Galletti
AIR CONDITIONING

EN

# TECHNICAL MANUAL

# ESTRO i

## ESTRO BLDC FAN COILS - BRUSHLESS TECHNOLOGY

## 1 kW - 11 kW

CE

EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

TABLE OF CONTENTS



## OPERATING LIMITS

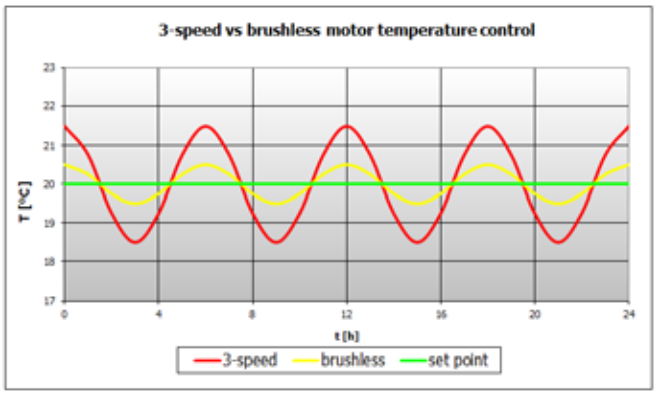
> thermal carrier fluid: water
> water temperature: from 5°C to 95°C
> maximum operating pressure: 10 bar
> air temperature: from 5°C to 43 °C
> supply voltage: 230 Vac

The technical and dimensional data provided herein may undergo changes in connection with product improvements.

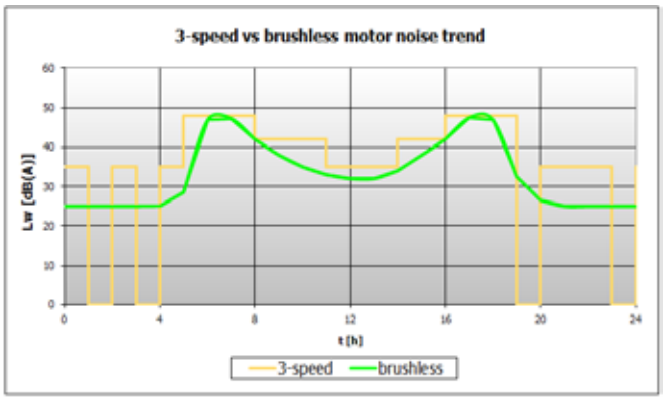
- For any further information, contact the manufacturer: info@galletti.it
- To get the weight of the unit, refer to the User Manual, Rated technical data table.

## 1 GENERALITIES

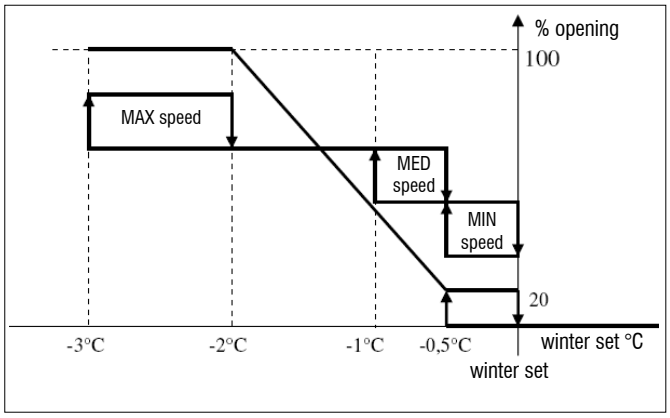
Backed by thirty years of experience in the manufacture of fan coil units Galletti introduces the new ESTRO BLDC line.
Galletti fan coils can be equipped with a permanent magnet (brushless) electric motor, controlled by an inverter, which enables continuous adjustment in the number of fan revolutions.
The great advantage of brushless motors is the significant reduction in power consumption, which in instant operations reaches up to a $^1/_3$ of that of conventional motors and at around 50% in integrated operations, with the corresponding reduction in $CO_2$ emissions!
The DC Inverter technology allows to continuously adjust the air flow to the actual needs of the environment by considerably reducing the fluctuations in room temperature that are typical of step-by-step adjustments.




The direct consequence is also the reduction in the noise emission of the fan coil, which is now proportional to the demands of the environment.




**THE CONTROL**
The operation of the unit with brushless motor is managed by the MYCOMFORT LARGE control panel, using an analogue output (0-10V) which is connected to the inverter.




The Galletti brushless fan coil thus represent the state of the art due to the possibility of regulating the operation, depending on the temperature of the air, its relative humidity, the temperature of the water and based on the programmable time slots.
By means of the digital outputs it is possible to switch on and off external units or devices such as chiller, boiler, pumps, water circulation pumps, etc.
Another analog output makes it possible to control the modulating valves.

Permanent magnets electric motor, mounted on vibration damping couplings, complete with winding thermal protection.
The unit is equipped with an inverter board to control the motor, which can be used separately or installed on the motor itself (features below). By means dipswitches this system makes it possible to precisely set the maximum rotation speed of the motor (the control signal range being always 0-10 V) even when the maximum rotation speed must be controlled to reduce noise levels.
The control inverter is equipped with Hall cells to precisely control the position of the rotor, and thus the rotation even at very low rotation speed (when traditional motors cannot be controlled).
For the ESTRO BLDC project we selected top quality materials which, together with the great care and attention dedicated to the assembly of the main constructive components, make the new Galletti fan coil units highly reliable from a performance standpoint while minimising noise levels.

New construction concept unifying the vertical and horizontal mounted models:

- **F L I** Suspended wall installation, with cabinet, with vertical air flow.
- **C L I** Suspended wall installation, with cabinet and vertical air flow, in a classic colour.
- **F A I** Wall-mounted, with cabinet, with inclined air flow.
- **F U I** Floor or ceiling mounted, with cabinet, with vertical air flow and air intake grille complete with filters.
- **F P I** Ceiling mounted, cabinet with air outlet grilles and rear air intake with filter.
- **F C I** Vertical or horizontal recess mounted with heat insulated galvanised sheet casing.
- **F F I** Vertical and horizontal recess mounted, with front air intake, with heat insulated galvanised sheet casing.
- **F B I** Low-cabinet version, suitable for floor and ceiling mounting. The cabinet has air outlet grilles and air intake grilles with built-in filter.
- **F B C I** Low-cabinet version for vertical and horizontal recess mounting, front air intake with air filter, thermally insulated galvanised sheet steel body.

