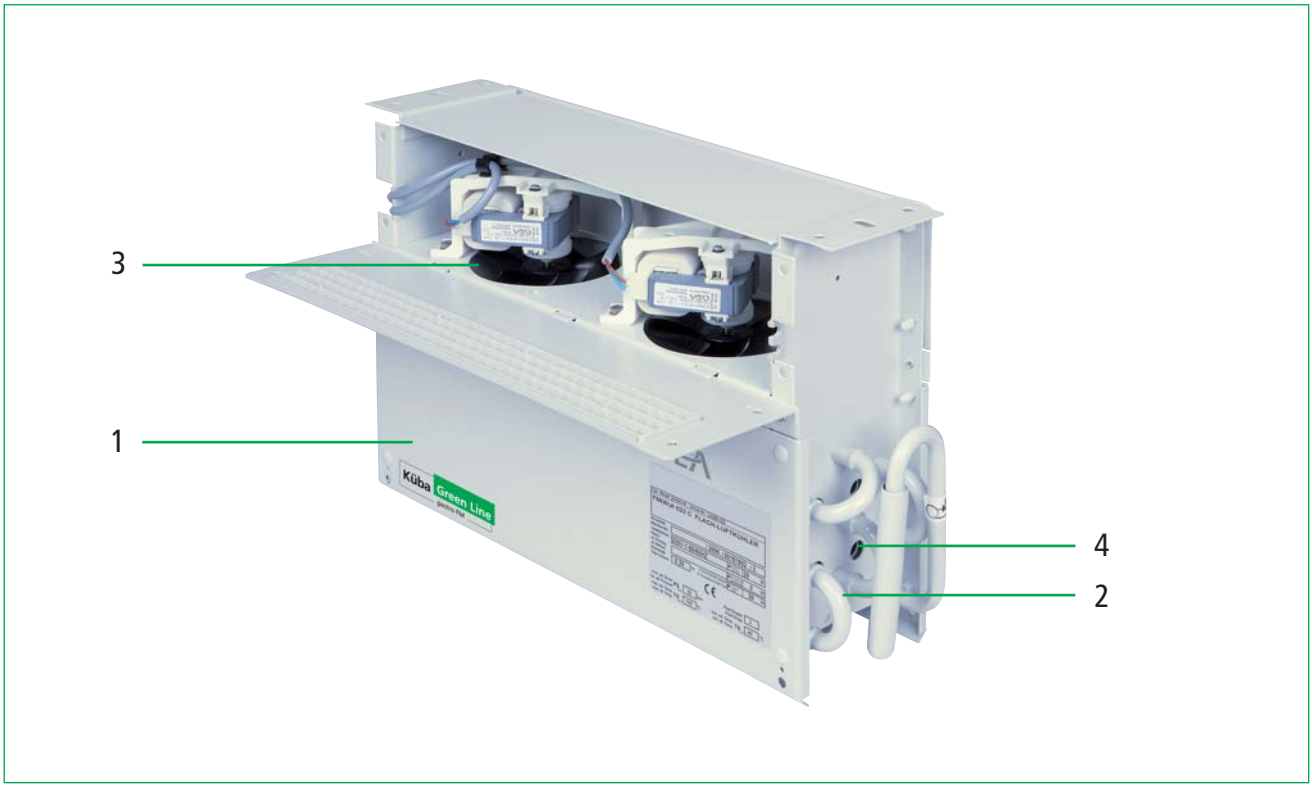
Standard

FM	O	A	02	2	D

- Line designation
- Air discharge upwards
- Fin spacing: **A = 4,5 mm**
- Generation code D
- Number of fans: **1 - 2**
- Installation size: **01 - 04**



Construction



1. Casing

- Aluminium, smooth
- High-quality powder coating, papyrus white RAL 9018
  - Food-safe
  - Easy to clean
  - Best corrosion protection
- Removeable side panels
- All components dishwasher-safe
- FMA air discharge sideways at both sides – with air guiding grille
  - can be converted to air discharge at one side using supplied cover plate
- FMOA air discharge upwards at both sides
  - can be converted to air discharge at one side using pluggable gill-shaped air guidance system

2. Cooler

- Fin spacing: 4,5 mm
- Tube arrangement aligned
- Tubing Cu-Special, Fins Al, End plates Al
- Fully powder coated

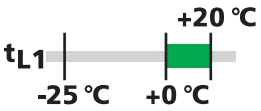
3. Fans CE

- Motors and plugs IP 54 in acc. with DIN EN 60529
- 3 m cable with plug connections
- 230V±10%, 50/60 Hz
- In acc. with VDE/CE
- Application range: RT -20 °C to +45 °C

4. Electric defrost

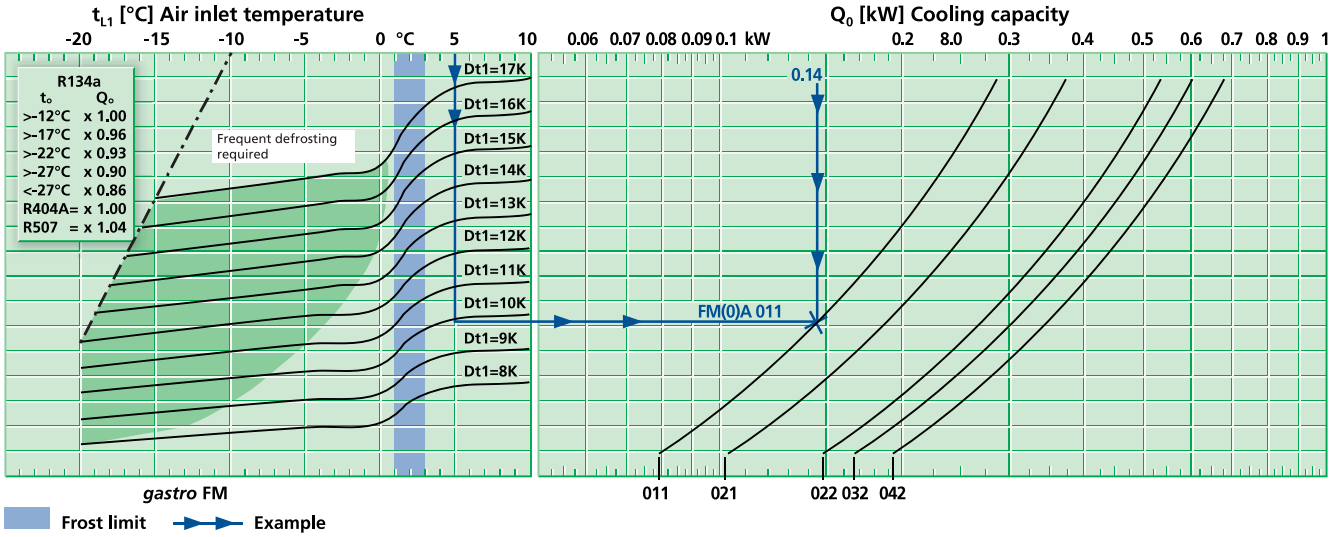
- With flexible Küba heater, TAS supplement element

Technical data — FM(O)A — 4,5 mm



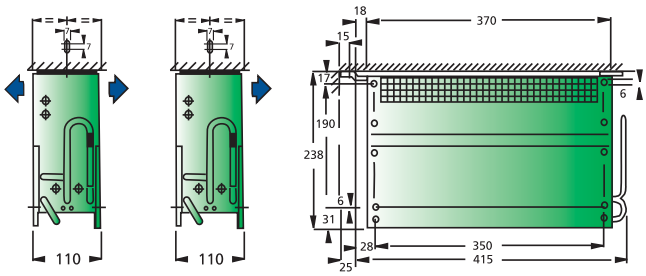
Model		Rating Q_0 bei t_{L1} ±5 °C DT1 = 10K	Surface	Air flow	Air throw two-sided	Air throw one-sided	Tube volume	Connections Inlet	Connections Outlet	Sound L_{WA}	Fans (Operating values at 50 Hz) Blade	Type of current	Per Fan		
		kW	m²	m³/h	m	m	dm³	Ø mm	Ø mm	dB(A)	St. x Ø mm	230±10% V-1 50/60Hz	min⁻¹	W	A
FM(O)A 011	✇	0,14	1,2	80	3	4	0,3	10	10	61	1 x 90	230V-1	2200	12	0,10
FM(O)A 021	✇	0,18	1,8	80	3	4	0,3	10	10	61	1 x 90	230V-1	2200	12	0,10
FM(O)A 022	✇✇	0,26	1,8	140	3	4	0,3	10	10	64	2 x 90	230V-1	2200	12	0,10
FM(O)A 032	✇✇	0,29	2,4	135	3	4	0,4	10	10	64	2 x 90	230V-1	2200	12	0,10
FM(O)A 042	✇✇	0,33	3,6	125	3	4	0,6	10	10	64	2 x 90	230V-1	2200	12	0,10

Q_V - diagram (R22, R134a, R404A, R507)

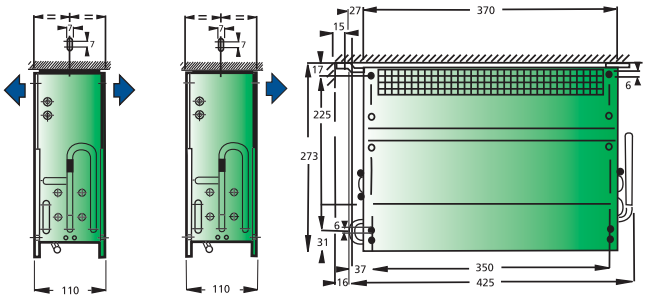


The technical data are also given in the product selection software.

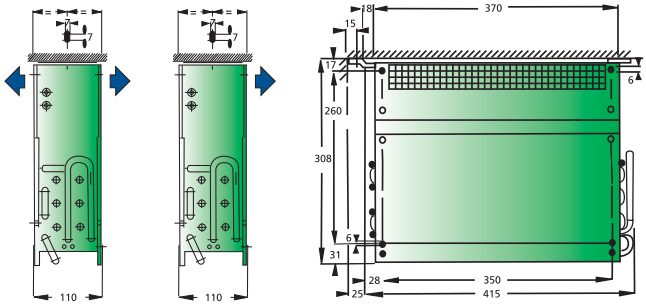
Dimensions



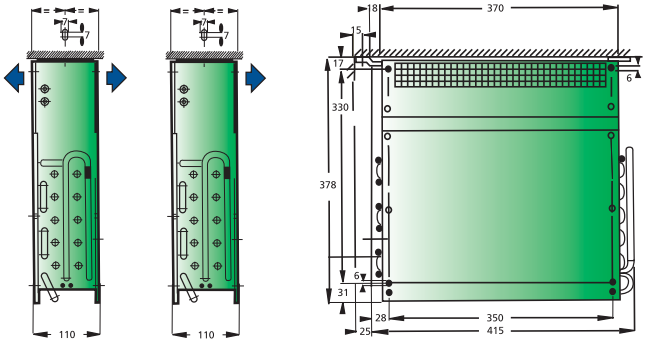
FMA 011



FMA 021, 022

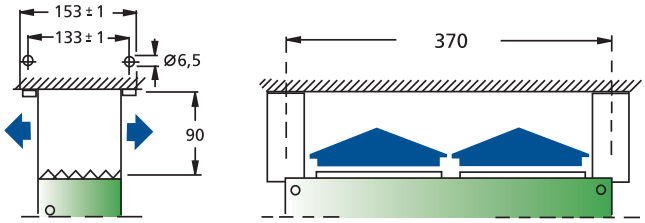


FMA 032



FMA 042

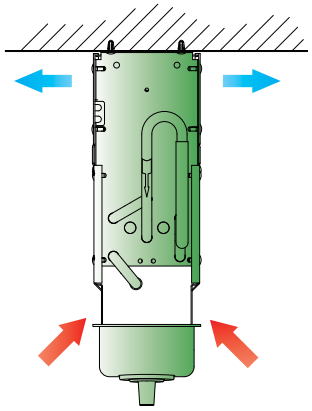
FMOA version corresponds to FMA dimensions of the FMOA ceiling fixture



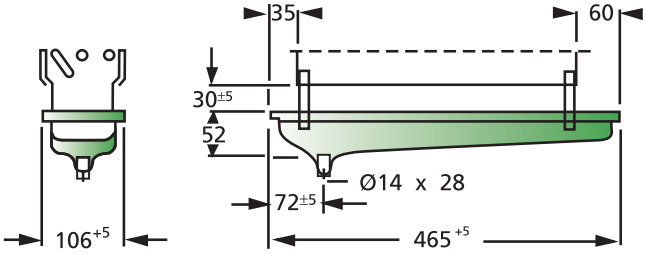
Accessories

Drip tray

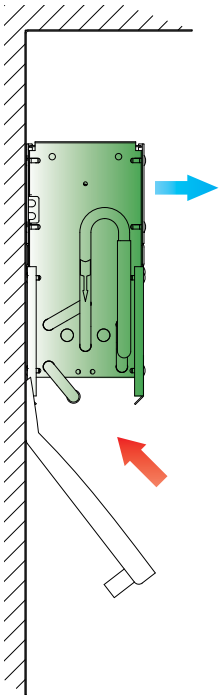
FMA, FMOA drip tray



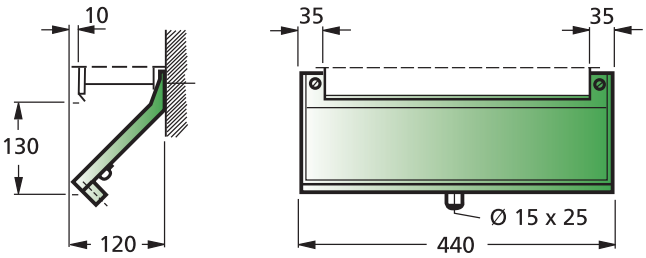
Polystyrene, not suited for el. heating
Stainless steel bracket



FMA, FMOA drip tray

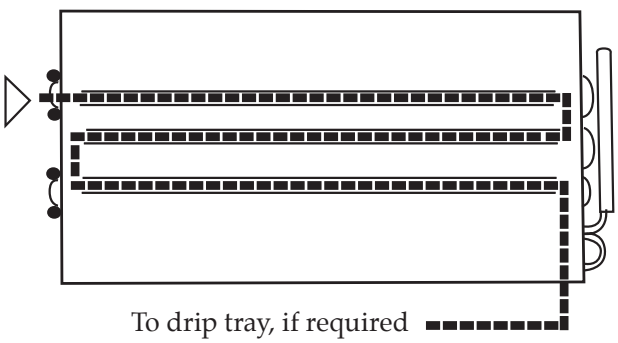


Aluminium, painted

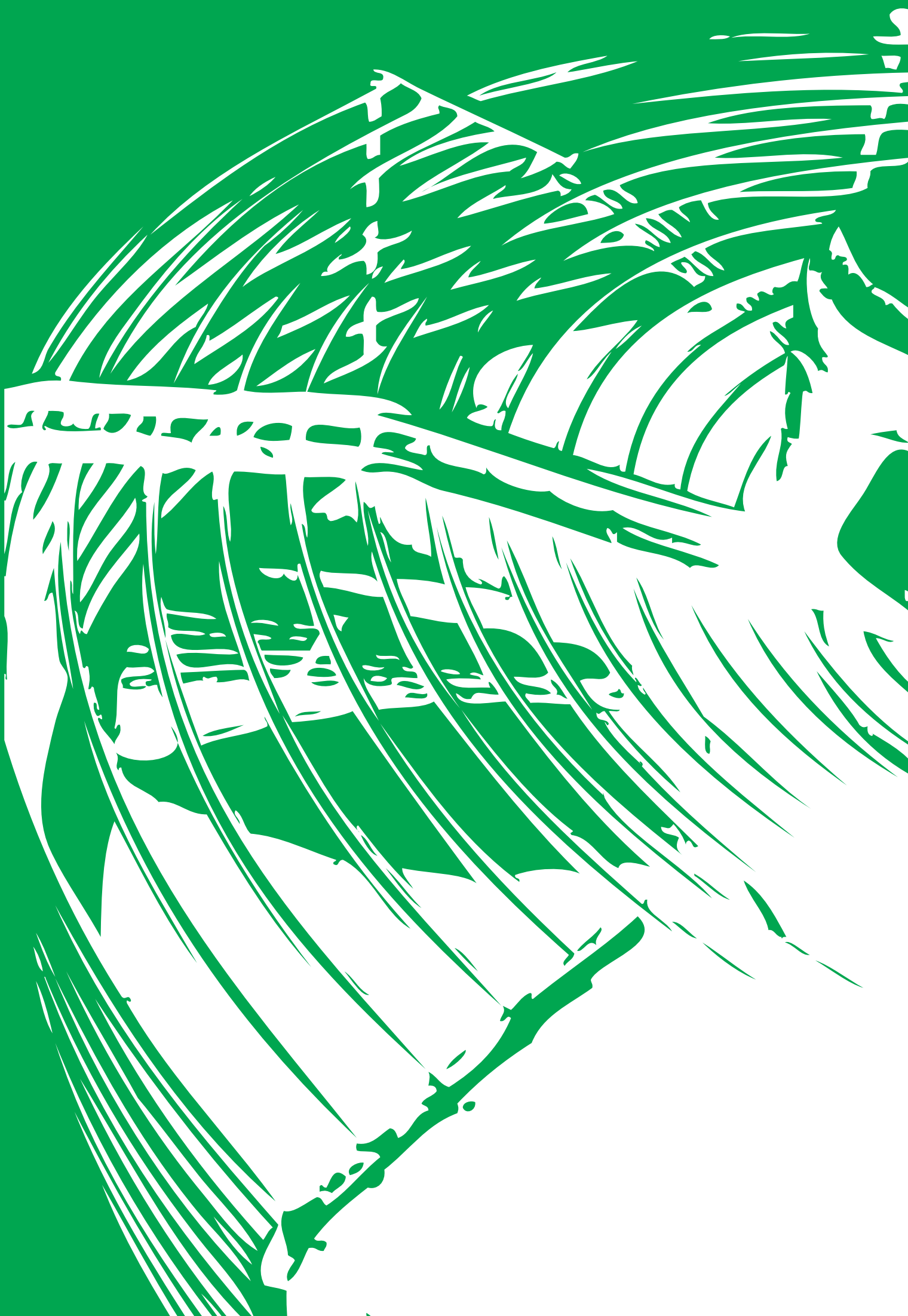


Flexible electric defrost TAS

230V-1
Standard version



For Cooler	Electric defrost for Cooler		Length in m
FM(O)A 011	TAS 13	72 W	1,3
FM(O)A 021	TAS 20	110 W	2,0
FM(O)A 022	TAS 20	110 W	2,0
FM(O)A 032	TAS 30	165 W	3,0
FM(O)A 042	TAS 40	220 W	4,0
FM(O)A 011	TAS 13	72 W	1,3
FM(O)A 021	TAS 20	110 W	2,0
FM(O)A 022	TAS 20	110 W	2,0
FM(O)A 032	TAS 30	165 W	3,0
FM(O)A 042	TAS 40	220 W	4,0



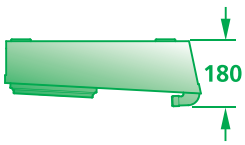
Küba *junior* DF

Ceiling Air Cooler
Hygienic version

Q_0

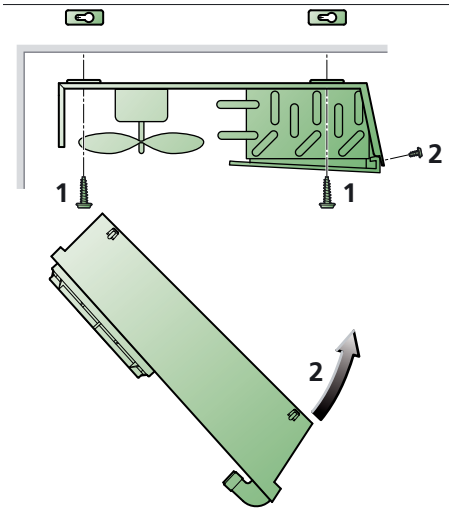
0,4 — 2,0 kW

H max.



