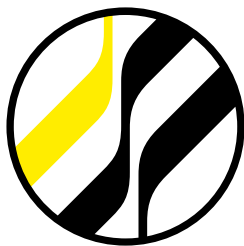


Kelvion



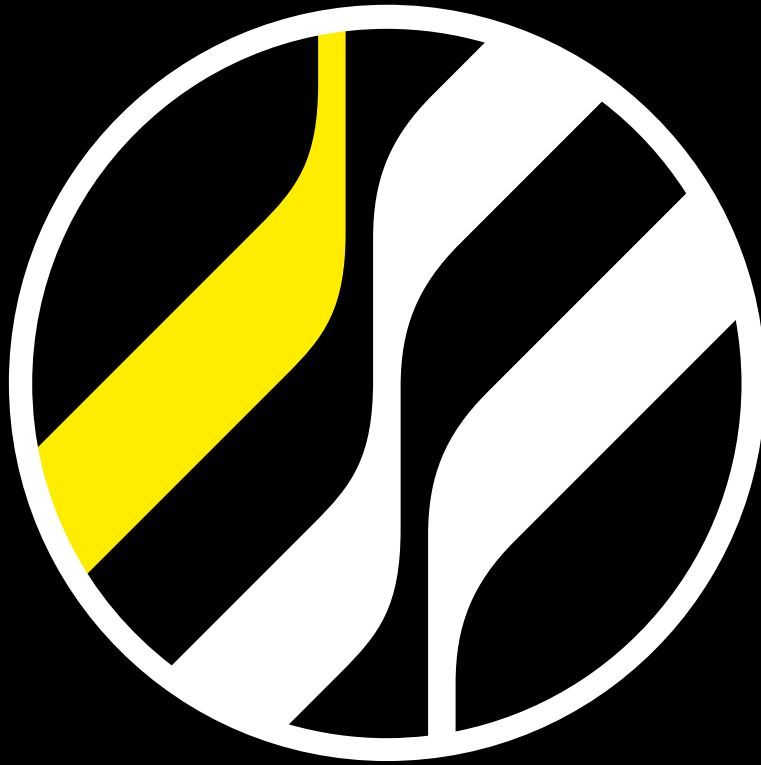
Commercial air coolers

Kelvion Commercial Air Coolers

TAKING HEAT OFF AROUND THE WORLD



Kelvion



EXPERTS IN HEAT EXCHANGE – SINCE 1920

Welcome to Kelvion! Where Heat Exchange is our Business. We are one of the leading global manufacturers of heat exchangers and have been providing solutions for almost every industrial application imaginable since the 1920s, specializing in customized solutions suitable for extreme environmental conditions - as of 2015 under the name of Kelvion.

With one of the most extensive selections of heat exchangers in the world, we are a well-known partner in many industries, including transportation, energy, oil and gas, chemical, marine as well as food and beverage, data center and the HVAC and refrigeration technology sector. Our products include Compact Fin Heat Exchangers, Plate Heat Exchangers, Single Tube Heat Exchangers, Transformer Cooling Systems, Cooling Towers and Shell & Tube Heat Exchangers.

Our many years of experience and in-depth expertise have made us specialists in this field. Our heat exchangers are designed specifically to meet the needs of the respective machine or equipment system, ensuring outstanding energy efficiency and reliability in any market segment. This gives our customers a cutting-edge over their competitors while also reducing operating costs over the long term.

As your heat exchange partner, we understand that outstanding and reliable after-sales services are critical for you, our customer, and we work alongside with you in close partnership supporting you throughout the full life cycle of your plant and equipment to ensure lasting business success.

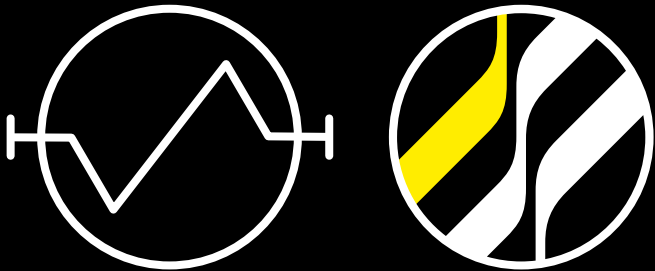
Kelvion – Experts in Heat Exchange.

**KELVION – A TRIBUTE
TO LORD KELVIN
(1824 - 1907)**

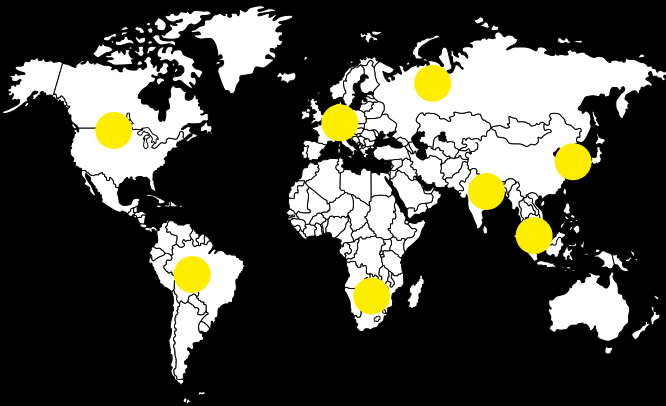


Lord Kelvin formulated the laws of thermodynamics and absolute units of temperature are stated in kelvin, in his honor.

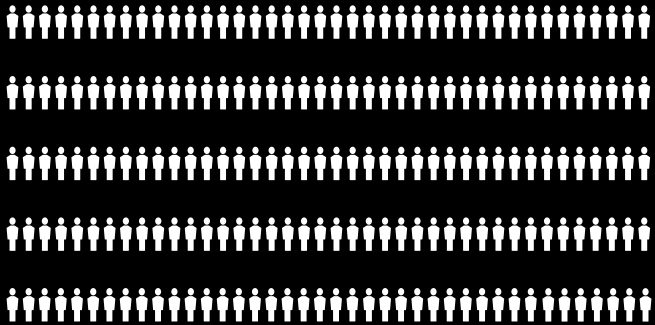
**OUR LOGO – INSPIRED
FROM THE SCHEMATIC
FOR HEAT EXCHANGER**



**67 BRANCHES AND SALES
PARTNERS WORLDWIDE**



**5,000 EMPLOYEES
WORLDWIDE**



**YOUR MARKETS ARE
OUR MARKETS**



Chemicals



Data Center



Food &
Beverage



HVAC



Refrigeration



Marine



Oil & Gas



Power



Transportation



... and more

**KELVION HAS A
LONG HISTORY**

2015

With the new name, the former GEA Heat Exchangers is writing its own history as Kelvion.

2014

GEA sells the Heat Exchangers Segment to Triton.

2010

Reorganization of GEA's 9 Divisions into technologically distinct Segments. The largest segment is the Heat Exchangers Segment.

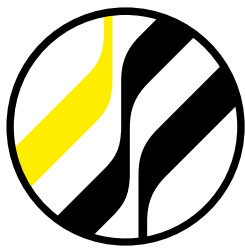
1999

In April 1999, GEA was acquired by mg technologies AG

1920

Foundation of GEA in Bochum by Otto Happel sen. (Born 1882)

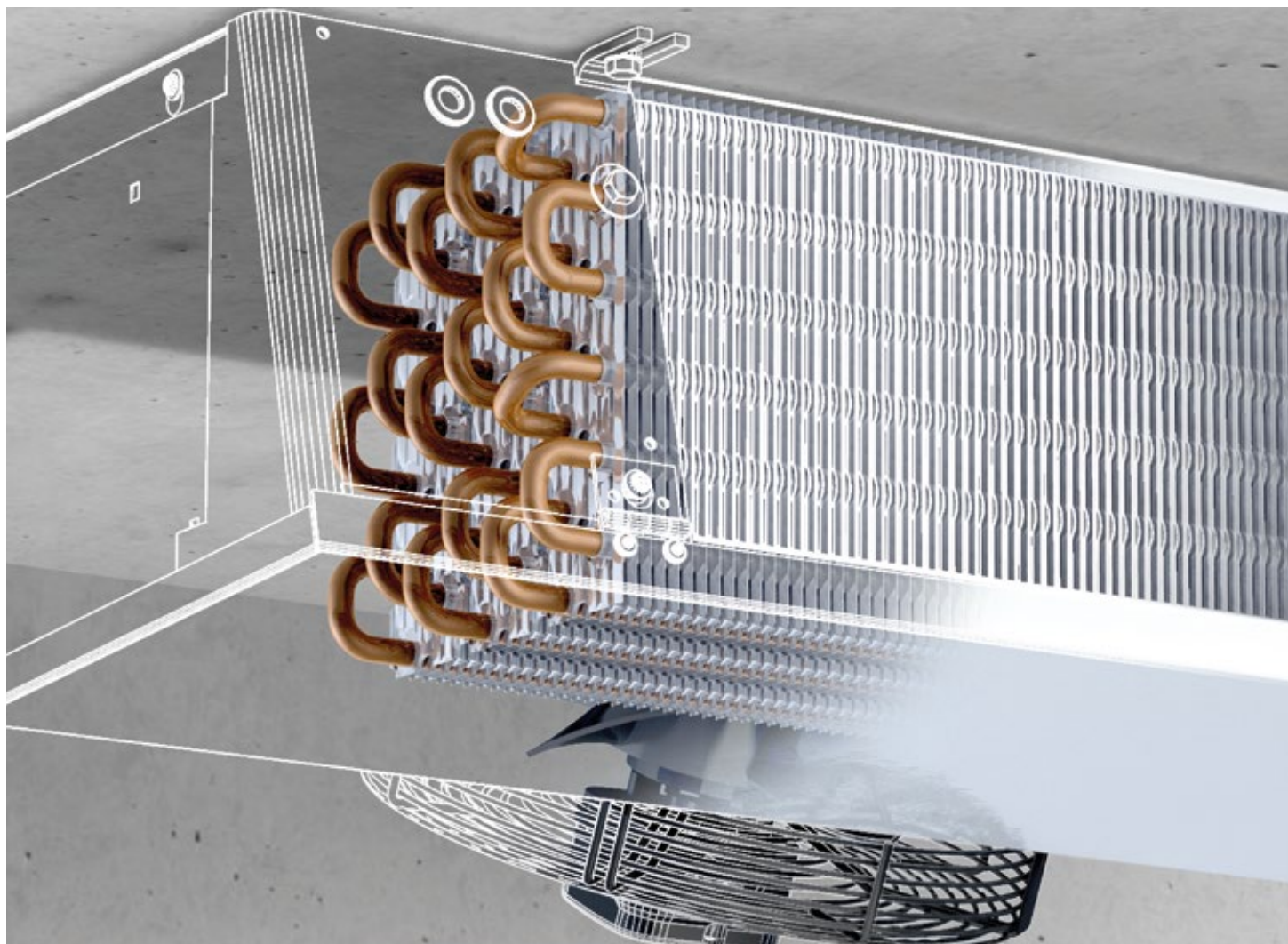
Kelvion



Commercial air coolers

Küba compact DF

CEILING MOUNTED COOLER FOR CATERING & RETAIL



Küba compact DF

THE SPACE-SAVING HELPER IN COLD ROOMS, FOOD STORAGE, FOOD PREPARATION COOL CABINETS.