The performance features of Galletti ESTRO BLDC products are certified by EUROVENT which guarantees the reliability of the data shown on this documentation.

EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

Inverter Technology

## 2 MODELS AND CONSTRUCTIVE COMPONENTS

**FLI Wall mounting**

> Cabinet composed of a thick steel sheet panel (10/10 mm), side panels and air outlet grille (swinging by 180°) built from ABS. The side doors make it possible to access the technical compartments and the control panel (accessory).
> Bearing structure built from thick galvanised steel sheet (thickness up to 15/10 mm), insulated by means of Class 1 self-extinguishing panels.
> High efficiency heat exchanger made with copper piping and aluminium fins blocked to pipings by mechanical expansion, provided with brass manifolds and air vent valve. The heat exchanger usually comes with water connections mounted on the left, but it can be turned by 180°.
> Permanent magnets electric synchronous motor (BLDC) mounted on vibration damping supports, complete with sinusoidal inverter board.
> Double suction centrifugal fans, statically and dynamically balanced, directly connected to the electrical motor, made with antistatic ABS, with blades having an airfoil section and offset modules, or aluminium.
> Honey-comb polypropylene washable air filter, mounted on a galvanised sheet frame protected by a net, easily removable for maintenance operations. The filter is secured to the cabinet with ¼-turn screws.

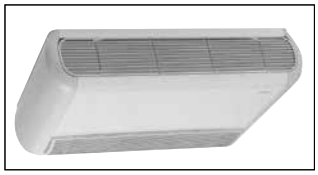
**CL Wall mounting, "classic" model**
**9 models (from CLI1 to CLI9)**

> Cabinet composed of a thick steel sheet panel (10/10 mm), side panels and air outlet grille (swinging by 180°) built from ABS. The side doors make it possible to access the technical compartments and the control panel (accessory).
Steel sheet panel colour: RAL 9001
ABS parts colour: PANTONE "warm gray 2u"
> Bearing structure built from thick galvanised steel sheet (thickness up to 15/10 mm), insulated by means of Class 1 self-extinguishing panels.
> High efficiency heat exchanger made with copper piping and aluminium fins blocked to pipings by mechanical expansion, provided with brass manifolds and air vent valve. The heat exchanger usually comes with water connections mounted on the left, but it can be turned by 180°.
> Permanent magnets electric synchronous motor (BLDC) mounted on vibration damping supports, complete with sinusoidal inverter board.
> Double suction centrifugal fans, statically and dynamically balanced, directly connected to the electrical motor, made with antistatic ABS, with blades having an airfoil section and offset modules.
> Honey-comb polypropylene washable air filter, mounted on a galvanised sheet frame protected by a net, easily removable for maintenance operations.

**FAI Wall-mounting**

> Cabinet composed of a thick steel sheet panel (10/10 mm), side panels and air outlet grille (swinging by 180°) built from ABS. The side doors make it possible to access the technical compartments and the control panel (accessory).
> Bearing structure built from thick galvanised steel sheet (thickness up to 15/10 mm), insulated by means of Class 1 self-extinguishing panels.
> High efficiency heat exchanger made with copper piping and aluminium fins blocked to pipings by mechanical expansion, provided with brass manifolds and vent valve. The heat exchanger usually comes with water connections mounted on the left, but it can be turned by 180°.
> Permanent magnets electric synchronous motor (BLDC) mounted on vibration damping supports, complete with sinusoidal inverter board.
> Double suction centrifugal fans, statically and dynamically balanced, directly connected to the electrical motor, made with antistatic ABS, with blades having an airfoil section and offset modules, or aluminium.
> Honey-comb polypropylene washable air filter, mounted on a galvanised sheet frame protected by a net, easily removable for maintenance operations.

**FUI Universal: floor/ceiling mounted**



> Cabinet composed of a thick steel sheet panel (10/10 mm), side panels, air outlet grille (swinging by 180°) and back suction grilles built from ABS. The side doors make it possible to access the technical compartments and the control panel (accessory).
> Bearing structure built from thick galvanised steel sheet (thickness up to 15/10 mm), insulated by means of Class 1 self-extinguishing panels. The unit is supplied complete with a double condensate collection and drainage system; in case of horizontal installation, condensate is collected in a capacious drip tray.
> High efficiency heat exchanger made with copper piping and aluminium fins blocked to pipings by mechanical expansion, provided with brass manifolds and vent valve. The heat exchanger usually comes with water connections mounted on the left, but it can be turned by 180°.
> Permanent magnets electric synchronous motor (BLDC) mounted on vibration damping supports, complete with sinusoidal inverter board.
> Double suction centrifugal fans, statically and dynamically balanced, directly connected to the electrical motor, made with antistatic ABS, with blades having an airfoil section and offset modules, or aluminium.
> Honey-comb polypropylene washable air filter, made up of modules fitted onto the air inlet grille situated on the front panel of the cabinet.

## 2 MODELS AND CONSTRUCTIVE COMPONENTS

**FP Ceiling mounted**

> Cabinet composed of a steel sheet panel (thickness 10/10 mm), side panels and air outlet grille (swinging by 180°) built from ABS.The side doors make it possible to access the technical compartments and the control panel (accessory).
> Bearing structure built from thick galvanised steel sheet (thickness up to 15/10 mm), insulated by means of Class 1 self-extinguishing panels. The unit is supplied complete with a double condensate collection and drainage system; in case of horizontal installation, condensate is collected in a capacious drip tray.
> High efficiency heat exchanger made with copper piping and aluminium fins blocked to pipings by mechanical expansion, provided with brass manifolds and air vent valve. The heat exchanger usually comes with water connections mounted on the left, but it can be turned by 180°.
> Permanent magnets electric synchronous motor (BLDC) mounted on vibration damping supports, complete with sinusoidal inverter board.
> Double suction centrifugal fans, statically and dynamically balanced, directly connected to the electrical motor, made with antistatic ABS, with blades having an airfoil section and offset modules, or aluminium.
> Honey-comb polypropylene washable air filter, mounted on a galvanised sheet frame protected by a net, easily removable for maintenance operations. The filter is secured to the cabinet with ¼-turn screws.

