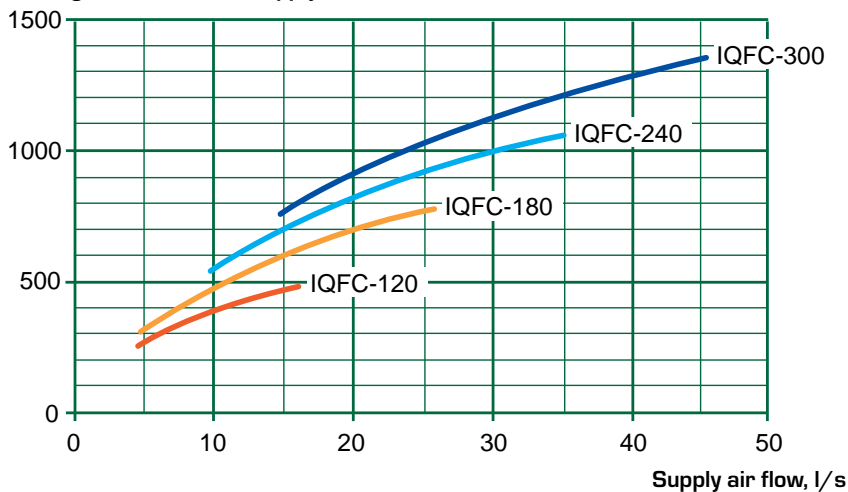# Chilled Beam Flexicool® IQFC

Functions

- FPC
- High Air-flow
- Controls
- Lighting
- Comfort control
- Heating

The chilled beam Flexicool® IQFC is an integrated system for ventilation, cooling and heating, fulfilling most needs for indoor climate. These supply air beams are designed to manage high cooling effects that, because of good mixing with room air, provide comfort and low air velocities in the occupied zone. The top side of IQFC is covered, and it is designed for exposed installation. The beam is also available with fittings for indirect illumination. The blow through the supply air slot is directed diagonally upwards, which increases the probability of adhesion to the ceiling and thereby draught-free room ventilation. The chilled beam is equipped with adjusting rails, comfort control, for the adjustment of air flow, cooling effect and flow pattern (FPC).

Product Facts

- Chilled beam IQFC for exposed installation.
- Air flow through the supply air slot is directed diagonally upwards.
- Capacity and flow directions easily adjustable.
- Bottom plate can be pushed aside to enable adjustments of capacity as well as check-up and cleaning.
- Patent pending for the sound attenuator.
- Enclosures for connections are available as accessories.
- Attachment brackets for quick and easy mounting - lift up - snap on.

Product code example

Chilled beam IQFC for exposed installation manufactured by Fläkt Woods. With stepless regulation of air flow and upwards ditribution pattern.
Chilled beam IQFC-240-1-1-1.

Quick Selection

Cooling effect in W incl supply air

Supply air flow, l/s

The diagram shows the approximate cooling effect P_{tot} in W with water flow q_w = 0,05 l/s, temperature difference between room air and supply air Δt= 8 °C, pressure drop 60 Pa on the air side and max. sound pressure level LA10 = 30 dB(A).

Technical data for cooling and heating effect

Cooling effect for two-way chilled beam at static pressure drop 60 Pa on the air side

Beam length = 1,2 m (Coil length = 1,0 m)

Water flow, q_w = 0,05 l/s

Pressure drop water, Δp_w = 1,2 kPa

q_l [l/s]	P_{tot} [W]			P_{coil} [W]			L_{A10} dB(A)
	Δt[°C]			Δt [°C]			
	6	8	10	6	8	10	
5	205	260	310	160	210	260	<15
10	315	385	460	215	290	365	<15
15	385	465	545	240	320	400	15

Beam length = 1,8 m (Coil length = 1,6 m)

Water flow, q_w = 0,05 l/s

Pressure drop water, Δp_w = 2,1 kPa

q_l [l/s]	P_{tot} [W]			P_{coil} [W]			L_{A10} dB(A)
	Δt[°C]			Δt [°C]			
	6	8	10	6	8	10	
10	385	480	575	290	380	480	<15
15	485	600	710	340	455	565	16
20	560	685	805	370	490	610	19
25	625	750	880	385	510	640	23

Beam length = 2,4 m (Coil length = 2,2 m)