Capacity range (for SC2)

1,5 kW    10 kW

Temperature range (t_{L1})

-25°C     +20°C

Type Designation Code

1 2 3 4 5 6

DF B E 07 1 C

1 Model range designation

2 Fin spacing

3 Electric defrost

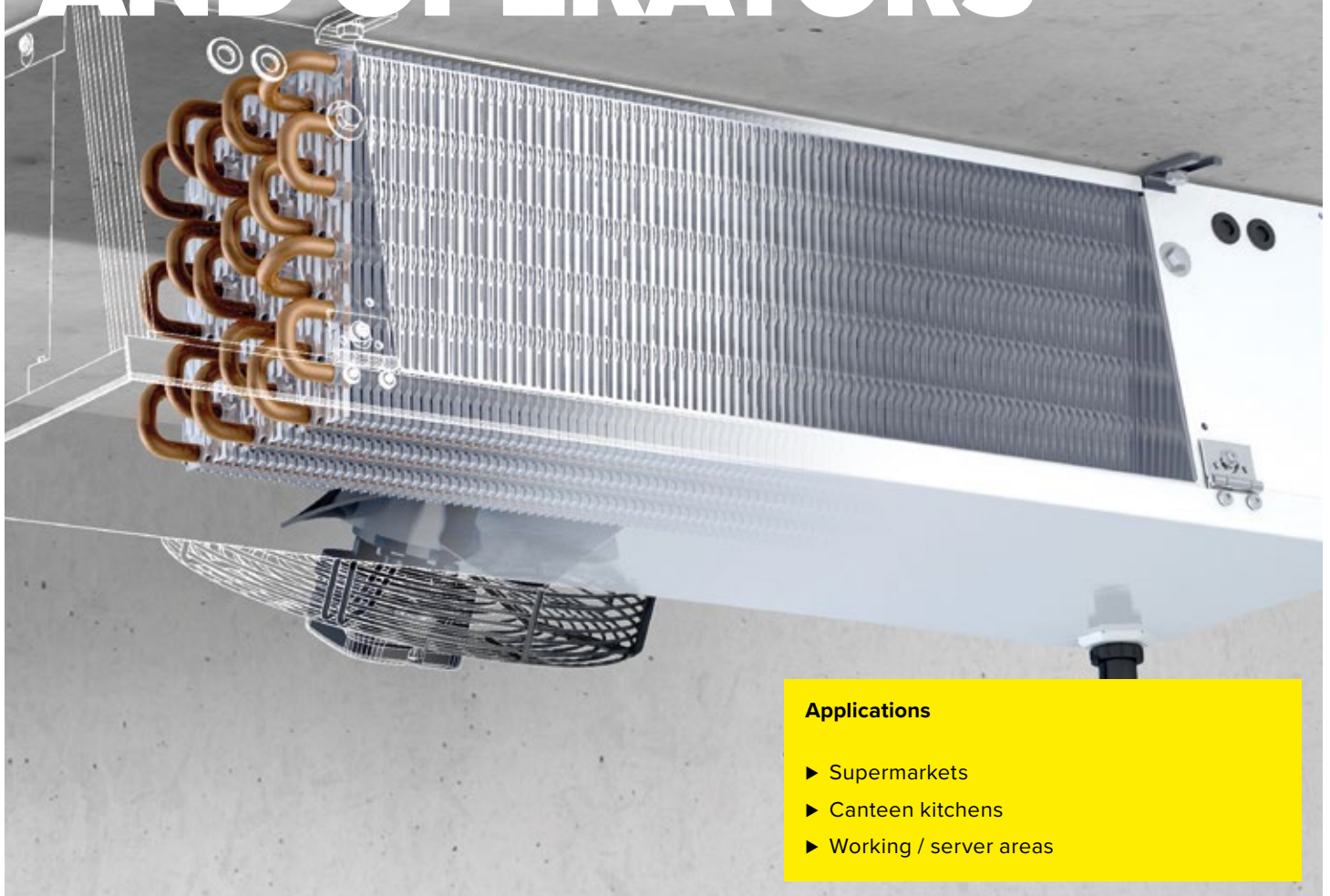
4 Size

5 Number of fans

6 Generation Code

Küba compact DF

APPLICATION BENEFITS FOR CONTRACTORS AND OPERATORS



Applications

- ▶ Supermarkets
- ▶ Canteen kitchens
- ▶ Working / server areas

FOR HIGH TURNOVER OF GOODS

Apart from fruit, vegetables and dairy products, packaged deep frozen products are part of the standard range of products of food retailers. It is essential that the required cold chain temperatures are maintained constantly during storage.

To determine which unit cooler fits to a cold storage, size and the chilled goods stored have to be considered. Food retailers are characterised by a frequent movement of goods and storage times as short as 1 - 3 days.

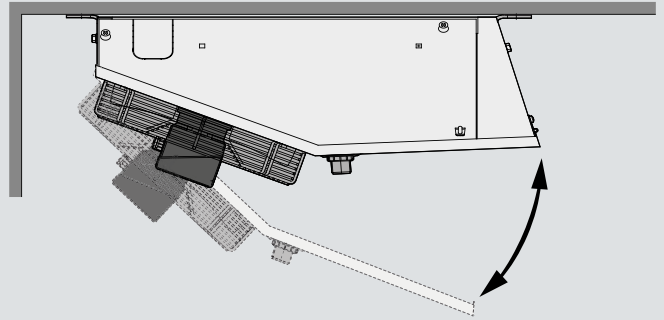
The evaporator's cooling capacity has to be dimensioned accordingly to ensure that the indoor temperature remains constant.

The Küba compact DF (especially for small rooms) is the first choice for these applications. The compact evaporator has the appropriate cooling capacity to ensure the uniform distribution of air even in the corners.

HYGIENE IN THE COLD ROOM

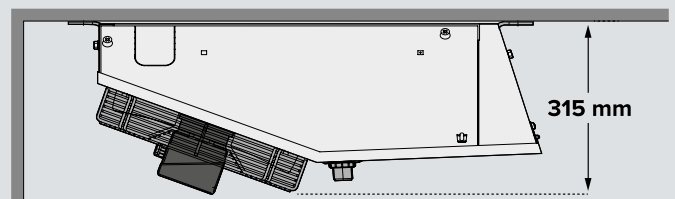
The Küba compact DF air cooler pursues a major objective: Keeping goods hygienically fresh in a cold room.

The food service specialist compact DF ensures best conditions right from the start – Hygiene and protection of chilled goods are priority: All component parts are easy to access and simple to clean.



LOW-SILHOUETTE DESIGN

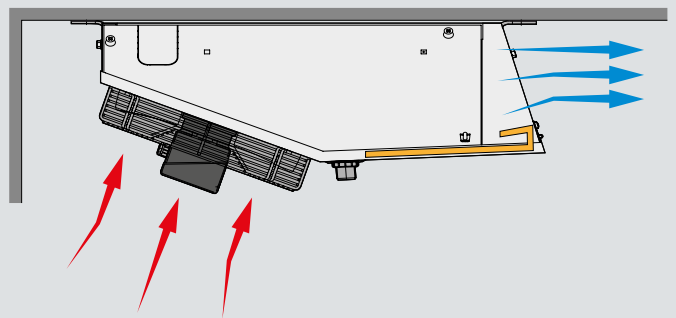
The Küba compact DF fully lives up to its name and is a power pack in small spaces. The compact DF provides reliable cooling power in temperature ranges both below and above zero, due to our Kelvion temperature security.



BEST AIR GUIDANCE THROUGH BUILT-IN BAFFLE PLATE

The integrated baffle-plates guide the cold air across the ceiling and thereby far into the room.

Even distribution of cold air guarantees chilled goods natural appearance and their taste. Retention of their full value is therefore ensured.





Küba compact DF

BASIC VERSION

CASING

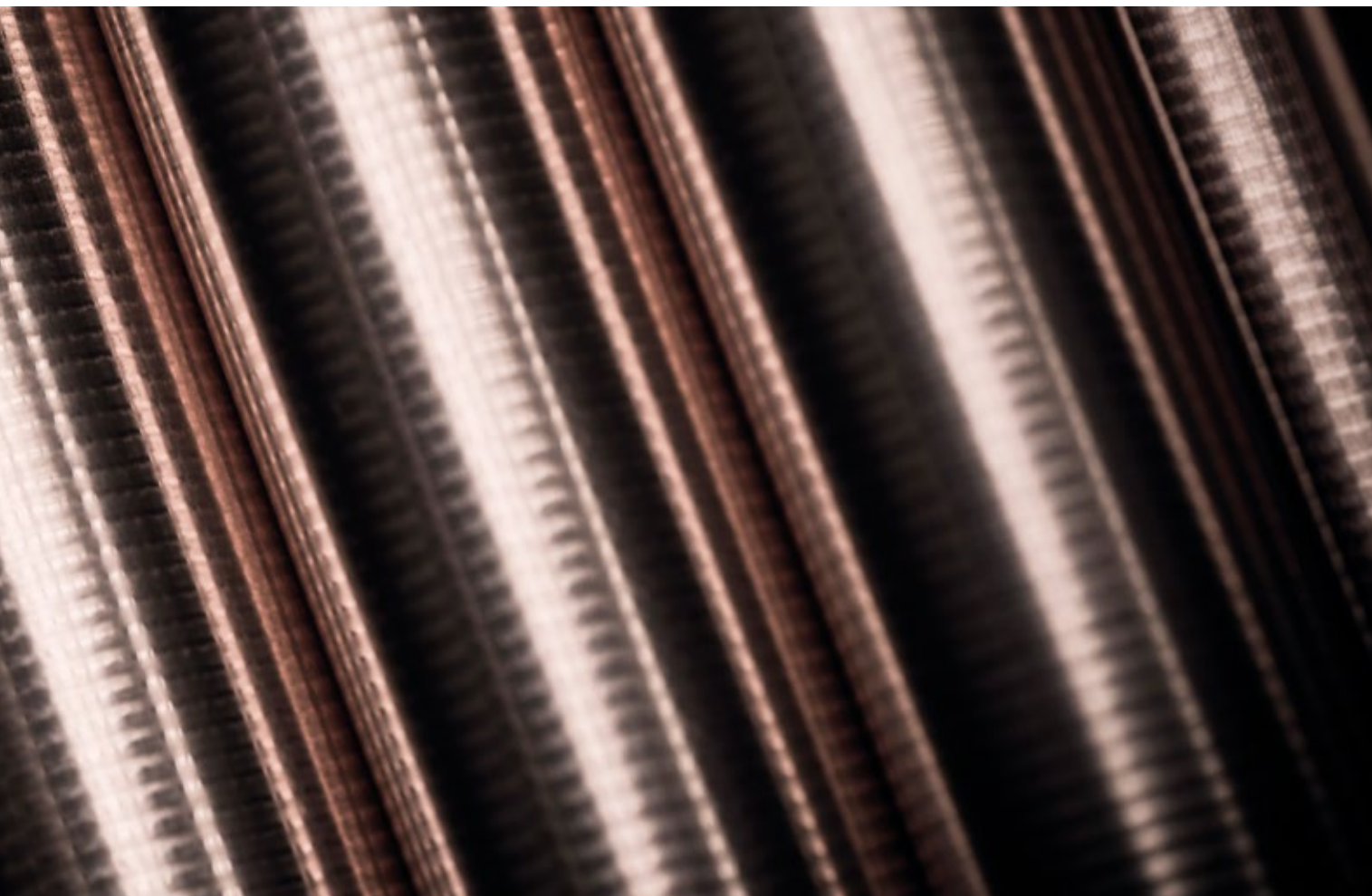
- ▶ Aluminum, Sendzimir zinc-plated steel, smooth
- ▶ Best quality powder coated edges thanks to high-grade powder coating, RAL 9010 pure white
- ▶ Food-safe
- ▶ Smooth surfaces: Easy to clean
- ▶ Drip tray and side pieces are removable
- ▶ Low height
- ▶ Quick and easy installation