**FC Vertical / horizontal recess mounted**

> Bearing structure built from thick galvanised steel sheet (thickness up to 15/10 mm), insulated by means of Class 1 self-extinguishing panels. The unit is supplied complete with a double condensate collection and drainage system; in case of horizontal installation, condensate is collected in a capacious drip tray.
> High efficiency heat exchanger made with copper piping and aluminium fins blocked to pipings by mechanical expansion, provided with brass manifolds and vent valve. The heat exchanger usually comes with water connections mounted on the left, but it can be turned by 180°.
> Permanent magnets electric synchronous motor (BLDC) mounted on vibration damping supports, complete with sinusoidal inverter board.
> Double suction centrifugal fans, statically and dynamically balanced, directly connected to the electrical motor, made with antistatic ABS, with blades having an airfoil section and offset modules, or aluminium.
> Honey-comb polypropylene washable air filter, mounted on a galvanised sheet frame protected by a net, easily removable for maintenance operations.

**FFI Vertical / horizontal recess mounted**

> Bearing structure built from thick galvanised steel sheet (thickness up to 15/10 mm), insulated by means of Class 1 self-extinguishing panels.
The unit is supplied complete with a double condensate collection and drainage system; in case of horizontal installation, condensate is collected in a capacious drip tray.
> High efficiency heat exchanger made with copper piping and aluminium fins blocked to pipings by mechanical expansion, provided with brass manifolds and air vent valve. The heat exchanger usually comes with water connections mounted on the left, but it can be turned by 180°.
> Permanent magnets electric synchronous motor (BLDC) mounted on vibration damping supports, complete with sinusoidal inverter board.
> Double suction centrifugal fans, statically and dynamically balanced, directly connected to the electrical motor, made with antistatic ABS, with blades having an airfoil section and offset modules, or aluminium.
> Honey-comb polypropylene washable air filter, mounted on a galvanised sheet frame protected by a net, easily removable for maintenance operations. The filter is secured to the cabinet with ¼-turn screws.

## 3 ACCESSORIES

A broad and complete range of accessories defines these indoor units and allows them to be tailored to every type of installation requirement.
The standard units are supplied without control panel.

| REF. | DESCRIPTION | APPLICABLE TO |
|---|---|---|
| | **CONTROL PANELS AND THERMOSTATS** | |
| **MCLE** | Wall-mounted microprocessor control - GALLETTI model **MYCOMFORT LARGE** | **ALL** |
| **KBESTE** | KIT for on-board installation on ESTRO (1 air probe + bracket + on-board LCD controller frame + wiring kit) | **FLI-FAI-FUI** |
| **MCSWE** | Water temperature electronic sensor for **MYCOMFORT** controls | **ALL** |
| **MCSUE** | Humidity sensor for on-board microprocessor controls model **MYCOMFORT MEDIUM** and **MYCOMFORT LARGE**. | **ALL** |
| | **ADDITIONAL HEAT EXCHANGERS** | |
| **DF** | 1 row additional heat exchanger for 4-pipe systems (hot water circuit) | **FLI-FAI-CLI-FUI-FPI-FCI-FFI** |
| | **SUPPORT COVERING FEET** | |
| **ZA** | Pair of support covering feet | **FAI** |
| **ZAG** | Pair of support covering feet with front grille | **FAI** |
| **ZL** | Pair of support covering feet | **FLI** |
| **ZC** | Pair of support covering feet | **CLI** |
| **ZLG** | Pair of support covering feet with front grille | **FLI** |
| **ZCG** | Pair of support covering feet with front grille | **CLI** |
| **D** | Support spacers | **FCI** |
| **PVL** | Rear painted panel for vertical installation fan coils with cabinet | **FLI-FUI** |
| **PVC** | Rear painted panel for vertical installation fan coils with cabinet | **CLI** |
| **PVA** | Rear painted panel for vertical installation fan coils with cabinet | **FAI** |
| **PH** | Rear painted panel for horizontal installation fan coils with cabinet | **FUI** |
| | **MOTOR-DRIVEN VALVES AND DRIP TRAYS** | |
| **VK S** | 3-way valve with ON/OFF electrothermal motor and hydraulic kit for standard heat exchanger | **ALL** |
| **VK DF** | 3-way valve with ON/OFF electrothermal motor and hydraulic kit for DF heat exchanger | **FLI-FAI-CLI-FUI-FPI-FCI-FFI** |
| **GIVK** | Valve body insulation shell | **ALL** |
| **BV** | Auxiliary water drip tray for vertical installation fan coil units | **ALL** |
| **BH** | Auxiliary water drip tray for horizontal installation fan coil units | **FUI-FPI-FCI-FFI** |
| **KSC** | Condensate drainage pump | **FCI-FFI** |
| | **ELECTRICAL HEATING ELEMENTS** | |
| **RE** | Electric heating element complete with installation kit, safety devices, power relay box, heat resistant grilles | **FLI-FUI-FPI-FCI-FFI** |
| | **AIR INTAKE AND OUTLET GRILLES** | |
| **GE+C** | Anodised aluminium grille for external air intake, complete with subframe | **FLI-FAI-CLI-FUI-FPI-FCI-FFI** |
| **GEF+C** | Anodised aluminium grille for external air intake, complete with filter and subframe | **FCI-FFI** |
| **GM+C** | Anodised aluminium double-row finned air outlet grille, complete with subframe | **FCI-FFI** |
| **RGCCD** | Plenum with circular collars for air outlet grille | **FCI-FFI** |
| | **INLET AND OUTLET CONNECTORS** | |
| **RM90** | Angular air outlet connector | **FCI-FFI** |
| **RMD** | Straight air outlet connector | **FCI-FFI** |
| **RA90** | Angular air inlet connectors | **FCI** |
| **RAD** | Straight air inlet connectors | **FCI** |
| **RMCD** | Air outlet plenum with circular collars | **FCI-FFI** |
| | **EXTERNAL AIR INTAKE LOUVERS** | |
| **S** | Manual external air intake louver | **FLI-FAI-CLI-FPI-FCI** |
| **SC** | Manual external air intake louver | **CLI** |
| **SM** | Motor-driven external air intake louver | **FLI-FAI-CLI-FPI-FCI** |
| **SM-C** | Motor-driven external air intake louver | **CLI** |