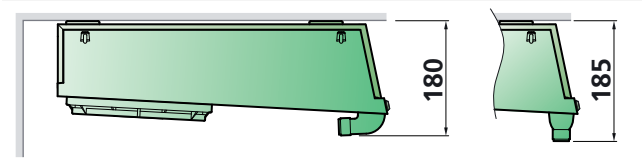
EUROVENT
CERTIFIED PERFORMANCE
applied for
"CERTIFY ALL"
Air Coolers

Application Benefits for Contractors and Operators



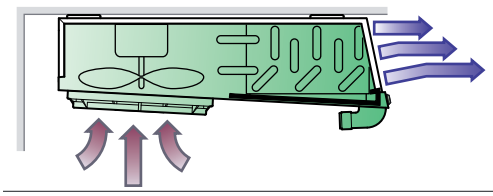
Straightforward mounting

- Removable fan plate
  ① Screw unit to ceiling
- Connect unit
  ② Re-install lower section



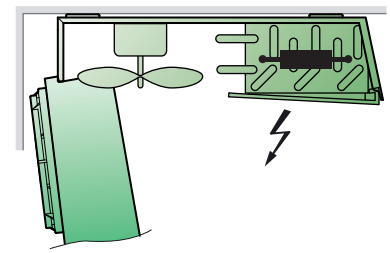
Space-saving

- Horizontal drain
- As a result the height including 90° elbow is reduced to 180 mm



Best air guidance

- Integrated air baffle plate
- Directs the air along the ceiling of the room and therefore projects it far into the room



Extreme applications

- Additional heating installation possible
- In extreme applications, e.g. in deep-freeze rooms with door openings, an additional electric heater can be retrofitted for trouble-free operation

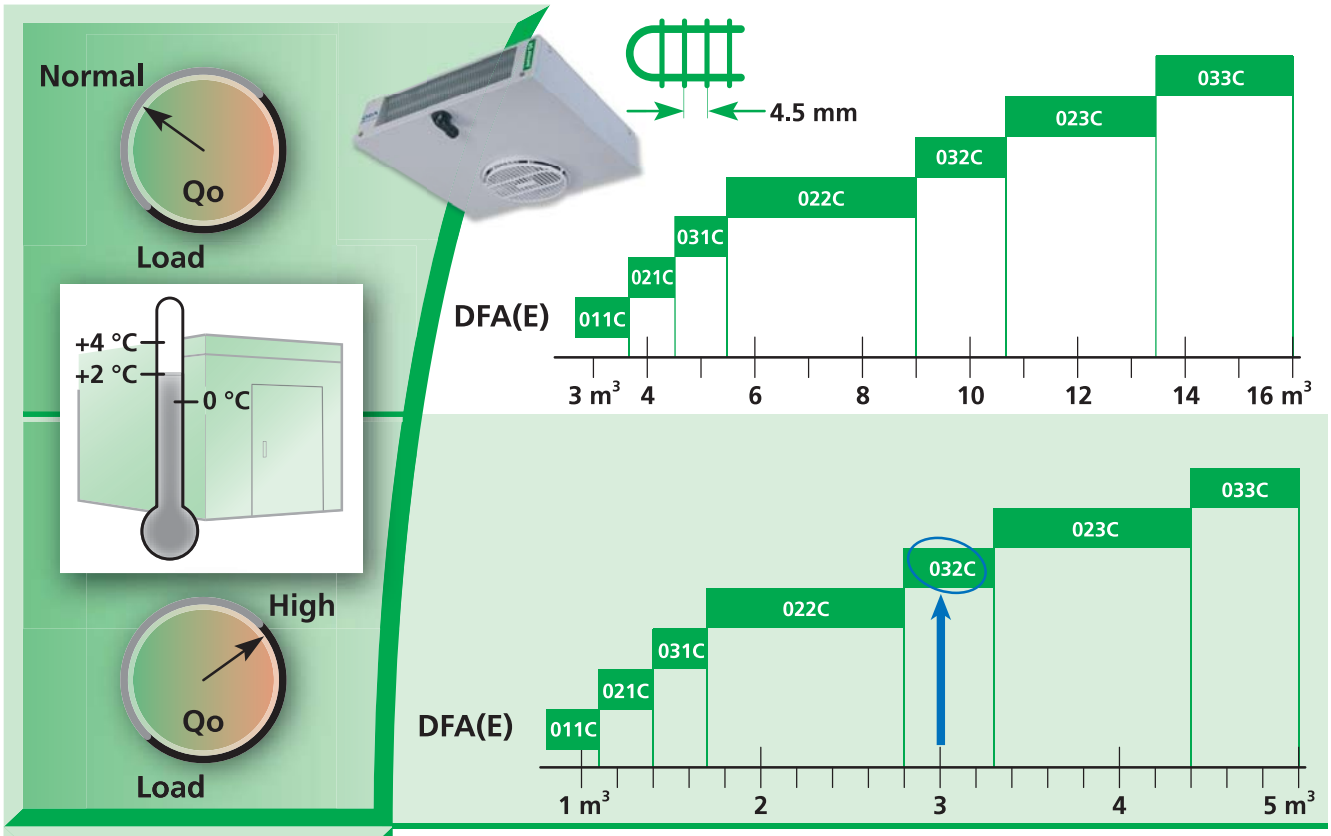
Nomenclature

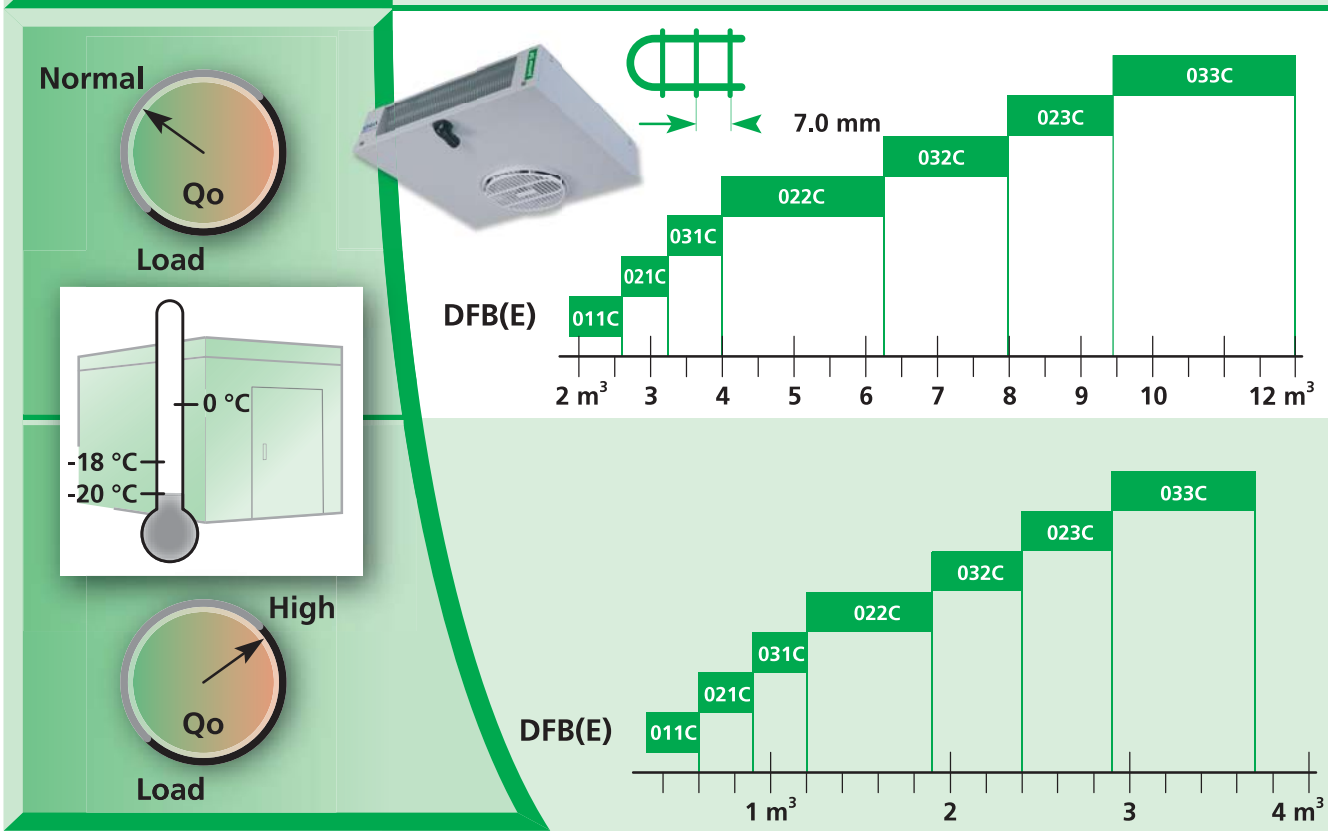
Standard

DF	B	E	02	3	C

- DF: Line designation
- B: Fin spacing: A = 4,5 mm, B = 7 mm
- E: E = with electric defrost
- 02: Size: 01 - 03
- 3: Number of fans: 1 - 3
- C: Generation code

Quick Selection





Example:

Information: • Volume of room: 3 m³ • Temperature: +2 °C • High loading

Selection: → Küba junior DFA(E) 032C

Construction

1. Casing

- Aluminium, Sendzimir zinc-plated steel, smooth
- High-quality powder coating, papyrus white RAL 9018
  - Food-safe
  - Easy to clean
  - Best corrosion protection
- Double drip tray
- Drip tray can be folded down and unclipped
- Height of *junior* DF. only 180 mm (incl. drain)

2. Cooler

- Internal cleanliness acc. to DIN 8964
- Fin spacing: DFA.C: 4,5 mm, DFB.C: 7,0 mm
- Tubing Cu-Special, fins Al, end plates Al
- Completely powder-coated (hygienic paint)

3. Fans

- Fans wired up to a terminal box
- With built-in protector according to VDE provisions
- Application range: DF.C: RT -30 °C bis +40 °C
- 230 V ±10 % V-1, adjustable
- Index of protection IP44 acc. to DIN 40050
- Insulation class B acc. to VDE 0530
- Operating values are the actual values of the built-in motor at +20 °C, with unobstructed air flow and a dry surface, as required for the refrigeration load calculation
- Motor label data = max. allowable value at t_{Umg} +40 °C, with unobstructed air flow

Motor label data (max. allowable value +40°C)

		50 Hz			60 Hz		
	mm	min^{-1}	W	A	min^{-1}	W	A
DF. 011-033C	200	1300	31	0,2	1550	30	0,2

4. Electric defrost

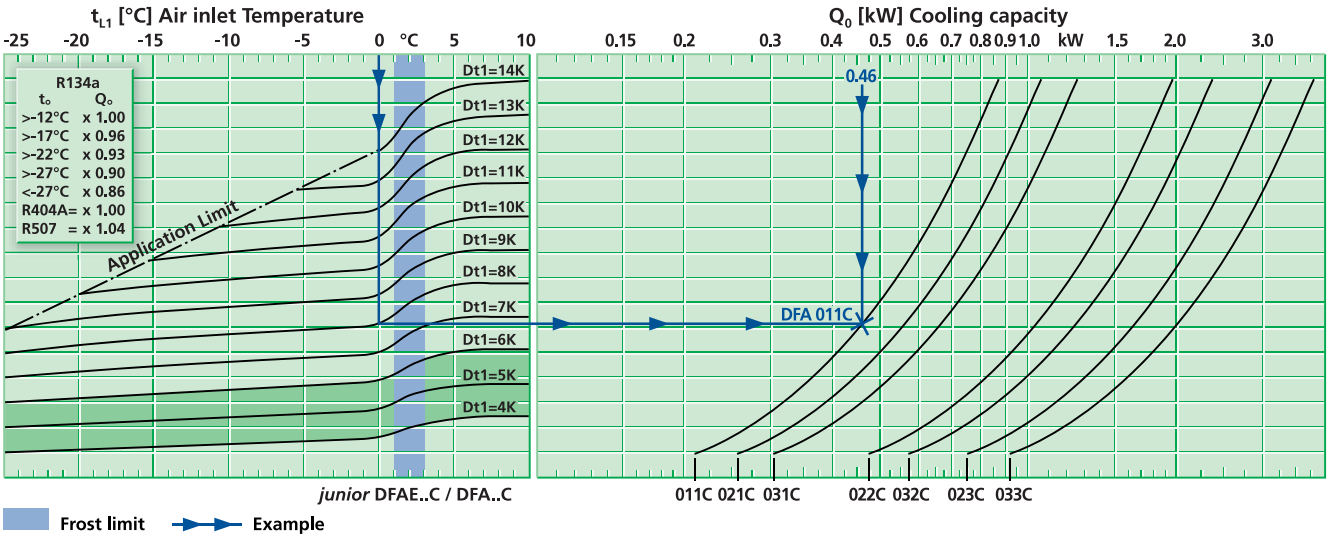
- Pre-wired, ready to connect in terminal box
- The heater rods are mounted between the coil and the tray for rapid and even defrosting
- 230 V-1

Technical data — DFA(E)...C — 4,5 mm

Model		Rating Q_0 at 50 Hz DT1, R404A t_{L1} ±0 °C DT1 = 8K	t_{L1} -18 °C DT1 = 7 K	Surface	Air flow	Air throw	Tube volume	Connections Inlet	Outlet	Sound L_{WA}*	Blade	Fans (Operating values at 50 Hz) Type of current	Per Fan			Electr. defrost
		kW	kW	m²	m³/h	m	dm³	Ø mm	Ø mm	dB(A)	St. x Ø mm	230±10% V-1 50/60Hz	min⁻¹	W	A	kW
DFA 011C	✇	0,46	0,37	2,1	250	5	0,3	10	10	62	1 x 200	230V-1	1310	29	0,21	0,35
DFA 021C	✇	0,56	0,45	2,8	290	5	0,4	10	10	62	1 x 200	230V-1	1310	29	0,21	0,42
DFA 031C	✇	0,67	0,54	4,1	260	5	0,6	10	10	62	1 x 200	230V-1	1310	29	0,21	0,42
DFA 022C	✇✇	1,12	0,89	5,6	580	6	0,8	10	10	65	2 x 200	230V-1	1310	29	0,21	0,73
DFA 032C	✇✇	1,34	1,07	8,2	520	6	1,2	10	10	65	2 x 200	230V-1	1310	29	0,21	0,73
DFA 023C	✇✇✇	1,68	1,34	8,4	870	9	1,2	10	10	67	3 x 200	230V-1	1310	29	0,21	1,04
DFA 033C	✇✇✇	2,01	1,61	12,3	780	9	1,8	10	10	67	3 x 200	230V-1	1310	29	0,21	1,04

* Modification of sound power level, see page 59

Q_V - diagram (R134a, R404A, R507)



The technical data are also given in the product selection software.

Technical data — DFB(E)...C — 7 mm

Model		Rating Q_0 at 50 Hz DT1, R404A t_{L1} ±0 °C DT1 = 8K	t_{L1} -18 °C DT1 = 7 K	Surface	Air flow	Air throw	Tube volume	Connections Inlet	Outlet	Sound L_{WA}*	Fans (Operating values at 50 Hz) Blade	Type of current		Per Fan		Electr. defrost
		kW	kW	m²	m³/h	m	dm³	Ø mm	Ø mm	dB(A)	St. x Ø mm	230±10% V-1 50/60Hz	min⁻¹	W	A	
DFB 011C	✇	0,40	0,32	1,4	280	5	0,3	10	10	62	1 x 200	230V-1	1310	29	0,21	0,35
DFB 021C	✇	0,48	0,38	1,8	320	5	0,4	10	10	62	1 x 200	230V-1	1310	29	0,21	0,42
DFB 031C	✇	0,61	0,49	2,7	290	5	0,6	10	10	62	1 x 200	230V-1	1310	29	0,21	0,42
DFB 022C	✇✇	0,96	0,77	3,6	640	6	0,8	10	10	65	2 x 200	230V-1	1310	29	0,21	0,73
DFB 032C	✇✇	1,22	0,97	5,4	580	6	1,2	10	10	65	2 x 200	230V-1	1310	29	0,21	0,73
DFB 023C	✇✇✇	1,44	1,15	5,4	960	9	1,2	10	10	67	3 x 200	230V-1	1310	29	0,21	1,04
DFB 033C	✇✇✇	1,83	1,46	8,1	870	9	1,8	10	10	67	3 x 200	230V-1	1310	29	0,21	1,04

* Modification of sound power level, see page 59

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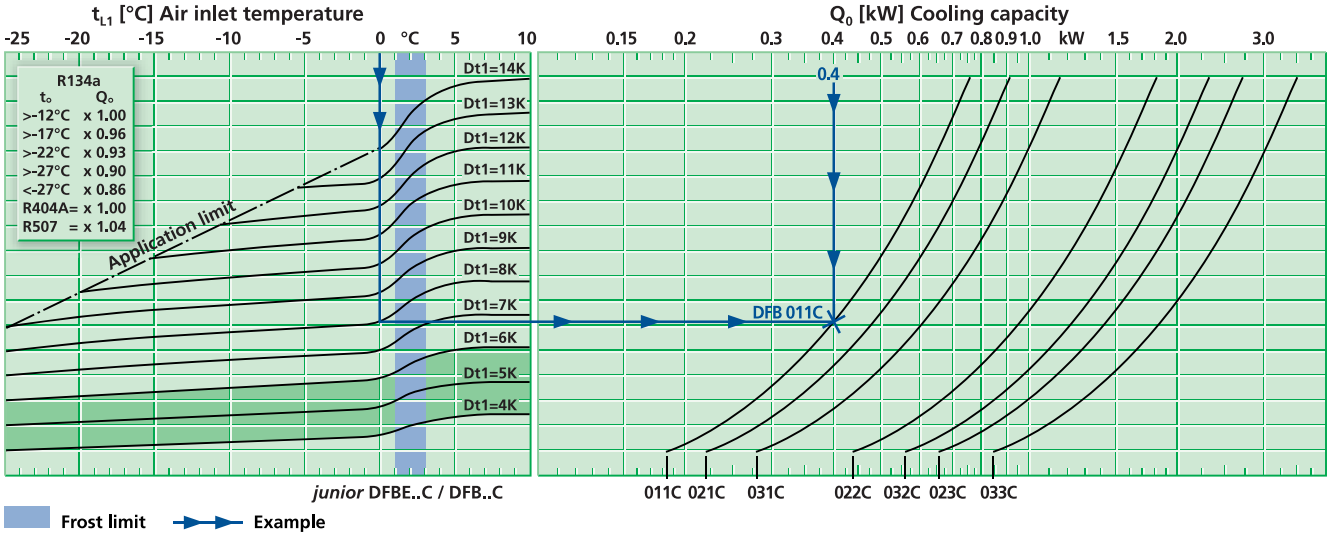
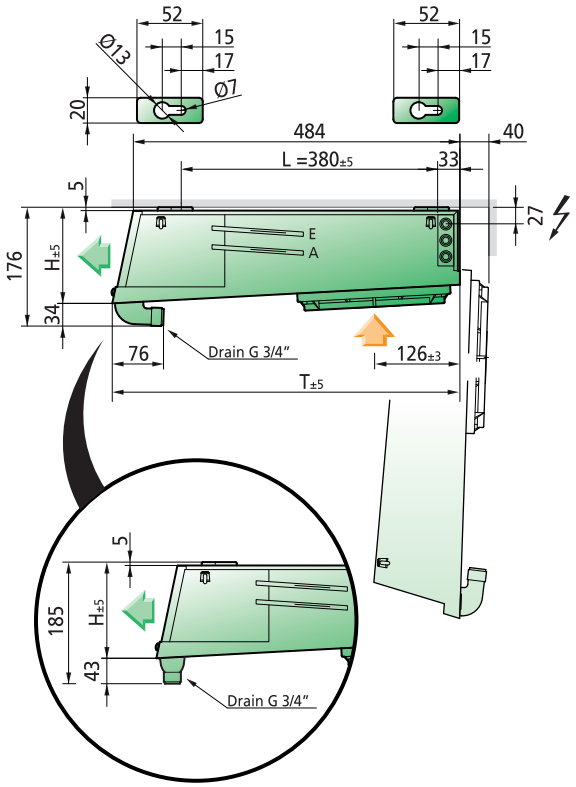
Q_V - diagram (R22, R134a, R404A, R507)

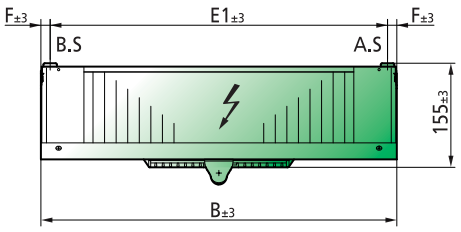


The technical data are also given in the product selection software.

