

# CHILLED BEAM IQ STAR STELLA

TECHNICAL CATALOGUE



## CHILLED BEAM IQ STAR STELLA

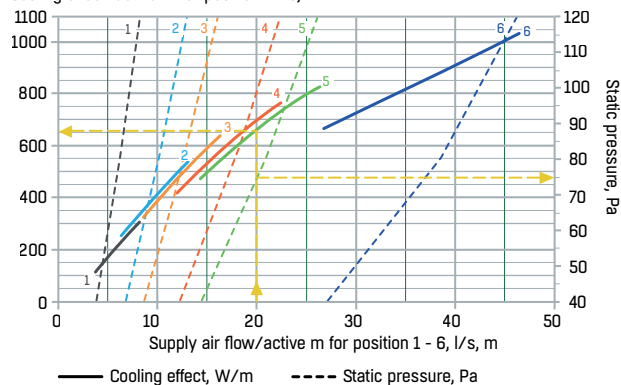


The IQ Star STELLA is a multiservice chilled beam system for ventilation, cooling and heating, fulfilling most needs for indoor climate. The chilled beam is designed to deliver exceptional cooling performance, while effective mixing with the air in the room gives a good level of comfort and low air speeds in the occupied zone. Stella is intended for ceiling mounting and can be equipped with a number of functions to provide a complete, multifunctional chilled beam. The following functions are available for STELLA: direct and indirect lighting, control and regulation equipment, Energy Control, Flow Pattern Control (FPC), high air flow and heating functions.

It also provides space for sprinkler piping, wiring, loudspeakers, presence detectors, etc. and up to three units can be connected in series. These various functions are described in separate parts in the catalogue.

### QUICK SELECTION

Cooling effect/active m for position 1 - 6, W/m



### KEY FEATURES

- Sprinkler
- Speaker
- FPC
- High air flow
- Controls
- Lighting
- Energy Control
- Heating

### SPECIFICATIONS

Freehanging Chilled Beam iQ Star STELLA

- Very flexible multiservice Chilled Beam.
- Can be supplied with the functions lighting, Control, Energy control, Flow Pattern Control, High Airflow, and Heating.
- Equipped with Energy Control.

### PRODUCT CODE EXAMPLE

Freehanging Chilled Beam IQFF-180-0-0-1-1-0.

## CAPACITY AND SOUND DATA

### COOLING EFFECT FOR TWO-WAY CHILLED BEAM AT STATIC PRESSURE DROP 70 PA ON THE AIR SIDE BEAM LENGTH: 1.8 M (COIL LENGTH: 1.5 M)

Water flow,  $q_w = 0.1$  l/s

Pressure drop water,  $\Delta p_w = 5.0$  kPa

Nozzle	$Q_l$ l/s	$P_{tot}$ W at $\Delta t$ , °C			$P_{coil}$ W at $\Delta t$ , °C			$L_{A10}$ dB(A)
		6	8	10	6	8	10	
1 ESM	8.0	325	410	495	250	335	420	<20
2	13.5	575	720	870	445	590	740	<20
3	17.5	725	910	1095	555	740	925	<20
4	24.5	920	1150	1380	685	975	1145	<20
5	28.5	1015	1260	1505	740	985	1230	<20
6 BST	54.0	1475	1790	2110	955	1270	1590	28

### BEAM LENGTH: 2.4 M (COIL LENGTH: 2.1 M)

Water flow,  $q_w = 0.1$  l/s

Pressure drop water,  $\Delta p_w = 6.1$  kPa

Nozzle	$Q_l$ l/s	$P_{tot}$ W at $\Delta t$ , °C			$P_{coil}$ W at $\Delta t$ , °C			$L_{A10}$ dB(A)
		6	8	10	6	8	10	
1 ESM	13.5	490	610	730	360	480	600	<20
2	21	835	1050	1265	635	850	1065	<20
3	26	1015	1275	1530	765	1025	1280	<20
4	37	1320	1640	1960	965	1285	1605	<20
5	43	1440	1780	2125	1030	1370	1715	<20
6 BST	76	2100	2555	3010	1370	1825	2280	33