# 4 RATINGS AND TECHNICAL DATA

| ESTRO i | | | 1 | | | 3 | | | 4 | | | 4M | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Motor / speeds | | | min | med | max | min | med | max | min | med | max | min | med | max |
| Total cooling capacity (1) | | kW | 0,77 | 0,92 | 1,15 | 1,26 | 1,52 | 1,74 | 1,36 | 1,70 | 1,96 | 1,50 | 1,85 | 2,24 |
| Sensible cooling capacity (1) | | kW | 0,59 | 0,70 | 0,87 | 0,95 | 1,14 | 1,30 | 1,00 | 1,24 | 1,42 | 1,06 | 1,32 | 1,60 |
| Water flow (1) | | l/h | 132 | 158 | 197 | 216 | 261 | 299 | 234 | 292 | 337 | 258 | 317 | 384 |
| Pressure drop (1) | | kPa | 4 | 5 | 7 | 8 | 11 | 14 | 6 | 9 | 12 | 10 | 14 | 20 |
| Heating capacity (2) | | kW | 1,11 | 1,30 | 1,55 | 1,71 | 2,04 | 2,20 | 1,78 | 2,16 | 2,55 | 1,83 | 2,26 | 2,74 |
| Pressure drop (2) | | kPa | 3 | 4 | 6 | 7 | 9 | 12 | 5 | 8 | 10 | 8 | 11 | 16 |
| Heating capacity (3) | | kW | 1,94 | 2,27 | 2,68 | 2,93 | 3,50 | 3,74 | 3,04 | 3,67 | 4,35 | 3,08 | 3,80 | 4,62 |
| Water flow (3) | | l/h | 171 | 199 | 235 | 257 | 307 | 329 | 267 | 322 | 382 | 270 | 333 | 405 |
| Pressure drop (3) | | kPa | 4 | 6 | 8 | 8 | 11 | 13 | 6 | 8 | 11 | 8 | 12 | 16 |
| Air flow rate | | m3/h | 149 | 189 | 231 | 211 | 271 | 344 | 211 | 271 | 344 | 211 | 271 | 344 |
| Electrical input | EC | W | 5 | 6 | 7 | 7 | 9 | 19 | 7 | 9 | 19 | 7 | 9 | 19 |
| Speed setting | | rpm | 850 | | | 950 | | | 950 | | | 950 | | |
| Control voltage | | V | 4.0 | 5.3 | 6.5 | 5.2 | 6.9 | 8.4 | 5.2 | 6.9 | 8.4 | 5.2 | 6.9 | 8.4 |
| Number of fans | | no. | 1 | | | 1 | | | 1 | | | 1 | | |
| Sound power level (4) | | dB/A | 30 | 32 | 40 | 38 | 44 | 49 | 40 | 44 | 50 | 41 | 45 | 51 |
| Sound pressure level (5) | | dB/A | 25 | 27 | 35 | 33 | 39 | 44 | 35 | 39 | 45 | 36 | 40 | 46 |
| Add. heat exch. heating cap. | | kW | 1,35 | 1,50 | 1,70 | 1,56 | 1,78 | 2,02 | 1,56 | 1,78 | 2,01 | N.A. | | |
| Water flow | | l/h | 118 | 132 | 149 | 137 | 156 | 177 | 137 | 156 | 176 | N.A. | | |
| Pressure drop | | kPa | 3 | 4 | 4 | 5 | 7 | 8 | 5 | 6 | 7 | N.A. | | |
| Water connections | std | inches | 1/2 | | | 1/2 | | | 1/2 | | | 1/2 | | |
| | DF | inches | 1/2 | | | 1/2 | | | 1/2 | | | N.A. | | |
| Water content | std | dm3 | 0,46 | | | 0,46 | | | 0,46 | | | 0,70 | | |
| | DF | dm3 | 0,18 | | | 0,18 | | | 0,18 | | | N.A. | | |

| ESTRO i | | | 5 | | | 6 | | | 6M | | | 7 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Motor / speeds | | | min | med | max | min | med | max | min | med | max | min | med | max |
| Total cooling capacity (1) | | kW | 1,60 | 2,03 | 2,42 | 1,76 | 2,38 | 2,93 | 1,93 | 2,64 | 3,30 | 1,98 | 2,63 | 3,51 |
| Sensible cooling capacity (1) | | kW | 1,18 | 1,57 | 1,88 | 1,26 | 1,70 | 2,11 | 1,33 | 1,83 | 2,30 | 1,45 | 2,04 | 2,75 |
| Water flow (1) | | l/h | 275 | 348 | 415 | 302 | 408 | 503 | 331 | 452 | 565 | 340 | 451 | 602 |
| Pressure drop (1) | | kPa | 8 | 12 | 16 | 5 | 8 | 11 | 7 | 12 | 17 | 4 | 7 | 12 |
| Heating capacity (2) | | kW | 2,07 | 2,68 | 3,20 | 2,09 | 2,83 | 3,50 | 2,33 | 3,21 | 4,04 | 2,81 | 3,69 | 4,78 |
| Pressure drop (2) | | kPa | 6 | 10 | 13 | 4 | 6 | 9 | 6 | 10 | 14 | 4 | 6 | 10 |
| Heating capacity (3) | | kW | 3,52 | 4,57 | 5,47 | 3,52 | 4,76 | 5,89 | 3,91 | 5,39 | 6,79 | 4,83 | 6,34 | 8,21 |
| Water flow (3) | | l/h | 308 | 401 | 480 | 308 | 417 | 517 | 343 | 473 | 595 | 424 | 556 | 720 |
| Pressure drop (3) | | kPa | 7 | 12 | 16 | 4 | 6 | 9 | 6 | 10 | 14 | 5 | 8 | 13 |
| Air flow rate | | m3/h | 241 | 341 | 442 | 241 | 341 | 442 | 241 | 341 | 442 | 320 | 450 | 640 |
| Electrical input | EC | W | 6 | 8 | 16 | 6 | 8 | 16 | 6 | 8 | 16 | 8 | 12 | 18 |
| Speed setting | | rpm | 850 | | | 850 | | | 850 | | | 850 | | |
| Control voltage | | V | 3.8 | 5.7 | 7.3 | 3.8 | 5.7 | 7.3 | 3.8 | 5.7 | 7.3 | 3.6 | 5.4 | 8.0 |
| Number of fans | | no. | 2 | | | 2 | | | 2 | | | 2 | | |
| Sound power level (4) | | dB/A | 35 | 43 | 48 | 36 | 42 | 48 | 35 | 43 | 49 | 35 | 43 | 52 |
| Sound pressure level (5) | | dB/A | 30 | 38 | 43 | 31 | 37 | 43 | 30 | 38 | 44 | 30 | 38 | 47 |
| Add. heat exch. heating cap. | | kW | 2,06 | 2,53 | 2,92 | 2,18 | 2,68 | 3,08 | N.A. | | | 3,21 | 3,96 | 4,80 |
| Water flow | | l/h | 181 | 222 | 257 | 191 | 235 | 270 | N.A. | | | 282 | 347 | 421 |
| Pressure drop | | kPa | 2 | 3 | 4 | 3 | 4 | 5 | N.A. | | | 10 | 14 | 20 |
| Water connections | std | inches | 1/2 | | | 1/2 | | | 1/2 | | | 1/2 | | |
| | DF | inches | 1/2 | | | 1/2 | | | N.A. | | | 1/2 | | |
| Water content | std | dm3 | 0,93 | | | 0,71 | | | 1,06 | | | 0,95 | | |
| | DF | dm3 | 0,29 | | | 0,29 | | | N.A. | | | 0,40 | | |