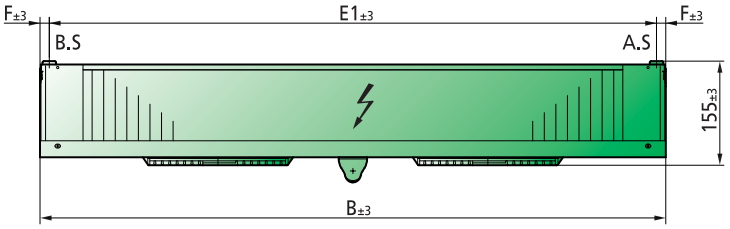
Dimensions and weights



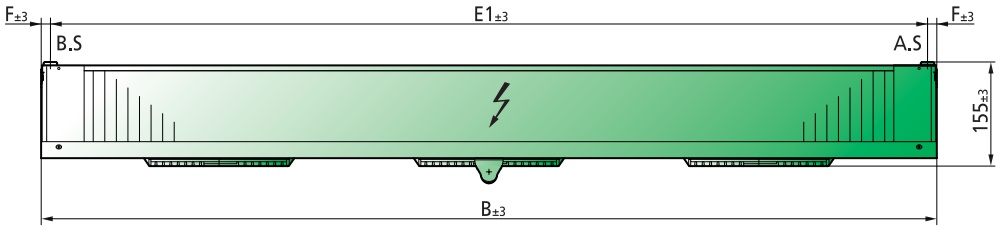
DF. (E) 011, 021, 031C



DF. (E) 022, 032C



DF. (E) 023, 033C



Model	Dimensions (mm)						Weight (net)	
							DFA.C	DFB.C
	H	B	T	L	E_1	F	kg	kg
DF. 011C	143	428	515	380	400	14	9	9
DF. 021C	143	528	515	380	500	14	10	10
DF. 031C	143	528	515	380	500	14	10	10
DF. 022C	143	928	515	380	900	14	15	15
DF. 032C	143	928	515	380	900	14	17	17
DF. 023C	143	1328	515	380	1300	14	22	22
DF. 033C	143	1328	515	380	1300	14	24	24

Küba *compact* DF

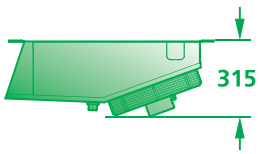
Ceiling Air Cooler

27

Q_0

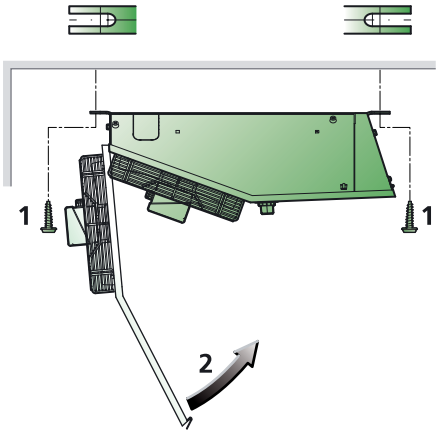
1,5 — 10 kW

H max.



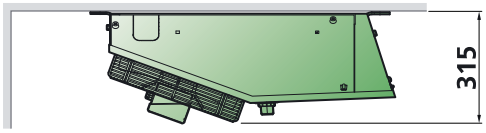
EUROVENT
CERTIFIED PERFORMANCE
applied for
"CERTIFY ALL"
Air Coolers

Application Benefits for Contractors and Operators



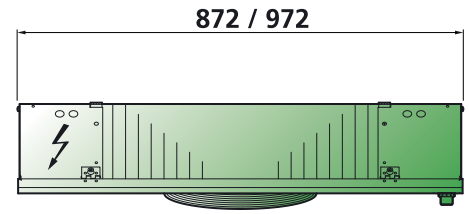
Straightforward mounting

- Hinged fan plate
- Removable side piece
  ① Remove side piece
- Mount and install unit
- Adjust valve
  ② Re-install side piece
- Close fan plate



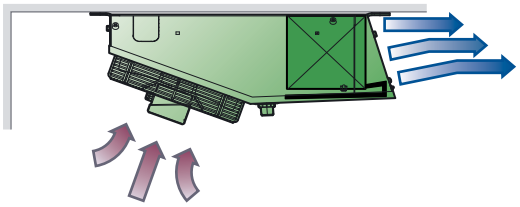
Space-saving

- Vertical drain
- Height including drain 315 mm



Saves width

- Compact design
- 872 mm / 972 mm wide thanks to compact design



Best air guidance

- Integrated air baffle plate
- Directs the air along the ceiling of the room and therefore projects it far into the room

Nomenclature

Standard

DF	B	E	07	1	C

- Line designation
- Fin spacing: A = 4,5 mm, B = 7 mm
- E = with electric defrost
- Generation code
- Number of fans: 1 - 4
- Size: 05 - 07

Construction

1. Casing

- Aluminium, Sendzimir zinc-plated steel, smooth
- High-quality powder coating,
  papyrus white RAL 9018
  - Food-safe
  - Easy to clean
  - Best corrosion protection
- Drip tray and side pieces removable
- Low height
- Quick and easy installation

2. Cooler

- Internal cleanliness acc. to DIN 8964
- Fin spacing: DFA.C: 4,5 mm, DFB.C: 7,0 mm
- Tubing Cu-Special, Fins Al, End plates Al
- DFA.C: Flow distributor, with multiple injection
  DFB.C: Küba-CAL® refrigerant distributor with multiple injection

3. Fans CE

- Fans pre-wired to an internal terminal box
- Ø 254 mm / Ø 300 mm
- With built-in protector according to VDE provisions
- Application range: RT: -30 °C bis +50 °C
- Voltage 230 V ±10 %, V-1, 50/60 Hz, adjustable
- Index of protection IP44 acc. to DIN 40050
  - DF.051, 052C = IP42
  - DF.061 – 074C = IP 44
- Insulation class B acc. to VDE 0700
- Operating values are the actual values of the built-in motor at +20 °C, with unobstructed air flow and a dry surface, as required for the refrigeration load calculation

Motor label data (max. allowable value +40 °C)

		50 Hz			60 Hz		
	Ø mm	min^{-1}	W	A	min^{-1}	W	A
DF. 051-052C	254	1300	90	0,62	1550	80	0,2
DF. 061-074C	300	1390	73	0,32	1580	100	0,45

4. Electric defrost

- Wired-up, ready to connect in terminal box
- The heater rods are mounted in special tube sleeves for rapid and even defrosting
- 230 V-1 / 400 V-3-Y

Technical data — DFA(E)...C — 4,5 mm

1,7 kW — 10 kW

t_{L1}: -25 °C — +0 °C — +20 °C

Model		Rating Q_0 at 50 Hz DT1, R404A t_{L1} ±0 °C DT1 = 8K	t_{L1} +10 °C DT1 = 10 K	Surface	Air flow	Air throw	Tube volume	Connections Inlet	Outlet	Sound L_{WA**}	Fans (Operating values at 50 Hz) Blade	Type of current	Per Fan			Electr. defrost
		kW	kW	m²	m³/h	m	dm³	Ø mm	Ø mm	dB(A)	St. x Ø mm	230±10% V-1 50/60Hz	min⁻¹	W	A	kW
DFA 051C	✇	1,66	2,44	10,2	630	7	2,1	10	12	62	1 x 254	230V-1	1347	85	0,59	1,07
DFA 061C	✇	2,14	3,14	8,2	1100	9	1,7	10	12	68	1 x 300	230V-1	1357	84	0,35	1,15
DFA 071C	✇	2,53	3,71	12,2	1035	9	2,5	10	18	68	1 x 300	230V-1	1357	84	0,35	1,15
DFA 052C	✇✇	3,32	4,87	20,4	1260	9	4,2	10	18	65	2 x 254	230V-1	1357	84	0,35	1,76
DFA 062C	✇✇	4,28	6,28	16,4	2200	11	3,4	12*	22	71	2 x 300	230V-1	1357	84	0,35	2,07
DFA 072C	✇✇	5,06	7,43	24,4	2070	11	5,0	12*	22	71	2 x 300	230V-1	1357	84	0,35	2,07
DFA 063C	✇✇✇	6,42	9,42	24,6	3300	12	5,1	12*	22	73	3 x 300	230V-1	1357	84	0,35	2,98
DFA 073C	✇✇✇	7,59	11,14	36,6	3105	12	7,5	12*	28	73	3 x 300	230V-1	1357	84	0,35	2,98
DFA 065C	✇✇✇✇	8,56	12,56	32,8	4400	16	6,8	12*	28	74	4 x 300	230V-1	1357	84	0,35	3,92
DFA 074C	✇✇✇✇	10,12	14,85	48,8	4140	16	10,0	15*	28	74	4 x 300	230V-1	1357	84	0,35	3,92

Multiple injection via * flow distributor

** Modification of sound power level, see page 59

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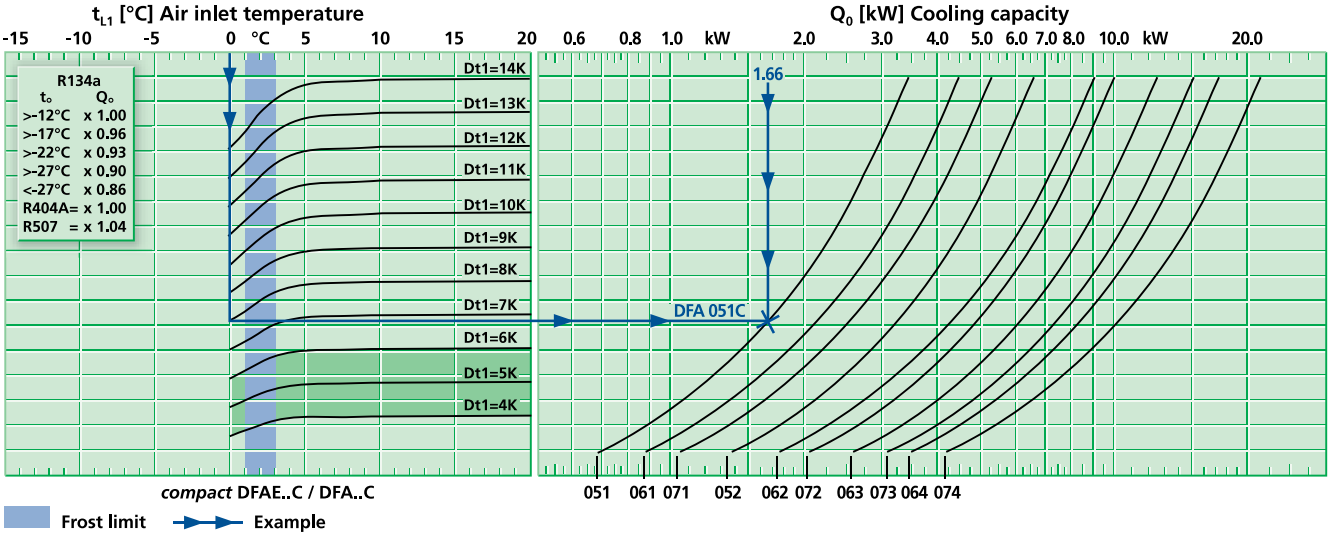
Q_V - diagram (R22, R134A, R404A, R507)



The technical data are also given in the product selection software.

Available for CO_2-DX up to 54 bar

Technical data — DFB(E)...C — 7 mm

1,5 kW — 8,8 kW

t_{L1} +10 °C / -25 °C

Model		Rating Q_0 at 50 Hz DT1, R404A t_{L1} ±0 °C DT1 = 8K	t_{L1} +10 °C DT1 = 10 K	Surface	Air flow	Air throw	Tube volume	Connections Inlet	Outlet	Sound L_{WA}**	Fans (Operating values at 50 Hz) Blade	Type of current	Per Fan			Electr. defrost
		kW	kW	m²	m³/h	m	dm³	Ø mm	Ø mm	dB(A)	St. x Ø mm	230±10% V-1 50/60Hz	min⁻¹	W	A	kW
DFB 051C	✇	1,52	1,21	6,8	730	7	2,1	10	12	62	1 x 254	230V-1	1347	85	0,59	1,07
DFB 061C	✇	1,81	1,45	5,5	1300	9	1,7	10	12	68	1 x 300	230V-1	1357	84	0,35	1,15
DFB 071C	✇	2,19	1,75	8,2	1130	9	2,5	10	18	68	1 x 300	230V-1	1357	84	0,35	1,15
DFB 052C	✇✇	3,04	2,43	13,6	1460	9	4,2	10	18	65	2 x 254	230V-1	1357	84	0,35	1,76
DFB 062C	✇✇	3,62	2,89	11,0	2600	11	3,4	12*	22	71	2 x 300	230V-1	1357	84	0,35	2,07
DFB 072C	✇✇	4,38	3,50	16,4	2260	11	5,0	12*	22	71	2 x 300	230V-1	1357	84	0,35	2,07
DFB 063C	✇✇✇	5,43	4,34	16,5	3900	12	5,1	12*	22	73	3 x 300	230V-1	1357	84	0,35	2,98
DFB 073C	✇✇✇	6,57	5,25	24,6	3390	12	7,5	12*	28	73	3 x 300	230V-1	1357	84	0,35	2,98
DFB 065C	✇✇✇✇	7,24	5,78	22,0	5200	16	6,8	12*	28	74	4 x 300	230V-1	1357	84	0,35	3,92
DFB 074C	✇✇✇✇	8,76	7,00	32,8	4520	16	10,0	15*	28	74	4 x 300	230V-1	1357	84	0,35	3,92

Multiple injection via * flow distributor

** Modification of sound power level, see page 59

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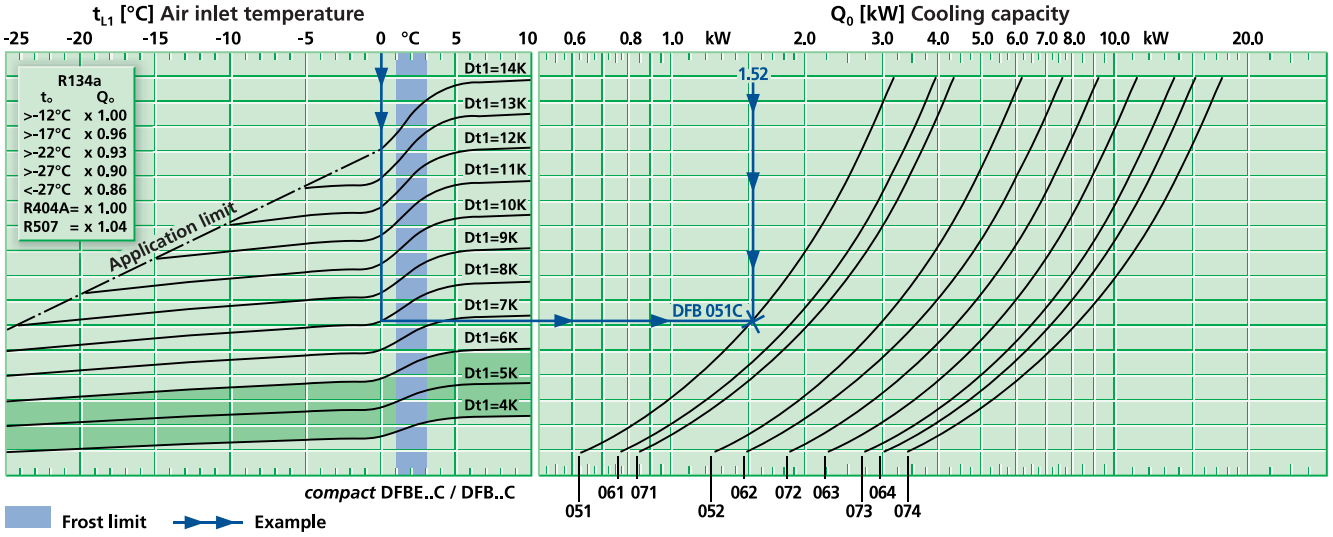
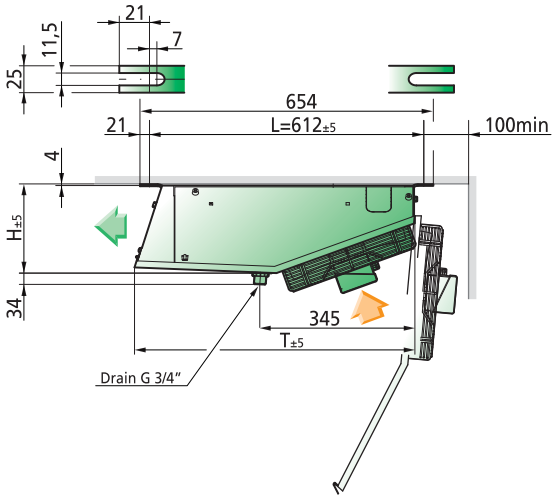
Q_V - diagram (R22, R134A, R404A, R507)



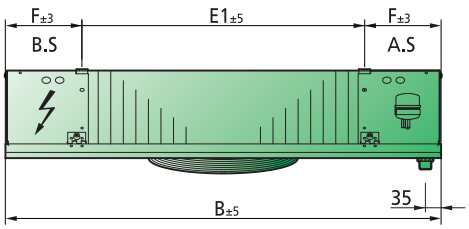
The technical data are also given in the product selection software.

Available for CO_2-DX up to 54 bar

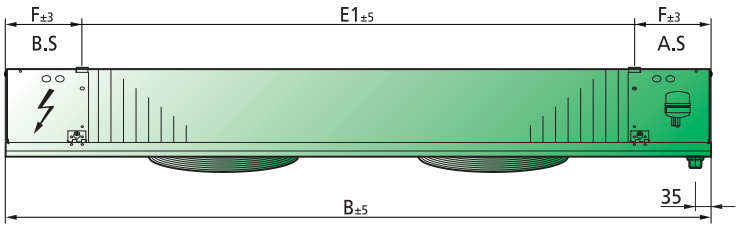
Dimensions and weights



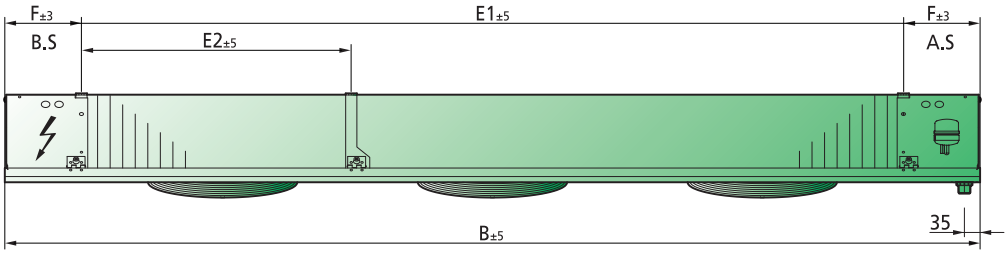
DF.(E) 051,061,071 C



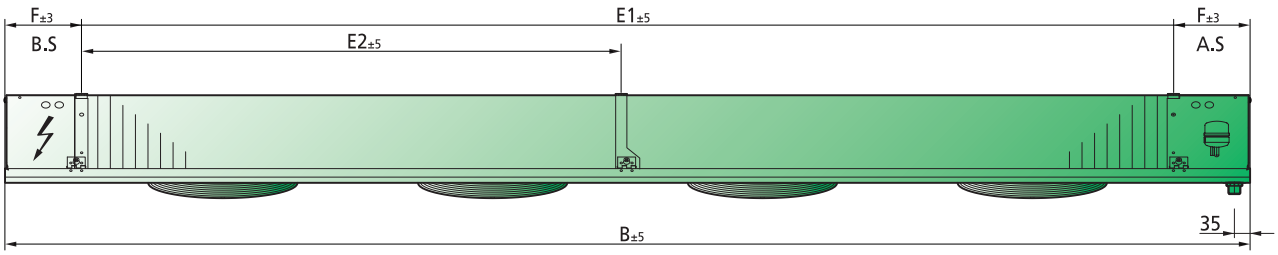
DF.(E) 052,062,072 C



DF.(E) 063,073 C



DF.(E) 064,074 C



Model	Dimensions (mm)							Weight (net)	
								DFA.C	DFB.C
	H	B	T	L	E_1	E_2	F	kg	kg
DF. 051C	268	872	626	612	530	-	171	26	25
DF. 061C	268	972	626	612	630	-	171	27	26
DF. 071C	268	972	626	612	630	-	171	28	27
DF. 052C	268	1372	626	612	1030	-	171	43	42
DF. 062C	268	1572	626	612	1230	-	171	45	44
DF. 072C	268	1572	626	612	1230	-	171	47	46
DF. 063C	268	2172	626	612	1830	629	171	58	56
DF. 073C	268	2172	626	612	1830	629	171	60	58
DF. 064C	268	2772	626	612	2430	1229	171	69	67
DF. 074C	268	2772	626	612	2430	1229	171	72	70

Variants and Electrical Radiators

Water / brine circulation

- Version .V2.05
  Large number of distributors (small pressure drop)
- Version .V2.06
  Small number of distributors (large pressure drop)

Connections for brine / water operation

Please use our Küba selection software for configuring the brine Air Coolers. Do not hesitate to contact us if you have any further questions.