### BEAM LENGTH: 3.0 M (COIL LENGTH: 2.7 M)

Water flow,  $q_w = 0.1$  l/s

Pressure drop water,  $\Delta p_w = 7.4$  kPa

Nozzle	$Q_l$ l/s	$P_{tot}$ W at $\Delta t$ , °C			$P_{coil}$ W at $\Delta t$ , °C			$L_{A10}$ dB(A)
		6	8	10	6	8	10	
1 ESM	20.5	635	780	925	440	585	730	<20
2	31	1080	1340	1600	780	1040	1300	<20
3	37.5	1305	1620	1935	945	1260	1575	<20
4	50	1650	2040	2430	1170	1560	1950	22
5	59	1835	2255	2680	1270	1690	2115	27
6 BST	103	2630	3175	3720	1640	2185	2730	40

## DEFINITIONS

ESM = Energy Save Mode, BST = Boost Mode

$q_l$  Supply airflow, l/s

$P_{air}$  Cooling effect of air, l/s

$P_{tot}$  Total cooling effect, W

$P_{coil}$  Cooling effect of the coil, W

$P_{coil\ heat}$  Heating effect of the coil, W

$\Delta t$  Difference between room air temperature and average water temperature, °C

$\Delta p_w$  Pressure drop water, kPa

$\Delta t_w$  (°C) =  $P_{batt}$  (W) / 208

$\Delta t_w$  (US imperial) -  $\Delta t_w$  (°F) =  $P_{batt}$  (BTU/tim) / 81177

$L_{A10}$  Sound pressure level in a room with 10 m<sup>2</sup> room absorption, dB(A)

## ASSUMPTIONS FOR COOLING EFFECT TABLES

Total cooling effect of beam  $P_{tot}$  = cooling effect of coil,  $P_{coil}$  + cooling effect of supply air,  $P_{air}$

The tables assume a static pressure drop on the air side of 70 Pa.

The cooling effect of supply air is based on an under-temperature of 8 °C for the supply air, when compared to the room temperature.

The effects for other water flows than 0.1 l/s or other pressures can be found in the FläktGroup Select product selection program.

### NOTE!

The tables here are based on tests done according to EN 15116. This European standard is used by Eurovent for certifying chilled beams.

## HEATING EFFECT FOR TWO-WAY CHILLED BEAM AT STATIC PRESSURE DROP 70 PA ON THE AIR SIDE

See separate documentation for Heating.

## TECHNICAL DATA FOR FLOW PATTERNS OTHER THAN TWO-WAY FLOW

Use FläktGroup product selection program Select for chilled beams.

## SOUND POWER LEVEL

STELLA	Correction $K_{oct}$ dB Octave band, mid-frequency, Hz							
	63	125	250	500	1000	2000	4000	8000
-180	7	6	3	0	-1	-6	-12	-8
-240	7	6	3	0	-1	-6	-12	-8
-300	7	6	3	0	-1	-6	-12	-8
Tol ±	6	3	2	2	2	2	2	3

The sound power levels for every octave band are obtained by adding together the sound pressure level  $L_{A10}$ , dB(A), and the corrections  $K_{oct}$  given in the table above, according to the following formula:

$$L_W = L_{A10} + K_{oct}$$

The correction  $K_{oct}$  is the average value for the area of application of the chilled beam STELLA.

## SOUND ATTENUATION

The average sound attenuation  $\Delta L$  of chilled beam STELLA from duct to room includes the end reflection of the connecting duct.

STELLA	Sound attenuation in supply duct for the beam $\Delta L$ , dB Octave band, mid-frequency, Hz							
	63	125	250	500	1000	2000	4000	8000
-180	23	13	7	8	10	11	13	13
-240	23	13	7	8	10	11	13	13
-300	23	13	7	8	10	11	13	13
Tol ±	6	3	2	2	2	2	2	3

## MATERIALS AND SURFACE FINISH, CONSTRUCTION AND FUNCTION, PRODUCT SELECTION

### MATERIALS AND SURFACE FINISH

The body, side panels, base panels and end panels of beams consist mainly of galvanized sheet steel, while the underside consists mainly of aluminium profiles. Visible components are finished as standard in white RAL 9010, which corresponds to NCS 0502-Y, gloss level 30.