**1** Water temperature 7-12°C, air temp. 27°C D.B., 19°C W.B. (47% R.H.)
**2** Water temperature 50°C, water flow rate same as in cooling mode, air inlet temperature 20°C
**3** Water temperature 70/60°C, air temp. 20°C
**4** Sound power measured according to standards ISO3741 and ISO3742
**5** Sound pressure level measured at a distance of 5 m with a directivity factor of 2

# 4 RATINGS AND TECHNICAL DATA

| ESTRO i | | | 8 | | | 9 | | | 9M | | | 95 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Motor / speeds | | | min | med | max | min | med | max | min | med | max | min | med | max |
| Total cooling capacity (1) | | kW | 2,51 | 3,27 | 4,33 | 3,00 | 3,66 | 4,51 | 3,52 | 4,37 | 5,40 | 3,42 | 4,19 | 5,26 |
| Sensible cooling capacity (1) | | kW | 1,80 | 2,45 | 3,15 | 2,23 | 2,82 | 3,53 | 2,47 | 3,07 | 3,82 | 2,34 | 3,00 | 3,82 |
| Water flow (1) | | l/h | 431 | 561 | 743 | 515 | 628 | 774 | 605 | 750 | 927 | 587 | 719 | 902 |
| Pressure drop (1) | | kPa | 5 | 8 | 12 | 7 | 10 | 14 | 11 | 16 | 24 | 9 | 13 | 19 |
| Heating capacity (2) | | kW | 2,98 | 3,90 | 5,10 | 3,93 | 4,84 | 5,91 | 4,24 | 5,24 | 6,47 | 4,22 | 5,18 | 6,57 |
| Pressure drop (2) | | kPa | 4 | 6 | 10 | 6 | 8 | 12 | 9 | 13 | 19 | 7 | 10 | 16 |
| Heating capacity (3) | | kW | 5,03 | 6,57 | 8,57 | 6,69 | 8,25 | 10,08 | 7,11 | 8,79 | 10,87 | 7,10 | 8,72 | 11,09 |
| Water flow (3) | | l/h | 442 | 576 | 752 | 588 | 724 | 884 | 623 | 772 | 953 | 623 | 765 | 973 |
| Pressure drop (3) | | kPa | 4 | 6 | 10 | 7 | 10 | 14 | 9 | 13 | 19 | 8 | 11 | 17 |
| Air flow rate | | m3/h | 361 | 497 | 706 | 470 | 605 | 785 | 470 | 605 | 785 | 488 | 615 | 814 |
| Electrical input | EC | W | 10 | 13 | 27 | 12 | 16 | 33 | 12 | 16 | 33 | 13 | 16 | 37 |
| Speed setting | | rpm | 950 | | | 950 | | | 950 | | | 1050 | | |
| Control voltage | | V | 3.7 | 5.4 | 8.0 | 5.0 | 6.7 | 8.9 | 5.0 | 6.7 | 8.9 | 4.8 | 6.1 | 8.3 |
| Number of fans | | no. | 2 | | | 2 | | | 2 | | | 2 | | |
| Sound power level (4) | | dB/A | 35 | 43 | 53 | 43 | 49 | 56 | 44 | 50 | 57 | 44 | 51 | 58 |
| Sound pressure level (5) | | dB/A | 30 | 38 | 48 | 38 | 44 | 51 | 39 | 45 | 52 | 39 | 46 | 53 |
| Add. heat exch. heating capacity | | kW | 3,11 | 3,67 | 4,36 | 4,04 | 4,65 | 5,30 | N.A. | | | 4,21 | 4,78 | 5,51 |
| Water flow | | l/h | 273 | 322 | 382 | 355 | 408 | 465 | N.A. | | | 369 | 419 | 483 |
| Pressure drop | | kPa | 11 | 14 | 19 | 6 | 8 | 10 | N.A. | | | 9 | 11 | 14 |
| Water connections | std | inches | 1/2 | | | 1/2 | | | 1/2 | | | 3/4 | | |
| | DF | inches | 1/2 | | | 1/2 | | | N.A | | | 1/2 | | |
| Water content | std | dm3 | 1,42 | | | 1,43 | | | 1,91 | | | 1,91 | | |
| | DF | dm3 | 0,40 | | | 0,40 | | | N.A. | | | 0,51 | | |

| ESTRO i | | | 11 | | | 11M | | |
|---|---|---|---|---|---|---|---|---|
| Motor / speeds | | | min | med | max | min | med | max |
| Total cooling capacity (1) | | kW | 4,11 | 6,24 | 8,02 | 4,66 | 6,98 | 8,98 |
| Sensible cooling capacity (1) | | kW | 3,05 | 4,63 | 5,96 | 3,29 | 4,94 | 6,39 |
| Water flow (1) | | l/h | 706 | 1071 | 1376 | 800 | 1198 | 1541 |
| Pressure drop (1) | | kPa | 6 | 13 | 20 | 9 | 19 | 29 |
| Heating capacity (2) | | kW | 5,24 | 7,80 | 10,00 | 5,70 | 8,43 | 10,80 |
| Pressure drop (2) | | kPa | 5 | 11 | 16 | 8 | 15 | 24 |
| Heating capacity (3) | | kW | 8,91 | 13,20 | 16,94 | 9,57 | 14,16 | 18,15 |
| Water flow (3) | | l/h | 782 | 1158 | 1486 | 840 | 1242 | 1593 |
| Pressure drop (3) | | kPa | 6 | 11 | 17 | 8 | 15 | 24 |
| Air flow rate | | m3/h | 642 | 1022 | 1393 | 642 | 1022 | 1393 |
| Electrical input | EC | W | 13 | 38 | 87 | 13 | 38 | 87 |
| Speed setting | | rpm | 1250 | | | 1250 | | |
| Control voltage | | V | 3.6 | 6.2 | 8.7 | 3.6 | 6.2 | 8.7 |
| Number of fans | | no. | 2 | | | 2 | | |
| Sound power level (4) | | dB/A | 49 | 60 | 67 | 50 | 61 | 68 |
| Sound pressure level (5) | | dB/A | 44 | 55 | 62 | 45 | 56 | 63 |
| Add. heat exch. heating capacity | | kW | 5,50 | 7,14 | 8,35 | N.A. | | |
| Water flow | | l/h | 483 | 627 | 733 | N.A. | | |
| Pressure drop | | kPa | 14 | 23 | 30 | N.A. | | |
| Water connections | std | inches | 3/4 | | | 3/4 | | |
| | DF | inches | 1/2 | | | N.A. | | |
| Water content | std | dm3 | 1,43 | | | 1,91 | | |
| | DF | dm3 | 0,53 | | | N.A. | | |

