



# Residential Fan Coil Unit Carisma Whisper

TECHNICAL MANUAL



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### Carisma Whisper

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## INTRODUCTION

The Carisma Whisper CFF-ECM fan coil unit combines a reduced dimension with a modern aesthetic, while maintaining great performances in terms of sound and consumption.

Carisma Whisper CFF-ECM includes the MV version for wall installation and the IV version for concealed installation; the MV version combines a reduced dimension, up to 126 mm depth only, with a modern aesthetic that perfectly suits with any kind of furnishing, while maintaining great performances in terms of sound and consumption.

The Carisma Whisper CFF-ECM range makes use of the excellent experience gained with the fan coil units with inverter board, first in the world in production since 2009, and which have had great success on all markets. The latest synchronous inverter driven BLAC brushless and sensorless electronic motor with permanent

magnets is controlled by an Inverter board designed and developed in Italy.

The electronic board is directly fitted on the motor.

The air flow can be varied continuously with a 1-10 V signal.

The continuous air flow control improves the acoustic comfort and allows a more punctual reply to the variation of the thermal loads and a greater stability of the requested ambient temperature.

The extreme efficiency, also at a low speed, makes possible a great reduction in electric consumption with absorption values, under normal operating conditions, that are no greater than 5 Watt.

The excellent values in terms of sound levels have been maintained in all working conditions, without any resonance phenomenon at any frequency.



## VERSION AND MAIN COMPONENTS

Range includes 5 air flow rates (from 75 to 645 m<sup>3</sup>/h) and 2 versions (standard with casing and for concealed installation), each one equipped with 2 row coil.

The standard versions with the casing are available in the following combinations:

- without control (CFF-ECM-MV)
- with CB-E control (CFF-ECM-MV-CB-E)
- with CB-Touch control (CFF-ECM-MV-CB-T)

The CB-E and CB-Touch versions are supplied with their power units (UP-ECO and UP-Touch) fitted on the unit.

The CB-E control must always be connected with a programmable thermostat (not supplied by us).

The Carisma Whisper CFF-ECM range is perfect to meet all air-conditioning requirements of residential and work environments like offices, shops, restaurants and hotel rooms.

### Outer casing

Made of galvanized steel and with plastic outer casing

The air diffuser, that is placed over the top of the unit, is of adjustable type.

White RAL 9003.

### Inner casing

Made of 1 mm galvanized steel, a rear panel and two lateral sides insulated with 3 mm polyolefin (PO) foam (class M1).

### Filter

Polypropylene cellular fabric regenerating filter.

The filter frame, made of synthetic material, is inserted into special plastic sliding guides fastened to the internal structure for easy insertion and removal of the filter.

### Fan assembly

Made of plastic tangential fan with anti-vibration fins.

The fan hub, dynamycally and statically balanced, is directly secured onto the motor shaft.

### Electronic motor

Electronic motor with three phase permanent magnet brushless electronic motor that is controlled with reconstructed current according to a BLAC sinusoidal wave.

The inverter board that controls the motor operation is powered by 230 Volt, single-phase and, with a switching system, it generates a three-phase frequency modulated, wave form power supply.

The electric power supply required for the machine is therefore single-phase with voltage of 230 - 240 V and frequency of 50 - 60 Hz.

### Coil

It is manufactured from drawn copper tube and the aluminium fins are mechanically bonded onto the tube by an expansion process.

The coil has two Ø 1/2 inch BSP internal connections.

The coil has Ø 1/8" inch BSP air vent and drain.

The heat exchanger is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

**Flow and return pipe connections are situated at the same end on the left side looking at the unit. On request we can deliver the unit with the connections on the right end side: this must be specified on the order as this operation can not be carried out on site during installation.**

### Valves

The versions without valves or with mounted valves are available for all sizes.

The available valves are:

- 2 way
- 3 way

The valves can be ordered separately and easily installed on the basic units without valves.

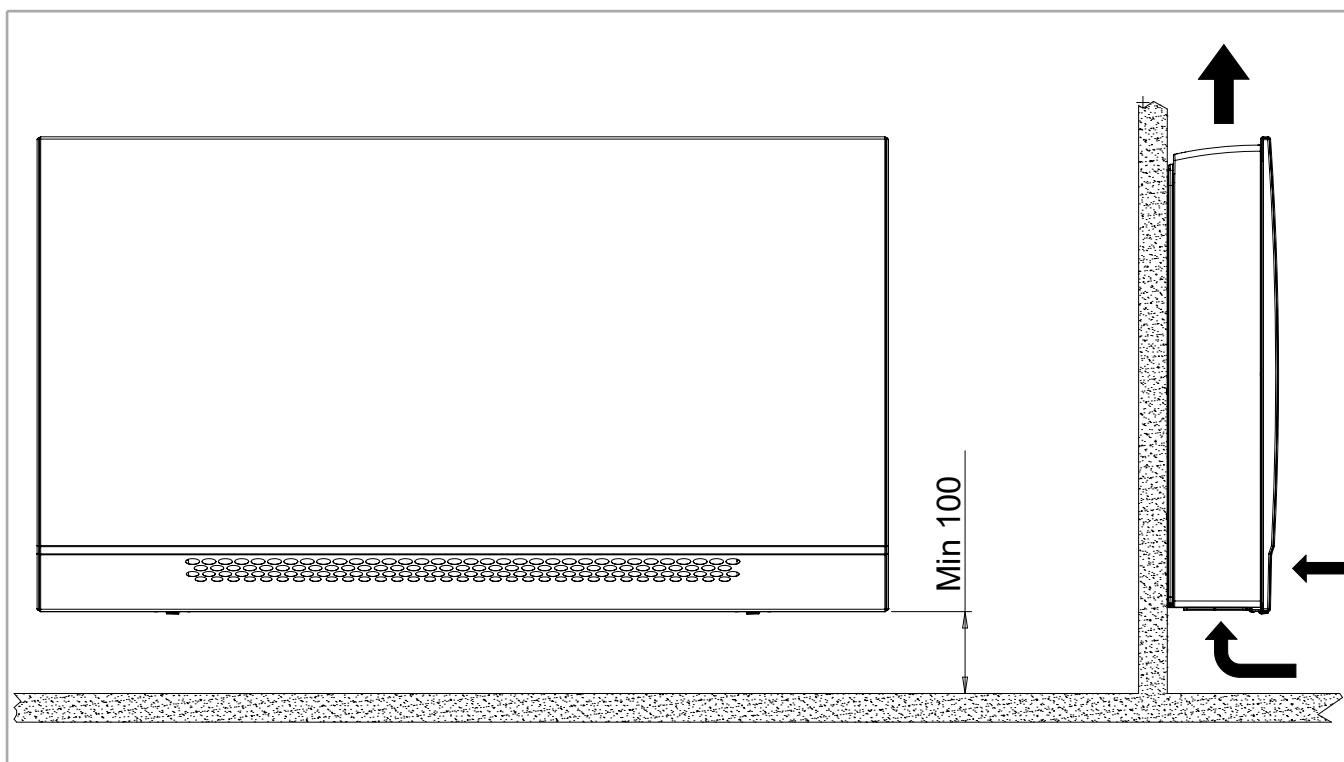
### Condensate collection tray

Made of plastic (ABS UL94 HB) and fixed to the internal structure. The outside diameter of the condensate discharge pipe is Ø 15 mm.

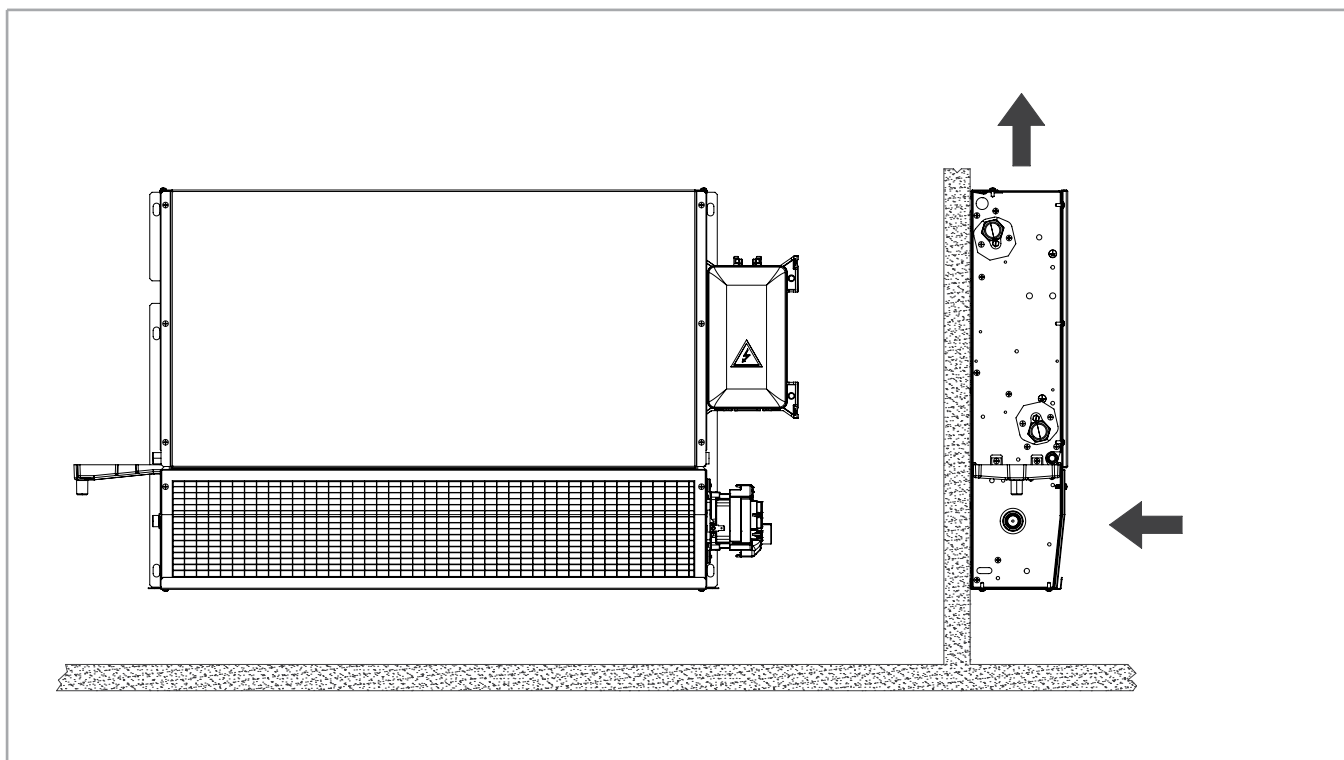


## VERSIONS

### Standard version with casing - MV



### Version for concealed installation - IV



## MAIN PERFORMANCE AND TECHNICAL CHARACTERISTICS

The following standard rating conditions are used:

### COOLING

Entering air temperature: + 27 °C d.b. + 19 °C w.b.

Water temperature: +7 °C E.W.T. +12 °C L.W.T.

### HEATING

Entering air temperature: + 20 °C

Water temperature: +45 °C E.W.T. +40 °C L.W.T.

| MODEL<br>Inverter power            |                   | CFF-ECM 10 |      |      |      |      |      | CFF-ECM 20 |      |      |      |      |      | CFF-ECM 30 |      |      |      |      |      |
|------------------------------------|-------------------|------------|------|------|------|------|------|------------|------|------|------|------|------|------------|------|------|------|------|------|
|                                    |                   | 1          | 2    | 3,5  | 5    | 7,5  | 10   | 1          | 2    | 3,5  | 5    | 7,5  | 10   | 1          | 2    | 3,5  | 5    | 7,5  | 10   |
|                                    |                   | MIN        |      |      | MED  |      | MAX  | MIN        |      |      | MED  |      | MAX  | MIN        |      |      | MED  |      | MAX  |
| Air flow                           | m <sup>3</sup> /h | 75         | 90   | 110  | 130  | 170  | 205  | 125        | 145  | 175  | 205  | 255  | 305  | 190        | 225  | 270  | 315  | 395  | 470  |
| Cooling total emission             | kW                | 0,40       | 0,48 | 0,58 | 0,66 | 0,80 | 0,92 | 0,67       | 0,83 | 1,01 | 1,15 | 1,39 | 1,62 | 0,92       | 1,08 | 1,56 | 1,91 | 2,30 | 2,61 |
| Cooling sensible emission          | kW                | 0,30       | 0,36 | 0,44 | 0,52 | 0,64 | 0,75 | 0,50       | 0,62 | 0,76 | 0,88 | 1,08 | 1,28 | 0,67       | 0,79 | 1,15 | 1,41 | 1,72 | 1,99 |
| Heating emission                   | kW                | 0,55       | 0,60 | 0,68 | 0,78 | 0,96 | 1,10 | 0,97       | 1,01 | 1,16 | 1,32 | 1,57 | 1,81 | 1,52       | 1,62 | 1,85 | 2,10 | 2,53 | 2,90 |
| Dp Cooling                         | kPa               | 4,9        | 6,0  | 7,5  | 9,1  | 12,0 | 14,7 | 3,1        | 3,6  | 4,3  | 4,9  | 6,1  | 7,4  | 4,5        | 5,4  | 8,6  | 11,5 | 15,2 | 18,6 |
| Dp Heating                         | kPa               | 6,1        | 6,7  | 8,0  | 9,6  | 13,0 | 16,2 | 3,7        | 3,9  | 4,4  | 5,0  | 6,1  | 7,3  | 7,1        | 7,7  | 9,2  | 11,0 | 14,6 | 18,2 |
| Motor power input                  | W                 | 3,2        | 3,5  | 4,2  | 5,2  | 7,4  | 10,3 | 3,7        | 4,0  | 4,9  | 6,3  | 9,5  | 14,0 | 4,1        | 4,8  | 6,3  | 8,6  | 14,1 | 21,6 |
| Sound power (Lw)                   | dB(A)             | 31         | 33   | 36   | 40   | 45   | 50   | 30         | 33   | 38   | 42   | 47   | 52   | 32         | 34   | 39   | 43   | 47   | 53   |
| Sound pressure (Lp) <sup>(1)</sup> | dB(A)             | 22         | 24   | 27   | 31   | 36   | 41   | 21         | 24   | 29   | 33   | 38   | 43   | 23         | 25   | 30   | 34   | 38   | 44   |

| MODEL<br>Inverter power            |                   | CFF-ECM 40 |      |      |      |      |      | CFF-ECM 50 |      |      |      |      |      |
|------------------------------------|-------------------|------------|------|------|------|------|------|------------|------|------|------|------|------|
|                                    |                   | 1          | 2    | 3,5  | 5    | 7,5  | 10   | 1          | 2    | 3,5  | 5    | 7,5  | 10   |
|                                    |                   | MIN        |      |      | MED  |      | MAX  | MIN        |      |      | MED  |      | MAX  |
| Air flow                           | m <sup>3</sup> /h | 220        | 260  | 320  | 380  | 480  | 575  | 255        | 300  | 365  | 430  | 535  | 645  |
| Cooling total emission             | kW                | 1,14       | 1,45 | 2,06 | 2,50 | 2,97 | 3,36 | 1,44       | 1,95 | 2,55 | 2,92 | 3,37 | 3,81 |
| Cooling sensible emission          | kW                | 0,82       | 1,05 | 1,48 | 1,80 | 2,17 | 2,49 | 1,04       | 1,40 | 1,82 | 2,10 | 2,47 | 2,83 |
| Heating emission                   | kW                | 1,79       | 1,91 | 2,23 | 2,58 | 3,13 | 3,62 | 2,19       | 2,25 | 2,61 | 3,00 | 3,60 | 4,20 |
| Dp Cooling                         | kPa               | 7,3        | 10,2 | 17,3 | 23,7 | 31,7 | 39,1 | 4,6        | 6,4  | 9,1  | 11,2 | 13,9 | 16,9 |
| Dp Heating                         | kPa               | 11,7       | 12,9 | 16,3 | 20,6 | 28,3 | 36,2 | 6,4        | 6,6  | 8,0  | 9,7  | 12,8 | 16,2 |
| Motor power input                  | W                 | 4,7        | 5,4  | 7,2  | 9,9  | 16,4 | 25,4 | 5,3        | 6,1  | 8,2  | 11,4 | 19,0 | 29,5 |
| Sound power (Lw)                   | dB(A)             | 33         | 37   | 41   | 45   | 51   | 55   | 34         | 38   | 42   | 46   | 51   | 55   |
| Sound pressure (Lp) <sup>(1)</sup> | dB(A)             | 24         | 28   | 32   | 36   | 42   | 46   | 25         | 29   | 33   | 37   | 42   | 46   |

(1) The sound pressure levels are 9 dB (A) lower than the sound power levels, apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.