Coils are made of copper pipe with a coupling Øy = 15 mm and with aluminium fins. Maximum working pressure 1.6 MPa.

### CONSTRUCTION AND FUNCTION

The chilled beam STELLA is designed for ceiling mounting and is exposed. STELLA is also prepared for installation in series of up to three chilled beams. Dummy sections may also be purchased as options.

The air flow is directed slightly upwards through the vents, encouraging air to flow along the ceiling to ensure draught-free ventilation.

The air flow is easily adjusted using the patented Energy Control function, which also allows different forms of air distribution (two-way, one-way and mid-way position). For even greater flexibility there is also a Motorized Energy Control (MEC) option for load-dependent ventilation. In normal operation the beam is set to the chosen air flow setting. At times of heavy demand (increased supply air demand) the chilled beam is switched to boost mode by means of a pushbutton or CO<sub>2</sub> sensor. If a presence detector or pushbutton is installed in the room the beam can also be programmed to switch to Energy Saving Mode (ESM), which reduces the supply air flow to a minimum.

Different settings of the Energy Control on both sides of the beam requires a damper at each air connection in order to make adjustment of the airflow.

See also the separate catalogue section on EC/MEC.

STELLA is a multifunction chilled beam that allows a variety of optional functions to be chosen over standard, and is designed so that it can be configured for special accessories. In standard specification Stella is prepared for direct and indirect lighting, control and regulation equipment, Energy Control (EC/MEC), Flow Pattern Control (FPC), high air flow, heating and sprinkler functions. It is also designed to provide space for piping, wiring, loud-speakers, smoke detectors, presence detectors, etc.

The bleed nipple can be selected in the product code, but cannot be combined with the series installation option.

The base panel and side panels can be removed to simplify access to connections and controls, and for maintenance.

If chilled beams are to be connected in series they are configured to allow series-coupling of air and parallel-coupling of water, see diagram on product code page.

### TECHNICAL DATA AND DIMENSIONS

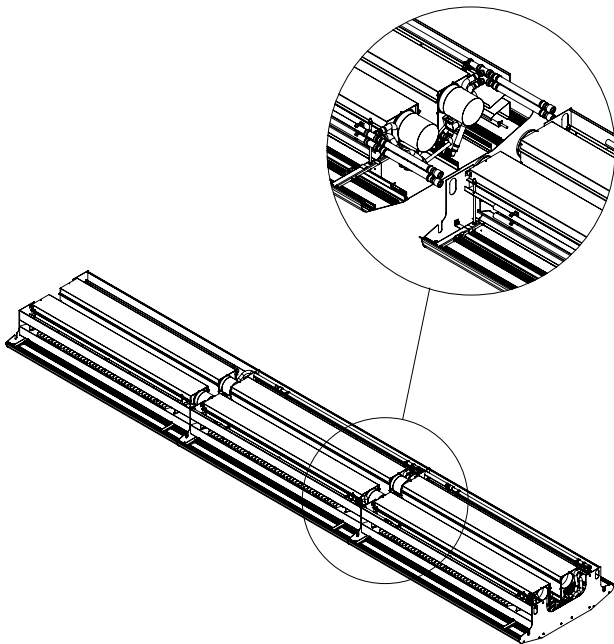
For information to aid selection of chilled beams please use FläktGroup, Select product selection program. Contact our nearest sales office for further information.

## SERIAL CONNECTION OF CHILLED BEAMS

### INSTALLATION OF CHILLED BEAMS IN SERIES

Chilled Beams installed in series must be defined in the product code as the first, middle or last Chilled Beam in the series. The Chilled Beam will be prepared before delivery and can be docked on site. As a standard solution the air can be connected in series between the Chilled Beams with a Ø125 mm circular duct, that is included in delivery. The copper tubes are Ø 22 mm and connected with flexible hoses between the sections.