Configuration
- Soldered connection

Corrosion protection

- Version .V6.01 and .V6.04
  Cooler
  - Tubes: Copper
  - Fins: Al „goldlack“ coating
  - End plates:
    Aluminium, anti-corrosion paint coating on both sides (.V6.01)
    Aluminium (.V6.04)

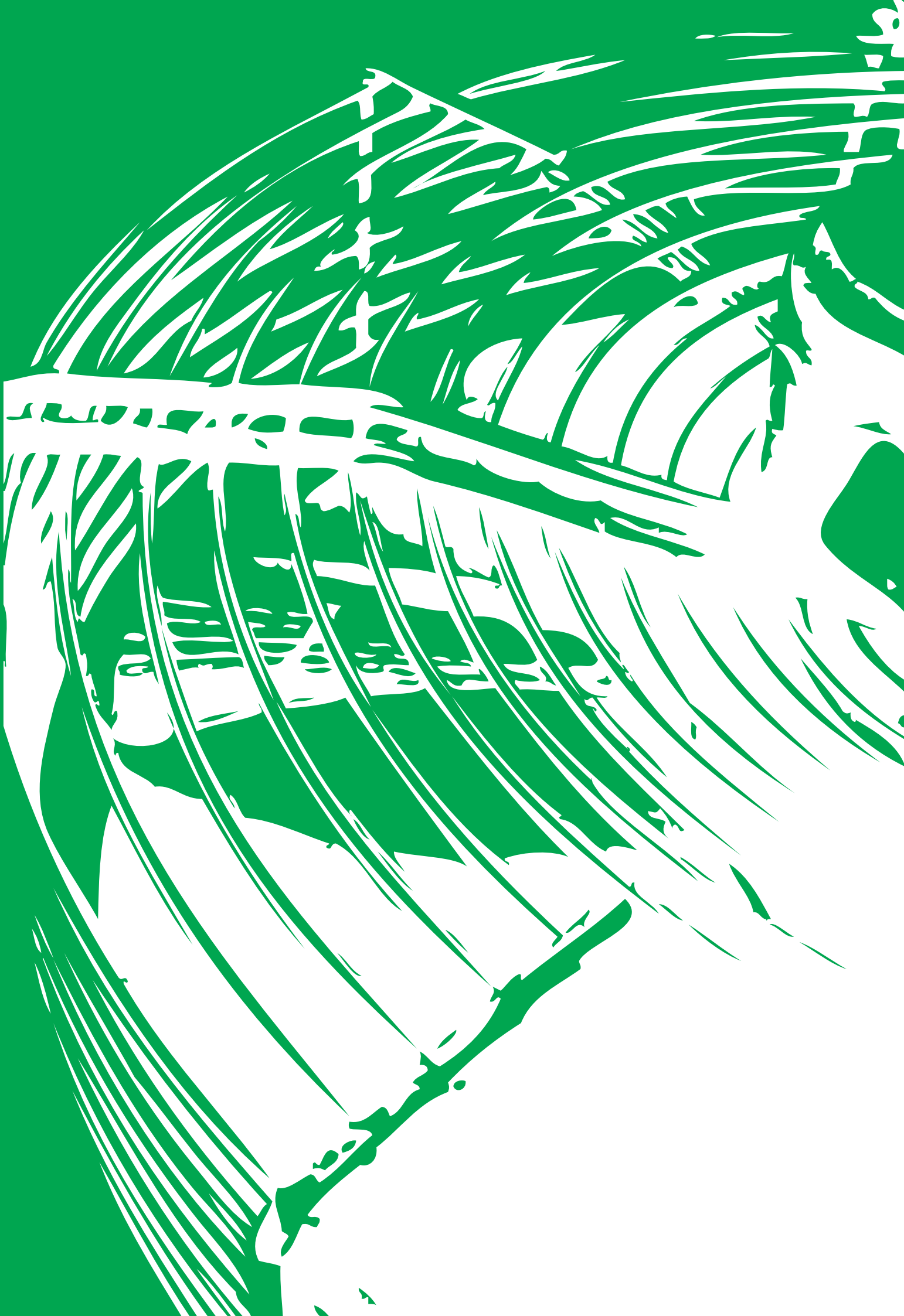
  Casing
  - Aluminium or Sendzimir zinc-plated steel, anti-corrosion paint coating on both sides (.V6.01)
    Aluminium, anti-corrosion paint coating (.V6.04)

Electrical radiator

Configuration
- Electrical tubular radiator with CrNi jacket Ø 8,5 mm
- Connection impervious to water vapour, 1,0 mm² x 1000 mm acc. to VDE 0700 / part 1
- Aluminium fin
- Sendzimir zinc-plated end, middle and top plates
- Copper tube bush
- Completely powder-coated

For Cooler	Inlet and Outlet	
	.V2.05	.V2.06
DF. 051C	Ø 15	-
DF. 061C	Ø 22	Ø 15
DF. 071C	Ø 22	Ø 15
DF. 052C	Ø 22	Ø 15
DF. 062C	Ø 22	Ø 22
DF. 072C	Ø 22	Ø 22
DF. 063C	Ø 22	Ø 22
DF. 073C	Ø 22	Ø 22
DF. 064C	Ø 22	Ø 22
DF. 074C	Ø 28	Ø 22

For Air Cooler	Model	Nominal power at 230 V		Dimensions		Weight
DF		kW	A	H	L	kg
051C	DFHR500	0,84	3,7	210	500	1,4
061C, 071C	DFHR600	0,96	4,2	210	600	1,7
052C	DFHR1000	1,72	7,5	210	1000	2,4
062C, 072C	DFHR1200	1,91	8,3	210	1200	2,9
063C, 073C	DFHR1800	2,87	12,5	210	1800	4,2
064C, 074C	DFHR2400	3,75	16,3	210	2400	5,6

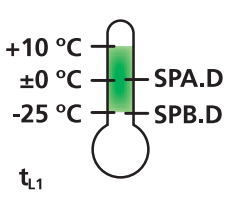


Küba *market plus* SP

High Performance Unit Cooler

Q_0

1,2 — 52 kW

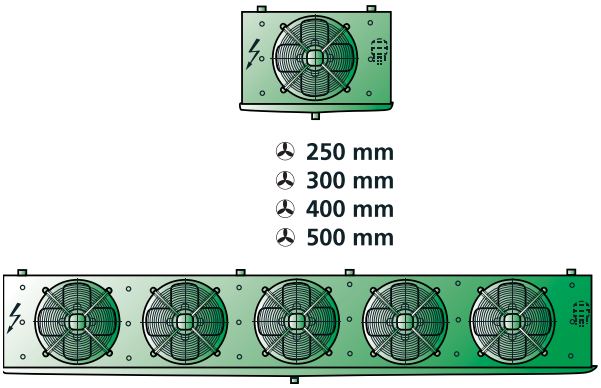


EUROVENT CERTIFIED PERFORMANCE
applied for
"CERTIFY ALL"
Air Coolers

Application Benefits for Contractors and Operators

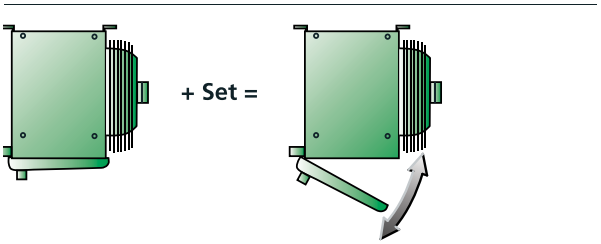
Expanded capacity range

- Up to 52 kW



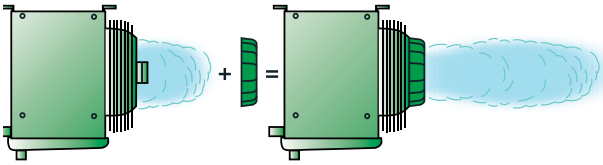
Closer-spaced capacity steps

- Thanks to five different fan sizes



Quick cleaning

- Hinged drain tray as accessory (can be retro-fitted)



Increased air throw

- Küba Air Jet as accessory

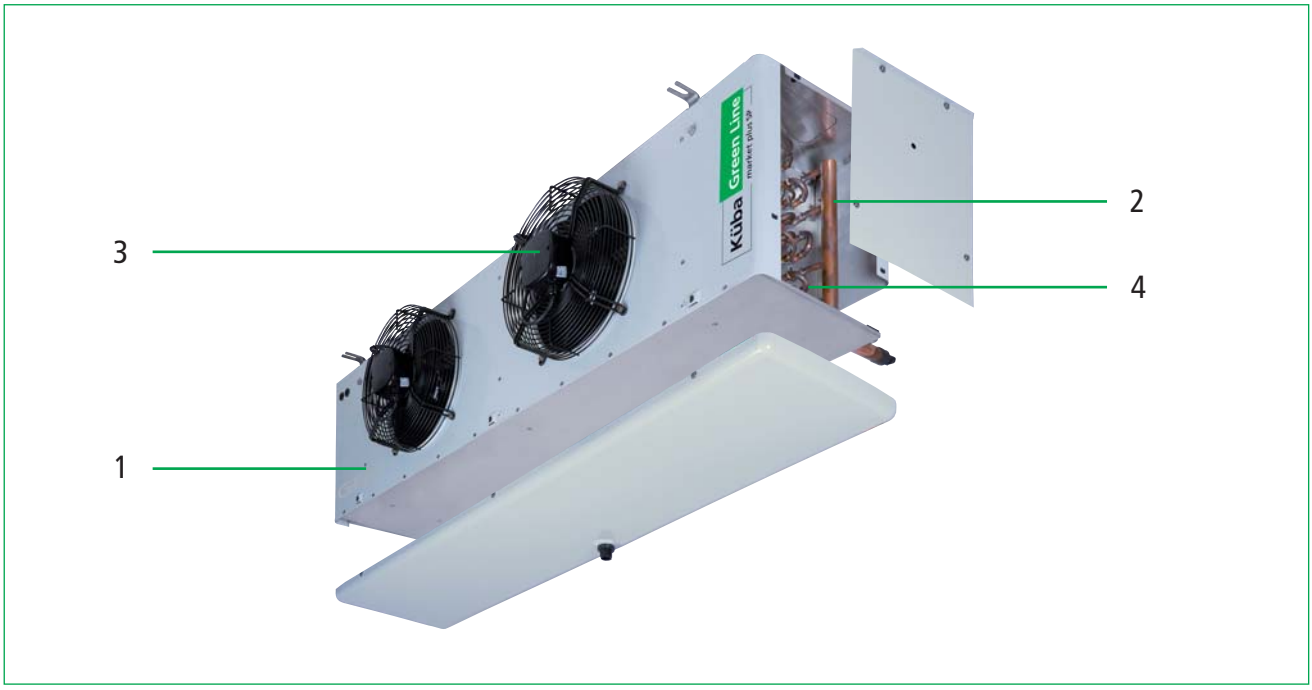
Nomenclature

Standard

SP	B	E	01	1	D

- Line designation: SP
- Fin spacing: A = 4,5 mm; B = 7 mm: B
- E = with electric defrost: E
- Size: 01 - 08: 01
- Number of fans: 1 - 5: 1
- Generation code: D

Construction



1. Casing

- Aluminium, smooth
- High-quality powder coating, papyrus white RAL 9018
  - Food-safe
  - Easy to clean
  - Best corrosion protection
- Removable side pieces

2. Cooler

- Internal cleanliness acc. to DIN 8964
- Fin spacing: SPA.D: 4,5 mm, SPB.D: 7,0 mm
- Refrigerant distributor:
  - SPA.D: Flow distributor
  - SPB.D: Küba-CAL®
- Tubing Cu-Special, Fins Al, End plates Al

3. Fans CE

- Fans wired up to an internal terminal box: Ø 250 mm / Ø 300 mm / Ø 400 mm
- With built-in protector according to VDE provisions (Ø 500 mm: Led-out protector wored up in parallel)
- Application range: RT: -30 °C bis +50 °C
- Voltage:
  - SP. 011 – 065D = 230 V ±10 %, V-1 50/60 Hz, adjustable
  - SP. 071 – 084D = 400 V ±10 %, V-3 50/60 Hz
- Index of protection acc. to DIN 40050:
  - SP. 011 – 024D = IP42
  - SP. 031 – 065D = IP44
  - SP. 071 – 084D = IP54
- Insulation class acc. to VDE 0700
  - SP. 011 – 065D = Insulation class B
  - SP. 071 – 084D = Insulation class F
- Operating values are the actual values of the built-in motor at +20 °C, with unobstructed air flow and a dry surface, as required for the refrigeration load calculation

Motor label data (max. allowable value +40 °C)

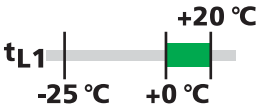
		50 Hz			60 Hz		
	Ø mm	min^{-1}	W	A	min^{-1}	W	A
SP.01.-02.D	250	1300	90	0,62	1550	80	0,55
SP.03.-04.D	300	1340	80	0,36	1460	112	0,48
SP.05.-06.D	400	1420	188	0,83	1630	270	1,20
SP.07.-08.D	500	1350	565	1,13	1450	830	1,50

4. Electric defrost

- Wired-up, ready to connect in terminal box
- The heater rods are mounted in special tube sleeves for rapid and even defrosting
- 230 V-1 / 400 V-3-Y
- With splash pan

Technical data — SPA(E)...D — 4,5 mm

1,6 kW — 52 kW



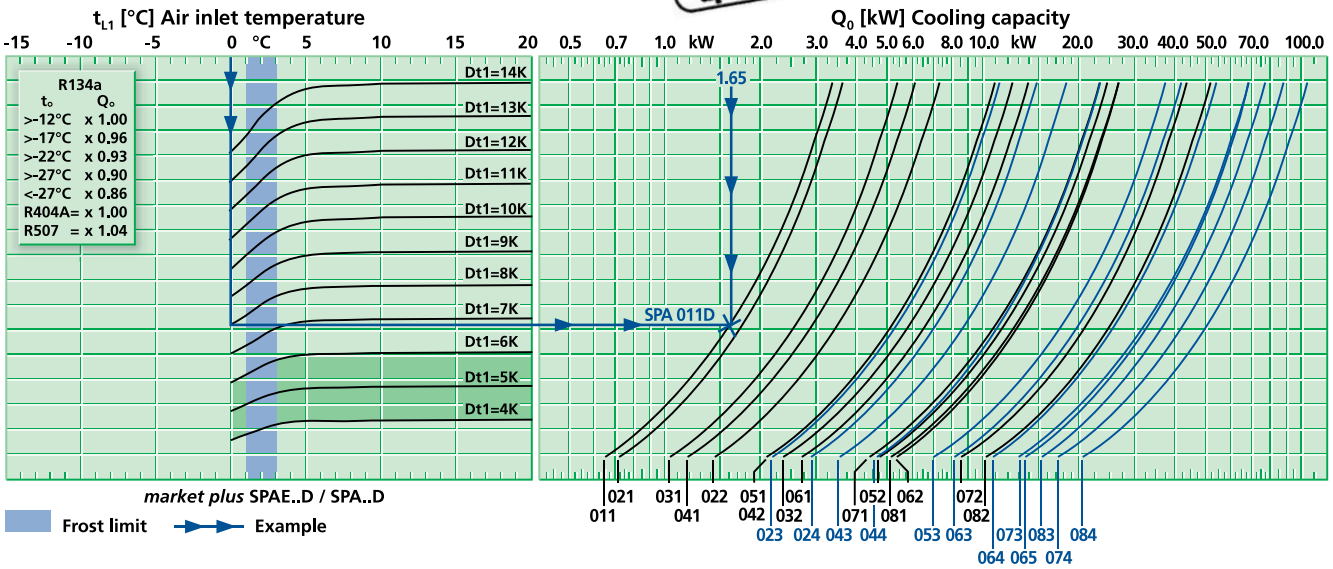
Model		Rating Q_0 at 50 Hz DT1, R404A t_{L1} ±0 °C DT1 = 8K	Rating Q_0 at 50 Hz DT1, R404A t_{L1} +10 °C DT1 = 10 K	Surface	Air flow	Air throw	Tube volume	Connections Inlet	Connections Outlet	Sound L_{WA**}	Fans (Operating values at 50 Hz) Blade	Fans Type of current	Fans Per Fan		
		kW	kW	m²	m³/h	m	dm³	Ø mm	Ø mm	dB(A)	St. x Ø mm	230±10% V-1 50/60Hz	min⁻¹	W	A
SPA 011D	✇	1,65	2,44	6,9	820	4	1,4	10	12	63	1 x 250	230V -1	1347	85	0,59
SPA 021D	✇	1,80	2,65	9,1	760	4	1,9	10	12	63	1 x 250	230V -1	1347	85	0,59
SPA 031D	✇	2,65	3,93	10,3	1380	6	2,1	10	18	70	1 x 300	230V -1	1340	80	0,36
SPA 041D	✇	3,00	4,44	13,6	1300	5	2,8	12*	22	70	1 x 300	230V -1	1340	80	0,36
SPA 051D	✇	6,05	8,98	20,5	3020	8	4,2	12*	28	77	1 x 400	230V -1	1420	188	0,83
SPA 061D	✇	6,83	10,1	30,6	2720	7	6,3	12*	28	77	1 x 400	230V -1	1420	188	0,83
SPA 071D	✇	11,3	16,8	36,3	5800	17	7,6	15*	35	83	1 x 500	400V -3	1362	560	1,01
SPA 081D	✇	13,1	19,3	54,2	5270	16	11,1	15*	35	83	1 x 500	400V -3	1362	560	1,01
SPA 022D	✇✇	3,62	5,34	18,2	1520	6	3,6	12*	22	66	2 x 250	230V -1	1347	85	0,59
SPA 032D	✇✇	5,33	7,90	20,6	2760	8	4,1	12*	28	73	2 x 300	230V -1	1340	80	0,36
SPA 042D	✇✇	6,02	8,92	27,3	2600	7	5,5	12*	28	73	2 x 300	230V -1	1340	80	0,36
SPA 052D	✇✇	11,9	17,7	40,9	6040	12	8,2	15*	35	80	2 x 400	230V -1	1420	188	0,83
SPA 062D	✇✇	13,4	19,7	60,9	5440	11	12,1	15*	35	80	2 x 400	230V -1	1420	188	0,83
SPA 072D	✇✇	21,7	31,9	72,7	11600	22	14,3	15*	42	86	2 x 500	400V -3	1362	560	1,01
SPA 082D	✇✇	25,7	37,9	108,3	10540	21	21,5	22*	42	86	2 x 500	400V -3	1362	560	1,01
SPA 023D	✇✇✇	5,51	8,16	27,3	2280	8	5,3	12*	28	68	3 x 250	230V -1	1347	85	0,59
SPA 043D	✇✇✇	8,96	13,3	40,9	3900	10	8,0	15*	35	75	3 x 300	230V -1	1340	80	0,36
SPA 053D	✇✇✇	18,2	27,0	61,4	9060	15	12,0	22*	42	82	3 x 400	230V -1	1420	188	0,83
SPA 063D	✇✇✇	20,6	30,4	91,5	8160	13	18,0	22*	42	82	3 x 400	230V -1	1420	188	0,83
SPA 073D	✇✇✇	33,4	49,5	109,2	17400	26	21,3	22*	54	88	3 x 500	400V -3	1362	560	1,01
SPA 083D	✇✇✇	38,3	56,3	162,7	15810	24	32,2	22*	54	88	3 x 500	400V -3	1362	560	1,01
SPA 024D	✇✇✇✇	7,26	10,7	36,3	3040	9	7,1	12*	28	69	4 x 250	230V -1	1347	85	0,59
SPA 044D	✇✇✇✇	11,7	17,2	54,5	5200	12	10,6	15*	35	76	4 x 300	230V -1	1340	80	0,36
SPA 064D	✇✇✇✇	26,9	39,6	122,0	10880	16	23,7	22*	42	83	4 x 400	230V -1	1420	188	0,83
SPA 074D	✇✇✇✇	43,5	64,1	145,5	23200	28	28,6	22*	54	89	4 x 500	400V -3	1362	560	1,01
SPA 084D	✇✇✇✇	51,6	76,1	216,9	21080	26	41,0	28**	54	89	4 x 500	400V -3	1362	560	1,01
SPA 065D	✇✇✇✇✇	34,1	50,4	152,4	13600	18	28,9	22*	54	84	5 x 400	230V -1	1420	188	0,83

Multiple injection via * flow distributor, ** KÜBA-CAL® distributor *** Modification of sound power level, see page 59

The technical data are also given in the product selection software.