## COOLING EMISSION

Entering air temperature: 27 °C – R.H.: 50%

| Model      | Vdc | Qv<br>m³/h | WT: 7 / 12 °C |          |           |              | WT: 8 / 13 °C |          |           |              | WT: 10 / 15 °C |          |           |              | WT: 12 / 17 °C |          |           |              |
|------------|-----|------------|---------------|----------|-----------|--------------|---------------|----------|-----------|--------------|----------------|----------|-----------|--------------|----------------|----------|-----------|--------------|
|            |     |            | Pc<br>kW      | Ps<br>kW | Qw<br>l/h | Dp(c)<br>kPa | Pc<br>kW      | Ps<br>kW | Qw<br>l/h | Dp(c)<br>kPa | Pc<br>kW       | Ps<br>kW | Qw<br>l/h | Dp(c)<br>kPa | Pc<br>kW       | Ps<br>kW | Qw<br>l/h | Dp(c)<br>kPa |
| CFF-ECM 10 | 10  | 205        | 0,99          | 0,73     | 172       | 16,6         | 0,88          | 0,70     | 154       | 13,9         | 0,69           | 0,66     | 120       | 9,6          | 0,53           | 0,53     | 93        | 6,7          |
|            | 7,5 | 170        | 0,87          | 0,63     | 151       | 13,5         | 0,78          | 0,60     | 135       | 11,4         | 0,60           | 0,56     | 105       | 7,9          | 0,46           | 0,46     | 80        | 5,6          |
|            | 5   | 130        | 0,72          | 0,51     | 124       | 10,1         | 0,64          | 0,48     | 111       | 8,6          | 0,50           | 0,45     | 86        | 6,2          | 0,38           | 0,38     | 65        | 4,5          |
|            | 3,5 | 110        | 0,63          | 0,44     | 108       | 8,3          | 0,56          | 0,42     | 97        | 7,2          | 0,43           | 0,38     | 75        | 5,2          | 0,33           | 0,33     | 57        | 3,9          |
|            | 2   | 90         | 0,52          | 0,36     | 90        | 6,6          | 0,47          | 0,34     | 81        | 5,8          | 0,36           | 0,31     | 63        | 4,3          | 0,27           | 0,27     | 47        | 3,4          |
|            | 1   | 75         | 0,44          | 0,30     | 75        | 5,3          | 0,39          | 0,28     | 68        | 4,7          | 0,30           | 0,26     | 53        | 3,7          | 0,23           | 0,23     | 40        | 3,0          |
| CFF-ECM 20 | 10  | 305        | 1,76          | 1,26     | 306       | 8,3          | 1,57          | 1,20     | 273       | 7,1          | 1,21           | 1,09     | 211       | 5,2          | 0,91           | 0,91     | 160       | 3,9          |
|            | 7,5 | 255        | 1,51          | 1,06     | 261       | 6,7          | 1,34          | 1,01     | 233       | 5,8          | 1,04           | 0,92     | 180       | 4,4          | 0,78           | 0,78     | 136       | 3,4          |
|            | 5   | 205        | 1,24          | 0,87     | 215       | 5,3          | 1,11          | 0,82     | 192       | 4,7          | 0,86           | 0,75     | 149       | 3,7          | 0,64           | 0,64     | 112       | 3,0          |
|            | 3,5 | 175        | 1,09          | 0,75     | 188       | 4,6          | 0,97          | 0,71     | 169       | 4,1          | 0,75           | 0,64     | 130       | 3,3          | 0,56           | 0,56     | 97        | 2,8          |
|            | 2   | 145        | 0,90          | 0,62     | 155       | 3,8          | 0,81          | 0,58     | 139       | 3,5          | 0,62           | 0,53     | 107       | 2,9          | 0,46           | 0,46     | 80        | 2,6          |
|            | 1   | 125        | 0,72          | 0,50     | 124       | 3,2          | 0,65          | 0,47     | 112       | 3,0          | 0,50           | 0,43     | 87        | 2,6          | 0,38           | 0,38     | 66        | 2,4          |
| CFF-ECM 30 | 10  | 470        | 2,81          | 1,97     | 488       | 21,0         | 2,53          | 1,86     | 438       | 17,6         | 1,96           | 1,70     | 341       | 11,9         | 1,48           | 1,48     | 259       | 7,9          |
|            | 7,5 | 395        | 2,47          | 1,71     | 428       | 17,1         | 2,23          | 1,61     | 385       | 14,4         | 1,73           | 1,46     | 300       | 9,8          | 1,30           | 1,30     | 226       | 6,7          |
|            | 5   | 315        | 2,05          | 1,40     | 355       | 12,7         | 1,86          | 1,32     | 321       | 10,9         | 1,44           | 1,19     | 248       | 7,6          | 1,07           | 1,07     | 186       | 5,3          |
|            | 3,5 | 270        | 1,68          | 1,14     | 290       | 9,5          | 1,51          | 1,08     | 262       | 8,2          | 1,18           | 0,97     | 204       | 5,9          | 0,89           | 0,89     | 153       | 4,3          |
|            | 2   | 225        | 1,16          | 0,79     | 201       | 5,8          | 1,05          | 0,75     | 181       | 5,2          | 0,82           | 0,68     | 142       | 4,0          | 0,63           | 0,63     | 109       | 3,2          |
|            | 1   | 190        | 0,99          | 0,67     | 171       | 4,9          | 0,89          | 0,63     | 154       | 4,4          | 0,70           | 0,57     | 121       | 3,5          | 0,53           | 0,53     | 92        | 2,9          |
| CFF-ECM 40 | 10  | 575        | 3,60          | 2,47     | 624       | 44,1         | 3,26          | 2,33     | 565       | 37,0         | 2,54           | 2,12     | 441       | 24,2         | 1,91           | 1,91     | 333       | 15,3         |
|            | 7,5 | 480        | 3,18          | 2,16     | 550       | 35,6         | 2,88          | 2,03     | 498       | 29,9         | 2,24           | 1,83     | 388       | 19,7         | 1,68           | 1,66     | 292       | 12,5         |
|            | 5   | 380        | 2,68          | 1,79     | 462       | 26,5         | 2,43          | 1,69     | 419       | 22,5         | 1,89           | 1,51     | 327       | 14,9         | 1,41           | 1,36     | 244       | 9,6          |
|            | 3,5 | 320        | 2,21          | 1,47     | 381       | 19,3         | 2,00          | 1,39     | 346       | 16,5         | 1,56           | 1,24     | 270       | 11,2         | 1,17           | 1,12     | 202       | 7,4          |
|            | 2   | 260        | 1,56          | 1,04     | 269       | 11,2         | 1,41          | 0,98     | 244       | 9,7          | 1,11           | 0,88     | 191       | 6,9          | 0,84           | 0,82     | 145       | 5,0          |
|            | 1   | 220        | 1,22          | 0,82     | 211       | 8,0          | 1,11          | 0,77     | 191       | 7,0          | 0,87           | 0,69     | 150       | 5,2          | 0,66           | 0,66     | 115       | 3,9          |
| CFF-ECM 50 | 10  | 645        | 4,10          | 2,81     | 710       | 18,9         | 3,70          | 2,65     | 641       | 16,0         | 2,87           | 2,40     | 498       | 10,8         | 2,15           | 2,15     | 376       | 7,3          |
|            | 7,5 | 535        | 3,62          | 2,46     | 626       | 15,5         | 3,28          | 2,31     | 567       | 13,2         | 2,53           | 2,07     | 439       | 9,0          | 1,89           | 1,87     | 329       | 6,1          |
|            | 5   | 430        | 3,14          | 2,10     | 541       | 12,4         | 2,84          | 1,98     | 491       | 10,7         | 2,20           | 1,75     | 380       | 7,4          | 1,64           | 1,57     | 283       | 5,2          |
|            | 3,5 | 365        | 2,72          | 1,81     | 470       | 10,0         | 2,47          | 1,71     | 427       | 8,7          | 1,92           | 1,51     | 331       | 6,2          | 1,42           | 1,34     | 246       | 4,5          |
|            | 2   | 300        | 2,09          | 1,40     | 361       | 7,0          | 1,90          | 1,31     | 328       | 6,2          | 1,48           | 1,17     | 255       | 4,6          | 1,10           | 1,06     | 190       | 3,5          |
|            | 1   | 255        | 1,55          | 1,04     | 267       | 4,9          | 1,40          | 0,98     | 242       | 4,4          | 1,10           | 0,88     | 190       | 3,6          | 0,83           | 0,83     | 144       | 2,9          |

**WT:** Water temperature  
**Vdc:** Inverter power  
**Qv:** Air flow  
**Pc:** Cooling total emission  
**Ps:** Cooling sensible emission  
**Qw:** Water flow rate  
**Dp(c):** Dp Cooling