ELECTRIC DEFROST

- ▶ Tubular heater: Stainless steel
- ▶ Connections: steam-proof
- ▶ Mains voltage: 1/N/PE 230V 50/60Hz
- ▶ Readily wired for connection box
- ▶ Optimized tubular heater configurations ensure fast and even defrosting
- ▶ Aluminum tube sleeves: Ensure excellent heat transfer to the fins and thus effective defrosting cycles with optimized service life

HEAT EXCHANGER

- ▶ Tube: Copper, inner finned, Ø 12 mm
- ▶ Fins: Aluminum HFE® fins
- ▶ End plates: Aluminum
- ▶ Staggered tube system
- ▶ Fin spacing:
A = 4,5 mm
B = 7 mm
- ▶ Fins flared to form-fit the core tube
- ▶ Internal cleanliness according to DIN 14276
- ▶ Connection Inlet:
DFA C: Flow distributor with multiple injection
DFB C: Küba-CAL® distributor with multiple injection
- ▶ Connection Outlet:
Copper pipe for solder connection with schrader valve UNF 7/16", sealed



FAN UNIT

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

Please observe the manufacturer's information!

MOTOR LABEL DATA

Type		50 Hz			60 Hz		
	Ø mm	rpm	W	A	rpm	W	A
DF 051 - 052 C	254	1,300	90	0.62	1,550	80	0.55
DF 061 - 074C	300	1,350	70	0.32	1,500	90	0.40

Motor data per fan

Data provided by the manufacturer

TECHNICAL DATA DFA (E)

Küba compact DF | Fin spacing 4.5 mm

Type	Rating Q _o at 50 Hz, DT1, R404 A		Cooling surface	Air flow	Air throw **	Tube volume	Connections		Sound	Fans (Operational values at 50 Hz)					
	SC1	SC2					Inlet	Outlet		Blade	Current	Per fan			
	kW	kW					Ø mm	Ø mm		Ø mm	230 ± 10% V-1 50 Hz	rpm	W	A	
DFA 051C	2,4	1,7	7,2	630	7	1,7	10	12	62	1 x 254	230V-1	1347	85	0,59	
DFA 061C	3,1	2,1	8,2	1100	9	2,1	10	12	68	1 x 300	230V-1	1350	75	0,35	
DFA 071C	3,7	2,5	12,2	1035	9	2,5	10	18	68	1 x 300	230V-1	1350	75	0,35	
DFA 052C	4,9	3,3	13,7	1260	9	3,4	10	18	65	2 x 254	230V-1	1347	85	0,59	
DFA 062C	6,3	4,3	16,4	2200	11	4,2	12*	22	71	2 x 300	230V-1	1350	75	0,35	
DFA 072C	7,4	5,1	24,4	2070	11	5	12*	22	71	2 x 300	230V-1	1350	75	0,35	
DFA 063C	9,4	6,4	24,6	3300	12	5,1	12*	22	73	3 x 300	230V-1	1350	75	0,35	
DFA 073C	11,1	7,6	36,6	3105	12	7,5	12 '	28	73	3 x 300	230V-1	1350	75	0,35	
DFA 064C	12,6	8,6	32,8	4400	16	6,8	12*	28	74	4 x 300	230V-1	1350	75	0,35	
DFA 074C	14,9	10,1	48,8	4140	16	10	15*	28	74	4 x 300	230V-1	1350	75	0,35	

Standard condition

t_{l1}

t_o

DT1

NB1/SC1

+10°C

0°C

10K

NB2/SC2

0°C

-8°C

8K

*

Multiple injection via flow distributor

**

Throw limit at 0.5 m/s

Subject to modification.

TECHNICAL DATA DFB (E)

Küba compact DF | Fin spacing 7 mm

Type	Rating Q _o at 50 Hz, DT1, R404 A		Cooling surface	Air flow	Air throw **	Tube volume	Connections		Sound	Fans (Operational values at 50 Hz)					
	SC1	SC2					Inlet	Outlet		Blade	Current	Per fan			
	kW	kW					Ø mm	Ø mm		Ø mm	230 ± 10% V-1 50 Hz	rpm	W	A	
DFB 051C	1,5	1,2	4,8	730	7	1,7	10	12	62	1 x 254	230V-1	1347	85	0,59	
DFB 061C	1,8	1,5	5,5	1300	9	2,1	10	12	68	1 x 300	230V-1	1350	75	0,35	
DFB 071C	2,2	1,8	8,2	1130	9	2,5	10	18	68	1 x 300	230V-1	1350	75	0,35	
DFB 052C	3,0	2,4	9,1	1460	9	3,4	10	18	65	2 x 254	230V-1	1347	85	0,59	
DFB 062C	3,6	2,9	11,0	2600	11	4,2	10*	22	71	2 x 300	230V-1	1350	75	0,35	
DFB 072C	4,4	3,5	16,4	2260	11	5	10*	22	71	2 x 300	230V-1	1350	75	0,35	
DFB 063C	5,4	4,3	16,5	3900	12	5,1	10*	22	73	3 x 300	230V-1	1350	75	0,35	
DFB 073C	6,6	5,3	24,6	3390	12	7,5	10*	28	73	3 x 300	230V-1	1350	75	0,35	
DFB 064C	7,2	5,8	22,0	5200	16	6,8	10*	28	74	4 x 300	230V-1	1350	75	0,35	
DFB 074C	8,8	7,0	32,8	4520	16	10	15*	28	74	4 x 300	230V-1	1350	75	0,35	

Standard condition

t_{l1}

t_o

DT1

NB2/SC2

+10°C

0°C

10K

NB3/SC3

0°C

-8°C

8K

*

Multiple injection via flow distributor

**

Throw limit at 0.5 m/s

Subject to modification.

DIMENSIONS, WEIGHTS, ELECTRIC DEFROST

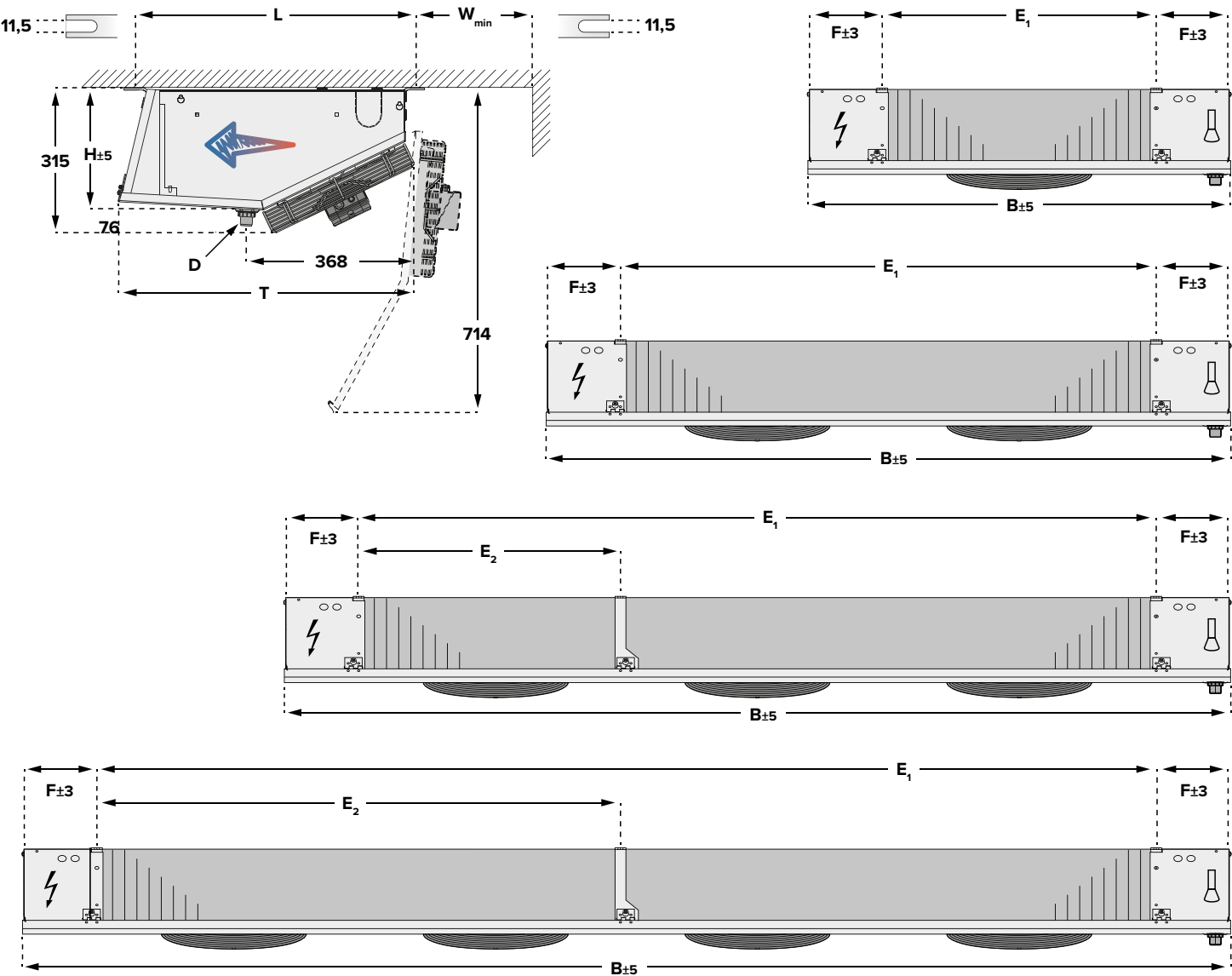
Küba compact DF

Type	Dimensions								Electric Defrost 230 V-1 / 400 V-3-Y	Weight (net) Unpacked		Weight (gross) Packed		Drain
	H	B	T	L	E ₁	E ₂	F	W _{min}	Coil	DFA/B	DFA/B E	DFA/B	DFA/B E	D
	mm	mm	mm	mm	mm	mm	mm	mm	kW	kg	kg	kg	kg	inch
DF 051 C	268	872	626	612	530	-	171	100	1,07	20,0	19,5	22,5	22	G ¾
DF 061 C	268	972	626	612	630	-	171	100	1,15	22,5	22,0	25,5	25	G ¾
DF 071 C	268	972	626	612	630	-	171	100	1,15	24,5	24,0	27,5	27	G ¾
DF 052 C	268	1372	626	612	1030	-	171	100	1,76	32,0	31,0	54,0	53	G ¾
DF 062 C	268	1572	626	612	1230	-	171	100	2,07	37,0	36,0	60,0	59	G ¾
DF 072 C	268	1572	626	612	1230	-	171	100	2,07	40,0	39,0	63,0	62	G ¾
DF 063 C	268	2172	626	612	1830	629	171	100	2,98	51,5	50,0	87,5	86	G ¾
DF 073 C	268	2172	626	612	1830	629	171	100	2,98	55,5	54,0	91,5	90	G ¾
DF 064 C	268	2772	626	612	2430	1229	171	100	3,92	67,5	65,5	108,0	106	G ¾
DF 074 C	268	2772	626	612	2430	1229	171	100	3,92	74,5	72,5	115,0	113	G ¾

The dimensions are only valid for the standard model design!
Note the differences in dimension among versions and accessories.