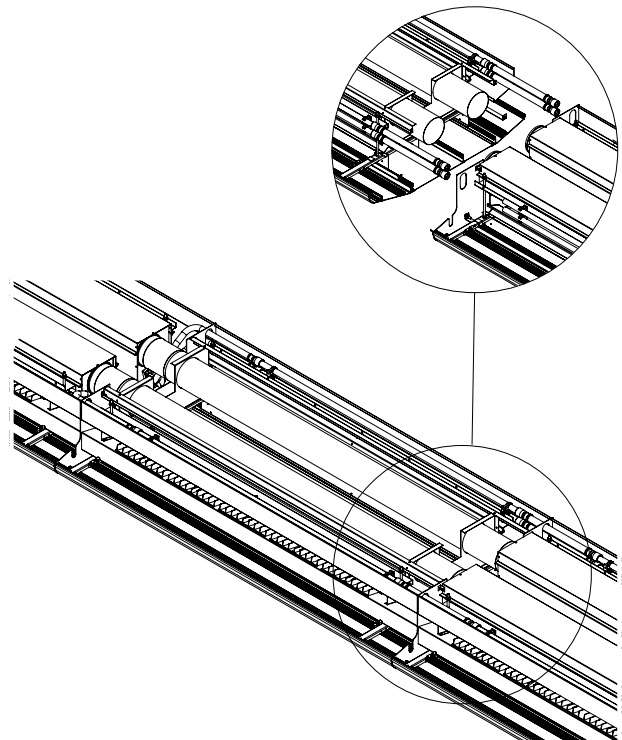
The chilled beams are connected in parallel on the water side. All flexible hoses are of the type push on, which means shorter time of installation. Type of purging nipple is selected in the product code, but cannot be combined with installation in series. It is possible to install up to three chilled beams in series and the air flow in the Ø125 mm circular duct should not exceed 3m/s for each connection, to guarantee that  $L_{A10}$  does not exceed 35 dB(A). This means that there is an air of 37 l/s for each connection, i.e. totally 74 l/s to the beam.



When installing chilled beams in series the side panels must be removed and the chilled beams placed in line on a flat surface. The chilled beams are docked by pushing them together and making sure that the pin bolts are fixed in the tracks of the connecting beam. Thereafter the flexible water hoses are connected to the pipes on the next chilled beam and the circular ducts are connected to the opposite nipples. Finally the units are bolted together with a small splice by using two screws.

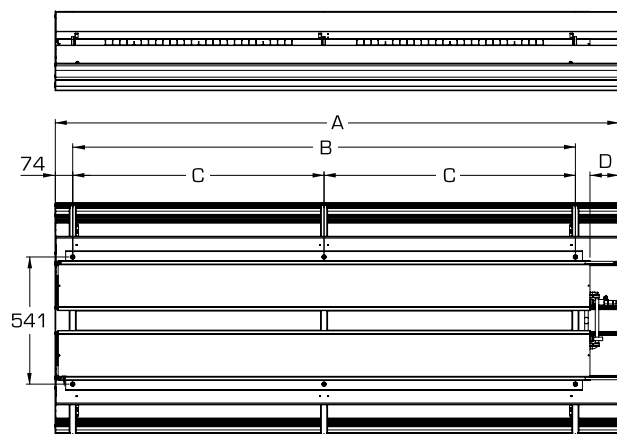
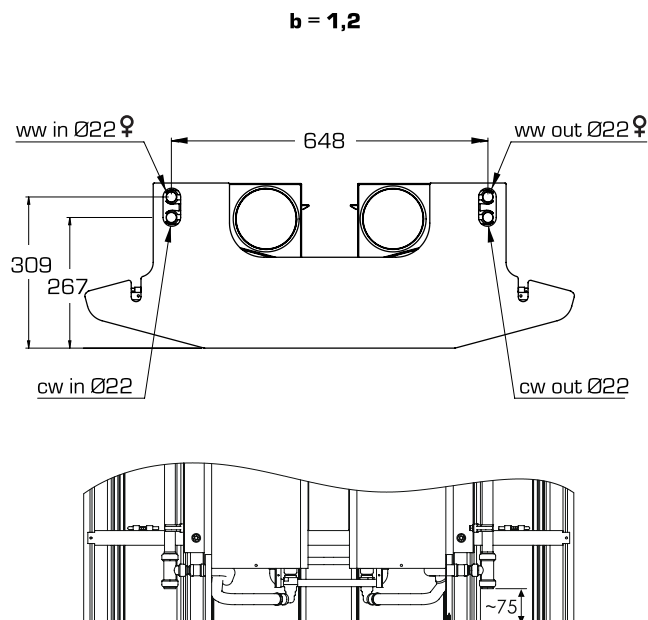
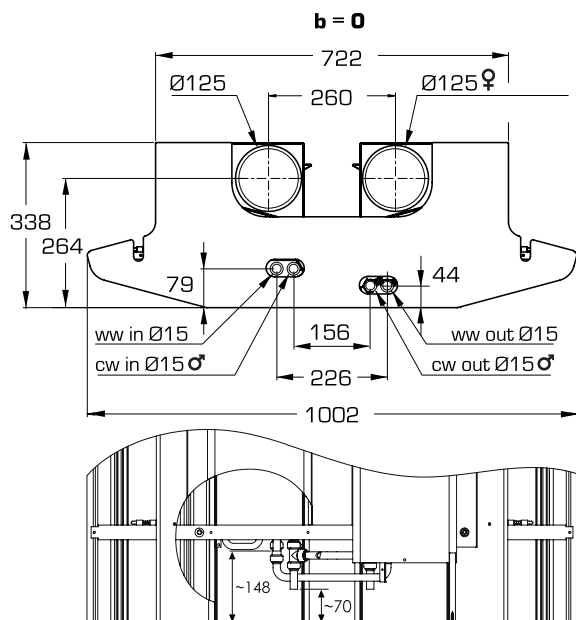
### DUMMY SECTION