## Entering air temperature 26 °C – R.H.: 50%

| Model      | Vdc | WT: 7 / 12 °C |          |          |           |              | WT: 8 / 13 °C |          |           |              |          | WT: 10 / 15 °C |           |              |          |          | WT: 12 / 17 °C |              |  |  |  |
|------------|-----|---------------|----------|----------|-----------|--------------|---------------|----------|-----------|--------------|----------|----------------|-----------|--------------|----------|----------|----------------|--------------|--|--|--|
|            |     | Qv<br>m³/h    | Pc<br>kW | Ps<br>kW | Qw<br>l/h | Dp(c)<br>kPa | Pc<br>kW      | Ps<br>kW | Qw<br>l/h | Dp(c)<br>kPa | Pc<br>kW | Ps<br>kW       | Qw<br>l/h | Dp(c)<br>kPa | Pc<br>kW | Ps<br>kW | Qw<br>l/h      | Dp(c)<br>kPa |  |  |  |
| CFF-ECM 10 | 10  | 205           | 0,88     | 0,70     | 153       | 13,8         | 0,78          | 0,68     | 136       | 11,5         | 0,61     | 0,61           | 106       | 8,0          | 0,46     | 0,46     | 81             | 5,7          |  |  |  |
|            | 7,5 | 170           | 0,77     | 0,60     | 134       | 11,3         | 0,68          | 0,58     | 119       | 9,5          | 0,53     | 0,53           | 92        | 6,7          | 0,40     | 0,40     | 70             | 4,8          |  |  |  |
|            | 5   | 130           | 0,64     | 0,48     | 111       | 8,6          | 0,57          | 0,46     | 98        | 7,3          | 0,43     | 0,43           | 75        | 5,3          | 0,33     | 0,33     | 57             | 3,9          |  |  |  |
|            | 3,5 | 110           | 0,56     | 0,42     | 97        | 7,2          | 0,49          | 0,40     | 85        | 6,1          | 0,38     | 0,37           | 66        | 4,5          | 0,28     | 0,28     | 49             | 3,5          |  |  |  |
|            | 2   | 90            | 0,47     | 0,34     | 81        | 5,7          | 0,41          | 0,33     | 71        | 5,0          | 0,31     | 0,30           | 55        | 3,8          | 0,23     | 0,23     | 41             | 3,1          |  |  |  |
|            | 1   | 75            | 0,39     | 0,28     | 67        | 4,7          | 0,34          | 0,27     | 60        | 4,2          | 0,26     | 0,25           | 46        | 3,3          | 0,20     | 0,20     | 34             | 2,8          |  |  |  |
| CFF-ECM 20 | 10  | 305           | 1,56     | 1,20     | 271       | 7,1          | 1,38          | 1,15     | 240       | 6,1          | 1,06     | 1,04           | 184       | 4,5          | 0,79     | 0,79     | 138            | 3,5          |  |  |  |
|            | 7,5 | 255           | 1,34     | 1,01     | 231       | 5,8          | 1,18          | 0,96     | 205       | 5,0          | 0,90     | 0,88           | 157       | 3,9          | 0,67     | 0,67     | 117            | 3,1          |  |  |  |
|            | 5   | 205           | 1,11     | 0,82     | 191       | 4,7          | 0,98          | 0,78     | 169       | 4,2          | 0,74     | 0,71           | 129       | 3,3          | 0,55     | 0,55     | 96             | 2,8          |  |  |  |
|            | 3,5 | 175           | 0,97     | 0,71     | 168       | 4,1          | 0,86          | 0,68     | 148       | 3,7          | 0,65     | 0,61           | 113       | 3,0          | 0,48     | 0,48     | 84             | 2,6          |  |  |  |
|            | 2   | 145           | 0,80     | 0,58     | 138       | 3,5          | 0,71          | 0,55     | 122       | 3,2          | 0,54     | 0,50           | 93        | 2,7          | 0,40     | 0,40     | 69             | 2,4          |  |  |  |
|            | 1   | 125           | 0,64     | 0,47     | 111       | 3,0          | 0,57          | 0,44     | 99        | 2,8          | 0,44     | 0,41           | 76        | 2,5          | 0,33     | 0,33     | 57             | 2,3          |  |  |  |
| CFF-ECM 30 | 10  | 470           | 2,51     | 1,87     | 436       | 17,6         | 2,23          | 1,78     | 387       | 14,5         | 1,71     | 1,62           | 298       | 9,8          | 1,28     | 1,28     | 224            | 6,6          |  |  |  |
|            | 7,5 | 395           | 2,22     | 1,62     | 384       | 14,4         | 1,96          | 1,54     | 340       | 11,9         | 1,50     | 1,39           | 261       | 8,1          | 1,12     | 1,12     | 195            | 5,6          |  |  |  |
|            | 5   | 315           | 1,84     | 1,32     | 318       | 10,8         | 1,63          | 1,25     | 283       | 9,1          | 1,25     | 1,13           | 216       | 6,3          | 0,93     | 0,93     | 161            | 4,5          |  |  |  |
|            | 3,5 | 270           | 1,50     | 1,08     | 260       | 8,1          | 1,34          | 1,02     | 231       | 6,9          | 1,02     | 0,93           | 177       | 5,0          | 0,76     | 0,76     | 132            | 3,8          |  |  |  |
|            | 2   | 225           | 1,04     | 0,75     | 180       | 5,2          | 0,93          | 0,70     | 160       | 4,6          | 0,72     | 0,66           | 124       | 3,6          | 0,55     | 0,55     | 95             | 3,0          |  |  |  |
|            | 1   | 190           | 0,88     | 0,63     | 153       | 4,4          | 0,79          | 0,59     | 136       | 3,9          | 0,61     | 0,56           | 106       | 3,2          | 0,46     | 0,46     | 80             | 2,7          |  |  |  |
| CFF-ECM 40 | 10  | 575           | 3,24     | 2,34     | 561       | 36,7         | 2,88          | 2,22     | 499       | 30,0         | 2,21     | 2,02           | 384       | 19,3         | 1,65     | 1,65     | 289            | 12,3         |  |  |  |
|            | 7,5 | 480           | 2,86     | 2,04     | 495       | 29,7         | 2,54          | 1,93     | 441       | 24,4         | 1,95     | 1,74           | 338       | 15,7         | 1,45     | 1,45     | 252            | 10,0         |  |  |  |
|            | 5   | 380           | 2,41     | 1,69     | 416       | 22,3         | 2,15          | 1,60     | 371       | 18,4         | 1,64     | 1,43           | 283       | 12,0         | 1,21     | 1,21     | 210            | 7,8          |  |  |  |
|            | 3,5 | 320           | 1,99     | 1,39     | 343       | 16,3         | 1,78          | 1,31     | 307       | 13,7         | 1,36     | 1,18           | 234       | 9,1          | 1,00     | 1,00     | 174            | 6,1          |  |  |  |
|            | 2   | 260           | 1,40     | 0,99     | 242       | 9,6          | 1,25          | 0,92     | 217       | 8,2          | 0,96     | 0,85           | 167       | 5,9          | 0,72     | 0,72     | 125            | 4,3          |  |  |  |
|            | 1   | 220           | 1,10     | 0,77     | 190       | 6,9          | 0,98          | 0,72     | 170       | 6,0          | 0,76     | 0,67           | 131       | 4,5          | 0,57     | 0,57     | 99             | 3,5          |  |  |  |
| CFF-ECM 50 | 10  | 645           | 3,68     | 2,66     | 637       | 15,9         | 3,26          | 2,52     | 566       | 13,2         | 2,49     | 2,29           | 434       | 8,9          | 1,86     | 1,86     | 324            | 6,0          |  |  |  |
|            | 7,5 | 535           | 3,25     | 2,32     | 563       | 13,1         | 2,88          | 2,19     | 499       | 10,9         | 2,20     | 1,97           | 382       | 7,5          | 1,63     | 1,63     | 284            | 5,2          |  |  |  |
|            | 5   | 430           | 2,82     | 1,98     | 487       | 10,6         | 2,50          | 1,87     | 433       | 8,9          | 1,91     | 1,65           | 330       | 6,2          | 1,40     | 1,40     | 243            | 4,4          |  |  |  |
|            | 3,5 | 365           | 2,45     | 1,71     | 424       | 8,7          | 2,18          | 1,61     | 377       | 7,4          | 1,66     | 1,42           | 287       | 5,3          | 1,22     | 1,22     | 211            | 3,9          |  |  |  |
|            | 2   | 300           | 1,88     | 1,32     | 325       | 6,1          | 1,68          | 1,24     | 291       | 5,4          | 1,28     | 1,11           | 221       | 4,0          | 0,94     | 0,94     | 164            | 3,2          |  |  |  |
|            | 1   | 255           | 1,39     | 0,98     | 240       | 4,4          | 1,24          | 0,92     | 215       | 4,0          | 0,96     | 0,85           | 165       | 3,2          | 0,72     | 0,72     | 124            | 2,7          |  |  |  |

**WT:** Water temperature  
**Vdc:** Inverter power  
**Qv:** Air flow  
**Pc:** Cooling total emission  
**Ps:** Cooling sensible emission  
**Qw:** Water flow rate  
**Dp(c):** Dp Cooling

Entering air temperature: 25 °C – R.H.: 50%

| Model      | Vdc | Qv<br>m³/h | WT: 7 / 12 °C |          |           |              | WT: 8 / 13 °C |          |           |              | WT: 10 / 15 °C |          |           |              | WT: 12 / 17 °C |          |           |              |
|------------|-----|------------|---------------|----------|-----------|--------------|---------------|----------|-----------|--------------|----------------|----------|-----------|--------------|----------------|----------|-----------|--------------|
|            |     |            | Pc<br>kW      | Ps<br>kW | Qw<br>l/h | Dp(c)<br>kPa | Pc<br>kW      | Ps<br>kW | Qw<br>l/h | Dp(c)<br>kPa | Pc<br>kW       | Ps<br>kW | Qw<br>l/h | Dp(c)<br>kPa | Pc<br>kW       | Ps<br>kW | Qw<br>l/h | Dp(c)<br>kPa |
| CFF-ECM 10 | 10  | 205        | 0,78          | 0,68     | 136       | 11,5         | 0,69          | 0,65     | 120       | 9,6          | 0,53           | 0,53     | 93        | 6,7          | 0,45           | 0,45     | 79        | 5,5          |
|            | 7,5 | 170        | 0,68          | 0,58     | 119       | 9,5          | 0,60          | 0,56     | 105       | 8,0          | 0,46           | 0,46     | 81        | 5,7          | 0,39           | 0,39     | 68        | 4,7          |
|            | 5   | 130        | 0,56          | 0,46     | 98        | 7,3          | 0,50          | 0,44     | 86        | 6,2          | 0,38           | 0,38     | 66        | 4,5          | 0,30           | 0,30     | 52        | 3,6          |
|            | 3,5 | 110        | 0,49          | 0,40     | 85        | 6,1          | 0,43          | 0,38     | 75        | 5,2          | 0,33           | 0,33     | 57        | 4,0          | 0,25           | 0,25     | 43        | 3,2          |
|            | 2   | 90         | 0,41          | 0,33     | 71        | 5,0          | 0,36          | 0,31     | 62        | 4,3          | 0,27           | 0,27     | 48        | 3,4          | 0,20           | 0,20     | 35        | 2,8          |
|            | 1   | 75         | 0,34          | 0,27     | 59        | 4,1          | 0,30          | 0,26     | 52        | 3,7          | 0,23           | 0,23     | 40        | 3,0          | 0,17           | 0,17     | 30        | 2,6          |
| CFF-ECM 20 | 10  | 305        | 1,38          | 1,14     | 239       | 6,0          | 1,21          | 1,09     | 211       | 5,2          | 0,92           | 0,92     | 160       | 3,9          | 0,77           | 0,77     | 134       | 3,4          |
|            | 7,5 | 255        | 1,18          | 0,96     | 204       | 5,0          | 1,03          | 0,92     | 180       | 4,4          | 0,78           | 0,78     | 136       | 3,5          | 0,62           | 0,62     | 109       | 3,0          |
|            | 5   | 205        | 0,97          | 0,78     | 168       | 4,2          | 0,86          | 0,74     | 148       | 3,7          | 0,65           | 0,65     | 112       | 3,0          | 0,49           | 0,49     | 85        | 2,6          |
|            | 3,5 | 175        | 0,85          | 0,68     | 147       | 3,7          | 0,75          | 0,64     | 129       | 3,3          | 0,56           | 0,56     | 98        | 2,8          | 0,42           | 0,42     | 72        | 2,5          |
|            | 2   | 145        | 0,70          | 0,55     | 122       | 3,2          | 0,62          | 0,53     | 107       | 2,9          | 0,47           | 0,47     | 81        | 2,6          | 0,34           | 0,34     | 60        | 2,3          |
|            | 1   | 125        | 0,57          | 0,44     | 98        | 2,8          | 0,50          | 0,42     | 86        | 2,6          | 0,38           | 0,38     | 66        | 2,4          | 0,28           | 0,28     | 49        | 2,2          |
| CFF-ECM 30 | 10  | 470        | 2,22          | 1,78     | 386       | 14,5         | 1,96          | 1,69     | 340       | 11,9         | 1,49           | 1,49     | 260       | 8,0          | 1,11           | 1,11     | 194       | 5,5          |
|            | 7,5 | 395        | 1,95          | 1,54     | 339       | 11,9         | 1,72          | 1,46     | 298       | 9,8          | 1,30           | 1,30     | 227       | 6,7          | 0,97           | 0,97     | 169       | 4,8          |
|            | 5   | 315        | 1,63          | 1,26     | 281       | 9,1          | 1,43          | 1,19     | 247       | 7,6          | 1,08           | 1,08     | 187       | 5,3          | 0,80           | 0,80     | 139       | 3,9          |
|            | 3,5 | 270        | 1,33          | 1,02     | 230       | 6,9          | 1,17          | 0,97     | 203       | 5,9          | 0,89           | 0,89     | 154       | 4,3          | 0,66           | 0,66     | 114       | 3,4          |
|            | 2   | 225        | 0,92          | 0,70     | 159       | 4,5          | 0,82          | 0,68     | 141       | 4,0          | 0,63           | 0,63     | 109       | 3,3          | 0,47           | 0,47     | 82        | 2,8          |
|            | 1   | 190        | 0,78          | 0,59     | 136       | 3,9          | 0,69          | 0,57     | 120       | 3,5          | 0,53           | 0,53     | 92        | 2,9          | 0,40           | 0,40     | 70        | 2,6          |
| CFF-ECM 40 | 10  | 575        | 2,86          | 2,22     | 497       | 29,9         | 2,53          | 2,11     | 439       | 24,2         | 1,92           | 1,92     | 334       | 15,5         | 1,43           | 1,43     | 249       | 9,9          |
|            | 7,5 | 480        | 2,54          | 1,94     | 439       | 24,3         | 2,23          | 1,83     | 387       | 19,7         | 1,69           | 1,65     | 293       | 12,6         | 1,25           | 1,25     | 217       | 8,2          |
|            | 5   | 380        | 2,14          | 1,60     | 370       | 18,4         | 1,88          | 1,51     | 325       | 14,9         | 1,42           | 1,35     | 245       | 9,7          | 1,04           | 1,04     | 180       | 6,4          |
|            | 3,5 | 320        | 1,77          | 1,31     | 305       | 13,6         | 1,55          | 1,24     | 268       | 11,2         | 1,17           | 1,12     | 203       | 7,5          | 0,86           | 0,86     | 149       | 5,1          |
|            | 2   | 260        | 1,25          | 0,93     | 215       | 8,2          | 1,10          | 0,88     | 190       | 6,9          | 0,84           | 0,82     | 145       | 5,0          | 0,63           | 0,63     | 109       | 3,8          |
|            | 1   | 220        | 0,98          | 0,73     | 169       | 6,0          | 0,86          | 0,69     | 149       | 5,2          | 0,66           | 0,65     | 115       | 4,0          | 0,50           | 0,50     | 86        | 3,2          |
| CFF-ECM 50 | 10  | 645        | 3,25          | 2,53     | 564       | 13,2         | 2,86          | 2,40     | 496       | 10,8         | 2,16           | 2,16     | 377       | 7,3          | 1,60           | 1,60     | 280       | 5,1          |
|            | 7,5 | 535        | 2,87          | 2,20     | 497       | 10,9         | 2,52          | 2,08     | 437       | 9,0          | 1,90           | 1,87     | 330       | 6,2          | 1,40           | 1,40     | 244       | 4,4          |
|            | 5   | 430        | 2,49          | 1,87     | 431       | 8,9          | 2,19          | 1,76     | 379       | 7,4          | 1,64           | 1,56     | 284       | 5,2          | 1,20           | 1,20     | 208       | 3,8          |
|            | 3,5 | 365        | 2,17          | 1,61     | 375       | 7,4          | 1,91          | 1,51     | 329       | 6,2          | 1,43           | 1,34     | 247       | 4,5          | 1,04           | 1,04     | 180       | 3,4          |
|            | 2   | 300        | 1,67          | 1,24     | 289       | 5,4          | 1,47          | 1,17     | 254       | 4,6          | 1,10           | 1,05     | 191       | 3,6          | 0,81           | 0,81     | 140       | 2,9          |
|            | 1   | 255        | 1,24          | 0,92     | 214       | 3,9          | 1,09          | 0,88     | 189       | 3,5          | 0,83           | 0,82     | 144       | 2,9          | 0,62           | 0,62     | 108       | 2,6          |

**WT:** Water temperature  
**Vdc:** Inverter power  
**Qv:** Air flow  
**Pc:** Cooling total emission  
**Ps:** Cooling sensible emission  
**Qw:** Water flow rate  
**Dp(c):** Dp Cooling