Available for CO_2-DX up to 54 bar

Q_V - diagram (R22, R134A, R404A, R507)



Technical data — SPB(E)...D — 7 mm

Model		Rating Q_0 at 50 Hz DT1, R404A t_{L1} ±0 °C DT1 = 8K	Rating Q_0 at 50 Hz DT1, R404A t_{L1} -18 °C DT1 = 7 K	Surface	Air flow	Air throw	Tube volume	Connections Inlet	Connections Outlet	Sound L_{WA**}	Fans (Operating values at 50 Hz) Blade	Fans Type of current	Fans Per Fan		
		kW	kW	m²	m³/h	m	dm³	Ø mm	Ø mm	dB(A)	St. x Ø mm	230±10% V-1 50/60Hz	min⁻¹	W	A
SPB 011D	✇	1,28	1,01	4,6	880	4	1,4	10	12	63	1 x 250	230V -1	1347	85	0,59
SPB 021D	✇	1,51	1,20	6,0	850	4	1,9	10	12	63	1 x 250	230V -1	1347	85	0,59
SPB 031D	✇	2,03	1,61	6,9	1450	7	2,1	10	18	70	1 x 300	230V -1	1340	80	0,36
SPB 041D	✇	2,45	1,94	9,1	1420	6	2,8	12*	22	70	1 x 300	230V -1	1340	80	0,36
SPB 051D	✇	4,78	3,78	13,7	3320	9	4,2	12*	28	77	1 x 400	230V -1	1420	188	0,83
SPB 061D	✇	5,93	4,70	20,4	3080	8	6,3	12*	28	77	1 x 400	230V -1	1420	188	0,83
SPB 071D	✇	8,75	6,92	24,3	6250	18	7,6	15*	35	83	1 x 500	400V -3	1362	560	1,01
SPB 081D	✇	11,1	8,76	36,3	5880	17	11,1	15*	35	83	1 x 500	400V -3	1362	560	1,01
SPB 022D	✇✇	3,03	2,41	12,2	1700	6	3,6	12*	22	66	2 x 250	230V -1	1347	85	0,59
SPB 032D	✇✇	4,05	3,21	13,7	2900	9	4,1	12*	28	73	2 x 300	230V -1	1340	80	0,36
SPB 042D	✇✇	4,89	3,88	18,2	2840	8	5,5	12*	28	73	2 x 300	230V -1	1340	80	0,36
SPB 052D	✇✇	9,49	7,52	27,3	6640	13	8,2	15*	35	80	2 x 400	230V -1	1420	188	0,83
SPB 062D	✇✇	11,7	9,31	40,7	6160	12	12,1	15*	35	80	2 x 400	230V -1	1420	188	0,83
SPB 072D	✇✇	17,1	13,5	48,6	12500	23	14,3	15*	42	86	2 x 500	400V -3	1362	560	1,01
SPB 082D	✇✇	21,9	17,4	72,5	11760	22	21,5	22*	42	86	2 x 500	400V -3	1362	560	1,01
SPB 023D	✇✇✇	4,59	3,63	18,2	2550	8	5,3	12*	28	68	3 x 250	230V -1	1347	85	0,59
SPB 043D	✇✇✇	7,31	5,80	27,3	4260	11	8,0	15*	35	75	3 x 300	230V -1	1340	80	0,36
SPB 053D	✇✇✇	14,4	11,4	41,0	9960	16	12,0	22*	42	82	3 x 400	230V -1	1420	188	0,83
SPB 063D	✇✇✇	17,8	14,1	61,1	9240	14	18,0	22*	42	82	3 x 400	230V -1	1420	188	0,83
SPB 073D	✇✇✇	26,0	20,6	73,0	18750	27	21,3	22*	54	88	3 x 500	400V -3	1362	560	1,01
SPB 083D	✇✇✇	32,6	25,9	108,8	17640	25	32,2	22*	54	88	3 x 500	400V -3	1362	560	1,01
SPB 024D	✇✇✇✇	6,08	4,82	24,3	3400	9	7,1	12*	28	69	4 x 250	230V -1	1347	85	0,59
SPB 044D	✇✇✇✇	9,63	7,65	36,5	5680	13	10,6	15*	35	76	4 x 300	230V -1	1340	80	0,36
SPB 064D	✇✇✇✇	23,5	18,7	81,6	12320	17	23,7	22*	42	83	4 x 400	230V -1	1420	188	0,83
SPB 074D	✇✇✇✇	34,2	27,1	97,1	25000	30	28,6	22*	54	89	4 x 500	400V -3	1362	560	1,01
SPB 084D	✇✇✇✇	43,8	34,7	144,8	23520	28	41,0	28*	54	89	4 x 500	400V -3	1362	560	1,01
SPB 065D	✇✇✇✇✇	29,7	23,5	101,9	15400	19	28,9	22*	54	84	5 x 400	230V -1	1420	188	0,83

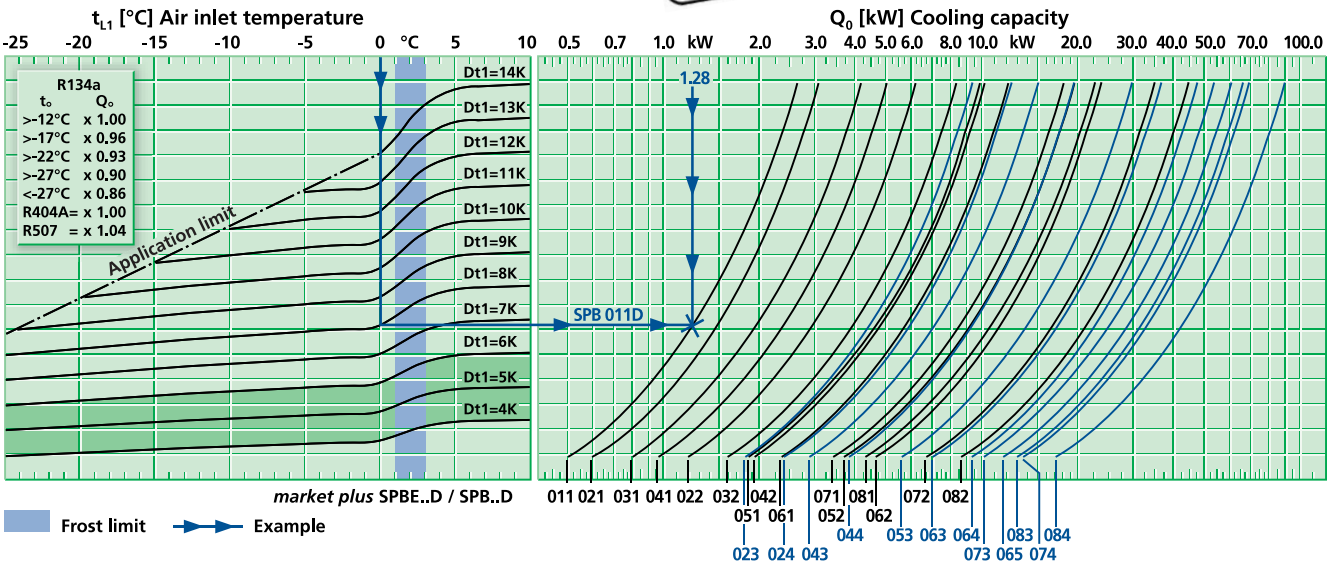
Multiple injection via * KÜBA-CAL® distributor

** Modification of sound power level, see page 59

The technical data are also given in the product selection software.

Available for CO_2-DX up to 54 bar

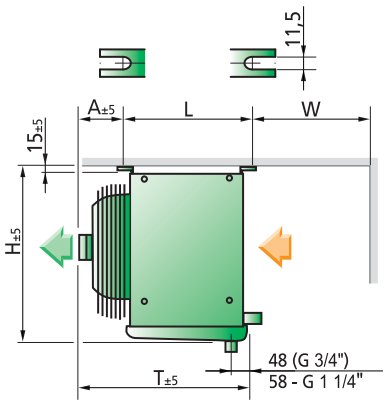
Q_V - diagram (R22, R134A, R404A, R507)

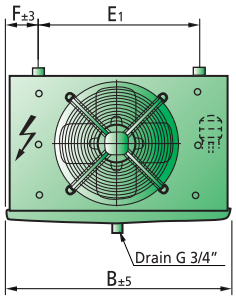


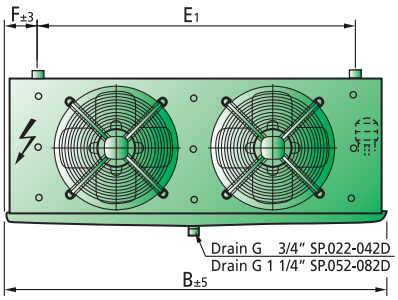
Dimensions, electric defrost, weights

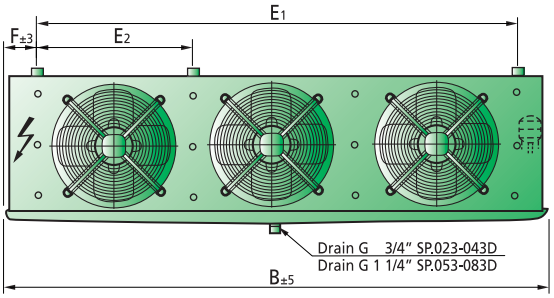
	Dimensions [mm]										Electric defrost 230 V-1 / 400 V-3-Y			Weight (net)	
Model	H	B	T	L	E_1	E_2	E_3	F	A	W	Coil	Tray	Total	SPA.D	SPB.D
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kW	kW	kW	kg	kg
SP. 011D	354	810	424	350	530	-	-	140	92	200	1,07	0,58	1,65	13	12
SP. 021D	354	810	424	350	530	-	-	140	92	200	1,07	0,58	1,65	15	14
SP. 031D	430	970	421	350	630	-	-	170	90	200	1,23	0,69	1,92	18	17
SP. 041D	430	970	421	350	630	-	-	170	90	200	1,23	0,69	1,92	19	18
SP. 051D	509	1180	501	420	780	-	-	200	100	300	2,07	0,88	2,95	27	26
SP. 061D	509	1180	501	420	780	-	-	200	100	300	2,90	0,88	3,78	32	31
SP. 071D	661	1430	592	500	1030	-	-	200	110	400	3,52	0,50	4,02	50	48
SP. 081D	661	1430	592	500	1030	-	-	200	110	400	5,52	0,50	6,02	60	58
SP. 022D	354	1310	424	350	1030	-	-	140	92	200	1,84	0,96	2,80	25	24
SP. 032D	430	1570	421	350	1230	-	-	170	90	200	2,14	1,15	3,29	31	30
SP. 042D	430	1570	421	350	1230	-	-	170	90	200	2,14	1,15	3,29	33	31
SP. 052D	509	1930	501	420	1530	-	-	200	100	300	3,90	1,44	5,34	48	46
SP. 062D	509	1930	501	420	1530	-	-	200	100	300	5,20	1,44	6,64	57	54
SP. 072D	661	2430	592	500	2030	-	-	200	110	400	6,74	0,86	7,60	89	86
SP. 082D	661	2430	592	500	2030	-	-	200	110	400	10,11	0,86	10,97	109	105
SP. 023D	354	1810	424	350	1530	-	-	140	92	200	2,60	1,30	3,90	35	33
SP. 043D	430	2170	421	350	1830	-	-	170	90	200	3,18	1,59	4,77	46	43
SP. 053D	509	2680	501	420	2280	750	-	200	100	300	5,63	1,95	7,58	70	67
SP. 063D	509	2680	501	420	2280	750	-	200	100	300	7,50	1,95	9,45	84	80
SP. 073D	661	3430	592	500	3030	1000	-	200	110	400	9,20	1,82	11,02	136	132
SP. 083D	661	3430	592	500	3030	1000	-	200	110	400	13,80	1,82	15,62	164	159
SP. 024D	354	2310	424	350	2030	1000	-	140	92	200	3,37	1,72	5,09	46	43
SP. 044D	430	2770	421	350	2430	1200	-	170	90	200	4,00	2,00	6,00	59	55
SP. 064D	509	3430	501	420	3030	1500	-	200	100	300	9,20	1,82	11,02	116	111
SP. 074D	661	4430	592	500	4030	2000	-	200	110	400	12,72	2,39	15,11	178	173
SP. 084D	661	4430	592	500	4030	2000	-	200	110	400	19,08	2,39	21,47	221	215
SP. 065D	509	4180	501	420	3780	1500	2250	200	100	300	11,92	2,24	14,16	146	141

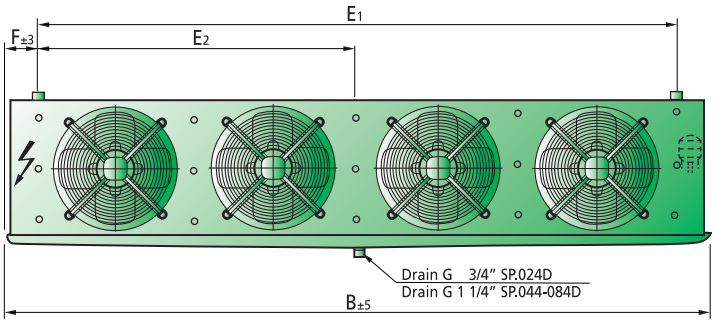
Dimensional drawings

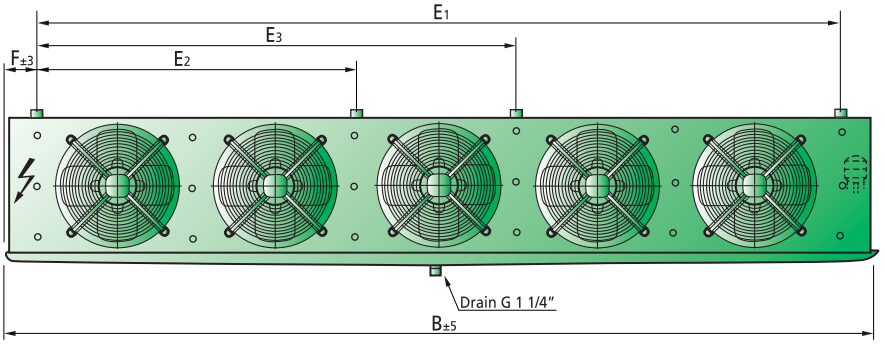












Constructions and Accessories

Water / brine operation

Please use our Küba selection software for configuring the brine Air Coolers. Do not hesitate to contact us if you have any further questions.

Configuration
- Soldered connections
- Ventilation and drainage

Corrosion protection

- Version .V6.01 and .V6.04
  Cooler
  - Tubes: Copper
  - Fins: Al „goldlack“ coating
  - End plates:
    Aluminium, anti-corrosion paint coating on both sides (.V6.01)
    Aluminium (.V6.04)

  Casing
  - Aluminium or Sendzimir zinc-plated steel, anti-corrosion paint coating on both sides (.V6.01)
    Aluminium, anti-corrosion paint coating (.V6.04)

Küba Air Jet

Advantages
- Longer air throw
- Even temperature distribution in cooled room

Loose as accessory

In mounted condition

Information:
Delivered not fitted
(Cannot be used in conjunction with electrical radiator SPHR)

For Model	Air Jet
	Ø mm
SP. 031D-044D	300
SP. 051D-065D	400
SP. 071D-084D	500

Accessories

Adapter for textile hose connection

Advantages
- Even cooling without draughts
- Even temperature distribution
- Best possible comfort in workrooms of all kinds

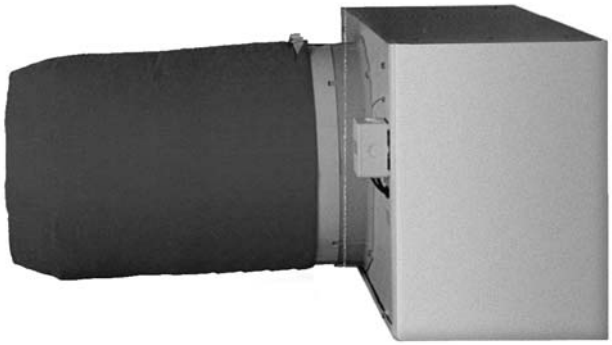
Information:
Delivered not fitted
(Cannot be used in conjunction
with electrical radiator SPHR)

For Model	Adapter
	Ø mm
SP. 031D-044D	320
SP. 051D-065D	420
SP. 071D-084D	520

Important note:
Using a fabric tube reduces the air volume and performance.

Shut-Up® with Küba Air Jet

Advantages
- Reduces defrosting time by more than 40 %
- With Shut-Up®, the defrosting heat is kept where it should be – in the Air Cooler
- For electrical defrosting and hot gas defrosting



Cooling phase, fans switched on:
Shut-Up® is inflated

Defrosting, fans switched off:
Shut-Up® locks the Air Cooler

Für Model	Shut-Up®
	Ø mm
SP. 031D-044D	320
SP. 051D-065D	420
SP. 071D-084D	520

Information:
Delivered not fitted
(Cannot be used in conjunction
with electrical radiator SPHR)

Important note:
1. Using a textile hose as well as a Shup-Up® reduces the air volume and performance.
2. Using a textile hose as well as a Shup-Up® requires the use of the Küba AIR JET and an adapter (see above).

Accessories

Finned tube heater SPHR

- For Air Coolers with sucking fans for installation by the client

Note:
Do not operate unless Air Cooler fans are running, to prevent the fans and cold room ceiling overheating!
Only use in conjunction with standard fan guard!