Water flow, q_w = 0,05 l/s

Pressure drop water, Δp_w = 2,7 kPa

q_l [l/s]	P_{tot} [W]			P_{coil} [W]			L_{A10} dB(A)
	Δt[°C]			Δt [°C]			
	6	8	10	6	8	10	
10	420	530	630	320	435	535	<15
15	560	695	835	415	550	690	<15
20	655	805	960	460	615	770	15
25	735	895	1055	495	655	815	16
30	805	975	1145	515	685	860	18
35	865	1040	1215	530	705	880	20

Beam length = 3,0 m (Coil length = 2,8 m)

Water flow, q_w = 0,05 l/s

Pressure drop water, Δp_w = 3,5 kPa

q_l [l/s]	P_{tot} [W]			P_{coil} [W]			LA10 dB(A)
	Δt[°C]			Δt [°C]			
	6	8	10	6	8	10	
15	600	745	895	455	605	755	<15
20	730	905	1085	535	710	890	<15
25	825	1020	1215	585	780	975	16
30	905	1110	1315	615	825	1025	18
35	975	1190	1400	640	855	1065	21
40	1045	1260	1480	660	875	1095	23
45	1105	1330	1550	670	895	1120	25

Conditions for cooling effect tables

Total cooling effect of beam P_{tot} = cooling effect of coil P_{coil} + cooling effect of supply air Pair.

The assumed pressure drop on the air side is 60 Pa.

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

The effects for other water flows can be found in the Fläkt Woods product selection program WinDon.

Note! The tables here are based on tests done according to the Nordtest method. The purpose of this method is to be able to compare different chilled beams on the same terms. The method requires a non-existing temperature difference between the air entering the beam coil and the air at 1,1 m above floor surface. To achieve this, the walls in the test room are cooled.

In actual conditions, the temperature difference is normally 1 - 2 °C. This is why the temperature difference Δt should be increased by 1 - 2 °C to avoid overdimensioning of the beam.

This means that the table value concerned can be increased by 10 - 20 %.

With top connection the sound generation increases by 2 - 3 dB(A).

The chilled beam can be supplied with a special construction for higher air flows than listed in these tables.

Heating effect for two-way chilled beam IQFC at static pressure drop 60 Pa on the air side

Heating effects can be found in separate catalogue section, heating.

Definitions

q_l	Supply air flow, l/s
P_{tot}	Total cooling capacity, W
P_{coil}	Cooling capacity of the coil, W
$P_{coil\ heat}$	Heating effect of the coil, W
L_{A10}	Sound pressure level in a room with 10 m2 room absorption, dB(A)
Δt	Difference between room air temperature and average water temperature, K
Δp_w	Pressure drop water, kPa
Δtw	Water temperature in the coil, K. Calculated with the formula: $\Delta t_w = P_{coil} / 208$

Technical data for other flow patterns and sound data

Technical data for flow patterns other than two-way air distribution

Beams with two-way air distribution utilize the coil in full, which is not the case in one-way distribution or middle positions. This effect factor can be found in the table below.

For a particular beam and supply air flow, the obtained effect factor is multiplied by the value given in the effect tables on the previous page.

Type of distribution	Beam length, m	Max. supply air flow, l/s	Effect factor
	1,2	5	0,8
One-way	1,8	15	0,8
	2,4	20	0,8
	3,0	25	0,8
	1,2	10	0,9
70% - 30%	1,8	15	0,9
	2,4	25	0,9
	3,0	30	0,9

Example

Requirements:

Beam of length = 2,4 m with one-way air distribution, air flow = 20 l/s, pressure drop air = 60 Pa, difference between room air temperature and average water temperature = 8° C and water flow = 0,05 l/s.

Result:

The table on the previous page gives coil effect P_{coil} = 615 W

Effect factor = 0,8

Coil effect for one-way air distribution = 0,8 x 615 = 492 W

Sound power level

IQFC	Correction K_{oct}, dB							
	Octave band, middle frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
-120	-4	0	3	3	-2	-4	-11	-18
-180	-4	0	3	3	-2	-4	-11	-18
-240	-4	0	3	3	-2	-4	-11	-18
-300	-4	0	3	3	-2	-4	-11	-18
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 LA10, 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 in the area of application of the chilled beam IQFC.