## HEATING EMISSION

Entering air temperature: 18 °C

| Model      | Vdc | Qv<br>m³/h | WT: 70 / 60 °C |           |              | WT: 60 / 50 °C |           |              | WT: 50 / 40 °C |           |              | WT: 50 / 45 °C |           |              | WT: 45 / 40 °C |           |              |
|------------|-----|------------|----------------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|
|            |     |            | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa |
| CFF-ECM 10 | 10  | 205        | 2,35           | 202       | 16,7         | 1,83           | 157       | 11,7         | 1,31           | 113       | 7,5          | 1,47           | 252       | 25,3         | 1,21           | 208       | 18,8         |
|            | 7,5 | 170        | 2,03           | 175       | 13,3         | 1,59           | 136       | 9,5          | 1,14           | 98        | 6,3          | 1,27           | 218       | 19,9         | 1,05           | 180       | 14,9         |
|            | 5   | 130        | 1,66           | 142       | 9,8          | 1,30           | 111       | 7,2          | 0,93           | 80        | 5,0          | 1,03           | 178       | 14,4         | 0,86           | 147       | 11,0         |
|            | 3,5 | 110        | 1,45           | 125       | 8,1          | 1,14           | 98        | 6,1          | 0,82           | 71        | 4,4          | 0,90           | 155       | 11,7         | 0,75           | 129       | 9,1          |
|            | 2   | 90         | 1,26           | 108       | 6,8          | 0,99           | 85        | 5,2          | 0,72           | 62        | 3,9          | 0,79           | 135       | 9,6          | 0,65           | 112       | 7,5          |
|            | 1   | 75         | 1,17           | 101       | 6,2          | 0,92           | 79        | 4,8          | 0,67           | 57        | 3,6          | 0,73           | 126       | 8,6          | 0,61           | 104       | 6,8          |
| CFF-ECM 20 | 10  | 305        | 3,84           | 330       | 7,5          | 3,00           | 258       | 5,6          | 2,16           | 186       | 4,1          | 2,40           | 412       | 10,6         | 1,98           | 341       | 8,3          |
|            | 7,5 | 255        | 3,33           | 287       | 6,2          | 2,61           | 225       | 4,8          | 1,88           | 162       | 3,6          | 2,08           | 358       | 8,7          | 1,72           | 296       | 6,8          |
|            | 5   | 205        | 2,79           | 240       | 5,1          | 2,19           | 188       | 4,1          | 1,59           | 136       | 3,2          | 1,74           | 299       | 6,9          | 1,44           | 248       | 5,5          |
|            | 3,5 | 175        | 2,45           | 211       | 4,4          | 1,93           | 166       | 3,6          | 1,40           | 120       | 2,9          | 1,53           | 263       | 5,8          | 1,27           | 218       | 4,8          |
|            | 2   | 145        | 2,15           | 185       | 3,9          | 1,69           | 145       | 3,3          | 1,23           | 106       | 2,7          | 1,34           | 230       | 5,0          | 1,11           | 191       | 4,2          |
|            | 1   | 125        | 2,05           | 176       | 3,8          | 1,61           | 139       | 3,2          | 1,17           | 101       | 2,7          | 1,27           | 219       | 4,8          | 1,06           | 182       | 4,0          |
| CFF-ECM 30 | 10  | 470        | 6,14           | 528       | 18,6         | 4,83           | 415       | 13,1         | 3,50           | 301       | 8,5          | 3,83           | 659       | 28,2         | 3,18           | 547       | 21,1         |
|            | 7,5 | 395        | 5,34           | 459       | 14,9         | 4,20           | 362       | 10,7         | 3,06           | 263       | 7,1          | 3,33           | 572       | 22,3         | 2,76           | 475       | 16,8         |
|            | 5   | 315        | 4,44           | 382       | 11,2         | 3,50           | 301       | 8,2          | 2,55           | 220       | 5,7          | 2,76           | 475       | 16,5         | 2,30           | 395       | 12,6         |
|            | 3,5 | 270        | 3,90           | 336       | 9,3          | 3,08           | 265       | 6,9          | 2,25           | 194       | 4,9          | 2,43           | 417       | 13,5         | 2,02           | 347       | 10,4         |
|            | 2   | 225        | 3,42           | 295       | 7,8          | 2,71           | 233       | 5,9          | 1,98           | 171       | 4,3          | 2,13           | 366       | 11,1         | 1,77           | 305       | 8,7          |
|            | 1   | 190        | 3,21           | 276       | 7,1          | 2,54           | 218       | 5,5          | 1,86           | 160       | 4,1          | 1,99           | 343       | 10,1         | 1,66           | 286       | 7,9          |
| CFF-ECM 40 | 10  | 575        | 7,64           | 657       | 36,8         | 6,02           | 518       | 25,4         | 4,39           | 378       | 15,8         | 4,76           | 819       | 56,9         | 3,95           | 680       | 42,1         |
|            | 7,5 | 480        | 6,60           | 567       | 28,7         | 5,21           | 448       | 20,1         | 3,81           | 328       | 12,7         | 4,11           | 707       | 44,1         | 3,42           | 588       | 32,8         |
|            | 5   | 380        | 5,44           | 468       | 20,9         | 4,30           | 370       | 14,8         | 3,15           | 271       | 9,6          | 3,38           | 582       | 31,7         | 2,82           | 485       | 23,8         |
|            | 3,5 | 320        | 4,70           | 405       | 16,5         | 3,72           | 320       | 11,9         | 2,74           | 235       | 7,9          | 2,92           | 503       | 24,8         | 2,44           | 419       | 18,8         |
|            | 2   | 260        | 4,04           | 347       | 13,0         | 3,20           | 275       | 9,5          | 2,36           | 203       | 6,5          | 2,51           | 431       | 19,3         | 2,09           | 360       | 14,7         |
|            | 1   | 220        | 3,78           | 325       | 11,8         | 3,00           | 258       | 8,7          | 2,21           | 190       | 6,0          | 2,35           | 404       | 17,4         | 1,96           | 337       | 13,3         |
| CFF-ECM 50 | 10  | 645        | 8,87           | 763       | 16,5         | 6,99           | 601       | 11,8         | 5,10           | 439       | 7,7          | 5,52           | 950       | 24,9         | 4,59           | 790       | 18,7         |
|            | 7,5 | 535        | 7,60           | 654       | 13,0         | 6,00           | 516       | 9,4          | 4,39           | 377       | 6,4          | 4,73           | 814       | 19,3         | 3,94           | 677       | 14,7         |
|            | 5   | 430        | 6,32           | 544       | 9,9          | 5,00           | 430       | 7,3          | 3,67           | 315       | 5,2          | 3,93           | 676       | 14,4         | 3,28           | 563       | 11,1         |
|            | 3,5 | 365        | 5,49           | 472       | 8,1          | 4,35           | 374       | 6,2          | 3,20           | 275       | 4,5          | 3,41           | 587       | 11,6         | 2,85           | 489       | 9,1          |
|            | 2   | 300        | 4,75           | 409       | 6,7          | 3,77           | 324       | 5,2          | 2,78           | 239       | 3,9          | 2,95           | 507       | 9,4          | 2,46           | 423       | 7,4          |
|            | 1   | 255        | 4,62           | 397       | 6,5          | 3,67           | 315       | 5,1          | 2,70           | 232       | 3,8          | 2,87           | 493       | 9,0          | 2,39           | 412       | 7,2          |

**WT:** Water temperature  
**Vdc:** Inverter power  
**Qv:** Air flow  
**Ph:** Heating emission  
**Qw:** Water flow rate  
**Dp(h):** Dp Heating

## Entering air temperature: 20 °C

| Model      | Vdc | Qv<br>m³/h | WT: 70 / 60 °C |           |              | WT: 60 / 50 °C |           |              | WT: 50 / 45 °C |           |              | WT: 50 / 40 °C |           |              | WT: 45 / 40 °C |           |              |
|------------|-----|------------|----------------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|
|            |     |            | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa |
| CFF-ECM 10 | 10  | 205        | 2,23           | 192       | 15,4         | 1,72           | 148       | 10,7         | 1,20           | 103       | 6,7          | 1,36           | 234       | 22,3         | 1,10           | 190       | 16,2         |
|            | 7,5 | 170        | 1,93           | 166       | 12,3         | 1,49           | 128       | 8,7          | 1,04           | 90        | 5,7          | 1,18           | 202       | 17,6         | 0,96           | 165       | 13,0         |
|            | 5   | 130        | 1,58           | 136       | 9,2          | 1,22           | 105       | 6,7          | 0,86           | 74        | 4,6          | 0,96           | 165       | 12,8         | 0,78           | 134       | 9,6          |
|            | 3,5 | 110        | 1,38           | 119       | 7,6          | 1,07           | 92        | 5,7          | 0,75           | 65        | 4,0          | 0,84           | 144       | 10,5         | 0,68           | 118       | 8,0          |
|            | 2   | 90         | 1,20           | 103       | 6,4          | 0,93           | 80        | 4,9          | 0,66           | 57        | 3,6          | 0,73           | 125       | 8,6          | 0,60           | 102       | 6,7          |
|            | 1   | 75         | 1,12           | 96        | 5,8          | 0,87           | 74        | 4,5          | 0,61           | 53        | 3,4          | 0,68           | 116       | 7,8          | 0,55           | 95        | 6,1          |
| CFF-ECM 20 | 10  | 305        | 3,66           | 315       | 7,0          | 2,82           | 243       | 5,2          | 1,98           | 170       | 3,8          | 2,22           | 382       | 9,5          | 1,81           | 311       | 7,3          |
|            | 7,5 | 255        | 3,18           | 273       | 5,9          | 2,46           | 211       | 4,5          | 1,73           | 149       | 3,4          | 1,93           | 332       | 7,8          | 1,57           | 270       | 6,1          |
|            | 5   | 205        | 2,66           | 229       | 4,8          | 2,06           | 177       | 3,8          | 1,46           | 125       | 3,0          | 1,61           | 278       | 6,2          | 1,32           | 227       | 5,0          |
|            | 3,5 | 175        | 2,34           | 201       | 4,2          | 1,81           | 156       | 3,5          | 1,29           | 111       | 2,8          | 1,42           | 244       | 5,3          | 1,16           | 199       | 4,4          |
|            | 2   | 145        | 2,05           | 176       | 3,8          | 1,59           | 137       | 3,2          | 1,13           | 97        | 2,6          | 1,24           | 213       | 4,6          | 1,01           | 174       | 3,9          |
|            | 1   | 125        | 1,95           | 168       | 3,6          | 1,52           | 130       | 3,1          | 1,08           | 93        | 2,6          | 1,18           | 203       | 4,4          | 0,97           | 166       | 3,7          |
| CFF-ECM 30 | 10  | 470        | 5,85           | 503       | 17,2         | 4,54           | 391       | 12,0         | 3,23           | 277       | 7,6          | 3,55           | 611       | 24,9         | 2,90           | 499       | 18,2         |
|            | 7,5 | 395        | 5,09           | 438       | 13,8         | 3,96           | 340       | 9,8          | 2,82           | 242       | 6,4          | 3,09           | 531       | 19,8         | 2,53           | 434       | 14,6         |
|            | 5   | 315        | 4,23           | 364       | 10,5         | 3,30           | 283       | 7,6          | 2,35           | 202       | 5,2          | 2,56           | 441       | 14,7         | 2,10           | 361       | 11,0         |
|            | 3,5 | 270        | 3,72           | 320       | 8,7          | 2,90           | 249       | 6,4          | 2,08           | 179       | 4,5          | 2,25           | 387       | 12,1         | 1,85           | 318       | 9,2          |
|            | 2   | 225        | 3,26           | 281       | 7,3          | 2,55           | 219       | 5,5          | 1,83           | 157       | 4,0          | 1,98           | 340       | 10,0         | 1,62           | 279       | 7,7          |
|            | 1   | 190        | 3,06           | 263       | 6,7          | 2,39           | 206       | 5,1          | 1,72           | 148       | 3,8          | 1,85           | 318       | 9,1          | 1,52           | 261       | 7,1          |
| CFF-ECM 40 | 10  | 575        | 7,27           | 626       | 33,8         | 5,67           | 487       | 23,0         | 4,05           | 348       | 13,9         | 4,42           | 759       | 50,0         | 3,62           | 622       | 36,2         |
|            | 7,5 | 480        | 6,29           | 541       | 26,5         | 4,90           | 422       | 18,2         | 3,51           | 302       | 11,2         | 3,81           | 656       | 38,9         | 3,13           | 538       | 28,3         |
|            | 5   | 380        | 5,18           | 446       | 19,3         | 4,05           | 348       | 13,5         | 2,91           | 250       | 8,6          | 3,14           | 540       | 28,0         | 2,58           | 443       | 20,6         |
|            | 3,5 | 320        | 4,48           | 386       | 15,3         | 3,51           | 302       | 10,9         | 2,52           | 217       | 7,1          | 2,71           | 467       | 22,0         | 2,23           | 384       | 16,3         |
|            | 2   | 260        | 3,85           | 331       | 12,1         | 3,02           | 259       | 8,8          | 2,18           | 187       | 5,9          | 2,33           | 400       | 17,2         | 1,91           | 329       | 12,9         |
|            | 1   | 220        | 3,61           | 310       | 11,0         | 2,83           | 243       | 8,0          | 2,04           | 176       | 5,5          | 2,18           | 375       | 15,5         | 1,79           | 309       | 11,7         |
| CFF-ECM 50 | 10  | 645        | 8,45           | 727       | 15,3         | 6,58           | 566       | 10,8         | 4,70           | 404       | 7,0          | 5,12           | 881       | 22,0         | 4,20           | 722       | 16,2         |
|            | 7,5 | 535        | 7,24           | 623       | 12,1         | 5,65           | 486       | 8,7          | 4,04           | 348       | 5,8          | 4,39           | 755       | 17,1         | 3,60           | 619       | 12,8         |
|            | 5   | 430        | 6,03           | 518       | 9,2          | 4,71           | 405       | 6,8          | 3,38           | 291       | 4,7          | 3,65           | 628       | 12,8         | 3,00           | 515       | 9,7          |
|            | 3,5 | 365        | 5,24           | 450       | 7,6          | 4,10           | 352       | 5,7          | 2,95           | 254       | 4,1          | 3,17           | 545       | 10,4         | 2,61           | 448       | 8,0          |
|            | 2   | 300        | 4,53           | 390       | 6,3          | 3,55           | 305       | 4,9          | 2,56           | 220       | 3,7          | 2,74           | 471       | 8,5          | 2,25           | 388       | 6,6          |
|            | 1   | 255        | 4,40           | 379       | 6,1          | 3,45           | 297       | 4,7          | 2,49           | 214       | 3,6          | 2,66           | 458       | 8,2          | 2,19           | 377       | 6,4          |

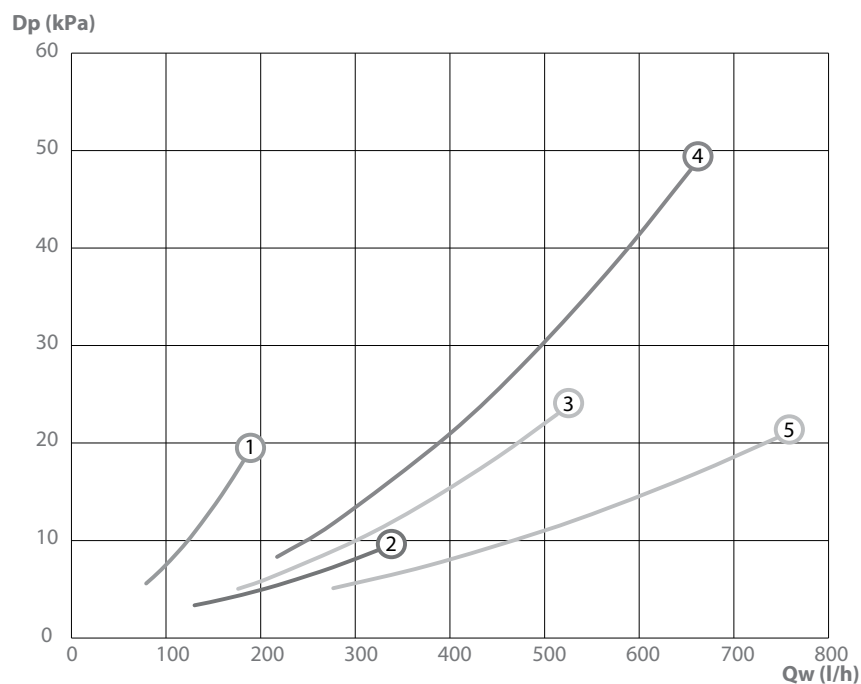
**WT:** Water temperature  
**Vdc:** Inverter power  
**Qv:** Air flow  
**Ph:** Heating emission  
**Qw:** Water flow rate  
**Dp(h):** Dp Heating