**1** Water temperature 7-12°C, air temp. 27°C D.B., 19°C W.B. (47% R.H.)
**2** Water temperature 50°C, water flow rate same as in cooling mode, air inlet temperature 20°C
**3** Water temperature 70/60°C, air temp. 20°C
**4** Sound power measured according to standards ISO3741 and ISO3742
**5** Sound pressure level measured at a distance of 5 m with a directivity factor of 2

# 4 RATINGS AND TECHNICAL DATA

| ESTRO FB-FBC i | | | 1 | | | 3 | | | 4 | | | 5 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Motor / speeds | | | min | med | max | min | med | max | min | med | max | min | med | max |
| Total cooling capacity (1) | | kW | 0,72 | 0,86 | 1,07 | 1,17 | 1,41 | 1,62 | 1,27 | 1,54 | 1,81 | 1,49 | 1,89 | 2,25 |
| Sensible cooling capacity (1) | | kW | 0,55 | 0,65 | 0,81 | 0,89 | 1,06 | 1,21 | 0,95 | 1,16 | 1,35 | 1,12 | 1,50 | 1,79 |
| Water flow (1) | | l/h | 124 | 148 | 184 | 201 | 242 | 278 | 218 | 264 | 310 | 256 | 324 | 386 |
| Pressure drop (1) | | kPa | 3 | 4 | 7 | 7 | 10 | 13 | 7 | 10 | 13 | 7 | 11 | 14 |
| Heating capacity (2) | | kW | 0,91 | 1,07 | 1,27 | 1,44 | 1,72 | 2,01 | 1,66 | 1,99 | 2,33 | 1,92 | 2,49 | 2,98 |
| Pressure drop (2) | | kPa | 3 | 4 | 5 | 6 | 8 | 10 | 6 | 8 | 11 | 6 | 9 | 12 |
| Heating capacity (3) | | kW | 1,56 | 1,84 | 2,14 | 2,44 | 2,92 | 3,42 | 2,85 | 3,40 | 3,98 | 3,27 | 4,25 | 5,09 |
| Water flow (3) | | l/h | 137 | 161 | 188 | 214 | 256 | 300 | 250 | 298 | 349 | 287 | 373 | 447 |
| Pressure drop (3) | | kPa | 3 | 4 | 5 | 6 | 8 | 11 | 7 | 10 | 13 | 6 | 10 | 14 |
| Air flow rate | | m3/h | 149 | 189 | 231 | 211 | 271 | 344 | 211 | 271 | 344 | 241 | 341 | 442 |
| Electrical input | EC | W | 5 | 6 | 7 | 7 | 9 | 19 | 7 | 9 | 19 | 6 | 8 | 16 |
| Number of fans | | no. | 1 | | | 1 | | | 1 | | | 2 | | |
| Sound power level (4) | | dB/A | 34 | 38 | 44 | 38 | 44 | 49 | 39 | 44 | 50 | 34 | 43 | 48 |
| Sound pressure level (5) | | dB/A | 29 | 33 | 39 | 33 | 39 | 44 | 34 | 39 | 45 | 29 | 38 | 43 |
| Water connections | std | inches | 1/2 | | | 1/2 | | | 1/2 | | | 1/2 | | |
| Water content | std | dm3 | 15,5 | | | 16,5 | | | 16,5 | | | 20,9 | | |

| ESTRO FB-FBC i | | | 6 | | | 7 | | | 8 | | | 9 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Motor / speeds | | | min | med | max | min | med | max | min | med | max | min | med | max |
| Total cooling capacity (1) | | kW | 1,64 | 2,21 | 2,72 | 1,84 | 2,45 | 3,26 | 2,33 | 3,04 | 4,03 | 2,95 | 3,60 | 4,44 |
| Sensible cooling capacity (1) | | kW | 1,20 | 1,59 | 1,97 | 1,35 | 1,95 | 2,61 | 1,68 | 2,35 | 2,95 | 1,95 | 2,48 | 3,10 |
| Water flow (1) | | l/h | 282 | 380 | 467 | 315 | 420 | 559 | 399 | 522 | 691 | 506 | 617 | 762 |
| Pressure drop (1) | | kPa | 4 | 7 | 10 | 4 | 6 | 11 | 4 | 7 | 11 | 6 | 9 | 13 |
| Heating capacity (2) | | kW | 2,11 | 2,85 | 3,54 | 2,59 | 3,42 | 4,44 | 3,04 | 3,98 | 5,23 | 3,40 | 4,18 | 5,44 |
| Pressure drop (2) | | kPa | 3 | 6 | 8 | 3 | 5 | 9 | 3 | 5 | 9 | 5 | 7 | 10 |
| Heating capacity (3) | | kW | 3,59 | 4,85 | 6,01 | 4,49 | 5,90 | 7,64 | 5,20 | 6,79 | 8,90 | 5,71 | 7,01 | 9,20 |
| Water flow (3) | | l/h | 315 | 426 | 527 | 394 | 518 | 670 | 456 | 596 | 781 | 501 | 615 | 807 |
| Pressure drop (3) | | kPa | 4 | 6 | 9 | 4 | 7 | 11 | 4 | 6 | 10 | 5 | 7 | 11 |
| Air flow rate | | m3/h | 241 | 341 | 442 | 320 | 450 | 640 | 361 | 497 | 706 | 470 | 605 | 785 |
| Electrical input | EC | W | 6 | 8 | 16 | 8 | 12 | 18 | 10 | 13 | 27 | 12 | 16 | 33 |
| Number of fans | | no. | 2 | | | 2 | | | 2 | | | 2 | | |
| Sound power level (4) | | dB/A | 35 | 43 | 47 | 34 | 43 | 51 | 35 | 45 | 55 | 45 | 51 | 56 |
| Sound pressure level (5) | | dB/A | 30 | 38 | 42 | 29 | 38 | 46 | 30 | 40 | 50 | 40 | 46 | 51 |
| Water connections | std | inches | 1/2 | | | 1/2 | | | 1/2 | | | 1/2 | | |
| Water content | std | dm3 | 1,06 | | | 0,95 | | | 1,42 | | | 1,42 | | |