Sound attenuation

IQFC	Sound attenuation in supply air duct of the beam ΔL, dB							
	Octave band, middle frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
-120	23	19	10	8	8	13	13	12
-180	23	19	10	8	8	13	13	12
-240	23	19	10	8	8	13	13	12
-300	23	19	10	8	8	13	13	12
Tol +/-	6	3	2	2	2	2	2	3

Installation, adjustment and maintenance

Detailed instructions for installation, adjustment and maintenance can be found in our technical instructions that are delivered with every product. The instructions are also available on our web pages at www.flaktwoods.com.

Construction and function

The chilled beam IQFC is designed for exposed installation.

The chilled beam IQFC is designed for exposed installation. The air flow through the supply air slot is directed diagonally upwards, which increases the probability of adhesion to the ceiling and thereby draught-free room ventilation.

The air flow can be adjusted by means of the patended adjusting rails, comfort control, with which the length of the holes in the supply air duct is changed. This can easily be done with normal adjustments.

The adjustable hole lengths allow different air distribution (two-way, one-way and middle positions).

The simple adjustment of air distribution and capacity makes it possible to adapt to changing conditions in the future.

Before delivery, the hole lengths of standard beams are preset at the longest possible position to provide a starting position for later adjustment. Individual adjustment of hole lengths is available at the factory. In this case, all beams are marked and must be identified at delivery and assorted at the building site.

The bottom plates can be pushed aside to allow easy cleaning and adjustment of air flow.

The purging nipple is included in the standard delivery.

Material and surface finish

The casing is mainly made of galvanized steel sheet and aluminium profiles, and it is powder painted in white. The gables are made of ABS plastic.

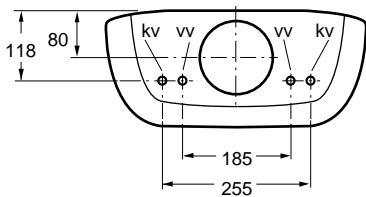The standard colour RAL 9010, which corresponds to NCS 0502-Y, gloss level 30.

Coil made of copper pipe with connection, Øout = 15 mm, and aluminium fins. Maximum working pressure 1,6 MPa.
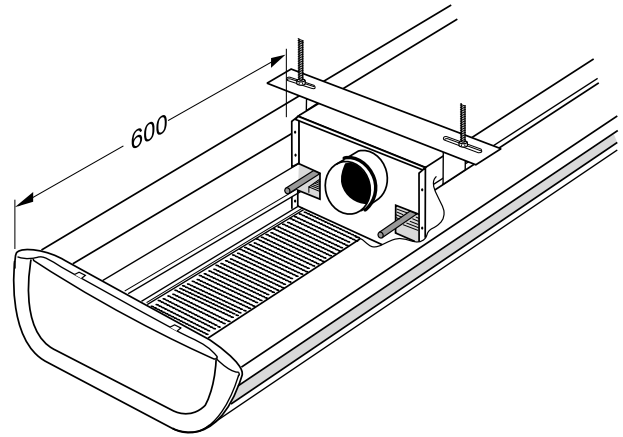
Dimensions and weights

Dimensions and weights

L = nominal length + 30 mm
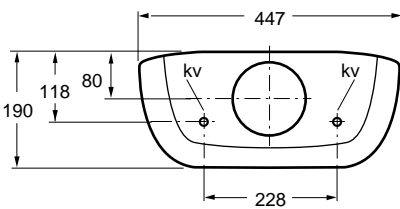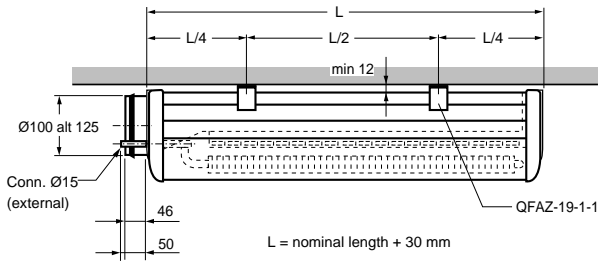
kv = kylvatten (kyla)
vv = värmevatten (värme)

Size	L	Weight, kg
IQFZ-120	1230	20
IQFZ-180	1830	28
IQFZ-240	2430	37
IQFZ-300	3030	46

Enclosure IQAZ-09

IQAZ-09	Length, mm	Weight, kg
-050	300-500	3,5
-090	500-900	5,5
-170	900-1700	9,9