## Entering air temperature: 22 °C

| Model      | Vdc | Qv<br>m³/h | WT: 70 / 60 °C |           |              | WT: 60 / 50 °C |           |              | WT: 50 / 40 °C |           |              | WT: 50 / 45 °C |           |              | WT: 45 / 40 °C |           |              |
|------------|-----|------------|----------------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|
|            |     |            | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa | Ph<br>kW       | Qw<br>l/h | Dp(h)<br>kPa |
| CFF-ECM 10 | 10  | 205        | 2,12           | 183       | 14,2         | 1,61           | 139       | 9,7          | 1,09           | 94        | 6,0          | 1,25           | 216       | 19,5         | 1,00           | 172       | 13,9         |
|            | 7,5 | 170        | 1,84           | 158       | 11,4         | 1,40           | 120       | 8,0          | 0,95           | 82        | 5,1          | 1,08           | 186       | 15,5         | 0,87           | 149       | 11,2         |
|            | 5   | 130        | 1,50           | 129       | 8,5          | 1,14           | 98        | 6,1          | 0,78           | 67        | 4,2          | 0,88           | 152       | 11,3         | 0,71           | 122       | 8,4          |
|            | 3,5 | 110        | 1,31           | 113       | 7,1          | 1,00           | 86        | 5,3          | 0,69           | 59        | 3,7          | 0,77           | 133       | 9,3          | 0,62           | 106       | 7,0          |
|            | 2   | 90         | 1,14           | 98        | 6,0          | 0,87           | 75        | 4,6          | 0,60           | 52        | 3,4          | 0,67           | 116       | 7,7          | 0,54           | 93        | 5,9          |
|            | 1   | 75         | 1,06           | 91        | 5,5          | 0,81           | 70        | 4,2          | 0,56           | 48        | 3,2          | 0,62           | 107       | 7,0          | 0,50           | 86        | 5,4          |
| CFF-ECM 20 | 10  | 305        | 3,48           | 299       | 6,6          | 2,64           | 227       | 4,9          | 1,81           | 155       | 3,5          | 2,05           | 352       | 8,5          | 1,64           | 282       | 6,4          |
|            | 7,5 | 255        | 3,02           | 259       | 5,5          | 2,30           | 198       | 4,2          | 1,58           | 136       | 3,2          | 1,78           | 306       | 7,0          | 1,42           | 245       | 5,4          |
|            | 5   | 205        | 2,53           | 217       | 4,6          | 1,93           | 166       | 3,6          | 1,33           | 114       | 2,9          | 1,49           | 256       | 5,7          | 1,19           | 205       | 4,5          |
|            | 3,5 | 175        | 2,22           | 191       | 4,0          | 1,70           | 146       | 3,3          | 1,17           | 101       | 2,7          | 1,31           | 225       | 4,9          | 1,05           | 180       | 4,0          |
|            | 2   | 145        | 1,94           | 167       | 3,6          | 1,49           | 128       | 3,0          | 1,03           | 89        | 2,6          | 1,14           | 197       | 4,3          | 0,92           | 158       | 3,6          |
|            | 1   | 125        | 1,85           | 159       | 3,5          | 1,42           | 122       | 2,9          | 0,99           | 85        | 2,5          | 1,09           | 188       | 4,1          | 0,88           | 151       | 3,4          |
| CFF-ECM 30 | 10  | 470        | 5,56           | 478       | 15,9         | 4,26           | 366       | 10,9         | 2,95           | 253       | 6,7          | 3,28           | 564       | 21,8         | 2,63           | 453       | 15,6         |
|            | 7,5 | 395        | 4,84           | 416       | 12,8         | 3,71           | 319       | 8,9          | 2,58           | 221       | 5,7          | 2,85           | 490       | 17,4         | 2,29           | 394       | 12,6         |
|            | 5   | 315        | 4,02           | 346       | 9,7          | 3,09           | 266       | 7,0          | 2,15           | 185       | 4,7          | 2,37           | 407       | 13,0         | 1,91           | 328       | 9,6          |
|            | 3,5 | 270        | 3,54           | 304       | 8,1          | 2,72           | 234       | 6,0          | 1,90           | 163       | 4,2          | 2,08           | 358       | 10,7         | 1,68           | 288       | 8,0          |
|            | 2   | 225        | 3,11           | 267       | 6,9          | 2,40           | 206       | 5,1          | 1,68           | 144       | 3,7          | 1,83           | 314       | 8,9          | 1,47           | 253       | 6,8          |
|            | 1   | 190        | 2,91           | 250       | 6,3          | 2,25           | 193       | 4,8          | 1,57           | 135       | 3,5          | 1,71           | 294       | 8,1          | 1,38           | 237       | 6,2          |
| CFF-ECM 40 | 10  | 575        | 6,92           | 595       | 31,1         | 5,32           | 457       | 20,8         | 3,70           | 319       | 12,1         | 4,08           | 701       | 43,6         | 3,28           | 564       | 30,6         |
|            | 7,5 | 480        | 5,98           | 514       | 24,4         | 4,60           | 396       | 16,5         | 3,22           | 277       | 9,9          | 3,52           | 606       | 33,9         | 2,84           | 488       | 24,0         |
|            | 5   | 380        | 4,93           | 424       | 17,8         | 3,81           | 327       | 12,3         | 2,67           | 229       | 7,6          | 2,90           | 499       | 24,5         | 2,34           | 403       | 17,6         |
|            | 3,5 | 320        | 4,27           | 367       | 14,2         | 3,30           | 283       | 9,9          | 2,32           | 199       | 6,4          | 2,51           | 431       | 19,3         | 2,03           | 348       | 14,0         |
|            | 2   | 260        | 3,66           | 315       | 11,2         | 2,83           | 244       | 8,0          | 2,00           | 172       | 5,3          | 2,15           | 370       | 15,1         | 1,74           | 299       | 11,1         |
|            | 1   | 220        | 3,43           | 295       | 10,2         | 2,66           | 229       | 7,4          | 1,88           | 161       | 5,0          | 2,02           | 347       | 13,7         | 1,63           | 281       | 10,1         |
| CFF-ECM 50 | 10  | 645        | 8,04           | 691       | 14,1         | 6,18           | 531       | 9,8          | 4,30           | 370       | 6,2          | 4,73           | 814       | 19,3         | 3,81           | 655       | 13,9         |
|            | 7,5 | 535        | 6,89           | 592       | 11,2         | 5,31           | 456       | 8,0          | 3,70           | 318       | 5,2          | 4,05           | 697       | 15,1         | 3,27           | 562       | 11,1         |
|            | 5   | 430        | 5,73           | 493       | 8,6          | 4,43           | 381       | 6,3          | 3,10           | 267       | 4,3          | 3,37           | 580       | 11,4         | 2,72           | 468       | 8,5          |
|            | 3,5 | 365        | 4,98           | 428       | 7,1          | 3,85           | 331       | 5,3          | 2,70           | 233       | 3,8          | 2,93           | 504       | 9,3          | 2,37           | 407       | 7,1          |
|            | 2   | 300        | 4,31           | 371       | 6,0          | 3,34           | 287       | 4,6          | 2,35           | 202       | 3,4          | 2,53           | 435       | 7,6          | 2,05           | 352       | 5,9          |
|            | 1   | 255        | 4,19           | 361       | 5,8          | 3,25           | 279       | 4,5          | 2,29           | 197       | 3,4          | 2,46           | 423       | 7,3          | 1,99           | 343       | 5,7          |

**WT:** Water temperature  
**Vdc:** Inverter power  
**Qv:** Air flow  
**Ph:** Heating emission  
**Qw:** Water flow rate  
**Dp(h):** Dp Heating

## WATER SIDE PRESSURE DROP



$D_p$  = pressure drop  
 $Q_w$  = water flow rate  
 1 = CFF-ECM 10  
 2 = CFF-ECM 20  
 3 = CFF-ECM 30  
 4 = CFF-ECM 40  
 5 = CFF-ECM 50

Pressure drop for mean water temperature of **10 °C**; for different temperatures multiply the pressure drop figure by the **K** correction factors in the table.

|                     | Mean water temperature (°C) |      |      |      |      |      |      |
|---------------------|-----------------------------|------|------|------|------|------|------|
|                     | 20                          | 30   | 40   | 50   | 60   | 70   | 80   |
| K correction factor | 0,94                        | 0,90 | 0,86 | 0,82 | 0,78 | 0,74 | 0,70 |

## OPERATING LIMITS

| Description  |                                      | UoM  | Value  |
|--------------|--------------------------------------|------|--------|
| Water flow   | Highest working pressure             | bars | 10     |
|              |                                      | kPa  | 1000   |
|              | Lowest water inlet temperature       | °C   | 6      |
|              | Highest water inlet temperature      | °C   | 85     |
| Power supply | Single-phase rated operating voltage | V/Hz | 230/50 |

## Coils water flow limits

### 2 row coil

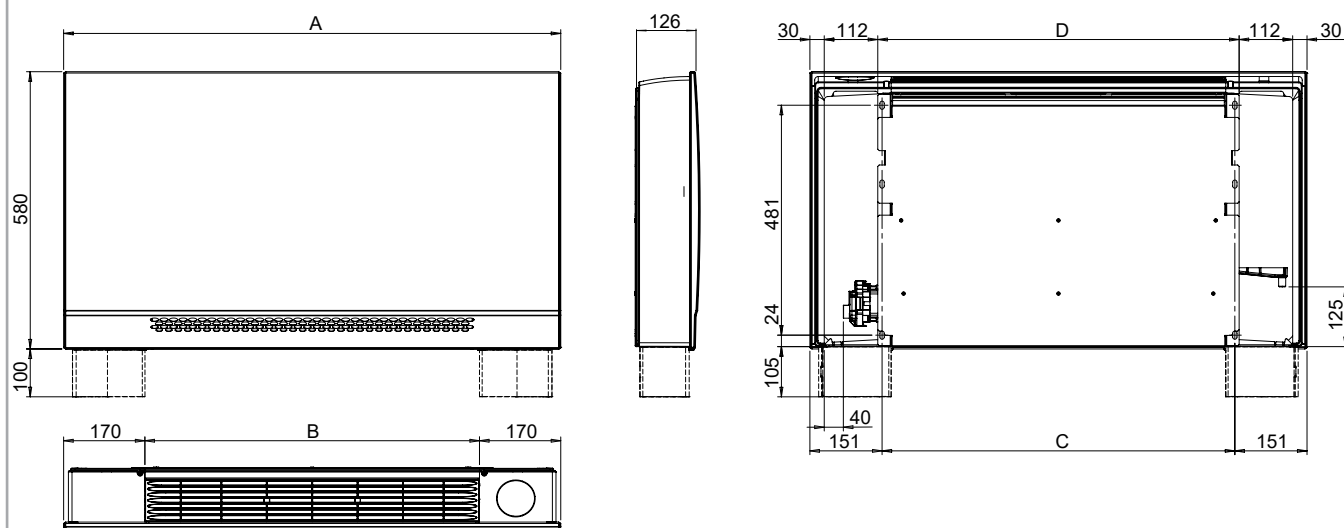
| Model                |     | CFF-ECM 10 | CFF-ECM 20 | CFF-ECM 30 | CFF-ECM 40 | CFF-ECM 50 |
|----------------------|-----|------------|------------|------------|------------|------------|
| Water flow rate Min. | l/h | 40         | 80         |            | 120        |            |
| Water flow rate Max. | l/h | 200        | 350        | 500        | 600        | 800        |

## Motor electrical data - max. absorption

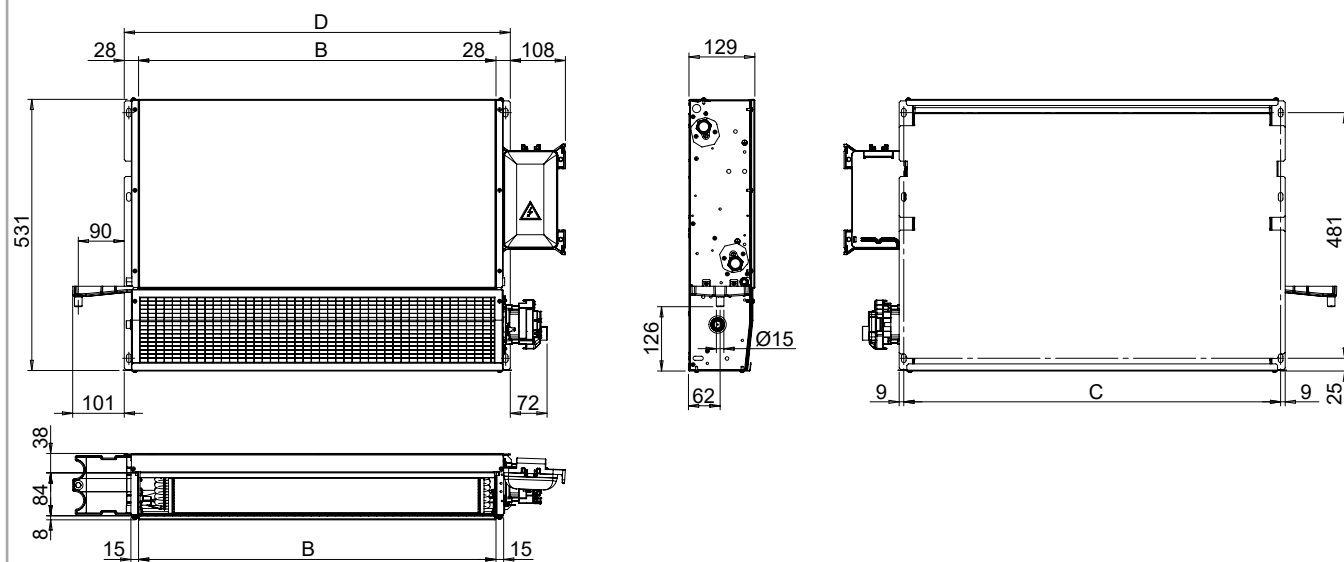
| Model            |   | CFF-ECM 10 | CFF-ECM 20 | CFF-ECM 30 | CFF-ECM 40 | CFF-ECM 50 |
|------------------|---|------------|------------|------------|------------|------------|
| Motor absorption | W | 10,3       | 14,0       | 21,6       | 25,4       | 29,7       |
| Current absorbed | A | 0,155      | 0,181      | 0,246      | 0,286      | 0,306      |