For installations where an inactive part is necessary, a dummy can be ordered as an accessory. The dummy can be placed either as the first, middle or last section in the series and should be specified in the ordering code. It is possible to order the dummy prepared for serial connection of the air and it will then have a mounted circular ducts. The water side can also be prepared with Ø22 mm Cu-pipes with flexible hoses for docking onto the next chilled beam or dummy in the series. The docking is carried out in the same way as for serial connected chilled beams with pin bolts and screws.



## DIMENSIONS AND WEIGHTS, LIGHTING

### DIMENSIONS AND WEIGHTS



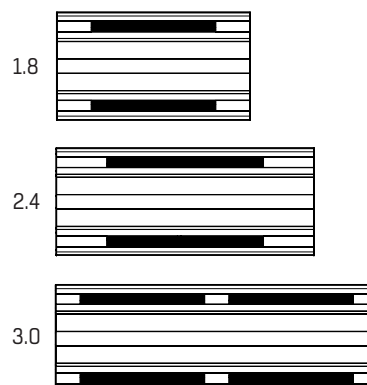
Beam length, (aaa) cm	A	B	C	D
180	1798	1548	-	116
240	2398	2138	1069	124
300	2998	2730	1385	132

Weight per metre chilled beam	kg/m
Dry weight	42.0
Water-filled cooling	43.4
Water-filled cooling and heating	43.8

### STELLA WITH DIRECT AND INDIRECT LIGHTING

Coil length, cm	Light fitting length, mm	No. of light fittings	Power, W
180	1169	2	28/54
240	1469	2	35/49
300	1169	4	28/54

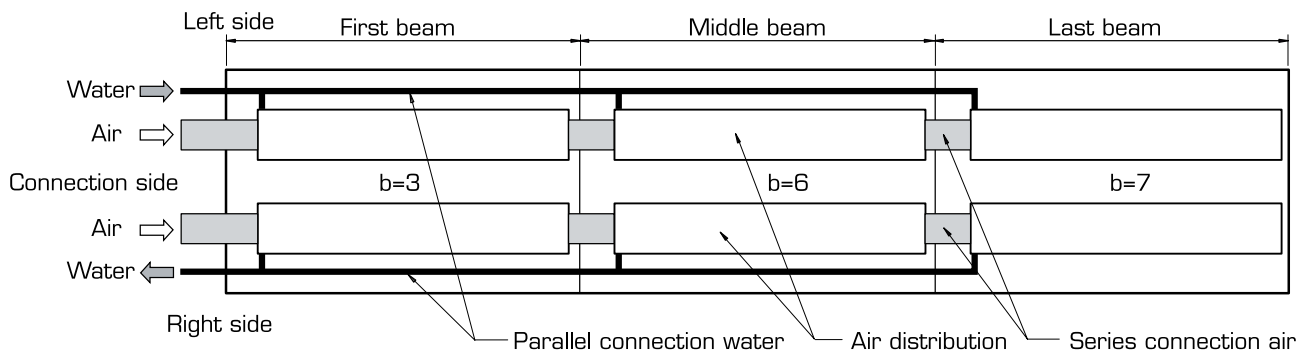
Light fittings are supplied complete with 800 mm long cable at both ends, fitted with Wieland connectors to allow wiring in series. Connecting cable is complete with 6-pole Wieland GST connector at both ends, with cable gland.