DIMENSIONAL DRAWINGS

Küba compact DF





Küba compact DF

VARIANTS

MOTOR - VARIANTS

V 1.33 FANS, SILENT VERSION

Fans 230V±10% V-1~
Reduced air volume flow
Lower sound power level

PROTECTION AGAINST CORROSION

STAINLESS STEEL 304 CASING

GOLDLACK PRE-COATED FIN

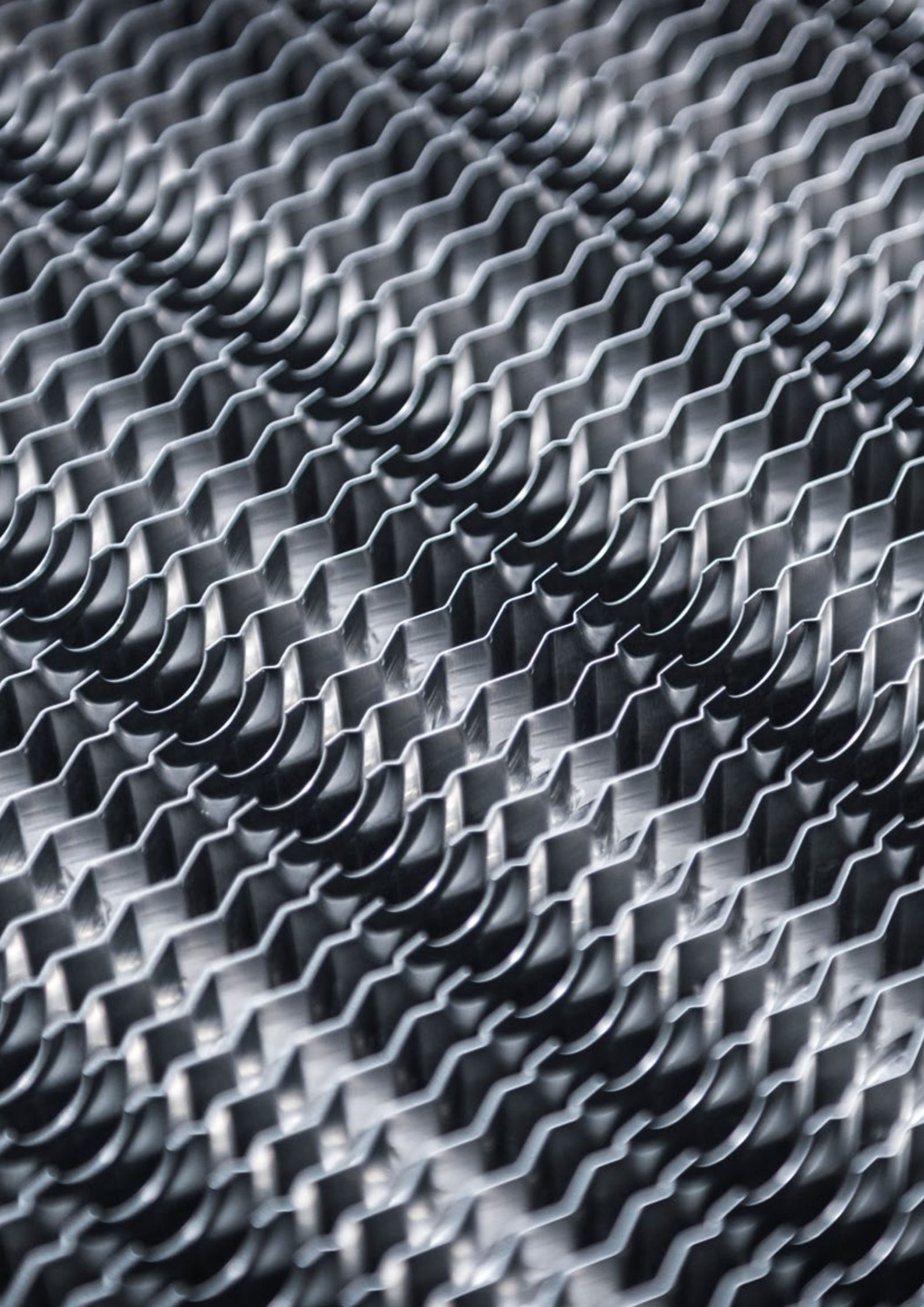
CONSTRUCTION - VARIANTS

V 2.05 WATER / BRINE CIRCULATION

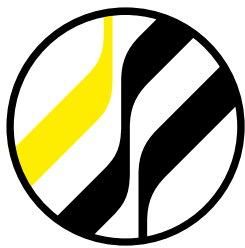
With a large number of circuits
(small pressure drop)

V 2.06 WATER / BRINE CIRCULATION

With a small number of circuits
(large pressure drop)



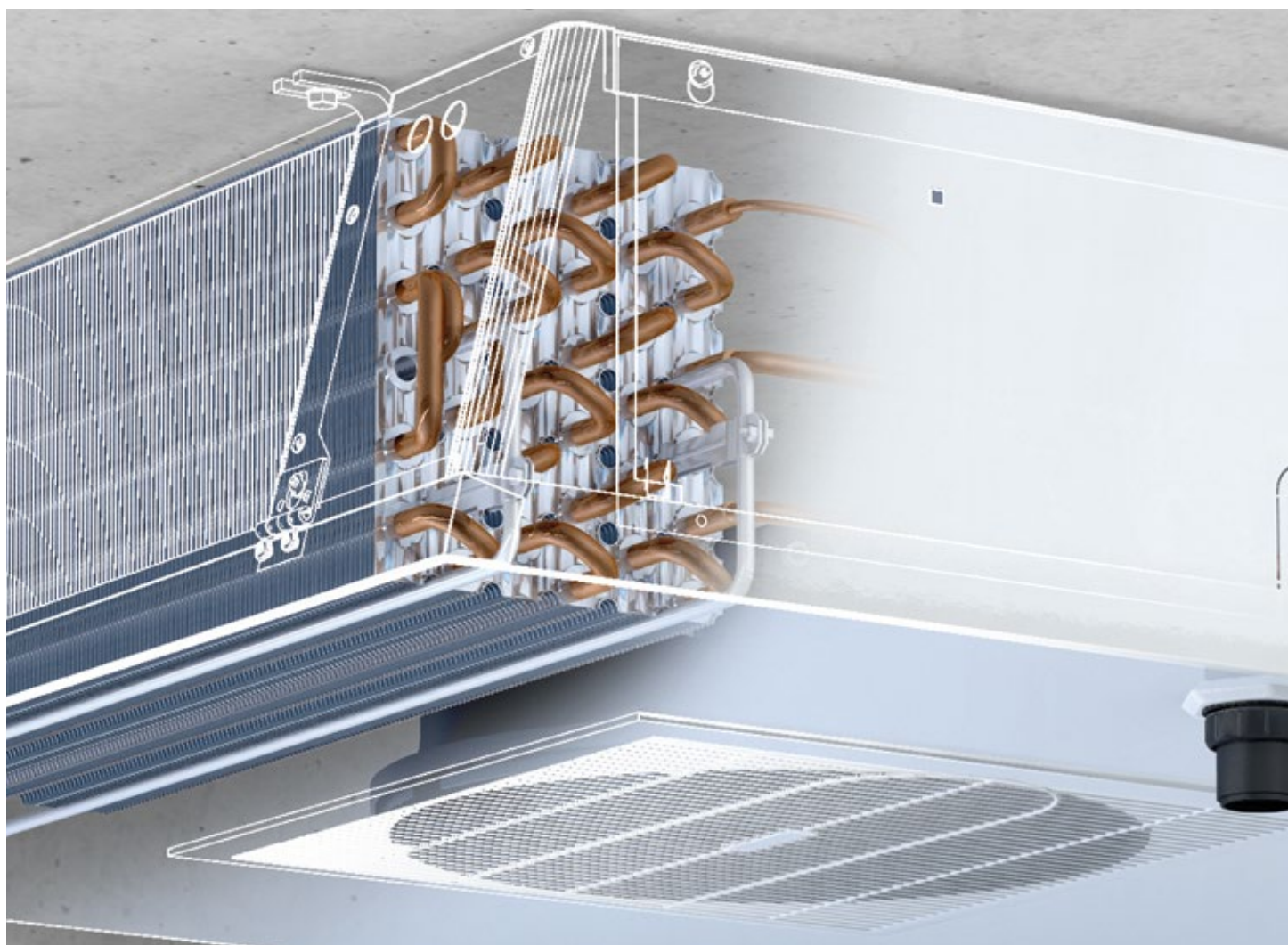
Kelvion



Commercial air coolers

Küba comfort DP

DRAUGHT-FREE VENTILATION AND QUIET OPERATION



Küba comfort DP

DRAUGHT-FREE VENTILATION AND EXTREMELY QUIET OPERATION



Capacity range (for SC2)

1.8 kW    17 kW

Temperature range (t_{L1})