## DIMENSIONS

### Standard version with casing - MV



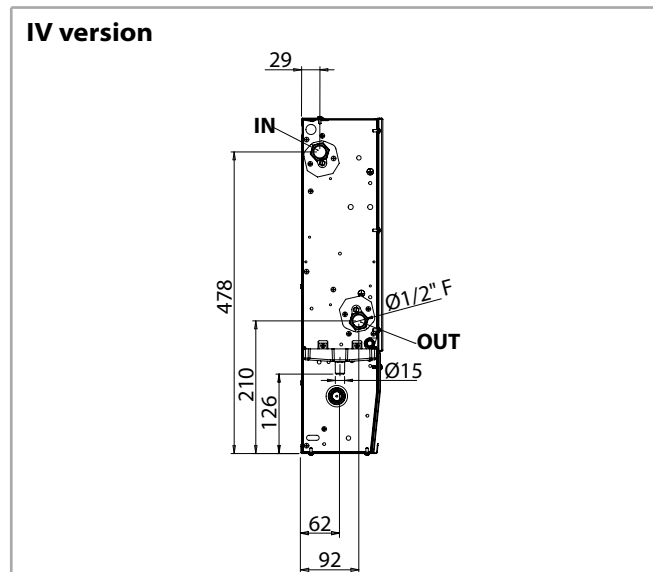
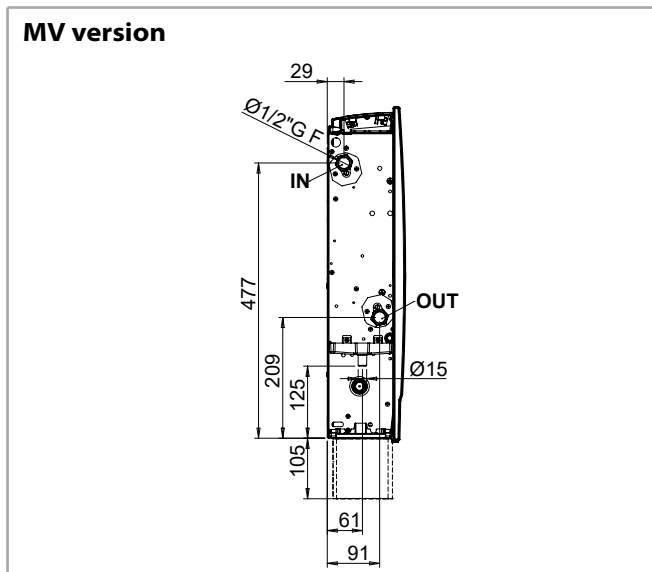
### Version for concealed installation - IV



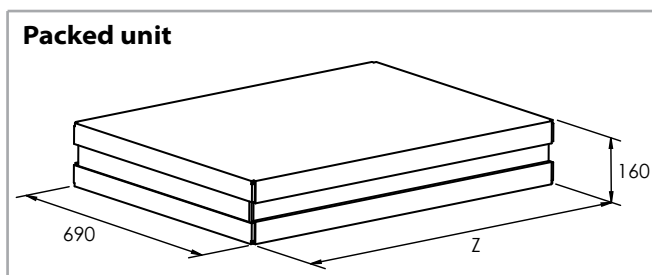
| Model |    | CFF-ECM 10 | CFF-ECM 20 | CFF-ECM 30 | CFF-ECM 40 | CFF-ECM 50 |
|-------|----|------------|------------|------------|------------|------------|
| A     | mm | 640        | 840        | 1040       | 1240       | 1440       |
| B     | mm | 300        | 500        | 700        | 900        | 1100       |
| C     | mm | 338        | 538        | 738        | 938        | 1138       |
| D     | mm | 356        | 556        | 756        | 956        | 1156       |



## Coil connections



## Packed unit



| Model |    | CFF-ECM 10 | CFF-ECM 20 | CFF-ECM 30 | CFF-ECM 40 | CFF-ECM 50 |
|-------|----|------------|------------|------------|------------|------------|
| Z     | mm | 720        | 920        | 1120       | 1320       | 1520       |

## Weight

The table of the weight is related to the standard versions with casing in the basic configuration without

control and without valves; the weights can change for those units completed with control and/or valve.

### Standard version with MV casing

| Model                    |    | CFF-ECM 10- MV | CFF-ECM 20- MV | CFF-ECM 30- MV | CFF-ECM 40- MV | CFF-ECM 50- MV |
|--------------------------|----|----------------|----------------|----------------|----------------|----------------|
| Weight with packaging    | kg | 11,6           | 14,9           | 18,5           | 21,9           | 25,7           |
| Weight without packaging | kg | 10,1           | 13,2           | 16,4           | 19,6           | 23,0           |

### IV version for concealed installation

| Model                    |    | CFF-ECM 10- IV | CFF-ECM 20- IV | CFF-ECM 30- IV | CFF-ECM 40- IV | CFF-ECM 50- IV |
|--------------------------|----|----------------|----------------|----------------|----------------|----------------|
| Weight with packaging    | kg | 10,1           | 13,6           | 17,3           | 20,9           | 24,9           |
| Weight without packaging | kg | 8,5            | 11,7           | 15,1           | 18,5           | 22,1           |

## Water content

| Model         |   | 10  | 20  | 30  | 40  | 50  |
|---------------|---|-----|-----|-----|-----|-----|
| Water content | l | 0,4 | 0,7 | 1,1 | 1,4 | 1,7 |

VALVES

The CFF-ECM units are available either in the versions with mounted valves and in the versions without valves. The features and the installation dimensions of the valves are shown as follows and are valid either for the

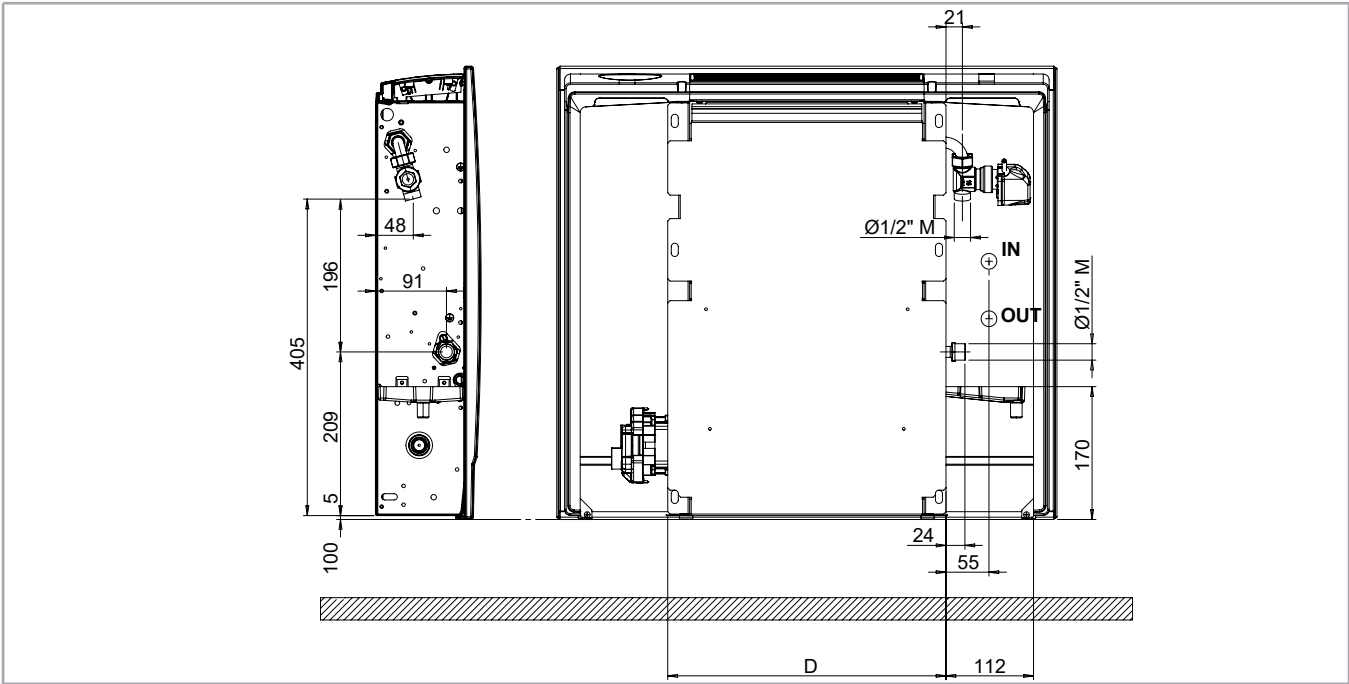
versions with mounted valves and for the versions with valves installed on site.

2 way valve

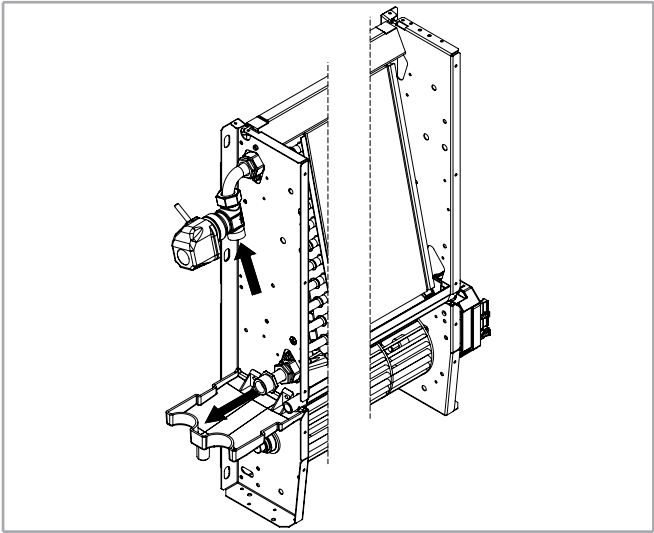
2 way valve ON-OFF 230 V

| Model          | Kvs<br>m³/h | Dp max <sup>(1)</sup><br>kPa | Valve connections (male)<br>Ø | NOT FITTED |      |
|----------------|-------------|------------------------------|-------------------------------|------------|------|
|                |             |                              |                               | Code       | ID   |
| 10-20-30-40-50 | 1,7         | 50                           | 1/2"                          | 9071090W   | V2-F |

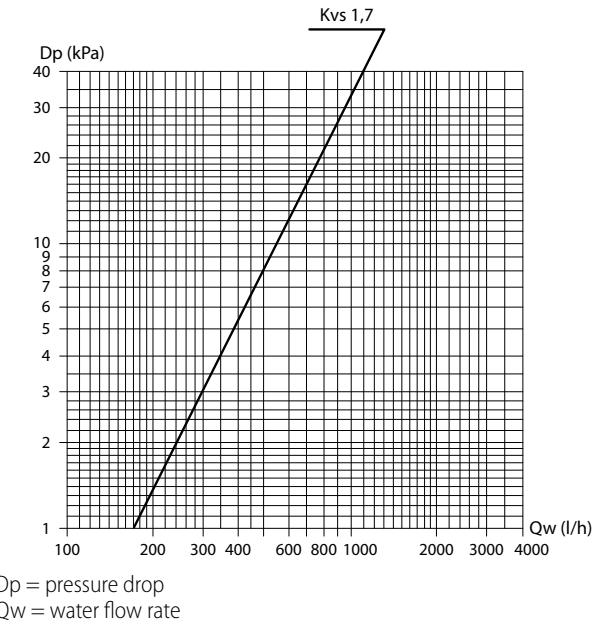
(1) Maximum pressure difference for valve to close



| Model | CFF-ECM 10 | CFF-ECM 20 | CFF-ECM 30 | CFF-ECM 40 | CFF-ECM 50 |
|-------|------------|------------|------------|------------|------------|
| D     | 356        | 556        | 756        | 956        | 1156       |



2 way valves pressure drop

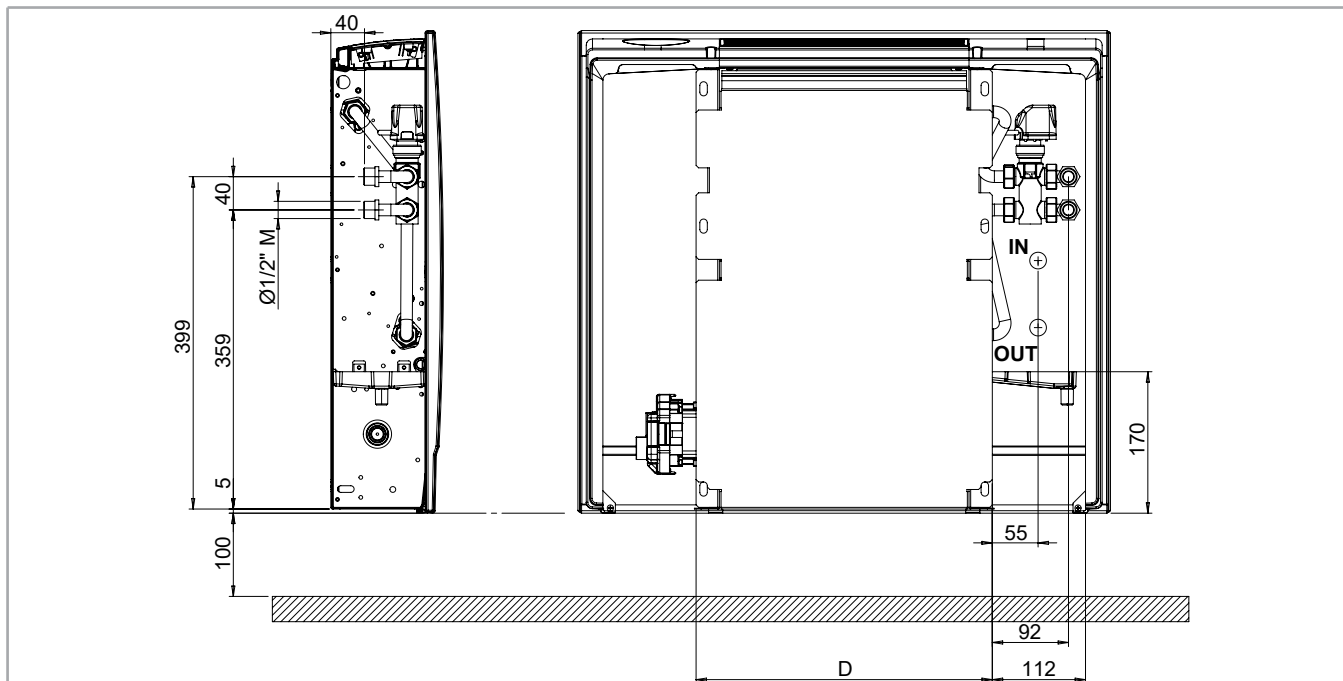


### 3 way valves

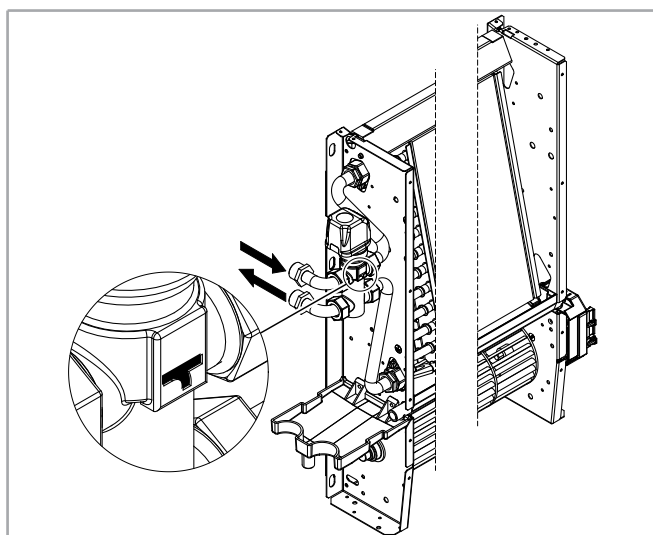
3 way water valve ON-OFF 230 V and mounting kit.