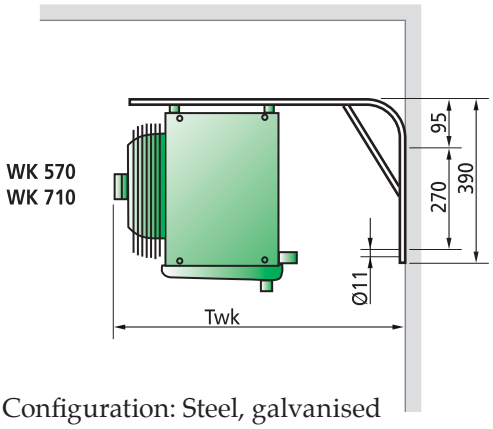
Scope of delivery
- Electrical finned tube radiator CrNi steel Ø 28 mm
- Connection ends 1000 mm long
- Fastening material Al, Nirosta
- Branching box acc. to VDE, ÖVE, SEV

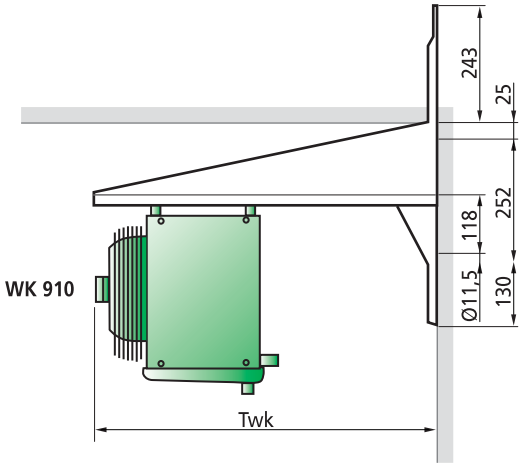
Model	For Blade	Nominal power at 230 V	Weight	Dimensions
	Ø mm	kW	kg	mm
SPHR25	250	1,36	0,65	245
SPHR30	300	1,75	0,75	300
SPHR40	400	2,47	0,94	400
SPHR50	500	3,19	1,13	500

Model	Order quantity	Rated power per unit at 230 V
		kW
SP. 011D	1x SPHR25	1,36
SP. 021D	1x SPHR25	1,36
SP. 031D	1x SPHR30	1,75
SP. 041D	1x SPHR30	1,75
SP. 051D	1x SPHR40	2,47
SP. 061D	1x SPHR40	2,47
SP. 071D	1x SPHR50	3,19
SP. 081D	1x SPHR50	3,19
SP. 022D	2x SPHR25	2,72
SP. 032D	2x SPHR30	3,50
SP. 042D	2x SPHR30	3,50
SP. 052D	2x SPHR40	4,94
SP. 062D	2x SPHR40	4,94
SP. 072D	1x SPHR50	6,38
SP. 082D	1x SPHR50	6,38
SP. 023D	3x SPHR25	4,08
SP. 043D	3x SPHR30	5,25
SP. 053D	3x SPHR40	7,41
SP. 063D	3x SPHR40	7,41
SP. 073D	3x SPHR50	9,57
SP. 083D	3x SPHR50	9,57
SP. 024D	4x SPHR25	5,44
SP. 044D	4x SPHR30	7,00
SP. 064D	4x SPHR40	9,88
SP. 074D	4x SPHR50	12,76
SP. 084D	4x SPHR50	12,76
SP. 065D	5x SPHR40	12,35

Accessories

Wall Bracket





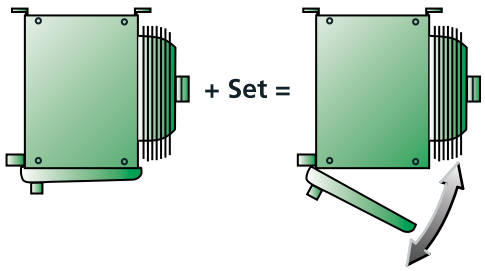
Configuration: Steel, galvanised

For Air Cooler	Model	Dimension Twk	Weight/piece
		mm	kg
SP. 011-044D	WK 570	570	1,80
SP. 051-065D	WK 710	700	2,10
SP. 071-084D	WK 910	910	4,60

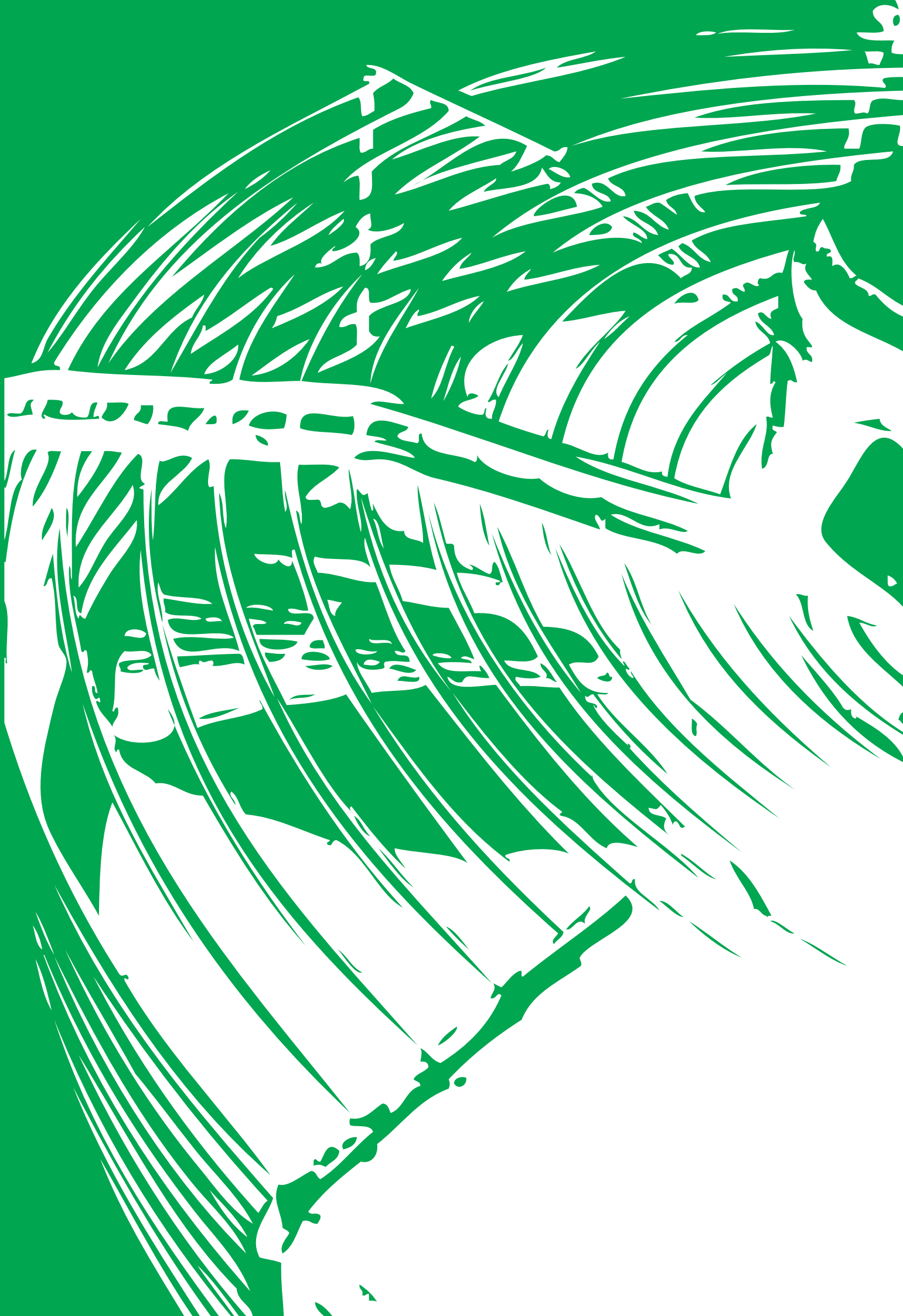
Model	Order quantity
SP. 011D-041D	2x WK 570
SP. 051D-061D	2x WK 710
SP. 071D-081D	2x WK 910
SP. 022D-042D	2x WK 570
SP. 052D-062D	2x WK 710
SP. 072D-082D	2x WK 910
SP. 023D-043D	2x WK 570
SP. 053D-063D	3x WK 710
SP. 073D-083D	3x WK 910
SP. 024D-044D	3x WK 570
SP. 064D	3x WK 710
SP. 074D-084D	3x WK 910
SP. 065D	4x WK 710

Mounting set for hinged drip tray

For Air Cooler	Order quantity
SP. 011-081D	2x Set
SP. 022-082D	3x Set
SP. 023-083D	4x Set
SP. 024-084D	5x Set
SP. 065D	6x Set



The standard drip tray can be converted to a hinged version without difficulty using the mounting set.

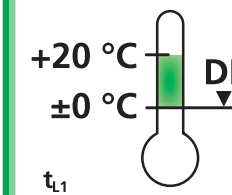


Küba *comfort* DP

Ceiling Air Cooler

Q_0

2,2 — 28 kW

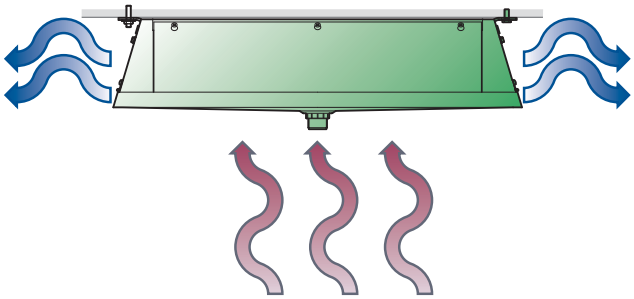


EUROVENT CERTIFIED PERFORMANCE
applied for
"CERTIFY ALL"
Air Coolers

Application Benefits for Contractors and Operators

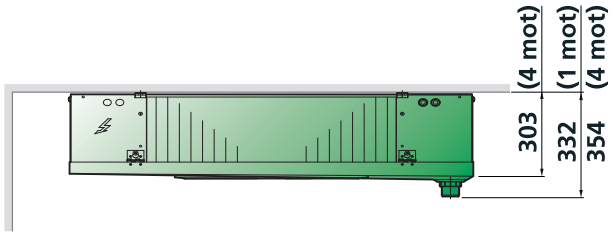
Expanded capacity range

- Up to 28 kW



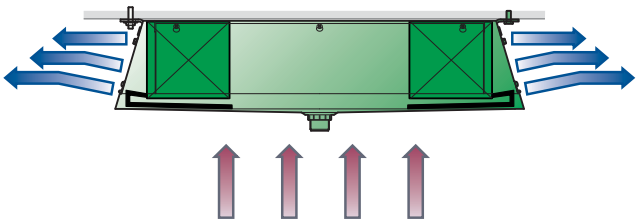
Low draught levels

- Integrated air baffle plate for low air speed in cooling room
- Low-noise version integrated, with two-speed fans as standard
- Extremely quiet version in the third speed „S“ with accessory (condenser)



Space-saving

- Height 303 mm



Best air guidance

- Integrated air baffle plate
- Low fan speed (up to 0.8 m/s)
- Directs the air to the ceiling of the room and therefore projects it far into the room

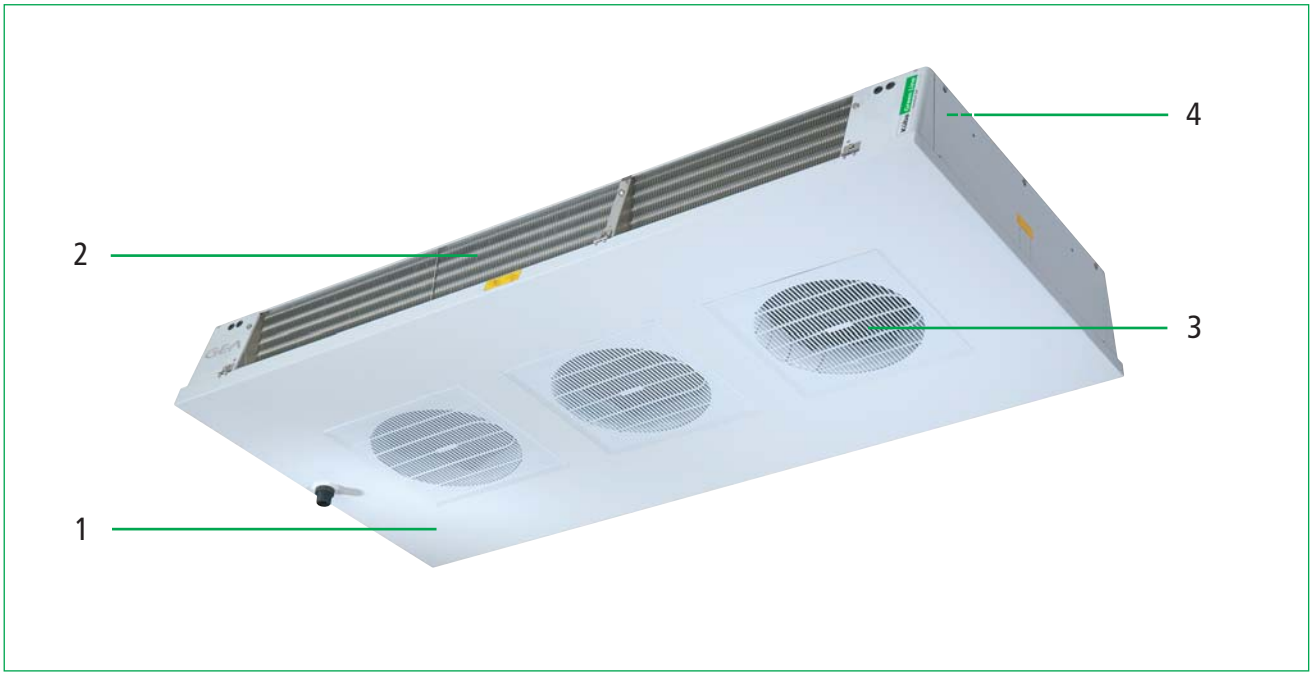
Nomenclature

Standard

DP	B	E	04	4	C

- Line designation
- Fin spacing: A = 4,5 mm, B = 7 mm
- E = with electric defrost
- Generation code
- Number of fans: 1-4
- Size: 03-04

Construction



1. Casing

- Sendzimir zinc-plated steel, smooth
- High-quality powder coating, papyrus white RAL 9018
  - Food-safe
  - Easy to clean
  - Best corrosion protection
- Drip tray and side pieces removable
- Drip tray folding at both sides

2. Cooler

- Internal cleanliness acc. to DIN 8964
- Fin spacing: DP.A: 4,5 mm, DP.B: 7,0 mm
- Tubing Cu-Special, Fins Al, End plates Al
- Küba-CAL® refrigerant distributor, with multiple injection

3. Fans CE

- Multi-stage fans wired up to an internal terminal box
- With built-in protector, without external contacts
- Ø 350 mm
- Plug connection on motor

- Application range: RT: -30 °C bis +60 °C
- 230 V ±10 %, V-1, 50/60 Hz, adjustable (transformer)
- Minimum Voltage = 100 V
- Index of protection IP44 acc. to DIN 40050
- Insulation class F acc. to VDE 0700
- Operating values are the actual values of the built-in motor at +20 °C and with dry surface
- Model plate information differ from the specified operating values (see installation instructions)

Motor label data (max. allowable value +40 °C)

		50 Hz			60 Hz		
	Ø mm	min^{-1}	W	A	min^{-1}	W	A
DP. 031-044C	350	1390	140	0,62	1550	195	0,86

4. Electric defrost

- Pre-wired, ready to connect in terminal box
- The coil heater rods are mounted in special tube sleeves for rapid and even defrosting
- 230 V-1 / 400 V-3
- With defrosting water drain plates

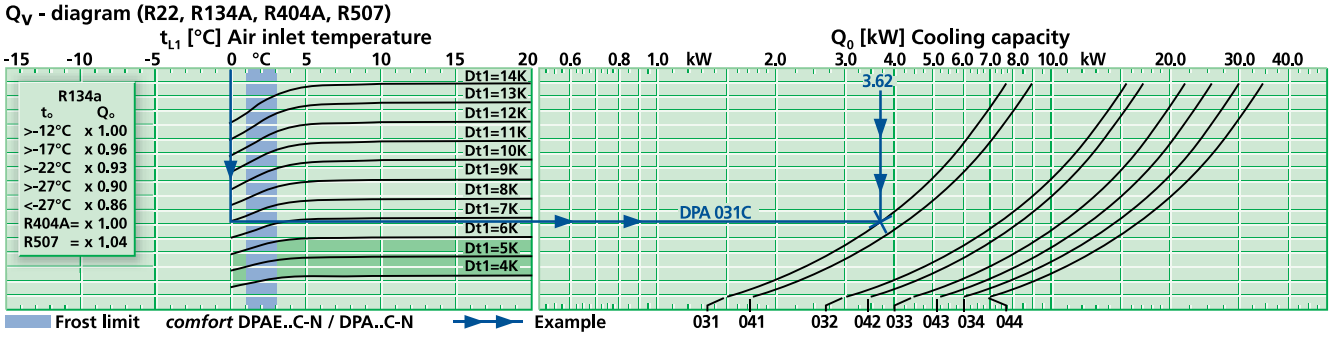
Technical data DPA(E)...C Normal Speed N 4,5 mm

3,6 kW 16 kW

t_{L1} +20 °C -25 °C +0 °C

Model		Rating Q_0 at 50 Hz DT1, R404A t_{L1} ±0 °C DT1 = 8K	t_{L1} +10 °C DT1 = 10 K	Surface	Air flow	Air throw	Tube volume	Connections Inlet	Outlet	Sound L_{WA**}	Fans (Operating values at 50 Hz) Blade	Type of current	Per Fan			Electr. defrost
		kW	kW	m²	m³/h	m	dm³	Ø mm	Ø mm	dB(A)	St. x Ø mm	230±10% V-1 50/60Hz	min⁻¹	W	A	kW
DPA 031C	✇	3,69	5,41	16,3	1720	2x11	3,4	10*	22	74	1 x 350	230V-1	1320	185	0,72	2,30
DPA 041C	✇	4,26	6,25	24,3	1620	2x9	5,1	10*	22	74	1 x 350	230V-1	1320	185	0,72	2,30
DPA 032C	✇✇	7,38	10,8	32,6	3440	2x12	6,8	10*	28	77	2 x 350	230V-1	1320	185	0,72	4,14
DPA 042C	✇✇	8,52	12,5	48,6	3240	2x10	10,2	10*	28	77	2 x 350	230V-1	1320	185	0,72	4,14
DPA 033C	✇✇✇	11,1	16,3	48,9	5160	2x13	10,2	10*	28	79	3 x 350	230V-1	1320	185	0,72	5,96
DPA 043C	✇✇✇	12,8	18,8	72,9	4860	2x11	15,3	15*	35	79	3 x 350	230V-1	1320	185	0,72	5,96
DPA 034C	✇✇✇✇	14,8	21,7	65,2	6880	2x14	13,6	15*	35	80	4 x 350	230V-1	1320	185	0,72	7,84
DPA 044C	✇✇✇✇	17,0	25,0	97,2	6480	2x12	20,4	22*	35	80	4 x 350	230V-1	1320	185	0,72	7,84

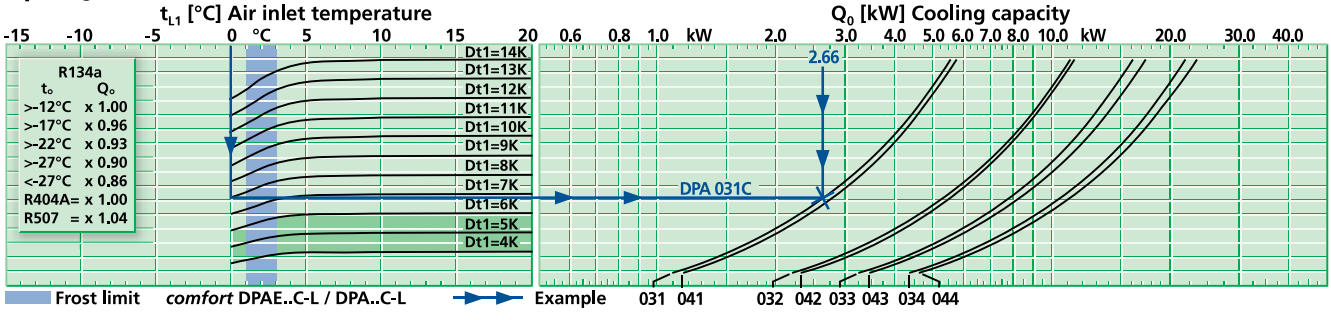
Q_V - diagram (R22, R134A, R404A, R507)

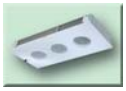


Technical data DPA(E)...C Quiet Speed L 4,5 mm

Model		Rating Q_0 at 50 Hz DT1, R404A t_{L1} ±0 °C DT1 = 8K	t_{L1} +10 °C DT1 = 10 K	Surface	Air flow	Air throw	Tube volume	Connections Inlet	Outlet	Sound L_{WA**}	Fans (Operating values at 50 Hz) Blade	Type of current	Per Fan			Electr. defrost
		kW	kW	m²	m³/h	m	dm³	Ø mm	Ø mm	dB(A)	St. x Ø mm	230±10% V-1 50/60Hz	min⁻¹	W	A	kW
DPA 031C	✇	2,66	3,71	16,3	1064	2x8	3,4	10*	22	64	1 x 350	230V-1	930	195	0,79	2,30
DPA 041C	✇	2,78	3,96	24,3	950	2x5	5,1	10*	22	64	1 x 350	230V-1	930	195	0,79	2,30
DPA 032C	✇✇	5,32	7,43	32,6	2128	2x9	6,8	10*	28	67	2 x 350	230V-1	930	195	0,79	4,14
DPA 042C	✇✇	5,56	7,92	48,6	1900	2x6	10,2	10*	28	67	2 x 350	230V-1	930	195	0,79	4,14
DPA 033C	✇✇✇	7,98	11,1	48,9	3192	2x10	10,2	10*	28	69	3 x 350	230V-1	930	195	0,79	5,96
DPA 043C	✇✇✇	8,34	11,9	72,9	2850	2x7	15,3	15*	35	69	3 x 350	230V-1	930	195	0,79	5,96
DPA 034C	✇✇✇✇	10,6	14,9	65,2	4256	2x11	13,6	15*	35	70	4 x 350	230V-1	930	195	0,79	7,84
DPA 044C	✇✇✇✇	11,1	15,9	97,2	3800	2x8	20,4	22*	35	70	4 x 350	230V-1	930	195	0,79	7,84