0°C    +20°C

Type Designation Code

1 2 3 4 5 6

DP B E 04 4 C

1 Model range designation

2 Fin spacing

3 Electric defrost

4 Size

5 Number of fans

6 Generation Code

Küba comfort DP

APPLICATION BENEFITS FOR CONTRACTORS AND OPERATORS



Application examples

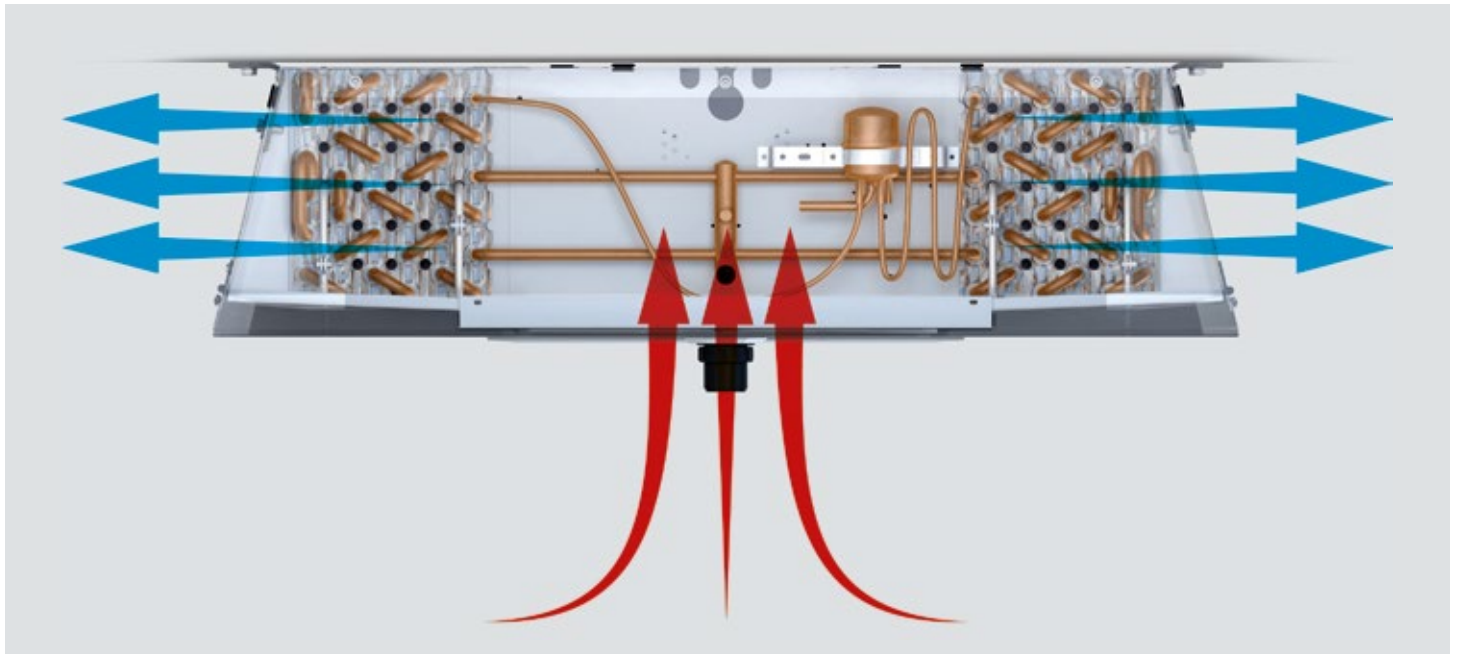
- ▶ Cold Rooms
- ▶ Laboratories
- ▶ Food Preparation areas

COOLING WHERE PEOPLE ARE WORKING

Our Küba comfort DP is the gentle one in the Küba Green Line, cooling where people are working.

Low-velocity bladed fans bring draught-free cold air to the working zone. The Küba comfort DP creates best conditions for processing goods. Drain trays can be swung down to give access to the bottom for cleaning or maintenance.

- ▶ Air baffles ensure low air speeds (up to 0.8 m/s) in the cold room, guiding the air across the ceiling and far into the room.
- ▶ Both 50 Hz and 60 Hz bladed fans can be fitted with a choice of high or low speed (normal speed “N”, silent speed “L”).
- ▶ Extremely silent operation “S”, with accessories (capacitor or speed switch).
- ▶ Saves space: Low profile of only 303 mm.



DRAUGHT-FREE AIR MOVEMENT AND SILENT OPERATION

The technical cooling demands and spatial conditions are only one aspect. Safety and health are top priority as soon as people need to work in cold rooms. For staff to perform their work without adverse effects their wellbeing must be assured.

Reduced noise and comfortable air movement are significant contributing factors to a pleasant indoor climate.

The demands made on equipment to ensure a constant temperature in rooms where sensitive goods such as cut flowers are exhibited for sale and where people also need to work are, of course, correspondingly high.

Draught-free air movement and silent operation create a pleasant indoor climate for the people and excellent conditions for the processing and short-time storage of sensitive products.

The air in the room is drawn in by the fans and exhausted via the heat exchangers on both sides. The integrated air baffle of the Küba comfort DP guides the air towards the ceiling where the Coanda effect carries it far into the room.

The Küba comfort DP in this way creates optimal air flow at very low air velocity.

Power ratings range from 2.2 kW to 28 kW. Low frame height saves space and allows its use even in rooms with low ceilings. In addition, the drip tray hinges down to facilitate comfortable cleaning.



Küba comfort DP

BASIC VERSION

CASING

- ▶ Aluminum, Sendzimir zinc-plated steel
- ▶ Best quality powder coated edges thanks to high-grade powder coating, RAL 9010 pure white
- ▶ Food-safe
- ▶ Smooth surfaces: Easy to clean
- ▶ Hinged drip tray on both sides, removable
- ▶ Removable side panels
- ▶ Drip tray: additional integrated splash pan

HEAT EXCHANGER

- ▶ Tube: Copper, inner finned, Ø 12 mm
- ▶ Fins: Aluminum HFE® fins
- ▶ End plates: Aluminum
- ▶ Staggered tube system
- ▶ Fin spacing:
A = 4,5 mm
B = 7 mm
- ▶ Fins flared to form-fit the core tube
- ▶ Internal cleanliness according to DIN 14276
- ▶ Connection Inlet:
Küba-CAL® refrigerant distributor with multiple injection, sealed
- ▶ Connection Outlet:
Copper pipe for solder connection with schrader valve UNF 7/16", sealed

ELECTRIC DEFROST

- ▶ Tubular heater: Stainless steel
- ▶ Connections: steam-proof
- ▶ Mains voltage: 1/N/PE 230V 50/60Hz
- ▶ Readily wired for connection box
- ▶ Optimized tubular heater configurations ensure fast and even defrosting
- ▶ Aluminum tube sleeves: Ensure excellent heat transfer to the fins and thus effective defrosting cycles with optimized service life



FAN UNIT

- ▶ AC technology
- ▶ Blow-through axial fan
- ▶ Fan diameter: 350 mm
- ▶ Permissible motor ambient temperatures: -30° C bis +60° C
- ▶ Supply voltage: 1/N/PE 230V 50/60Hz
- ▶ Motor protection: Built-in thermal contact (inaccessible)
- ▶ Protection class: IP44
- ▶ Insulation class: F
- ▶ Fans are wired to 1 internal distribution box
- ▶ Plug connection on motor
- ▶ Minimum Voltage = 100 V
- ▶ Motor Control:
 - Phase control ☐
 - Transformer ☒ (50Hz only)
 - Delta/Star ☐
 - Frequency converter ☐

Please observe the manufacturer's information!

MOTOR LABEL DATA

Type		50 Hz			60 Hz		
	Ø mm	rpm	W	A	rpm	W	A
DP 031-044 C	350	1,390	140	0.62	1,550	195	0.86

Motor data per fan

Data provided by the manufacturer

TECHNICAL DATA

DPA (E)

[SPEED N NORMAL]

Küba comfort DP | Fin spacing 4,5 mm

Type	Rating Q _o at 50 Hz, DT1, R404A		Cooling surface	Air flow	Air throw ***	Tube volume	Connections		Sound	Fans (Operational values at 50 Hz)				
	SC1	SC2					Inlet	Outlet		Blade	Current	Per fan		
	kW	kW					Ø mm	Ø mm		Ø mm	230±10% V-1 50Hz	rpm	W	A
DPA 031 C	5.4	3.8	16.3	1,720	2 x 11	3.4	10 x 1.0**	22 x 1.0	74	350	230 V-1	1,335	158	0.7
DPA 041 C	6.3	4.4	24.3	1,620	2 x 9	5.1	10 x 1.0**	22 x 1.0	74	350	230 V-1	1,335	158	0.7
DPA 032 C	10.8	7.6	32.6	3,440	2 x 12	6.8	10 x 1.0**	28 x 1.5	77	350	230 V-1	1,335	158	0.7
DPA 042 C	12.5	8.6	48.6	3,240	2 x 10	10.2	10 x 1.0**	28 x 1.5	77	350	230 V-1	1,335	158	0.7
DPA 033 C	16.3	11.0	48.9	5,160	2 x 13	10.2	10 x 1.0**	28 x 1.5	79	350	230 V-1	1,335	158	0.7
DPA 043 C	18.8	12.9	72.9	4,860	2 x 11	15.3	15 x 1.0**	35 x 1.5	79	350	230 V-1	1,335	158	0.7
DPA 034 C	21.7	14.9	65.2	6,880	2 x 14	13.6	15 x 1.0**	35 x 1.5	80	350	230 V-1	1,335	158	0.7
DPA 044 C	25.0	17.2	97.2	6,480	2 x 12	20.4	22 x 1.0**	35 x 1.5	80	350	230 V-1	1,335	158	0.7

[SPEED L QUIET]

Type	Rating Q _o at 50 Hz, DT1, R404A		Cooling surface	Air flow	Air throw ***	Tube volume	Connections		Sound	Fans (Operational values at 50 Hz)				
	SC1	SC2					Inlet	Outlet		Blade	Current	Per fan		
	kW	kW					Ø mm	Ø mm		Ø mm	230±10% V-1 50Hz	rpm	W	A
DPA 031 C	3.7	2.7	16.3	1,064	2 x 8	3.4	10 x 1.0**	22 x 1.0	64	350	230 V-1	935	112	0.8
DPA 041 C	4.0	2.9	24.3	950	2 x 5	5.1	10 x 1.0**	22 x 1.0	64	350	230 V-1	935	112	0.8
DPA 032 C	7.4	5.5	32.6	2,128	2 x 9	6.8	10 x 1.0**	28 x 1.5	67	350	230 V-1	935	112	0.8
DPA 042 C	7.9	5.7	48.6	1,900	2 x 6	10.2	10 x 1.0**	28 x 1.5	67	350	230 V-1	935	112	0.8
DPA 033 C	11.1	8.1	48.9	3,192	2 x 10	10.2	10 x 1.0**	28 x 1.5	69	350	230 V-1	935	112	0.8
DPA 043 C	11.9	8.6	72.9	2,850	2 x 7	15.3	15 x 1.0**	35 x 1.5	69	350	230 V-1	935	112	0.8
DPA 034 C	14.9	10.9	65.2	4,256	2 x 11	13.6	15 x 1.0**	35 x 1.5	70	350	230 V-1	935	112	0.8
DPA 044 C	15.9	11.4	97.2	3,800	2 x 8	20.4	22 x 1.0**	35 x 1.5	70	350	230 V-1	935	112	0.8

[SPEED S VERY QUIET]

Type	Rating Q _o at 50 Hz, DT1, R404A		Cooling surface	Air flow	Air throw ***	Tube volume	Connections		Sound	Fans (Operational values at 50 Hz)				
	SC1	SC2					Inlet	Outlet		Blade	Current	Per fan		
	kW	kW					Ø mm	Ø mm		Ø mm	230±10% V-1 50Hz	rpm	W	A
DPA 031 C	3.0	2.1	16.3	760	2 x 5	3.4	10 x 1.0**	22 x 1.0	56	350	230 V-1	715	85	0.7
DPA 041 C	3.1	2.2	24.3	670	2 x 4	5.1	10 x 1.0**	22 x 1.0	56	350	230 V-1	715	85	0.7
DPA 032 C	6.1	4.3	32.6	1,520	2 x 6	6.8	10 x 1.0**	28 x 1.5	59	350	230 V-1	715	85	0.7
DPA 042 C	6.3	4.1	48.6	1,340	2 x 5	10.2	10 x 1.0**	28 x 1.5	59	350	230 V-1	715	85	0.7
DPA 033 C	9.1	6.3	48.9	2,280	2 x 7	10.2	10 x 1.0**	28 x 1.5	61	350	230 V-1	715	85	0.7
DPA 043 C	9.4	6.4	72.9	2,010	2 x 6	15.3	15 x 1.0**	35 x 1.5	61	350	230 V-1	715	85	0.7
DPA 034 C	12.2	8.5	65.2	3,040	2 x 8	13.6	15 x 1.0**	35 x 1.5	62	350	230 V-1	715	85	0.7
DPA 044 C	12.5	8.4	97.2	2,680	2 x 7	20.4	22 x 1.0**	35 x 1.5	62	350	230 V-1	715	85	0.7

Standard condition

t_{l1} t_o DT1

NB1/SC1 +10°C 0°C 10K

NB2/SC2 0°C -8°C 8K

*

Single injection

**

Multiple injection via Küba-CAL® distributor

Throw limit at 0.5 m/s

Subject to modification.