| Model          | Kvs               | Dp max <sup>(1)</sup> | Pipe kit connection (male) | NOT FITTED |      |
|----------------|-------------------|-----------------------|----------------------------|------------|------|
|                | m <sup>3</sup> /h | kPa                   | Ø                          | Code       | ID   |
| 10-20-30-40-50 | 1,6               | 50                    | 1/2"                       | 9071091W   | V3-F |

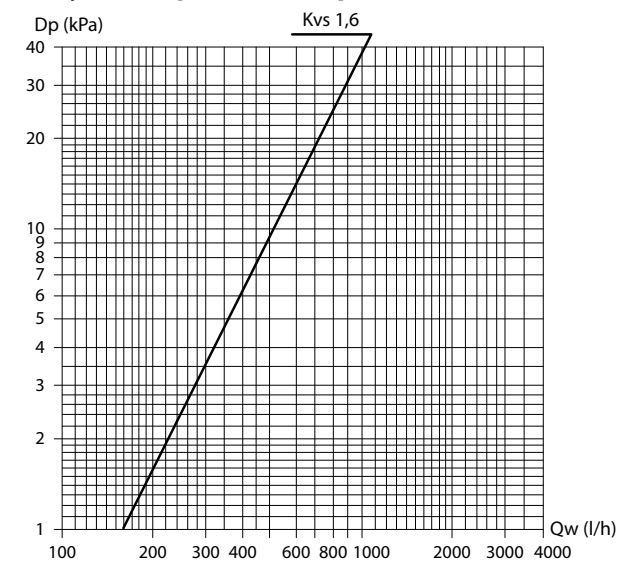
(1) Maximum pressure difference for valve to close



| Model | CFF-ECM 10 | CFF-ECM 20 | CFF-ECM 30 | CFF-ECM 40 | CFF-ECM 50 |
|-------|------------|------------|------------|------------|------------|
| D     | 356        | 556        | 756        | 956        | 1156       |



### 3 way valves pressure drop



Dp = pressure drop  
Qw = water flow rate

## CONFIGURATIONS AND ELECTRONIC CONTROLS

### Configuration

For this fan coil configuration, the 1-10 Vdc signal, which controls the inverter, must be supplied by a controller with the following signal specifications:

#### Fan Drive Signal

0 Vdc = Fan OFF

>1 Vdc = Fan ON - Minimum speed

10 Vdc = Maximum speed

#### Blac-ECM Inverter board

0÷10 Vdc Circuit Input Impedance Value= 100 kOhm

### Controls

All the Carisma Whisper CFF-ECM units can be supplied and managed with the following controls:

- **CB-E** control fitted on the unit (only version with casing, available mounted on site or supplied with separate packaging)
- **CB-Touch** control fitted on the unit with Bluetooth and Wi-Fi features (only version with casing; available mounted on site or with separate packaging)
- **WM-AU** wall control (supplied with separate packaging)
- **T-MB** wall control (supplied with separate packaging)

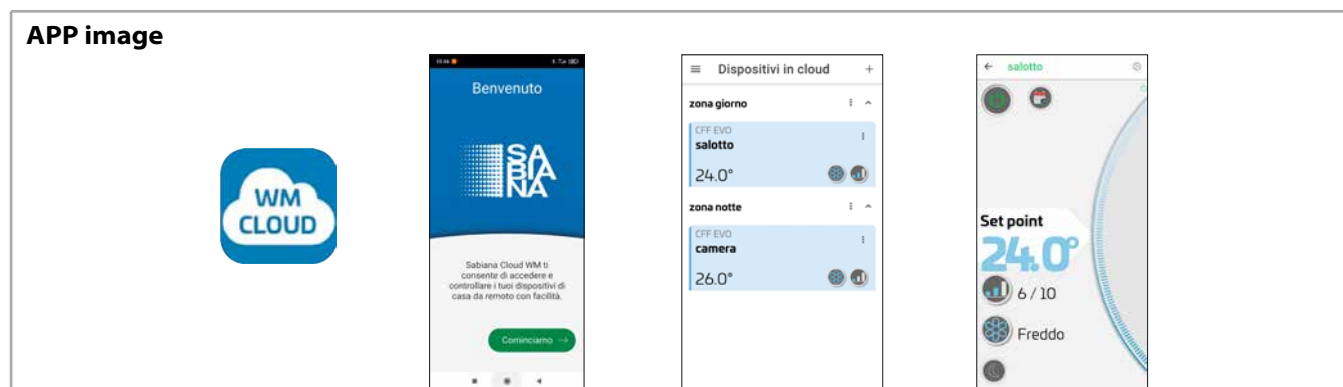
The **CB-Touch** control fitted on the unit allows moreover the control with the **Sabiana Cloud WM** APP. This makes this fan coil unit the ideal solution for the air-conditioning of all residential ambients.

The **CB-Touch** control is equipped with a microprocessor with WiFi feature, that allows to control at distance or remotely all the units installed in your home.

With the WiFi technology you can switch on or off the fan coil units, set the operation mode, the air flux direction and the desired temperature value.

It is moreover possible to manage each single unit or to create some groups; a weekly program can be created by setting, for each day of the week, until four different operation modes.

Just a WiFi connection is required to use the application and to download our **"Sabiana Cloud WM"** APP, that is compatible with the iOS® and Android™ systems.



The **CB-E** and **CB-Touch** controls fitted on the unit, whose characteristics are described at p. 22, can be supplied either fitted on the unit or with separate packaging; those controls fitted on the unit that are separately bought can be used only with UP power unit to buy separately.

The **WM-AU** and **T-MB** wall controls, whose characteristics are described from p. 23, are electronic controls that allow to manage one single unit or a group of units (only with the use of a power unit for each unit); the **WM-AU** and **T-MB** controls can be bought only separately and can be used only with **UP-Touch** power units to buy separately.

The room temperature can be controlled through the Sabiana electronic room thermostats and are suitable when the user wants to set the fan speed.

## CONTROLS

### Controls fitted on the unit features

#### CB-E control fitted on the unit features



The CB-E control can be used only with a programmable thermostat not supplied by Sabiana. It allows to switch on and off the unit (Stand-by) and therefore to easily set the ventilation by progressively acting on the fan speed, leaving the temperature control to a centralised programmable thermostat or to a thermostat for the home automation system, which, in addition to enabling fan operation, will also control the opening and closing of the water valve on the connection pipe.

After a period of 3 minutes since the last action the brightness of the panel is reduced (SLEEPING mode) in order to increase the energy saving and the comfort during the night; only the symbol  is shown on the display.

By pressing the same button twice, the brightness is restored.

#### CB-Touch control fitted on the unit features



The CB-Touch control allows to control and adjust the room temperature in a simple and intuitive way by means of a probe positioned in the lower part of the unit.

CB-Touch allows to select the desired operation mode, heat, cool or just ventilate the room, set a desired temperature set and adjust the fan operating speed according to your needs.

On the one hand the maximum operation speed must be set to reach quickly the comfort temperature. On the other hand the minimum speed must be set when a noiseless operation is required.

With the low temperature cut-out thermostat (T3 sensor collocated between the coil fins; already wired for

the units with fitted control, included together with the power unit and to wire for the versions without control) and according to the selected operation there will be as follows:

- winter cycle - the fan will only start operating if the water temperature is above 30 °C, thus preventing cold air from flowing out from the unit.
- summer cycle - the fan will only start operating if the water temperature is below 21 °C, thus preventing hot air from flowing out from the unit.

To improve comfort, it is also possible to select the night mode which minimises the fan speed and smartly changes the set temperature independently.

The control has a memory, so all settings will not be lost either in the event of switching off or power failure.

After a period of 3 minutes since the last action the brightness of the panel is reduced (SLEEPING mode) in order to increase the energy saving and the comfort during the night; only the symbol  is shown on the display.

By pressing the same button twice, the brightness is restored.

The control is designed to be managed at distance with the smart features of one's own telephone by using the bluetooth wireless connection or wifi via APP downloadable from the Web.



## Controls fitted on the unit

### CB-E control fitted on the unit

| Model          | Code    | ID   |
|----------------|---------|------|
| 10-20-30-40-50 | 9071060 | CB-E |



**The control must always be connected with UP-ECO power unit (separately delivered).**

(the power unit is already installed on the units with fitted control and must be ordered separately for the versions without control)

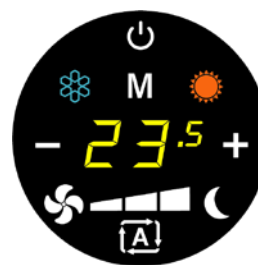
The main characteristics are:

- Set the unit ON or stand-by
- Set the fan speed
- Fan OFF and valve closing when the SETPOINT selected with the centralized thermostat (programmable thermostat) is reached.
- Button lock controller
- Regulation of LED brightness

Control power absorption: see the UP-ECO power unit

### CB-Touch control fitted on the unit

| Model          | Code    | ID       |
|----------------|---------|----------|
| 10-20-30-40-50 | 9071061 | CB-Touch |



**The control must always be connected with UP-Touch power unit (separately delivered).**

(the power unit is already installed on the units with fitted control and must be ordered separately for the versions without control)

The main characteristics are:

- Set the unit ON or stand-by
- Operation mode (Summer/Winter/Ventilation)
- Set the fan speed
- Set the automatic fan speed
- Possibility to use the T1 sensor as return air probe (mounted on the power unit)
- Possibility to use the T3 sensor as low temperature cut-out thermostat (mounted on the power unit)
- It allows to use the T2 sensor as Change-over (mounted on the power unit).
- Night mode
- Alarm messages
- OFFSET regulation
- Button lock controller
- Regulation of LED brightness
- Sabiana Cloud WM application use

Control power absorption: see the UP-Touch power unit

## Wall controls

### WM-AU wall control

| Model          | Code    | ID    |
|----------------|---------|-------|
| 10-20-30-40-50 | 9066632 | WM-AU |



**The control must always be connected with UP-Touch power unit (separately delivered).**

The main characteristics are:

- ON/OFF switch
- Manual/automatic 3 speed switch.
- Manual, automatic or centralized Summer/Winter switch.
- Summer/Winter/Fan/Auto mode push button.
- Electronic room thermostat for fan and water valves control (ON-OFF).
- Simultaneous thermostatic control of the valves and fan.
- Possibility to use the T1 sensor as return air probe (mounted on the power unit)
- Possibility to use the T3 sensor as low temperature cut-out thermostat (mounted on the power unit)
- Possibility to use the T2 sensor as Change-over (mounted on the power unit).
- Energy saving function.
- Presence of a LED signal when the thermostat is on.

Control power absorption: see the UP-Touch power unit

Dimensions: 135x86x24 mm

### T-MB wall control

| Model          | Code     | ID   |
|----------------|----------|------|
| 10-20-30-40-50 | 9066331E | T-MB |



**The control must always be connected with UP-Touch power unit (separately delivered).**

Wall control with display that allows controlling one or more units in Master/Slave mode. The control is equipped with internal sensor to detect the room temperature, which can be defined as a priority compared to the return air sensor on the fan coil.

The main characteristics are:

- ON/OFF switch
- temperature set
- manual, automatic or centralized Summer/Winter switch
- set the fan speed (low, medium, high or auto fan)
- set the operation mode (fan only, cooling, heating)
- Possibility to use the T1 sensor as return air probe (mounted on the power unit)
- Possibility to use the T3 sensor as low temperature cut-out thermostat (mounted on the power unit)
- It allows to use the T2 sensor as Change-over (mounted on the power unit).
- time setting
- weekly ON/OFF program

Control power absorption: see the UP-Touch power unit

Dimensions: 110x72x25 mm

## Power units and probes

### UP-ECO power unit

| Model          | Code    | ID     |
|----------------|---------|--------|
| 10-20-30-40-50 | 9071064 | UP-ECO |



### Power unit for CB-E control.

Power unit to be installed on the end unit (fan coil interface) and it is an interlock for the connection with an external programmable thermostat for the ON/OFF mode activation.

- It controls the motor/the fan and the fan coil valve.
- It is connected to the electric supply.
- It receives the required information to manage such parts from the remote control (programmable thermostat)

Power unit absorption: 11 VA (6 W)

### UP-Touch power unit

| Model          | Code    | ID       |
|----------------|---------|----------|
| 10-20-30-40-50 | 9071065 | UP-Touch |



### Power unit for CB-Touch, WM-AU and T-MB controls

Power unit to be installed on the end unit (fan coil interface).

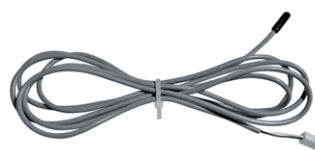
- It controls the motor/the fan and the fan coil valve.
- It is connected to the electric supply.
- It receives the information required to manage such parts from the CB-Touch control, from the WM-AU or from the T-MB controls
- Possibility to use the T1 sensor (included) for the T1 function which allows the return air control.
- Possibility to use the T3 sensor (included) for the T3 function as water coil low temperature cut-out thermostat (summer and winter operation)
- Possibility to use the T2 sensor (included) for the T2 function which controls the summer/winter switch (change-over).