Q_V - diagram (R22, R134A, R404A, R507)





Technical data DPA(E)...C Very quiet Speed S 4,5 mm

1,9 kW 8 kW

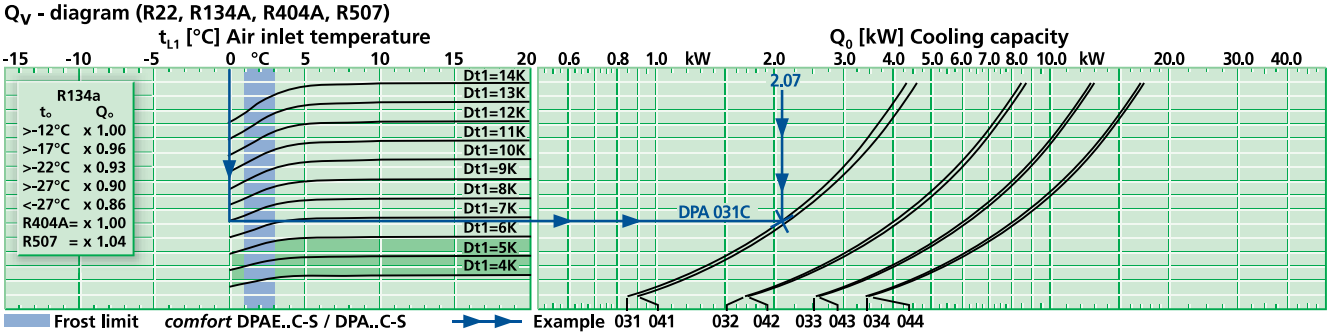
t_{L1} +20 °C -25 °C +0 °C

Model		Rating Q_0 at 50 Hz DT1, R404A t_{L1} ±0 °C DT1 = 8K	t_{L1} +10 °C DT1 = 10 K	Surface	Air flow	Air throw	Tube volume	Connections Inlet	Outlet	Sound L_{WA**}	Fans (Operating values at 50 Hz) Blade	Type of current	Per Fan			Electr. defrost
		kW	kW	m²	m³/h	m	dm³	Ø mm	Ø mm	dB(A)	St. x Ø mm	230±10% V-1 50/60Hz	min⁻¹	W	A	kW
DPA 031C	✇	2,07	3,04	16,3	760	2x5	3,4	10*	22	56	1 x 350	230V-1	660	195	0,79	2,30
DPA 041C	✇	2,13	3,13	24,3	670	2x4	5,1	10*	22	56	1 x 350	230V-1	660	195	0,79	2,30
DPA 032C	✇✇	4,14	6,08	32,6	1520	2x6	6,8	10*	28	59	2 x 350	230V-1	660	195	0,79	4,14
DPA 042C	✇✇	4,26	6,25	48,6	1340	2x5	10,2	10*	28	59	2 x 350	230V-1	660	195	0,79	4,14
DPA 033C	✇✇✇	6,21	9,11	48,9	2280	2x7	10,2	10*	28	61	3 x 350	230V-1	660	195	0,79	5,96
DPA 043C	✇✇✇	6,39	9,38	72,9	2010	2x6	15,3	15*	35	61	3 x 350	230V-1	660	195	0,79	5,96
DPA 034C	✇✇✇✇	8,28	12,2	65,2	3040	2x8	13,6	15*	35	62	4 x 350	230V-1	660	195	0,79	7,84
DPA 044C	✇✇✇✇	8,52	12,5	97,2	2680	2x7	20,4	22*	35	62	4 x 350	230V-1	660	195	0,79	7,84

Multiple injection via * Küba-CAL® distributor

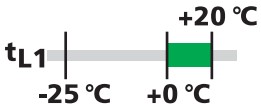
** Modification of sound power level, see page 59

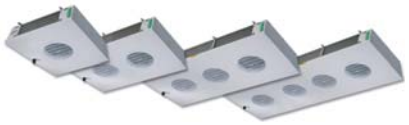
Q_V - diagram (R22, R134A, R404A, R507)



The technical data are also given in the product selection software.

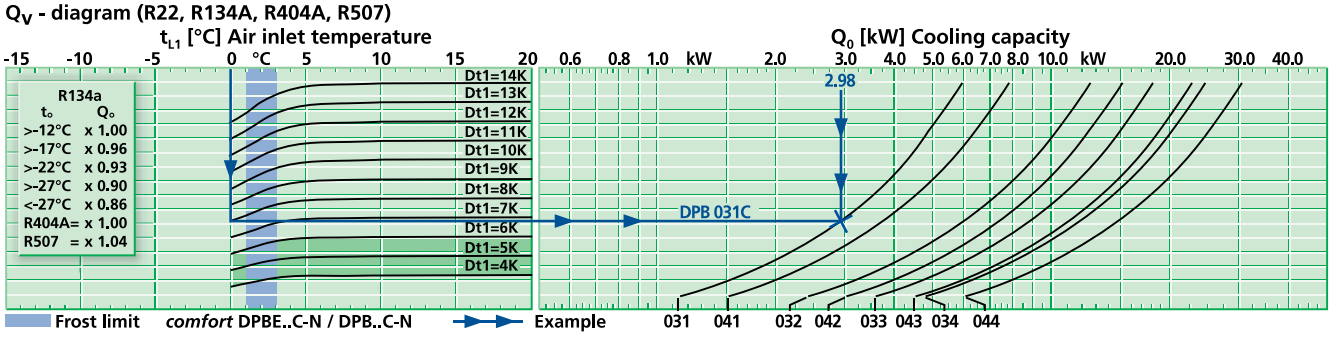
Technical data — DPB(E)...C Normal — Speed N — 7 mm





Model		Rating Q_0 at 50 Hz DT1, R404A t_{L1} ±0 °C DT1 = 8K	t_{L1} +10 °C DT1 = 10 K	Surface	Air flow	Air throw	Tube volume	Connections Inlet	Outlet	Sound L_{WA**}	Fans (Operating values at 50 Hz) Blade	Type of current	Per Fan			Electr. defrost
		kW	kW	m²	m³/h	m	dm³	Ø mm	Ø mm	dB(A)	St. x Ø mm	230±10% V-1 50/60Hz	min⁻¹	W	A	kW
DPB 031C	✇	2,98	4,37	11,0	1850	2x11	3,4	10*	22	74	1 x 350	230V-1	1320	185	0,72	2,30
DPB 041C	✇	3,72	5,46	16,4	1770	2x9	5,1	10*	22	74	1 x 350	230V-1	1320	185	0,72	2,30
DPB 032C	✇✇	5,96	8,75	22,0	3700	2x12	6,8	10*	28	77	2 x 350	230V-1	1320	185	0,72	4,14
DPB 042C	✇✇	7,44	10,9	32,8	3540	2x10	10,2	10*	28	77	2 x 350	230V-1	1320	185	0,72	4,14
DPB 033C	✇✇✇	8,94	13,1	33,0	5550	2x13	10,2	10*	28	79	3 x 350	230V-1	1320	185	0,72	5,96
DPB 043C	✇✇✇	11,2	16,4	49,2	5310	2x11	15,3	15*	35	79	3 x 350	230V-1	1320	185	0,72	5,96
DPB 034C	✇✇✇✇	11,9	17,5	44,0	7400	2x14	13,6	15*	35	80	4 x 350	230V-1	1320	185	0,72	7,84
DPB 044C	✇✇✇✇	14,9	21,8	65,6	7080	2x12	20,4	22*	35	80	4 x 350	230V-1	1320	185	0,72	7,84

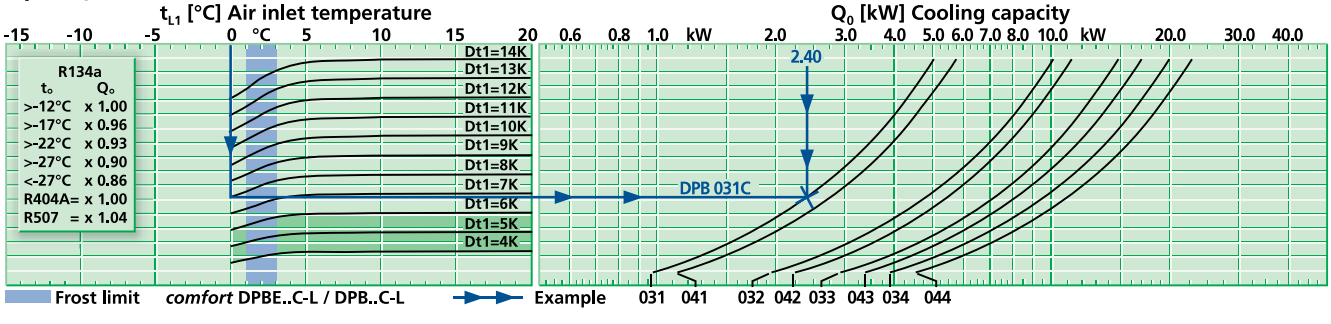
Q_V - diagram (R22, R134A, R404A, R507)

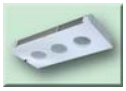


Technical data — DPB(E)...C Quiet — Speed L — 7 mm

Model		Rating Q_0 at 50 Hz DT1, R404A t_{L1} ±0 °C DT1 = 8K	t_{L1} +10 °C DT1 = 10 K	Surface	Air flow	Air throw	Tube volume	Connections Inlet	Outlet	Sound L_{WA**}	Fans (Operating values at 50 Hz) Blade	Type of current	Per Fan			Electr. defrost
		kW	kW	m²	m³/h	m	dm³	Ø mm	Ø mm	dB(A)	St. x Ø mm	230±10% V-1 50/60Hz	min⁻¹	W	A	kW
DPB 031C	✇	2,40	3,52	11,0	1300	2x8	3,4	10*	22	64	1 x 350	230V-1	930	195	0,79	2,30
DPB 041C	✇	2,74	4,02	16,4	1140	2x5	5,1	10*	22	64	1 x 350	230V-1	930	195	0,79	2,30
DPB 032C	✇✇	4,80	7,04	22,0	2600	2x9	6,8	10*	28	67	2 x 350	230V-1	930	195	0,79	4,14
DPB 042C	✇✇	5,48	8,04	32,8	2280	2x6	10,2	10*	28	67	2 x 350	230V-1	930	195	0,79	4,14
DPB 033C	✇✇✇	7,20	10,6	33,0	3900	2x10	10,2	10*	28	69	3 x 350	230V-1	930	195	0,79	5,96
DPB 043C	✇✇✇	8,22	12,1	49,2	3420	2x7	15,3	15*	35	69	3 x 350	230V-1	930	195	0,79	5,96
DPB 034C	✇✇✇✇	9,60	14,1	44,0	5200	2x11	13,6	15*	35	70	4 x 350	230V-1	930	195	0,79	7,84
DPB 044C	✇✇✇✇	11,0	16,1	65,6	4560	2x8	20,4	22*	35	70	4 x 350	230V-1	930	195	0,79	7,84

Q_V - diagram (R22, R134A, R404A, R507)





Technical data DPB(E)...C Very quiet Speed S 7 mm

1,9 kW 8 kW

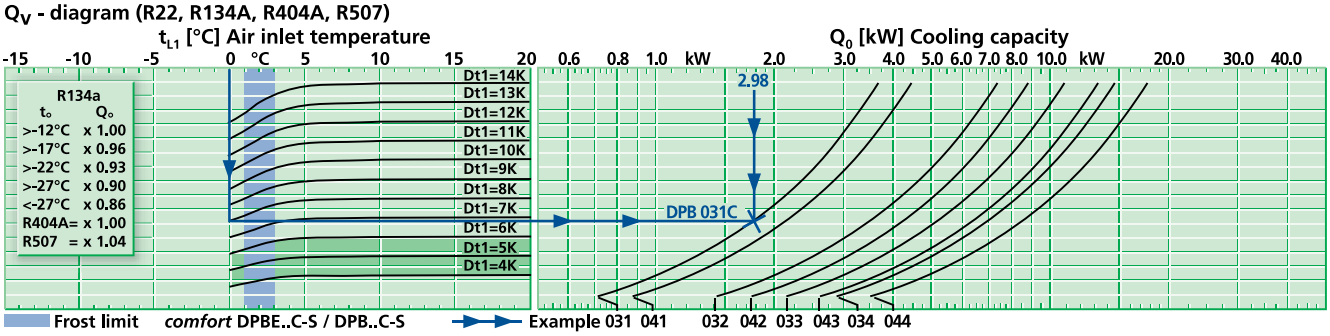
t_{L1} +20 °C -25 °C +0 °C

Model		Rating Q_0 at 50 Hz DT1, R404A t_{L1} ±0 °C DT1 = 8K	Rating Q_0 at 50 Hz DT1, R404A t_{L1} +10 °C DT1 = 10 K	Surface	Air flow	Air throw	Tube volume	Connections Inlet	Connections Outlet	Sound L_{WA}**	Fans (Operating values at 50 Hz) Blade	Fans Type of current	Per Fan			Electr. defrost
		kW	kW	m²	m³/h	m	dm³	Ø mm	Ø mm	dB(A)	St. x Ø mm	230±10% V-1 50/60Hz	min⁻¹	W	A	kW
DPB 031C	✇	1,75	2,57	11,0	810	2x5	3,4	10*	22	56	1 x 350	230V-1	660	195	0,79	2,30
DPB 041C	✇	2,13	3,13	16,4	800	2x4	5,1	10*	22	56	1 x 350	230V-1	660	195	0,79	2,30
DPB 032C	✇✇	3,50	5,14	22,0	1620	2x6	6,8	10*	28	59	2 x 350	230V-1	660	195	0,79	4,14
DPB 042C	✇✇	4,26	6,25	32,8	1600	2x5	10,2	10*	28	59	2 x 350	230V-1	660	195	0,79	4,14
DPB 033C	✇✇✇	5,25	7,70	33,0	2430	2x7	10,2	10*	28	61	3 x 350	230V-1	660	195	0,79	5,96
DPB 043C	✇✇✇	6,39	9,38	49,2	2400	2x6	15,3	15*	35	61	3 x 350	230V-1	660	195	0,79	5,96
DPB 034C	✇✇✇✇	7,00	10,3	44,0	3240	2x8	13,6	15*	35	62	4 x 350	230V-1	660	195	0,79	7,84
DPB 044C	✇✇✇✇	8,52	12,5	65,6	3200	2x7	20,4	22*	35	62	4 x 350	230V-1	660	195	0,79	7,84

Multiple injection via * Küba-CAL® distributor

** Modification of sound power level, see page 59

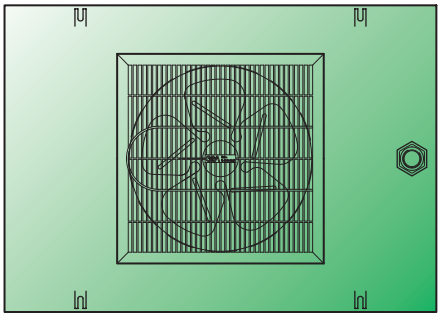
Q_V - diagram (R22, R134A, R404A, R507)

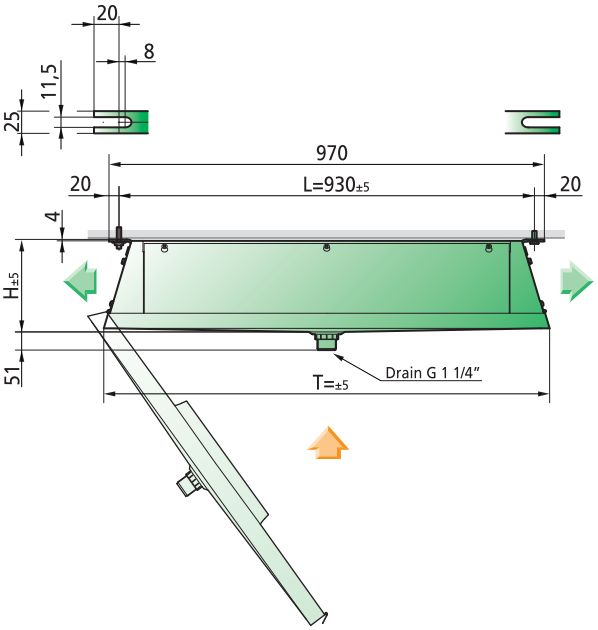


The technical data are also given in the product selection software.

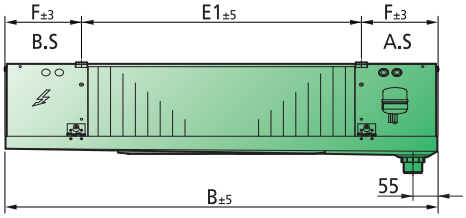
Available for CO_2-DX up to 54 bar

Dimensions and weights

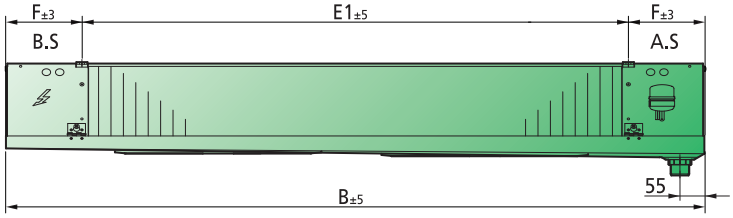




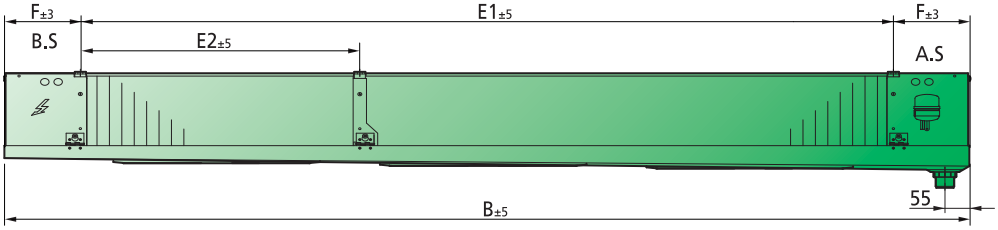
DP.(E) 031, 041 C



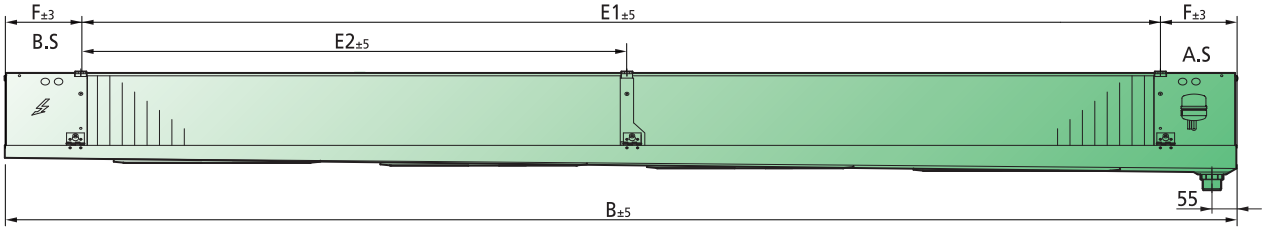
DP.(E) 032, 042 C



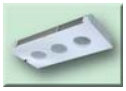
DP.(E) 033, 043 C



DP.(E) 034, 044 C



Model	Dimensions (mm)							Weight (net)	
								DPA.C	DPB.C
	H	B	T	L	E_1	E_2	F	kg	kg
DP. 031C	281	972	1010	930	630	-	171	46	44
DP. 041C	281	972	1010	930	630	-	171	50	48
DP. 032C	288	1572	1010	930	1230	-	171	72	70
DP. 042C	288	1572	1010	930	1230	-	171	76	74
DP. 033C	296	2172	1010	930	1830	629	171	105	102
DP. 043C	296	2172	1010	930	1830	629	171	111	108
DP. 034C	303	2772	1010	930	2430	1229	171	131	127
DP. 044C	303	2772	1010	930	2430	1229	171	137	133



Variants and Electrical radiators

Alternating current motor, 1-speed

- Version .V1.02 230 V ±10 %, V-1, 50 / 60 Hz, adjustable

Motor label data 50 / 60 Hz

DP:	DP. 031 – 044 C
Fan:	Ø 350
Index of protection:	IP44
I (A):	0,62 / 0,86
P (W):	140 / 195
n (min):	1390 / 1550
C (µF):	5

Water/brine circulation

- Version .V2.05
  Large number of distributors (small pressure drop)
- Version .V2.06
  Small number of distributors (large pressure drop)

Connections for brine / water operation

Please use our Küba selection software for configuring the brine Air Coolers. Do not hesitate to contact us if you have any further questions.