TECHNICAL DATA **DPB (E)**

[SPEED N NORMAL]

Küba comfort DP | **Fin spacing 7 mm**

Type	Rating Q _o at 50 Hz, DT1, R404A		Cooling surface	Air flow	Air throw ***	Tube volume	Connections		Sound	Fans (Operational values at 50 Hz)				
	SC1	SC2					Inlet	Outlet		Blade	Current	Per fan		
	kW	kW					Ø mm	Ø mm		Ø mm	230 ±10% V-1 50Hz	rpm	W	A
DPB 031 C	4.4	3.1	11.0	1,850	2 x 11	3.4	10 x 1.0**	22 x 1.0	74	350	230 V-1	1,335	158	0.7
DPB 041 C	5.5	3.8	16.4	1,770	2 x 9	5.1	10 x 1.0**	22 x 1.0	74	350	230 V-1	1,335	158	0.7
DPB 032 C	8.8	6.2	22.0	3,700	2 x 12	6.8	10 x 1.0**	28 x 1.5	77	350	230 V-1	1,335	158	0.7
DPB 042 C	10.9	7.5	32.8	3,540	2 x 10	10.2	10 x 1.0**	28 x 1.5	77	350	230 V-1	1,335	158	0.7
DPB 033 C	13.1	9.0	33.0	5,550	2 x 13	10.2	10 x 1.0**	28 x 1.5	79	350	230 V-1	1,335	158	0.7
DPB 043 C	16.4	11.3	49.2	5,310	2 x 11	15.3	15 x 1.0**	35 x 1.5	79	350	230 V-1	1,335	158	0.7
DPB 034 C	17.5	12.2	44.0	7,400	2 x 14	13.6	15 x 1.0**	35 x 1.5	80	350	230 V-1	1,335	158	0.7
DPB 044 C	21.8	15.1	65.6	7,080	2 x 12	20.4	22 x 1.0**	35 x 1.5	80	350	230 V-1	1,335	158	0.7

[SPEED L QUIET]

Type	Rating Q _o at 50 Hz, DT1, R404A		Cooling surface	Air flow	Air throw ***	Tube volume	Connections		Sound	Fans (Operational values at 50 Hz)				
	SC1	SC2					Inlet	Outlet		Blade	Current	Per fan		
	kW	kW					Ø mm	Ø mm		Ø mm	230 ±10% V-1 50Hz	rpm	W	A
DPB 031 C	3.5	2.5	11.0	1,300	2 x 8	3.4	10 x 1.0**	22 x 1.0	64	350	230 V-1	935	112	0.8
DPB 041 C	4.0	2.8	16.4	1,140	2 x 5	5.1	10 x 1.0**	22 x 1.0	64	350	230 V-1	935	112	0.8
DPB 032 C	7.0	5.0	22.0	2,600	2 x 9	6.8	10 x 1.0**	28 x 1.5	67	350	230 V-1	935	112	0.8
DPB 042 C	8.0	5.6	32.8	2,280	2 x 6	10.2	10 x 1.0**	28 x 1.5	67	350	230 V-1	935	112	0.8
DPB 033 C	10.6	7.3	33.0	3,900	2 x 10	10.2	10 x 1.0**	28 x 1.5	69	350	230 V-1	935	112	0.8
DPB 043 C	12.1	8.4	49.2	3,420	2 x 7	15.3	15 x 1.0**	35 x 1.5	69	350	230 V-1	935	112	0.8
DPB 034 C	14.1	9.8	44.0	5,200	2 x 11	13.6	15 x 1.0**	35 x 1.5	70	350	230 V-1	935	112	0.8
DPB 044 C	16.1	11.2	65.6	4,560	2 x 8	20.4	22 x 1.0**	35 x 1.5	70	350	230 V-1	935	112	0.8

[SPEED S VERY QUIET]

Type	Rating Q _o at 50 Hz, DT1, R404A		Cooling surface	Air flow	Air throw ***	Tube volume	Connections		Sound	Fans (Operational values at 50 Hz)				
	SC1	SC2					Inlet	Outlet		Blade	Current	Per fan		
	kW	kW					Ø mm	Ø mm		Ø mm	230 ±10% V-1 50Hz	rpm	W	A
DPB 031 C	2.6	1.8	11.0	810	2 x 5	3.4	10 x 1.0**	22 x 1.0	56	350	230 V-1	715	85	0.7
DPB 041 C	3.1	2.2	16.4	800	2 x 4	5.1	10 x 1.0**	22 x 1.0	56	350	230 V-1	715	85	0.7
DPB 032 C	5.1	3.6	22.0	1,620	2 x 6	6.8	10 x 1.0**	28 x 1.5	59	350	230 V-1	715	85	0.7
DPB 042 C	6.3	4.4	32.8	1,600	2 x 5	10.2	10 x 1.0**	28 x 1.5	59	350	230 V-1	715	85	0.7
DPB 033 C	7.7	5.4	33.0	2,430	2 x 7	10.2	10 x 1.0**	28 x 1.5	61	350	230 V-1	715	85	0.7
DPB 043 C	9.4	6.5	49.2	2,400	2 x 6	15.3	15 x 1.0**	35 x 1.5	61	350	230 V-1	715	85	0.7
DPB 034 C	10.3	7.2	44.0	3,240	2 x 8	13.6	15 x 1.0**	35 x 1.5	62	350	230 V-1	715	85	0.7
DPB 044 C	12.5	8.7	65.6	3,200	2 x 7	20.4	22 x 1.0**	35 x 1.5	62	350	230 V-1	715	85	0.7

Standard condition t_l t_o DT1

NB1/SC1 +10°C 0°C 10K

NB2/SC2 0°C -8°C 8K

*

Single injection

**

Multiple injection via Küba-CAL® distributor

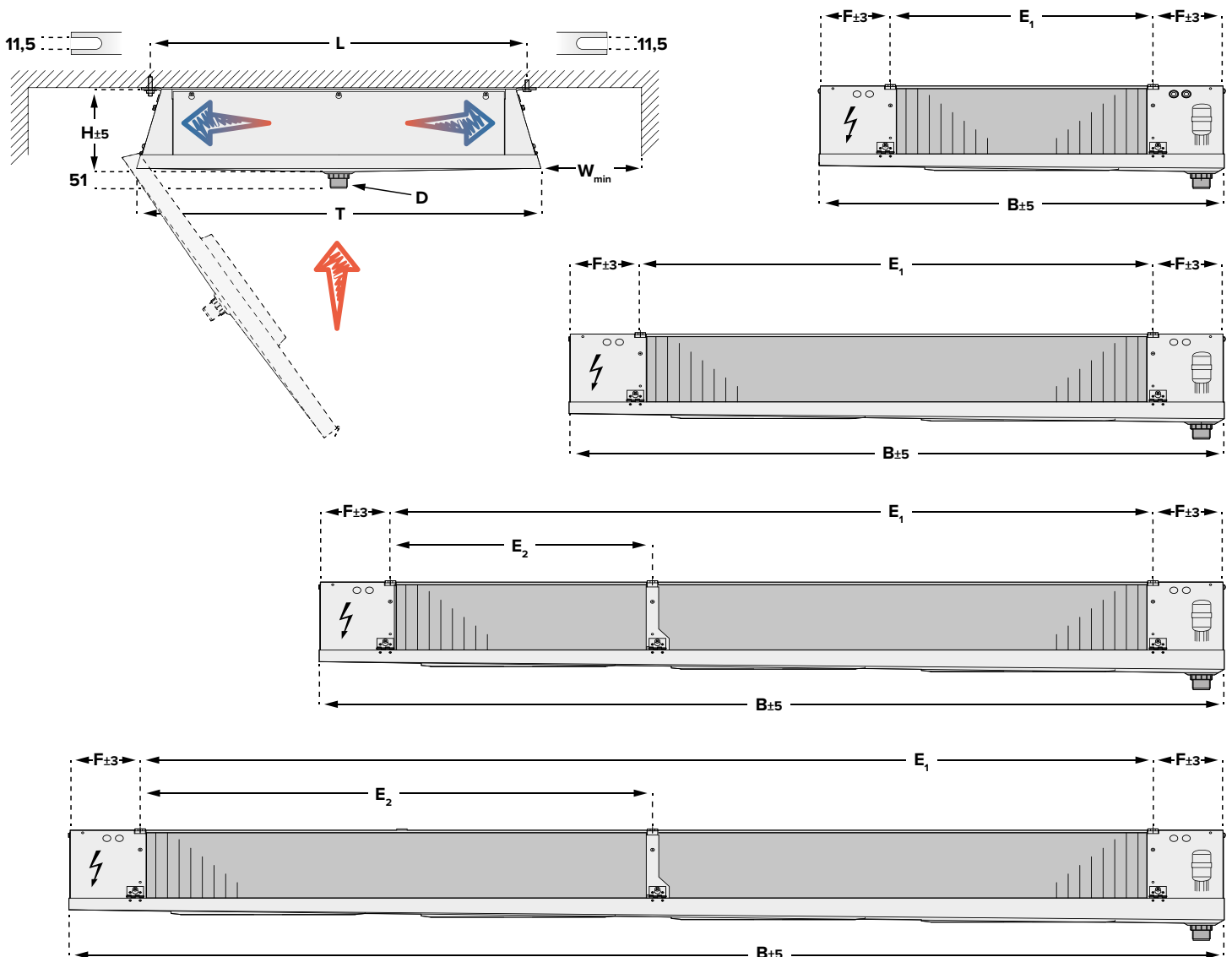
Throw limit at 0.5 m/s

Subject to modification.

Küba comfort DP

The dimensions are only valid for the standard model design!
Note the differences in dimension among versions and accessories.

Küba comfort DP



Küba comfort DP

VARIANTS



MOTOR - VARIANTS

V 1.52 EC FAN WITH CONTROLLABLE SPEED

CASING - VARIANTS

V 3.09 DOUBLE-WALLED, INSULATED DRIP TRAY

Prevents condensed water from forming on the bottom side of the pan, and it reduces the transfer of defrost heat into the cold rooms.