## PRODUCT CODE, ACCESSORIES

### PRODUCT CODE

Example of combination for beams seen from above



### CHILLED BEAMS IN SERIES

#### Freehanging supply air beam

IQFF-aaa-b-c-d-e-f

Nominal length in cm (aaa) \_\_\_\_\_

180, 240, 300

Beam type (b) \_\_\_\_\_

0 = Single

1 = First

2 = First









3 = First

4 = Middle

5 = Middle

6 = Middle

7 = Last

Single	First	Middle	Last
 b = 0	 b = 1	 b = 4	 b = 7
	 b = 2	 b = 5	
	 b = 3	 b = 6	

Extension (c) \_\_\_\_\_

0 = Standard, no extension

Coil type (d) \_\_\_\_\_

1 = Cooling

2 = Cooling with purging nipple on the right side (only b = 0 - 3)

3 = Cooling and heating

4 = Cooling and heating with purging nipple on the right side (only b = 0 - 3)

Comfort control (e) \_\_\_\_\_

1 = With EC, normal air flow

2 = With EC, normal air flow and FPC

3 = With EC, high air flow

4 = With EC, high air flow and FPC

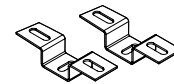
Duct connection, mm (f) \_\_\_\_\_

1 = Ø125

2 = Ø160

### ACCESSORIES

#### Fastening bracket



QFAZ-21-bbb-cc

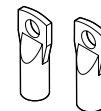
Length (aaa in beam code) (bbb) \_\_\_\_\_

180, 240, 300

Model (cc) \_\_\_\_\_

01 = STELLA (IQFF)

#### Hanging lug



QFAZ-22-bbb-cc

Length (aaa in beam code) (bbb) \_\_\_\_\_

Model (cc) \_\_\_\_\_

01 = STELLA (IQFF)

#### Motorized Energy Control

IQAZ-23-01-c-d-e-f

Connected sides (c) \_\_\_\_\_

1 = Both side

2 = Right side

3 = Left side

Design (d) \_\_\_\_\_

1 = 24 V, 2-modes On/Off

2 = 230 V, 2-modes On/Off

3 = 24 V, 3-modes variable (e = 0; f = 0)

Factory set nozzle adjustment

for normal operating conditions (e) \_\_\_\_\_

1-6 Nozzle adjustment

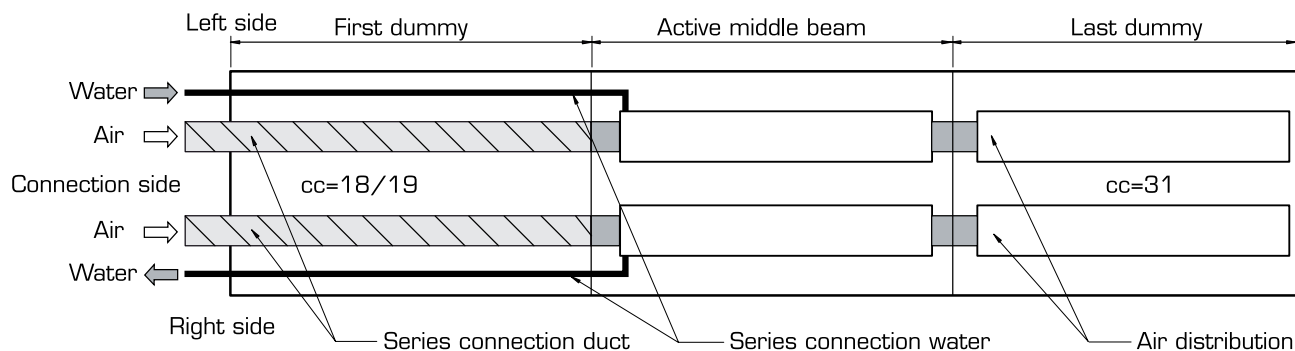
Factory set nozzle adjustment f

or activated operating conditions (f) \_\_\_\_\_

1-6 Nozzle adjustment

## PRODUCT CODE

Example of combination for beams seen from above



### Dummy

### IQAZ-25-bbb-cc-d-e

Nominal length in cm (bbb)  
180, 240, 300

Execution (cc)