For Cooler	Inlet and Outlet	
	.V2.05	.V2.06
DP. 031C	Ø 22	Ø 22
DP. 041C	Ø 22	Ø 22
DP. 032C	Ø 28	Ø 22
DP. 042C	Ø 28	Ø 22
DP. 033C	Ø 28	Ø 22
DP. 043C	Ø 28	Ø 22
DP. 034C	Ø 28	Ø 28
DP. 044C	Ø 35	Ø 28

Configuration
- Soldered connections
- Ventilation and drainage

Corrosion protection

- Version .V6.01 and .V6.04
  Cooler
  – Tubes: Copper
  – Fins: Al „goldlack“ coating
  – End plates:
  Aluminium, anti-corrosion paint coating on both sides (.V6.01)
  Aluminium (.V6.04)
  Casing
  – Aluminium or Sendzimir zinc-plated steel, anti-corrosion paint coating on both sides (.V6.01)
  Aluminium, anti-corrosion paint coating (.V6.04)

Insulated drip tray

- Version .V3.09

Insulation prevents condensation formation on the underside of the tray and reduces the transfer of defrosting heat into the cooling rooms.

Area of application
- Foodstuffs industry, e.g. butchering rooms

Electrical radiator

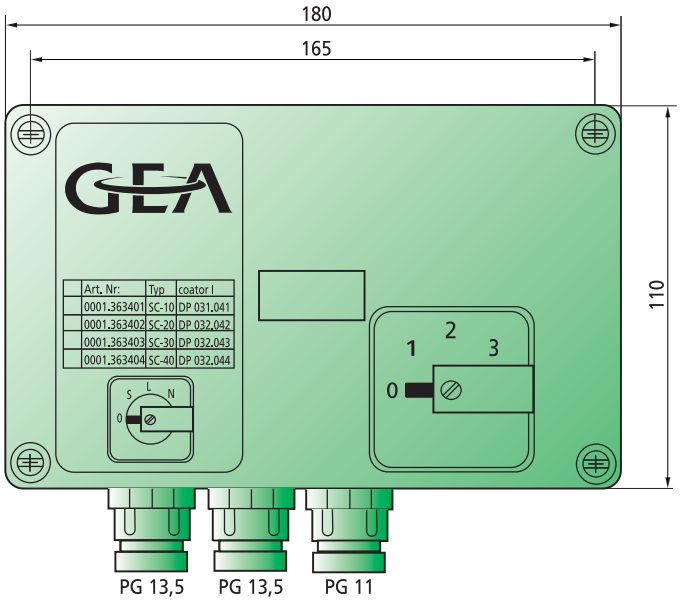
Configuration
- Electrical tubular radiator with CrNi jacket Ø 8,5 mm
- Connection impervious to water vapour, 1,0 mm² x 1000 mm acc. to VDE 0700 / part 1
- Aluminium fin
- Sendzimir zinc-plated end, middle and top plates
- Copper tube bush
- Completely powder-coated

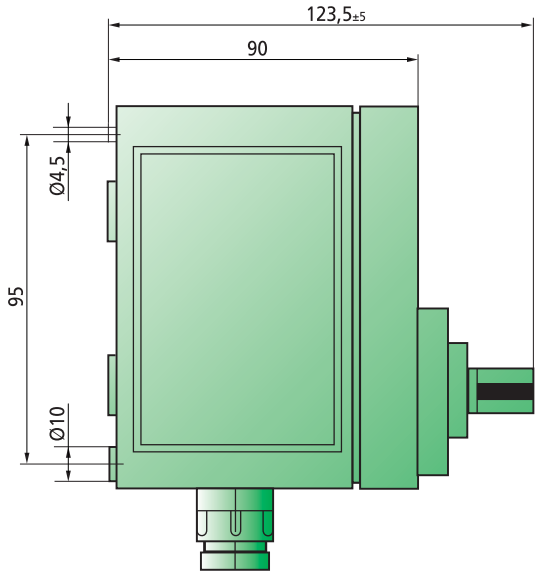
Model	Nominal power at 230 V		Dimensions		Weight
	kW	A	H	L	kg
DPHR 600	0,96	4,2	210	600	1,7
DPHR 1200	1,91	8,3	210	1200	2,9
DPHR 1800	2,87	12,5	210	1800	4,2
DPHR 2400	3,75	16,3	210	2400	5,6

Model	Piece	Model	Electrical radiator at 230V ± 10%, V-1 Connected load per Air Cooler	
			kW	A
DP031, 041C	2	DPHR 600	1,92	8,4
DP032, 042C	2	DPHR 1200	3,82	16,6
DP033, 043C	2	DPHR 1800	5,74	25,0
DP034, 044C	2	DPHR 2400	7,50	32,6

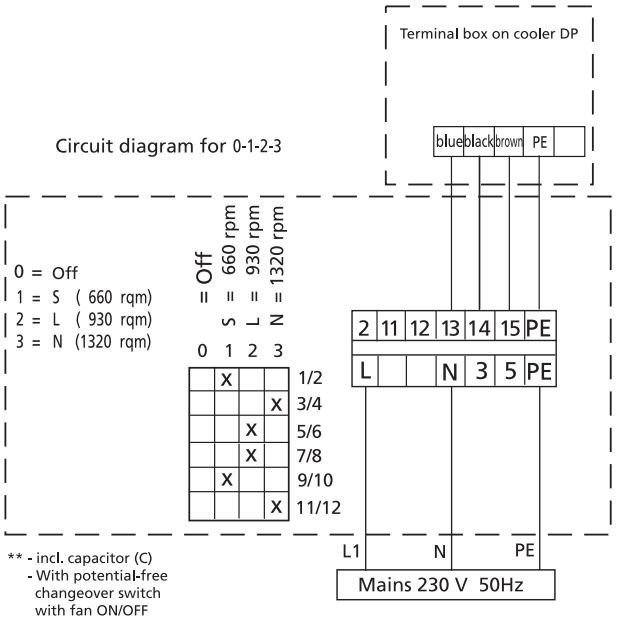
Accessories

Speed switch operation

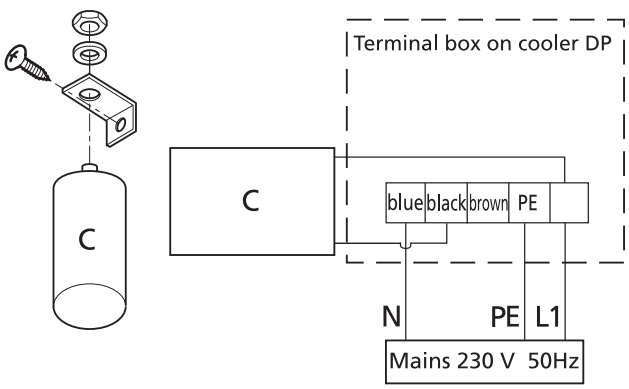


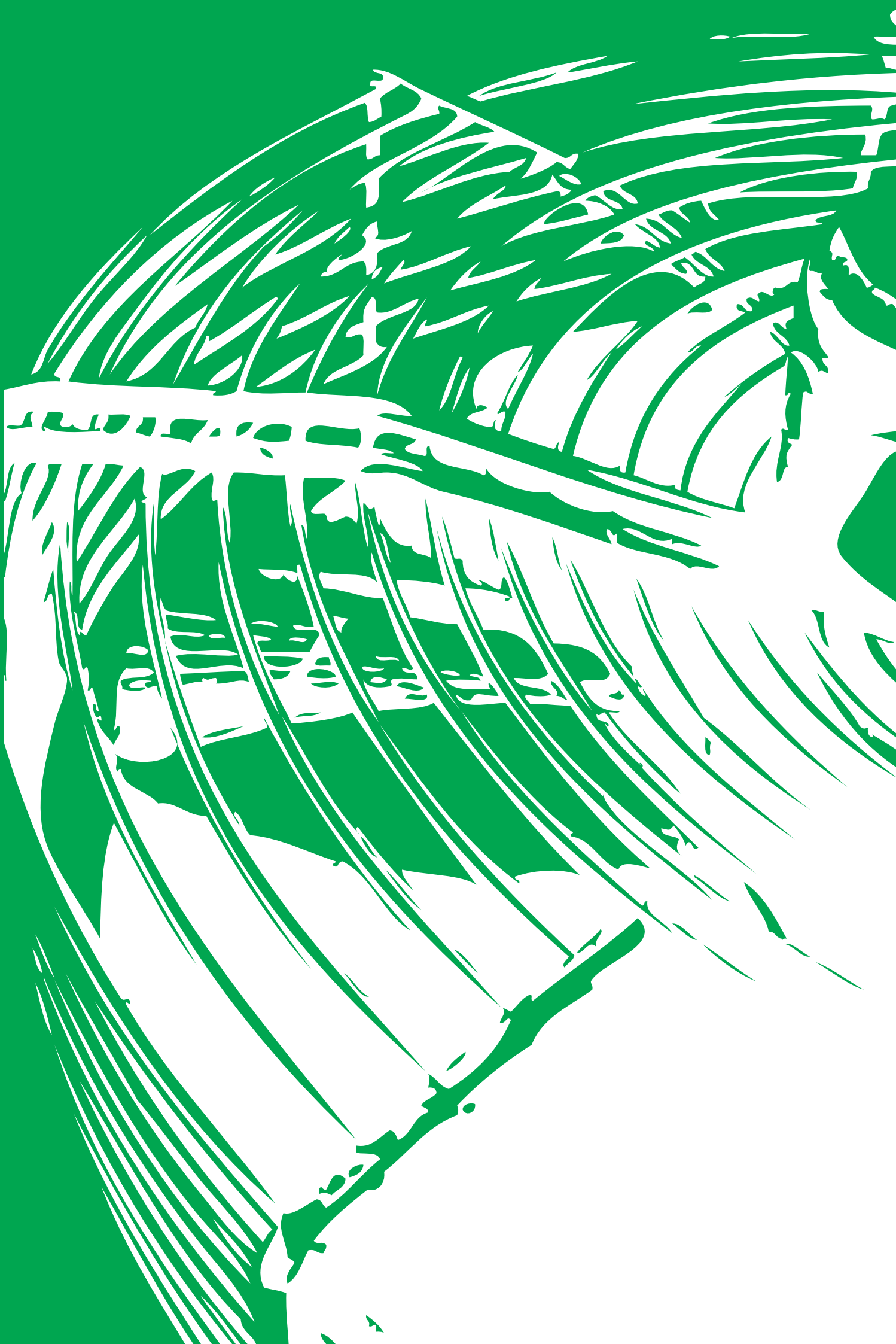


Model	for		Index of protection
SC-10**	DP 031C, 041C	✇	IP 54
SC-20**	DP 032C, 042C	✇✇	IP 54
SC-30**	DP 033C,043C	✇✇✇	IP 54
SC-40**	DP 034C, 044C	✇✇✇✇	IP 54

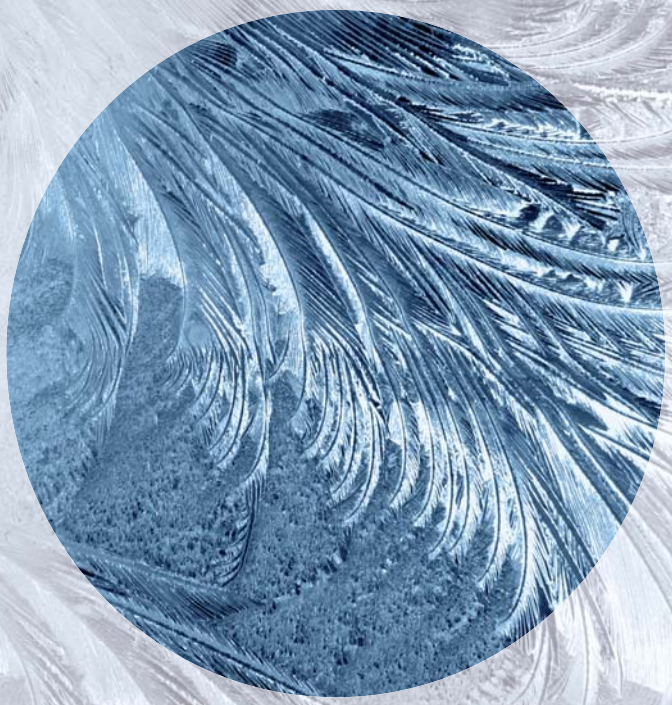


Model	for		Index of protection
C-10	DP 031C, 041C	✇	IP 54
C-20	DP 032C, 042C	✇✇	IP 54
C-30	DP 033C,043C	✇✇✇	IP 54
C-40	DP 034C, 044C	✇✇✇✇	IP 54





Further information



Sound specifications

Introduction

In the technical design of Air Coolers and condensers, capacity and sound output are defined parameters that must be specified. With regard to sound output specifications in the international market there are a variety of calculation methods. Different sound output specifications have significance for refrigeration contractors, designers and planners. For heat exchangers and condensers, compliance with specific immission values (e.g. noise level, workplace safety legislation, etc.), is best calculated using sound power use in the form of acoustic pressure Lp(A). However, for Air Coolers, information regarding sound power $L_{W(A)}$ is most suitable.

Acoustic pressure L_p

Pressure = force / surface [N/m²]
Alternating pressure generated by acoustic oscillation in the medium (e.g. air)

- **Advantage:**

Measurement can be directly determined
Thermal analogy: temperature measurement

- **Disadvantages:**
  Dependent on environmental influences such as: installation location, environment
  Dependent on distance to the sound source and reference surface used

Acoustic power L_W

is the sound energy radiated per time unit in [W] = [Nm/s]

- Advantages:
  Independent of environmental influences, of distance to the sound source or on the reference surface used
- Disadvantage:
  Cannot be measured directly

Sound intensity and A-evaluation

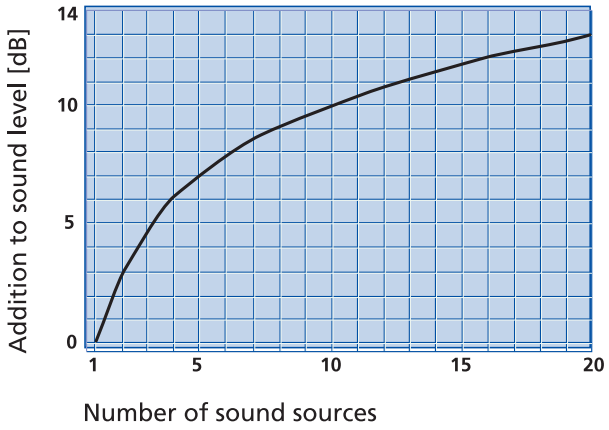
The human ear can perceive sound at frequencies between approx. 15 and 20,000 Hertz. Perception, or sensitivity to sound, depends strongly on the respective frequency. Very high and low tones are less often experienced as less loud than those in the mid-frequency range from about 1000 to 5000 Hertz. For this reason, evaluation filters in accordance with EN 61 672-1 are used. In audio technology and the environmental sector, the A-evaluation is most significant because it has similar frequency behaviour as the human ear for certain sound intensities.

Sound output specifications for Air Coolers

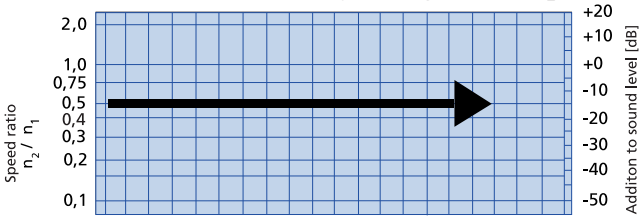
Due to the reflection in the cold storage area, the sound power $L_{W(A)}$ should always be used for a technical comparison between Air Coolers. In this case only sound power offers information that can be compared because it does not depend on the distance to the sound source, the installation location or the surroundings.

Sound power

Addition of sound sources at the same level



Correction of sound level by change of fan speed



Assembly

Suction line (not with brine operation) ①

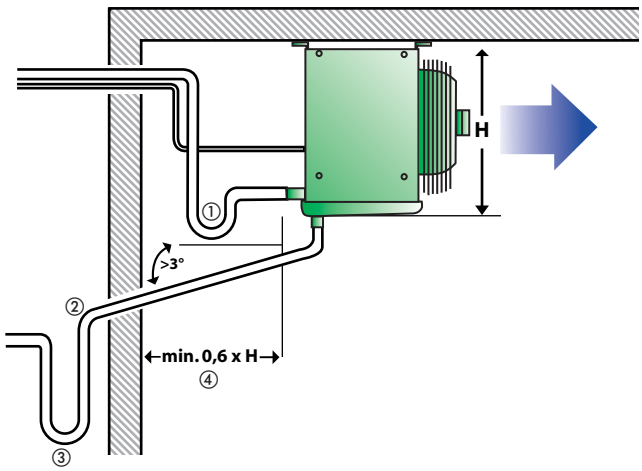
If the suction line cannot be laid on an incline to the evaporator an oil collector should be installed. The high speed of the refrigerant in the bend will ensure that oil is recirculated to the compressor. The bend should be located below the cooler so that the air cooler capacity is not affected by oil collecting in the air cooler.

Condensation water line ②

The condensation water line must always be laid at an incline great enough to ensure that the water can flow out. In cold storage areas with an ambient temperature below 4 °C, plan to use trace heating to prevent the condensation water from freezing in the line.

Trap ③

Installing a trap is required for trouble-free operation and not just from an energy perspective. If an air cooler is operated without a trap, it always takes in „the warmer air“ at higher temperatures and humidity from outside of the Cold Room. This „warm air“ significantly reduces the air cooler capacity and can, depending on temperature level, lead to ice formation and total failure of the system. The trap should always be installed outside of the Cold Room. Each cooler should have its own trap. Otherwise there is a risk of interaction.

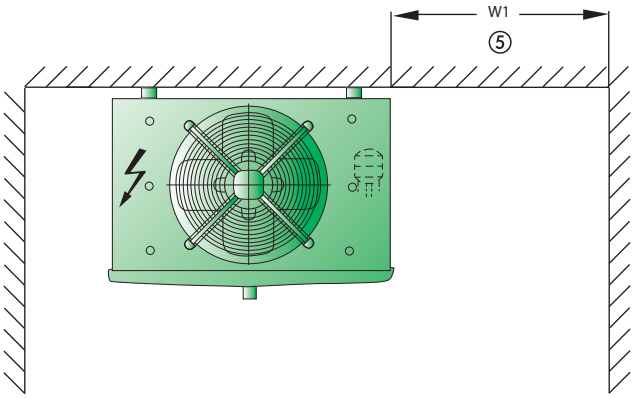


Wall clearance ④

Maintain a sufficient wall clearance to ensure optimum air cooler air flow rates. No tubes, etc. should pass through this minimum clearance area. In some circumstances this can lead to uneven frost build-up and loss of capacity. The recommended clearance always corresponds with the free intake area.

Side clearance ⑤

Side clearance should be selected such that service work can be carried out. This, together with the wall clearance ④, should be equal to at least the area of the air inlet. This ensures a 100% air flow rate and full cooling capacity.



Fax Request

Küba Product Information

Fax Request

to ++49(0)89/744 73-107

I would like documentation regarding the following subjects:

- ❑ More copies of the Küba Green Line brochure
- ❑ Küba Blue Line brochure
- ❑ Küba high performance air cooler flyer
- ❑ Price list
- ❑ Spare parts price list
- ❑ „Forum“ customer journal
- ❑ Condenser brochure (CAV/H, CAV/H 05+06, NAV/H)
- ❑ Dry Cooler brochure (GAV/H)
- ❑ Küba Select CD
- ❑ Expansion valve calculator

❑ **Yes,** I would like to order the free newsletter that appears approx. 3 times a year.

My e-mail address is: _____

❑ Our address has changed:

Company: _____

Contact person: _____

Street: _____

Postal code/City: _____

Telephone: _____

Fax: _____

E-mail: _____

❑ **I would not like to receive any more information from Küba.**
Please remove me from your information distribution list.

Notes

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Notes

Notes

Notes

Notes

You can find Küba products at:

Subject to error and revision

43 0094.392 132 E 2000 Status as of 11/2008

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