The following dimensions are changed:

Width B: +60 mm

Height H: +30 mm

Depth T: +30 mm

PROTECTION AGAINST CORROSION

STAINLESS STEEL 304 CASING

GOLDLACK PRE-COATED FIN

CO₂ - VARIANTS

V 7.45 CO₂ - DIRECT EXPANSION

up to 45 bar operating pressure

CONSTRUCTION - VARIANTS

V 2.05 WATER / BRINE CIRCULATION

With a large number of distributors
(small pressure drop)

V 2.06 WATER / BRINE CIRCULATION

With a small number of distributors
(large pressure drop)

ACCESSORIES

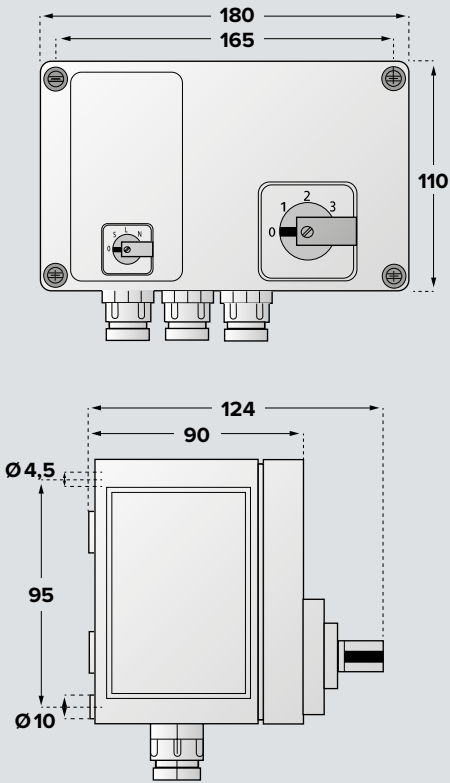
SPEED SWITCH OPERATION N, L, S

Construction:

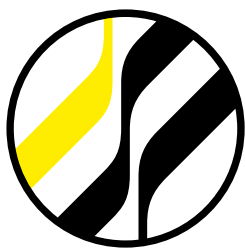
- ▶ With floating change-over at fan ON/OFF, contact open in switch position 0
- ▶ Floating drag switch contacts on terminals 11/12
- ▶ Capacitor (C) for level S included

Selection table & Dimensions:

For Type	Description	Description	Protection class	µF
	Speed switch	Capacitor (S)		
DP 031 C	SC - 10	C - 10	IP 54	10
DP 041 C	SC - 10	C - 10	IP 54	10
DP 032 C	SC - 20	C - 20	IP 54	20
DP 042 C	SC - 20	C - 20	IP 54	20
DP 033 C	SC - 30	C - 30	IP 54	30
DP 043 C	SC - 30	C - 30	IP 54	30
DP 034 C	SC - 40	C - 40	IP 54	40
DP 044 C	SC - 40	C - 40	IP 54	40







Küba market plus SP

THE STANDARD FOR BASIC REFRIGERATION APPLICATIONS



Küba market plus SP

THE STANDARD FOR BASIC REFRIGERATION APPLICATIONS



Capacity range (for SC2)

1.2 kW    52 kW

Temperature range (t_{L1})

-25°C     +10°C

Type Designation Code

1	2	3	4	5	6
SP	A	E	01	1	D

- | | |
|---------------------------|-------------------|
| 1 Model range designation | 5 Number of fans |
| 2 Fin spacing | 6 Generation Code |
| 3 Electric defrost | |
| 4 Size | |



Küba market plus SP

BASIC VERSION

CASING

- ▶ Aluminium, smooth
- ▶ High-quality powder coating
- ▶ papyrus white RAL 9010
- ▶ Food-safe
- ▶ Easy to clean
- ▶ Best corrosion protection
- ▶ Removable side pieces

HEAT EXCHANGER

- ▶ 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

ELECTRIC DEFROST

- ▶ Wired-up, ready to connect in terminal box
- ▶ To prevent steam build-up and to accomplish heat exchange with almost no loss, the heaters are located in special expanded tube sleeves
- ▶ 230 V-1/400 V-3-Y
- ▶ With splash pan



FAN UNIT

- ▶ Fans are wired 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)
- ▶ Application range: RT: -30 °C to +50 °C
- ▶ Voltage:
SP. 011 – 065D = 230 V $\pm$ 10 %, V-1 50/60 Hz:
Ø 250 mm, non-adjustable; Ø 300 mm, adjustable;
Ø 400 mm, adjustable
- ▶ SP. 071 – 084D = 400 V $\pm$ 10 %, V-3 50/60 Hz:
Ø 500 mm, adjustable
- ▶ Index of protection
SP. 011 – 024D = IP42
SP. 031 – 065D = IP44
SP. 071 – 084D = IP54
- ▶ Insulation class
SP. 011 – 065D = Insulation class B
SP. 071 – 084D = Insulation class F
- ▶ Operating values are the values of the built-in
motor at +20 °C, with an unobstructed air flow
and a dry surface, as required for the refrigeration
load calculation

Please observe the manufacturer's information!

MOTOR LABEL DATA

Type		50 Hz			60 Hz		
	Ø mm	rpm	W	A	rpm	W	A
SP.01.-02.D	250	1300	90	0,62	1550	80	0,55
SP.03.-04.D	300	1400	65	0,3	1500	90	0,4
SP.05.-06.D	400	1365	214	0,96	1630	270	1,2
SP.07.-08.D	500	1082	544	0,95	1170	770	1,13

Motor data per fan

Data provided by the manufacturer

TECHNICAL DATA SPA (E)

Küba market plus SP | Fin spacing 4.5 mm

Type	Rating Q _o at 50 Hz, DT1, R404A		Cooling surface	Air flow	Air throw ***	Tube volume	Connections		Sound	Fans (Operational values at 50 Hz)				
	SC1	SC2					Inlet	Outlet		Blade	Current	Per fan		
	kW	kW					Ø mm	Ø mm		Ø mm	230±10% V-1 50Hz	rpm	W	A
SPA 011D	2,4	1,7	6,9	820	4	1,4	10	12	63	1 x 250	230V -1	1347	85	0,59
SPA 021D	2,7	1,8	9,1	760	4	1,9	10	12	63	1 x 250	230V -1	1347	85	0,59
SPA 031D	3,9	2,7	10,3	1380	6	2,1	10	18	70	1 x 300	230V -1	1340	80	0,36
SPA 041D	4,4	3,0	13,6	1300	5	2,8	12*	22	70	1 x 300	230V -1	1340	80	0,36
SPA 051D	9,0	6,1	20,5	3020	8	4,2	12*	28	77	1 x 400	230V -1	1365	214	0,96
SPA 061D	10,1	6,8	30,6	2720	7	6,3	12*	28	77	1 x 400	230V -1	1365	214	0,96
SPA 071D	13,12	9,66	36,8	5740	18	7,6	15	35	78	1x500	400V-3	1082	544	0,95
SPA 081D	15,67	11,42	54,9	4950	16	11,1	15	35	78	1x500	400V-3	1082	544	0,95
SPA 022D	5,3	3,6	18,2	1520	6	3,6	12*	22	66	2 x 250	230V -1	1347	85	0,59
SPA 032D	7,9	5,3	20,6	2760	8	4,1	12*	28	73	2 x 300	230V -1	1340	80	0,36
SPA 042D	8,9	6,0	27,3	2600	7	5,5	12*	28	73	2 x 300	230V -1	1340	80	0,36
SPA 052D	17,7	11,9	40,9	6040	12	8,2	15*	35	80	2 x 400	230V -1	1420	188	0,83
SPA 062D	19,7	13,4	60,9	5440	11	12,1	15*	35	80	2 x 400	230V -1	1420	188	0,83
SPA 072D	28,15	21,08	73,7	11480	22	14,3	15	42	81	2x500	400V-3	1082	544	0,95
SPA 082D	32,65	24,74	109,7	9900	19	21,5	22	42	81	2x500	400V-3	1082	544	0,95
SPA 023D	8,2	5,5	27,3	2280	8	5,3	12*	28	68	3 x 250	230V -1	1347	85	0,59
SPA 043D	13,3	9,0	40,9	3900	10	8	15*	35	75	3 x 300	230V -1	1340	80	0,36
SPA 053D	27,0	18,2	61,4	9060	15	12	22*	42	82	3 x 400	230V -1	1420	188	0,83
SPA 063D	30,4	20,6	91,5	8160	13	18	22*	42	82	3 x 400	230V -1	1420	188	0,83
SPA 073D	44,29	33,28	110,5	17220	25	21,3	22	54	83	3x500	400V-3	1082	544	0,95
SPA 083D	48,12	36,39	164,6	14850	23	32,2	22	54	83	3x500	400V-3	1082	544	0,95
SPA 024D	10,7	7,3	36,3	3040	9	7,1	12*	28	69	4 x 250	230V -1	1347	85	0,59
SPA 044D	17,2	11,7	54,5	5200	12	10,6	15*	35	76	4 x 300	230V -1	1340	80	0,36
SPA 064D	39,6	26,9	122	10880	16	23,7	22*	42	83	4 x 400	230V -1	1420	188	0,83
SPA 074D	56,64	42,50	147,4	22960	27	28,6	22	54	84	4x500	400V-3	1082	544	0,95
SPA 084D	65,57	49,78	219,4	19800	24	41,0	28	54	84	4x500	400V-3	1082	544	0,95
SPA 065D	50,4	34,1	152,4	13600	18	28,9	22*	54	84	5 x 400	230V -1	1420	188	0,83

Standard condition

t_l

t_o

DT1

NB1/SC1

+10°C

0°C

10K

NB2/SC2

0°C

-8°C

8K

*

Single injection

**

Multiple injection

Throw limit at 0.5 m/s

Subject to modification.