Expanded casing, IQFC-aaa-3-c-d

Enclosure IQAZ-10
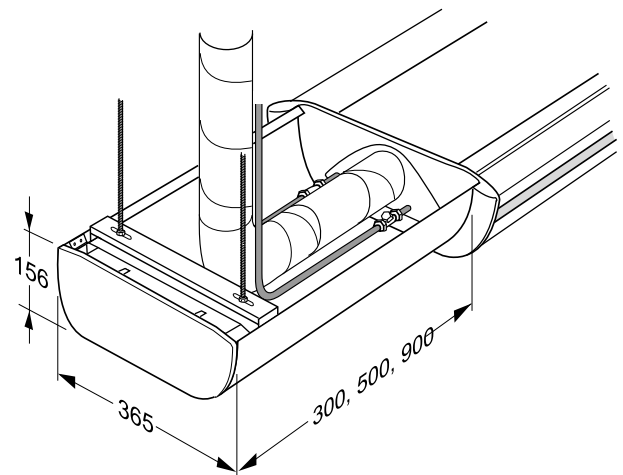
IQAZ-10	Length, mm	Weight, kg
-030	300	1,5
-050	500	2,5
-090	900	4

Description and product code

Description

Chilled beam IQFC for exposed installation manufactured by Fläkt Woods. With stepless regulation of air flow and uppwards ditribution pattern.

Product code

Main code

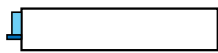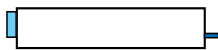|	
Supply air beam for exposed installation, standard	**IQFC-aaa-b-c-d**

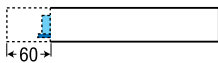Nominal length, cm (aaa)
120, 180, 240, 300

Connection alternative (b)
1 = air and water horizontally through gable

2 = air and water horizontally through opposite gables

3 = Expanded casing with connection alternatives for air and water, installation space 60 cm, tight gables.

(Casing length 180, 240, 300, 360 cm)

Duct connection[1], mm (c)
1 = 125, 1 hole row
2 = 100, 1 hole row
3 = 125, 2 hole rows[2]
5 = 125, 1 hole row, with FPC
6 = 100, 1 hole row, with FPC
7 = 125, 2 hole rows, with FPC[2]

Coil construction (d)
1 = cooling
2 = cooling and heating

[1] 1 hole row = standard air flow
2 hole rows = high air flow

[2] Not a standard solution for IQFC-120, can be offered by request.

Fastening bracket, unpainted	**QFAZ-19-1-1**

Set containing 2 pcs. members
1 set QFAZ-19 per beam.

Special constructions

Describe the deviations from the standard model clearly and replace the product code letter standing for the construction part in question with an X.

Example of code and definition: IQFC-240-X-1-1, where X e.g. stands for an overhead connection of air and water at the same gable.

Deviations that cannot be included in the product code should be specified in writing.

Description and product code

Pluscodes

Not for beams on stock

Hole adjustment in the factory   IQAZ-01-aa-bb

Hole opening on the left side (aa)
n air flow direction, 02-18 mm

Hole opening on the right side (bb)
n air flow direction, 02-18 mm

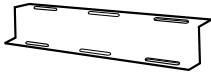**Construction for clean installation**   IQAZ-11-2

Protective film over painted surfaces.
(Plastic covers for duct and pipeline openings are standard).
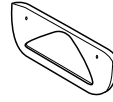
Accessories

Suspension brackets   QFAZ-11-1

2 pcs. per beam

Suspension rods M8   QFAZ-12

Set with 2 pcs. Length 500 mm.
2 sets per beam

Enclosure, without end walls   IQAZ-09-aaa

Between beam and wall.
Attachments are included, (2 pcs.).

Length (aaa)
050 = 30-50 cm
090 = 50-90 cm
170 = 90-170 cm
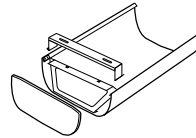

End plate   IQAZ-12

Enclosure, with sealed end walls   IQAZ-10-aaa

Attachment is included, (1 pc.).

Length (aaa)
030 = 30 cm
050 = 50 cm
090 = 90 cm

Gauge rod   IQAZ-05

For hole length adjustment

Flow pattern control (FPC), High air flow, Controls, Lighting, Comfort control and Heating.
Descriptions included in a separate section of this catalogue.