- 00 = Single d = 0, 5
- 01 = Single d = 0, 5
- 10 = First d = 0, 5
- 11 = First d = 0, 5
- 12 = First d = 0, 5
- 13 = First d = 1, 2, 6, 7
- 14 = First d = 3, 4, 8, 9
- 15 = First d = 1, 2, 6, 7
- 16 = First d = 3, 4, 8, 9
- 20 = Middle d = 0, 5
- 21 = Middle d = 0, 5
- 22 = Middle d = 0, 5
- 23 = Middle d = 1, 6
- 24 = Middle d = 3, 8
- 25 = Middle d = 1, 6
- 26 = Middle d = 3, 8
- 27 = Middle d = 0, 5
- 28 = Middle d = 1, 6
- 29 = Middle d = 3, 8
- 30 = Last d = 0, 5
- 31 = Last d = 0, 5

Single	First	Middle	Last
cc = 00	cc = 10	cc = 20	cc = 30
cc = 01	cc = 11	cc = 21	cc = 31
	cc = 12	cc = 22	
	cc = 13, 14	cc = 23, 24	
	cc = 15, 16	cc = 25, 26	
	cc = 17	cc = 27	
	cc = 18, 19	cc = 28, 29	

Comfort control (e)

- 1 = With EC, normal airflow
- 2 = With EC, normal airflow and FPC
- 3 = With EC, high airflow
- 4 = With EC, high airflow and FPC
- 5 = Without EC (only cc = 00, 10, 20, 30, 17-19, 27-29)
- 6 = Without EC but with FPC (only cc = 00, 10, 20, 30, 17-19, 27-29)

Connections in mm (d)

- 0 = Ø125, without water connection
- 1 = Ø125, Piping for cooling
- 2 = Ø125, Piping for cooling with purging nipple on the right side (only cc = 13, 15, 18)
- 3 = Ø125, Piping for cooling and heating
- 4 = Ø125, Piping for cooling and heating with purging nipple on the right side (only cc = 14, 16, 19)
- 5 = Ø160, without water connection
- 6 = Ø160, Piping for cooling
- 7 = Ø160, Piping for cooling with purging nipple on the right side (only cc = 13, 15, 18)
- 8 = Ø160, Piping for cooling and heating
- 9 = Ø160, Piping for cooling and heating with purging nipple on the right side (only cc = 14, 16, 19)



**Part code****IQAZ-cc**

Beam (cc) \_\_\_\_\_

0 = Single

1 = First

2 = Middle

3 = Last

Type (cc) \_\_\_\_\_

0 = Without air distribution

1 = Stop at air distribution rear

2 = Air distribution with series connection

3, 4 = Stop at air distributor rear and water

5, 6 = Stop at air distribution rear with water connection

7 = Series connection with water

8, 9 = Series connection duct with water

**Pre-setup Energy Control****IQAZ-26-bb-c-d**

Model (bb) \_\_\_\_\_

01 = Stella (IQFF)

Default right side (c) \_\_\_\_\_

1-6 = Hole setting

Default left side (d) \_\_\_\_\_

1-6 = Hole setting

## EXCELLENCE IN SOLUTIONS

FläktGroup is the European market leader for smart and energy efficient Indoor Air and Critical Air solutions to support every application area. We offer our customers innovative technologies, high quality and outstanding performance supported by more than a century of accumulated industry experience. The widest product range in the market, and strong market presence in 65 countries worldwide, guarantee that we are always by your side, ready to deliver Excellence in Solutions.

### PRODUCT FUNCTIONS BY FLÄKTGROUP

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Air Management & ATD's | Air Conditioning & Heating | Controls | Service

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