TECHNICAL DATA SPB (E)

Küba market plus SP | Fin spacing 7 mm

Type	Rating Q _o at 50 Hz, DT1, R404 A		Cooling surface	Air flow	Air throw ***	Tube volume	Connections		Sound	Fans (Operational values at 50 Hz)					
	SC2	SC3					Inlet	Outlet		L _{WA}	Blade	Current	Per fan		
	kW	kW											m²	m³/h	m
SPB 011D	1,3	1,0	4,6	880	4	1,4	10	12	63	1 x 250	230V -1	1347	85	0,59	
SPB 021D	1,5	1,2	6,0	850	4	1,9	10	12	63	1 x 250	230V -1	1347	85	0,59	
SPB 031D	2,0	1,6	6,9	1450	7	2,1	10	18	70	1 x 300	230V -1	1340	80	0,36	
SPB 041D	2,5	1,9	9,1	1420	6	2,8	12*	22	70	1 x 300	230V -1	1340	80	0,36	
SPB 051D	4,8	3,8	13,7	3320	9	4,2	12*	28	77	1 x 400	230V -1	1365	214	0,96	
SPB 061D	5,9	4,7	20,4	3080	8	6,3	12*	28	77	1 x 400	230V -1	1365	214	0,96	
SPB 071D	8,18	6,22	24,6	6530	20	7,6	15	35	78	1x500	400V-3	1082	544	0,95	
SPB 081D	10,46	8,01	36,6	5880	18	11,1	15	35	78	1x500	400V-3	1082	544	0,95	
SPB 022D	3,0	2,4	12,2	1700	6	3,6	12*	22	66	2 x 250	230V -1	1347	85	0,59	
SPB 032D	4,1	3,2	13,7	2900	9	4,1	12*	28	73	2 x 300	230V -1	1340	80	0,36	
SPB 042D	4,9	3,9	18,2	2840	8	5,5	12*	28	73	2 x 300	230V -1	1340	80	0,36	
SPB 052D	9,5	7,5	27,3	6640	13	8,2	15*	35	80	2 x 400	230V -1	1420	188	0,83	
SPB 062D	11,7	9,3	40,7	6160	12	12,1	15*	35	80	2 x 400	230V -1	1420	188	0,83	
SPB 072D	18,20	12,62	49,2	13060	24	14,3	15	42	81	2x500	400V-3	1082	544	0,95	
SPB 082D	22,04	15,56	73,3	11760	23	21,5	22	42	81	2x500	400V-3	1082	544	0,95	
SPB 023D	4,6	3,6	18,2	2550	8	5,3	12*	28	68	3 x 250	230V -1	1347	85	0,59	
SPB 043D	7,3	5,8	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	25,13	18,94	73,8	19590	27	21,3	22	54	83	3x500	400V-3	1082	544	0,95	
SPB 083D	33,77	22,69	109,9	17640	25	32,2	22	54	83	3x500	400V-3	1082	544	0,95	
SPB 024D	6,1	4,8	24,3	3400	9	7,1	12*	28	69	4 x 250	230V -1	1347	85	0,59	
SPB 044D	9,6	7,7	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	36,61	25,52	98,4	26120	29	28,6	22	54	84	4x500	400V-3	1082	544	0,95	
SPB 084D	44,28	31,40	146,6	23520	28	41,0	28	54	84	4x500	400V-3	1082	544	0,95	
SPB 065D	29,7	23,5	101,9	15400	19	28,9	22*	54	84	5 x 400	230V -1	1420	188	0,83	

DIMENSIONS, WEIGHTS, ELECTRIC DEFROST

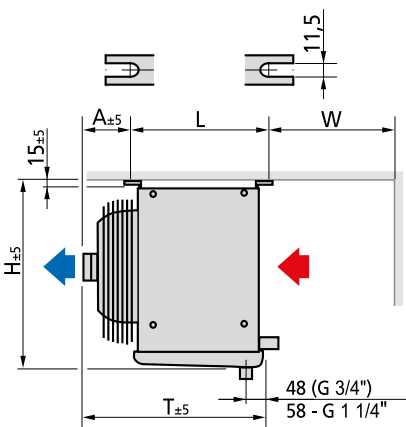
Küba market plus SP

Type	Dimensions										Electrical defrost 230 V-1 / 400 V-3-Y			Weight (net)		Weight (gross)		Drain
	H	B	T	L	E ₁	E ₂	E ₃	F	A	W _{min}	Coil	Tray	Total	SPA/B	SPA/B E	SPA/B	SPA/B E	D
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kW	kW	kW	kg	kg	kg	kg	inch
SP. 011D	354	810	424	350	530	-	-	140	92	200	1,07	0,58	1,65	14	13,5	17	16,5	G ¾
SP. 021D	354	810	424	350	530	-	-	140	92	200	1,07	0,58	1,65	15	14,5	18	17,5	G ¾
SP. 031D	430	970	421	350	630	-	-	170	90	200	1,23	0,69	1,92	18,5	18	22,5	22	G ¾
SP. 041D	430	970	421	350	630	-	-	170	90	200	1,23	0,69	1,92	21	20,5	25	24,5	G ¾
SP. 051D	509	1180	501	420	780	-	-	200	100	300	2,07	0,88	2,95	31,5	30,5	37	36	G ¾
SP. 061D	509	1180	501	420	780	-	-	200	100	300	2,90	0,88	3,78	36,5	35,5	42	41	G ¾
SP. 071D	661	1430	592	500	1030	-	-	200	110	400	3,52	0,50	4,02	55	53	75	73	G ¾
SP. 081D	661	1430	592	500	1030	-	-	200	110	400	5,52	0,50	6,02	65	63	85	83	G ¾
SP. 022D	354	1310	424	350	1030	-	-	140	92	200	1,84	0,96	2,80	26,5	25,5	30,5	29,5	G ¾
SP. 032D	430	1570	421	350	1230	-	-	170	90	200	2,14	1,15	3,29	33,5	32,5	51	50	G ¾
SP. 042D	430	1570	421	350	1230	-	-	170	90	200	2,14	1,15	3,29	36,5	35,5	54	53	G ¾
SP. 052D	509	1930	501	420	1530	-	-	200	100	300	3,90	1,44	5,34	56	54	76	74	G 1¼
SP. 062D	509	1930	501	420	1530	-	-	200	100	300	5,20	1,44	6,64	65	63	85	83	G 1¼
SP. 072D	661	2430	592	500	2030	-	-	200	110	400	6,74	0,86	7,60	96,5	93,5	180,5	177,5	G 1¼
SP. 082D	661	2430	592	500	2030	-	-	200	110	400	10,11	0,86	10,97	117	114	201	198	G 1¼
SP. 023D	354	1810	424	350	1530	-	-	140	92	200	2,60	1,30	3,90	37,5	36	56,5	55	G ¾
SP. 043D	430	2170	421	350	1830	-	-	170	90	200	3,18	1,59	4,77	51,5	50	72	70,5	G ¾
SP. 053D	509	2680	501	420	2280	750	-	200	100	300	5,63	1,95	7,58	78,5	77	137,5	136	G 1¼
SP. 063D	509	2680	501	420	2280	750	-	200	100	300	7,50	1,95	9,45	96	93	155	152	G 1¼
SP. 073D	661	3430	592	500	3030	1000	-	200	110	400	9,20	1,82	11,02	139,5	135,5	244,5	240,5	G 1¼
SP. 083D	661	3430	592	500	3030	1000	-	200	110	400	13,80	1,82	15,62	168,5	164,5	273,5	269,5	G 1¼
SP. 024D	354	2310	424	350	2030	1000	-	140	92	200	3,37	1,72	5,09	48,5	46,5	73	71	G ¾
SP. 044D	430	2770	421	350	2430	1200	-	170	90	200	4,00	2,00	6,00	67	65	127	125	G 1¼
SP. 064D	509	3430	501	420	3030	1500	-	200	100	300	9,20	1,82	11,02	125	121	229	225	G 1¼
SP. 074D	661	4430	592	500	4030	2000	-	200	110	400	12,72	2,39	15,11	183	178	293	288	G 1¼
SP. 084D	661	4430	592	500	4030	2000	-	200	110	400	19,08	2,39	21,47	221	216	331	326	G 1¼
SP. 065D	509	4180	501	420	3780	1500	2250	200	100	300	11,92	2,24	14,16	156,5	150,5	252,5	246,5	G 1¼

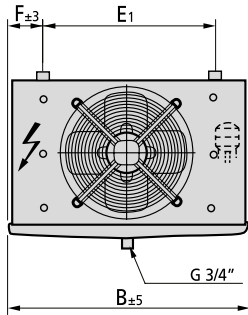
The dimensions are only valid for the standard model design!
Note the differences in dimension among versions and accessories.

DIMENSIONAL DRAWINGS

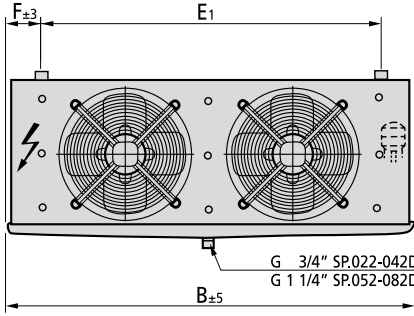
Küba market plus SP



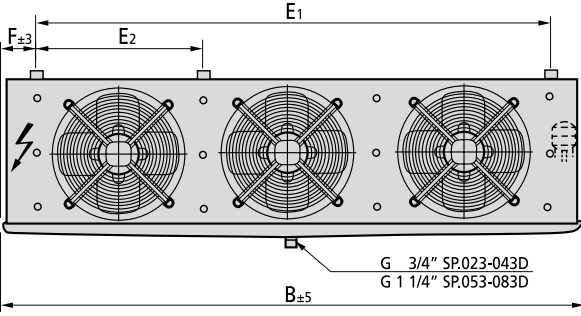
SP.(E) 011, 021, 031, 041, 051, 061, 071, 081 D



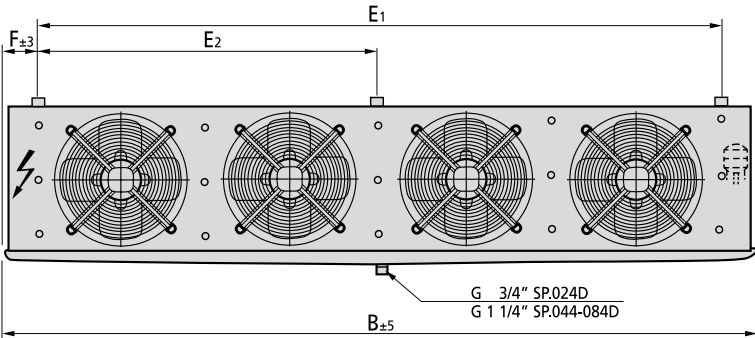
SP.(E) 022, 032, 042, 052, 062, 072, 082 D



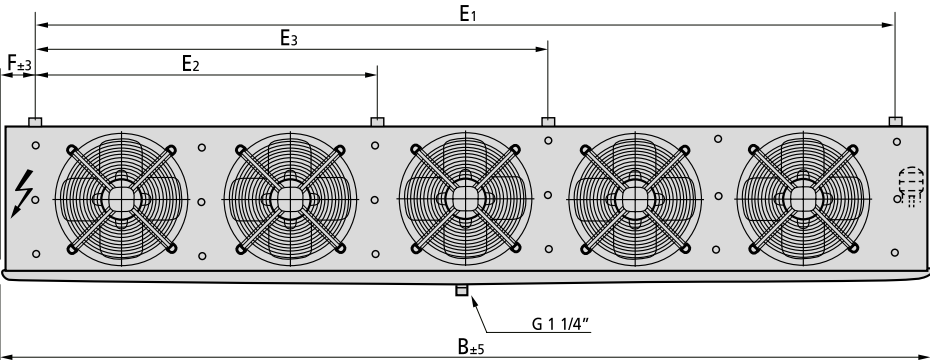
SP.(E) 023, 043, 053, 063, 073, 083 D



SP.(E) 024, 044, 064, 074, 084 D



SP.(E) 065 D



Küba market plus SP

VARIANTS



PROTECTION AGAINST CORROSION

STAINLESS STEEL 304 CASING

GOLDLACK PRE-COATED FIN

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

OTHER VARIANTS

INSULATED DRIPTRAY

FAN RING HEATER (300/400/500MM FAN ONLY)

DEFROST VARIANTS

HOT-GAS COIL IN THE DRIP TRAY (CU)

Hot-gas coil without connection; copper

KÜBA AIR JET

Advantages

- ▶ Longer air throw
- ▶ Even temperature distribution in the cold room

Information:

Unassembled upon delivery
(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





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