- It allows to control up to 10 units (1 master and 9 slaves).
- Max. network length: 100 meters.
- Max cable length between control and first connected power unit: 20 meters.

Power unit absorption: 11 VA (6 W)

### T2 probe

| Model          | Code    | ID |
|----------------|---------|----|
| 10-20-30-40-50 | 9025310 | T2 |



Type NTC sensor, to be placed on the water supply pipe upstream 3 way valves (not to be used with 2 way valves).

The T2 probe is to be used as Change-Over for 2 pipe systems, for the automatic switch of the operation mode. If water temperature is lower than 20 °C, cooling mode is set; on the other hand, if water temperature exceeds 30 °C, heating mode is set

### T1-T3 probe

| Model          | Code    | ID    |
|----------------|---------|-------|
| 10-20-30-40-50 | 9071075 | T1-T3 |



The kit consists of:

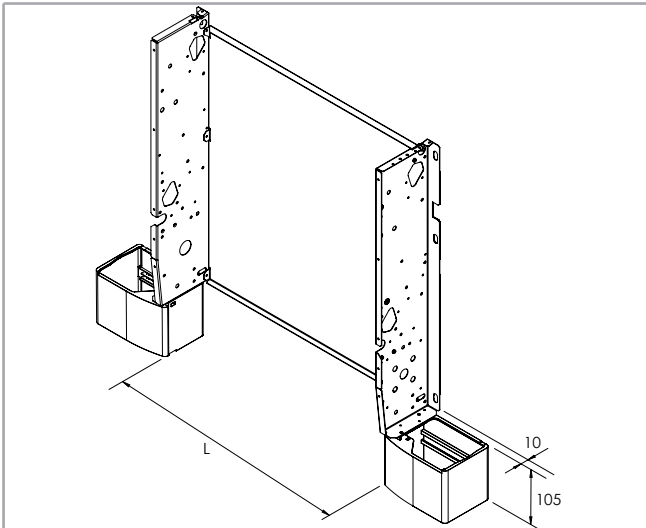
- N° 1 T1 sensor for return air control
- N° 1 T3 sensor to be used as low temperature cut-out thermostat



## ACCESSORIES

### Feet

| Model          | Code    | ID    |
|----------------|---------|-------|
| 10-20-30-40-50 | 9071074 | PAP-F |

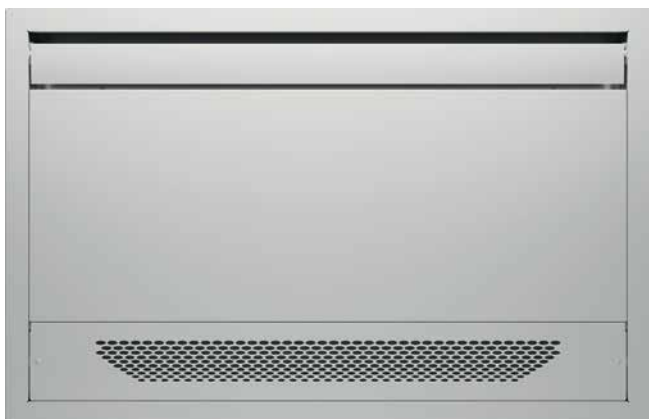


| Model | CFF-ECM 10 | CFF-ECM 20 | CFF-ECM 30 | CFF-ECM 40 | CFF-ECM 50 |
|-------|------------|------------|------------|------------|------------|
| D     | 300        | 500        | 700        | 900        | 1100       |

## BREEZE frame kit for wall concealed installation

The kit is available in 3 sizes and allows the wall installation of the recessed Carisma Whisper CFF-ECM fan coil units.

The kit includes a top closing panel that prevents the access to technical spaces and coil ensuring the safety of the end user.



The aesthetic frame kit and the recessed box kit must be always combined together; the kits have separate codes because they are supplied in separate packagings.



The accessory can be used only for the CFF-ECM models, IV version, sizes 20-30-40.

In case of unit for concealed installation, the fan coil must be connected to a remote control and it is not possible to use controls fitted on the unit.

## Constructional features of the main components

The aesthetic frame includes:

- the closing frame;
- the air supply louvre;
- the front panel;
- the air intake grid.

Perimeter frame, front panel and air intake grid made of steel painted with epoxy polyester coat, dried in a furnace at 180 °C, colour RAL 9003.

It is possible to repaint the entire frame of the same color as the wall.

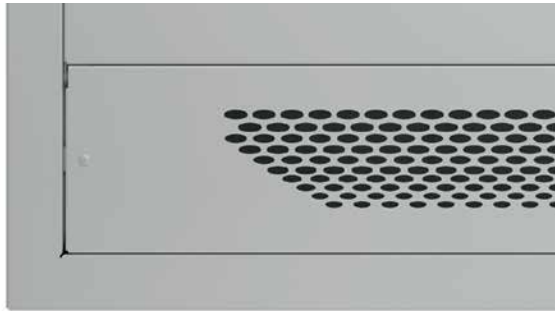


The air supply louvre is made of extruded aluminium and painted with epoxy polyester coat, dried in a furnace at 180 °C, colour RAL 9003.



The air intake grid is fixed to the frame by using a simple and fast connecting system.

The grid can be easily removed to clean the filter and the inner casing.

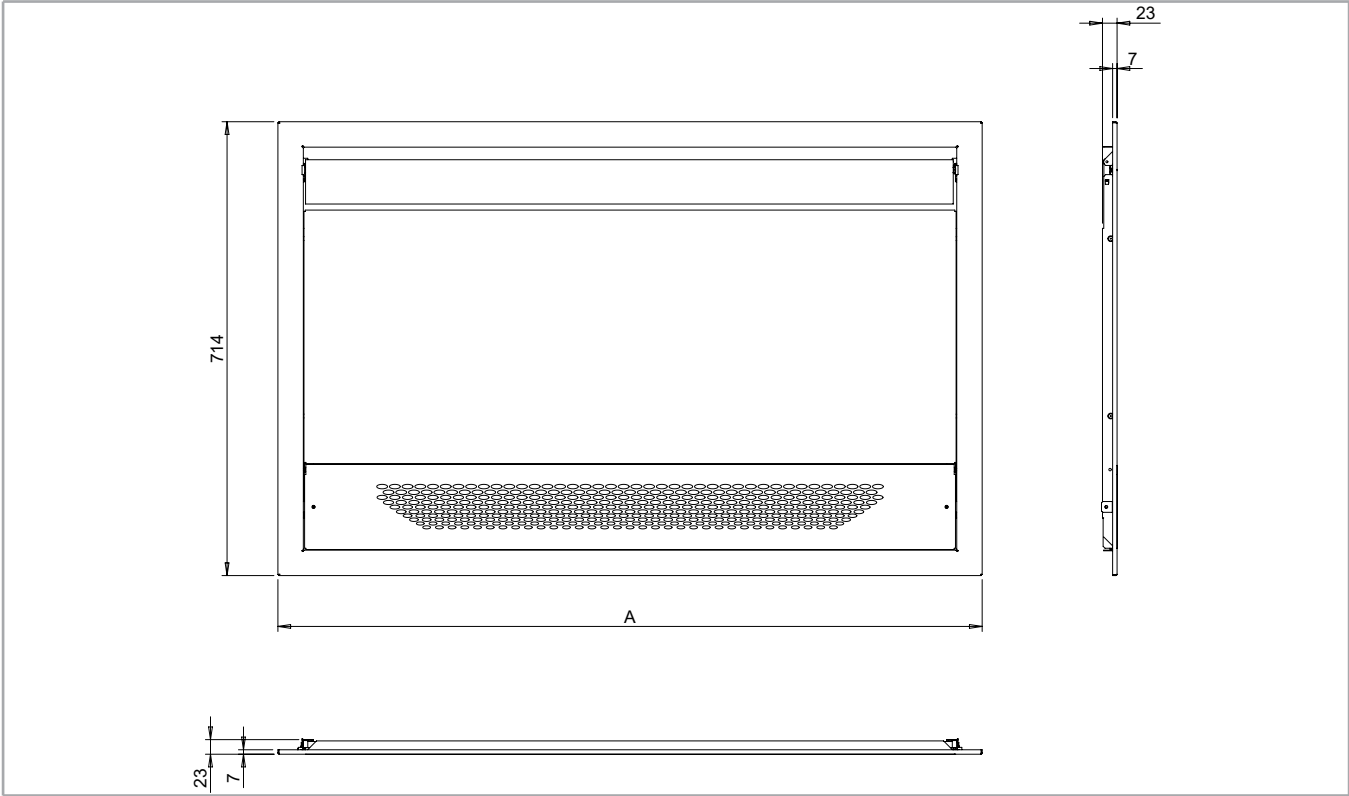


The recessed box is made of galvanized steel with openings for the electrical and hydraulic connections.

To fit in the unit easily, there are 4 grub screws.



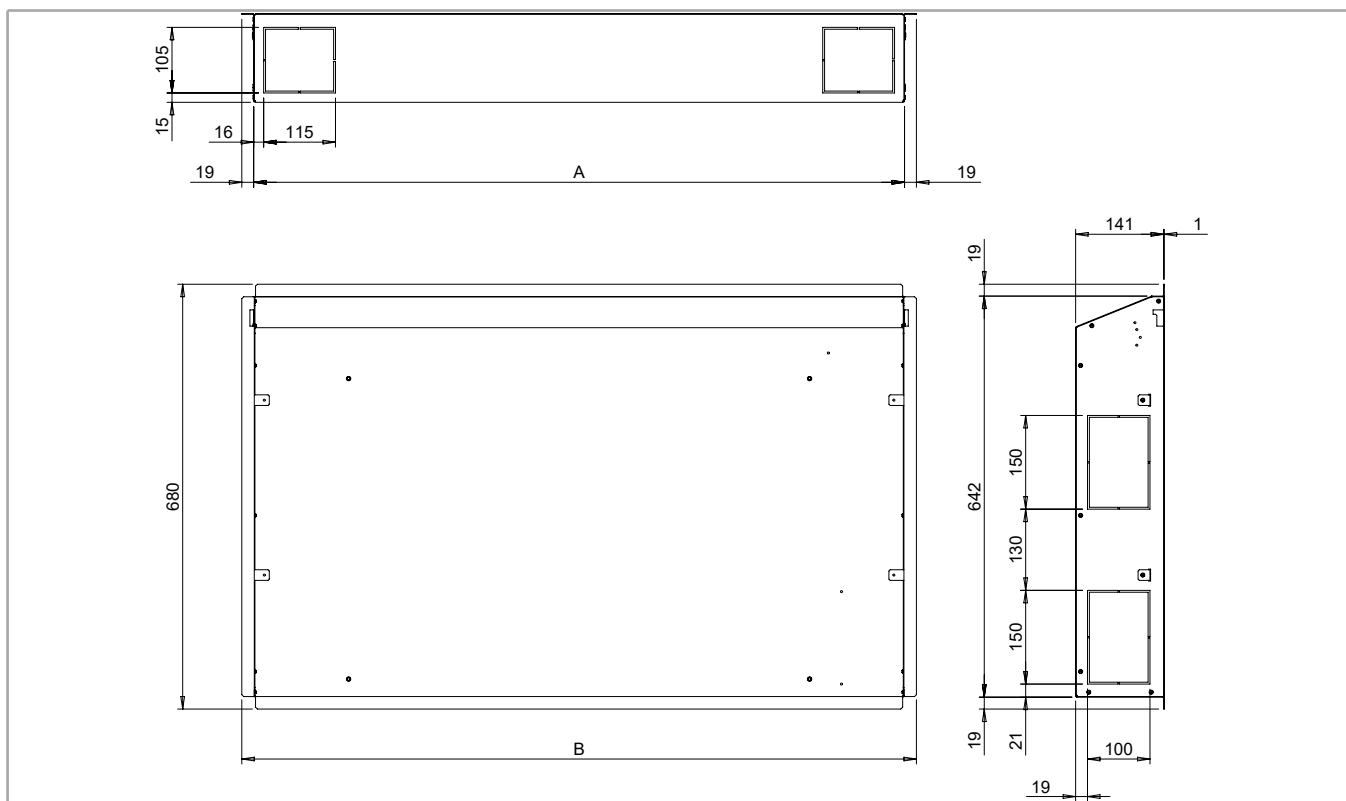
Aesthetic frame dimensions



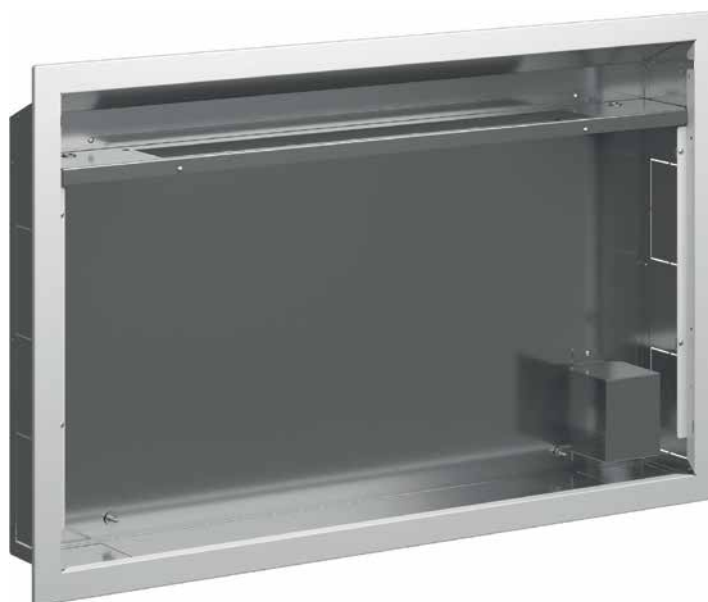
| Model      | A    | Code    | ID    |
|------------|------|---------|-------|
| CFF-ECM 20 | 908  | 9071162 | CBF-A |
| CFF-ECM 30 | 1108 | 9071163 | CBF-B |
| CFF-ECM 40 | 1308 | 9071164 | CBF-C |



## Recessed box dimensions



| Model      | A    | B    | Code    | ID    |
|------------|------|------|---------|-------|
| CFF-ECM 20 | 842  | 880  | 9071152 | IBF 2 |
| CFF-ECM 30 | 1042 | 1080 | 9071153 | IBF 3 |
| CFF-ECM 40 | 1242 | 1280 | 9071154 | IBF 4 |







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 Produzione di ventilconvettori, magazzino e logistica

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EA: 18

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Data emissione  
 First issue  
 10/06/1996

Emissione corrente  
 Current issue  
 10/04/2018

Data di scadenza  
 Expiring date  
 09/04/2021

ICIM S.p.A.

Piazza Don Enrico Mapei, 75 - 20099 Sesto San Giovanni (MI)  
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SGQ N° 004 A PRD N° 004 B  
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