**1** Water temperature 7-12°C, air temp. 27°C D.B., 19°C W.B. (47% R.H.)
**2** Water temperature 50°C, water flow rate same as in cooling mode, air inlet temperature 20°C
**3** Water temperature 70/60°C, air temp. 20°C
**4** Sound power measured according to standards ISO3741 and ISO3742
**5** Sound pressure level measured at a distance of 5 m with a directivity factor of 2

## 4.1 WEIGHTS

| ESTRO i | | 1 | 3 | 4 | 4M | 5 | 6 | 6M | 7 | 8 | 9 | 9M | 95 | 11 | 11M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FL** | kg | 19.7 | 19.7 | 19.7 | 20.6 | 21.5 | 25.5 | 26.7 | 27.3 | 32.3 | 32.3 | 33.4 | 33.8 | 41.6 | 43.2 |
| **CL** | kg | 19.7 | 19.7 | 19.7 | 20.6 | 21.5 | 25.5 | 26.7 | 27.3 | 32.3 | 32.3 | 33.4 | 33.8 | 41.6 | 43.2 |
| **FA** | kg | 19.8 | 19.8 | 19.8 | 20.4 | 21.3 | 24.6 | 25.6 | 26.2 | 30.3 | 30.3 | 31.6 | N.D. | 40.3 | 41.9 |
| **FC** | kg | 16.5 | 16.5 | 16.5 | 16.9 | 17.8 | 21.4 | 22.1 | 22.7 | 26.4 | 26.6 | 27.4 | 27.0 | 35.4 | 37.0 |
| **FU** | kg | 20.6 | 20.6 | 20.6 | 21.2 | 22.1 | 26.5 | 27.5 | 29.3 | 33.5 | 33.6 | 34.7 | 35.8 | 43.1 | 44.7 |
| **FF** | kg | 16.5 | 16.5 | 16.5 | 16.9 | 17.8 | 21.4 | 22.1 | 22.7 | 26.4 | 26.6 | 27.4 | 27.0 | 35.4 | 37.0 |
| **FP** | Kg | 20.6 | 20.6 | 20.6 | 21.2 | 22.1 | 26.5 | 27.5 | 29.3 | 33.5 | 33.6 | 34.7 | 35.8 | 43.1 | 44.7 |

| ESTRO i | | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| **FB** | kg | 15.5 | 16.5 | 16.5 | 20.9 | 20.9 | 25.6 | 25.6 | 26.4 |
| **FBC** | kg | 14.5 | 15.5 | 15.5 | 19.0 | 20.0 | 24.0 | 24.0 | 24.5 |

## 5 PERFORMANCES

In order to define the performances of ESTRO i subject to conditions different from rated conditions, a computer program for the correct choice of the units is provided by Galletti SpA.

With a few input data it will be possible to get information on the behaviour of an ESTRO i referring to the desired operating conditions.

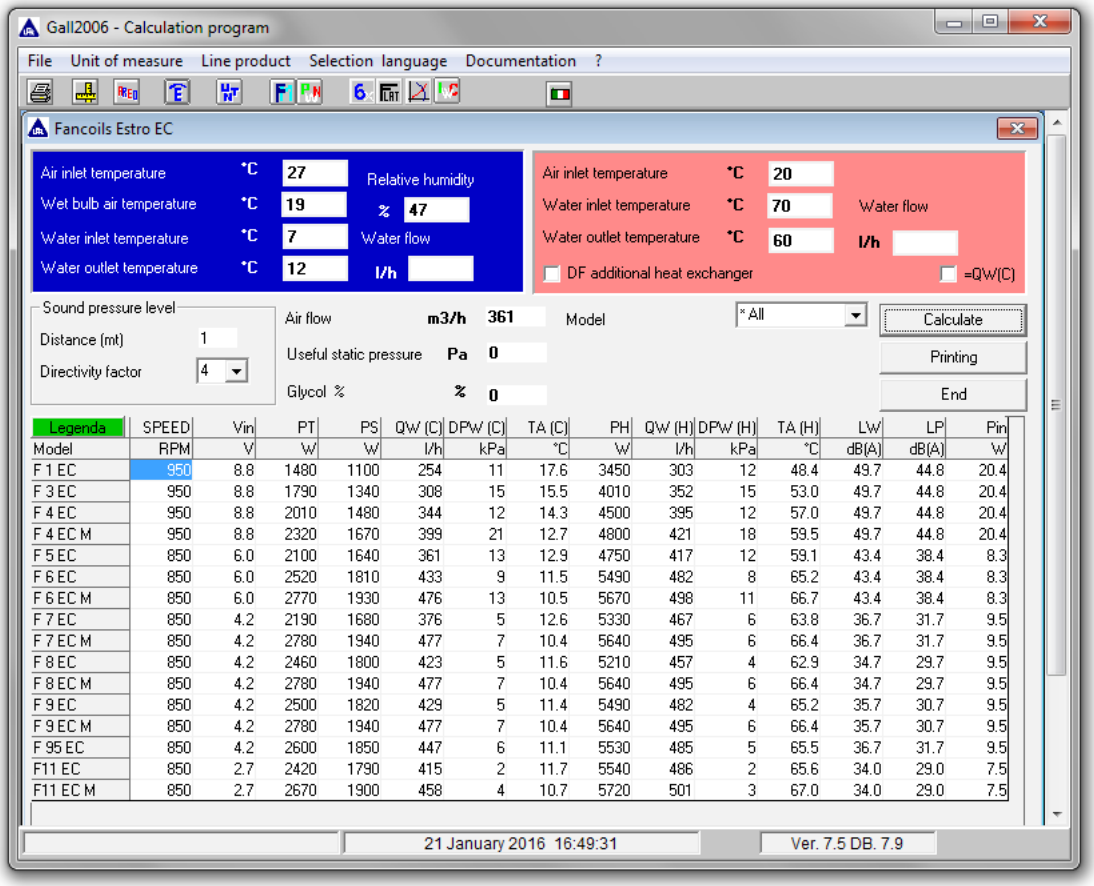
It will be sufficient to enter the following data:

- Dry bulb inlet air temperature
- Wet bulb inlet air temperature or alternatively the relative humidity
- Inlet water temperature
- Outlet water temperature or alternatively the water flow
- Ethylene glycol percentage (default 0)
- Fan speed
- Available static head (default 0) and air flow rate (≠0)
- Directivity factor and distance

Output data

- Selected full scale (850-1450 RPM)
- Control voltage
- Total cooling / heating capacity
- Sensible cooling capacity
- Water flow
- Pressure drop, water side
- Outlet air temperature
- Sound power level
- Sound pressure level under the specified conditions
- Power input

The selection report generated by the software includes the drawing with overall dimensions and description of the unit.




| Legenda | SPEED | Vin | PT | PS | QW (C) | DPW (C) | TA (C) | PH | QW (H) | DPW (H) | TA (H) | LW | LP | Pin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | RPM | V | W | W | l/h | kPa | °C | W | l/h | kPa | °C | dB(A) | dB(A) | W |
| F 1 EC | 950 | 8.8 | 1480 | 1100 | 254 | 11 | 17.6 | 3450 | 303 | 12 | 48.4 | 49.7 | 44.8 | 20.4 |
| F 3 EC | 950 | 8.8 | 1790 | 1340 | 308 | 15 | 15.5 | 4010 | 352 | 15 | 53.0 | 49.7 | 44.8 | 20.4 |
| F 4 EC | 950 | 8.8 | 2010 | 1480 | 344 | 12 | 14.3 | 4500 | 395 | 12 | 57.0 | 49.7 | 44.8 | 20.4 |
| F 4 EC M | 950 | 8.8 | 2320 | 1670 | 399 | 21 | 12.7 | 4800 | 421 | 18 | 59.5 | 49.7 | 44.8 | 20.4 |
| F 5 EC | 850 | 6.0 | 2100 | 1640 | 361 | 13 | 12.9 | 4750 | 417 | 12 | 59.1 | 43.4 | 38.4 | 8.3 |
| F 6 EC | 850 | 6.0 | 2520 | 1810 | 433 | 9 | 11.5 | 5490 | 482 | 8 | 65.2 | 43.4 | 38.4 | 8.3 |
| F 6 EC M | 850 | 6.0 | 2770 | 1930 | 476 | 13 | 10.5 | 5670 | 498 | 11 | 66.7 | 43.4 | 38.4 | 8.3 |
| F 7 EC | 850 | 4.2 | 2190 | 1680 | 376 | 5 | 12.6 | 5330 | 467 | 6 | 63.8 | 36.7 | 31.7 | 9.5 |
| F 7 EC M | 850 | 4.2 | 2780 | 1940 | 477 | 7 | 10.4 | 5640 | 495 | 6 | 66.4 | 36.7 | 31.7 | 9.5 |
| F 8 EC | 850 | 4.2 | 2460 | 1800 | 423 | 5 | 11.6 | 5210 | 457 | 4 | 62.9 | 34.7 | 29.7 | 9.5 |
| F 8 EC M | 850 | 4.2 | 2780 | 1940 | 477 | 7 | 10.4 | 5640 | 495 | 6 | 66.4 | 34.7 | 29.7 | 9.5 |
| F 9 EC | 850 | 4.2 | 2500 | 1820 | 429 | 5 | 11.4 | 5490 | 482 | 4 | 65.2 | 35.7 | 30.7 | 9.5 |
| F 9 EC M | 850 | 4.2 | 2780 | 1940 | 477 | 7 | 10.4 | 5640 | 495 | 6 | 66.4 | 35.7 | 30.7 | 9.5 |
| F 95 EC | 850 | 4.2 | 2600 | 1850 | 447 | 6 | 11.1 | 5530 | 485 | 5 | 65.5 | 36.7 | 31.7 | 9.5 |
| F11 EC | 850 | 2.7 | 2420 | 1790 | 415 | 2 | 11.7 | 5540 | 486 | 2 | 65.6 | 34.0 | 29.0 | 7.5 |
| F11 EC M | 850 | 2.7 | 2670 | 1900 | 458 | 4 | 10.7 | 5720 | 501 | 3 | 67.0 | 34.0 | 29.0 | 7.5 |

# 5 PERFORMANCES

## 5.1 SOUND LEVEL

**Lw** Sound power level by octave band, not weighted
**Vin** Inverter control voltage
**Qa** Air flow rate
**Speed Setting** Speed selection

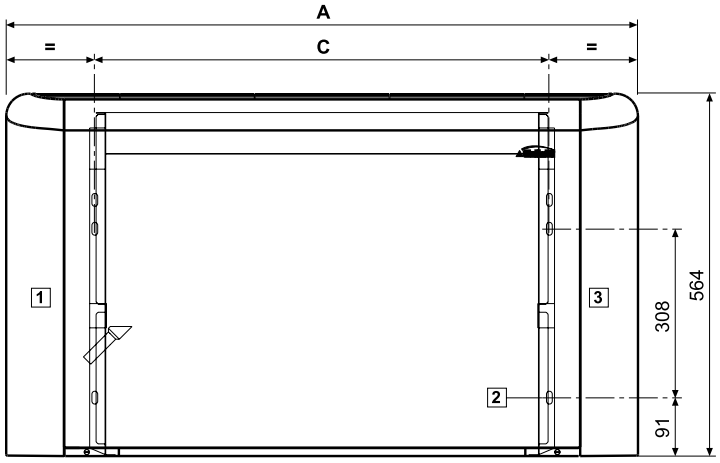
| Octave band | | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | GLOBAL |
|---|---|---|---|---|---|---|---|---|---|
| Model | Qa m3/h | Lw dB | Lw dB | Lw dB | Lw dB | Lw dB | Lw dB | Lw dB | Lw dB(A) |
| 1 | 149 | 28,50 | 35,20 | 28,00 | 18,00 | 13,20 | 13,50 | 14,40 | 30 |
| | 189 | 31,70 | 38,20 | 34,80 | 26,70 | 20,40 | 12,70 | 11,50 | 35 |
| | 231 | 36,70 | 43,20 | 39,80 | 31,70 | 25,40 | 17,70 | 16,50 | 40 |
| | 342 | 46,70 | 53,20 | 49,80 | 41,70 | 35,40 | 27,70 | 26,50 | 50 |
| | 380 | 49,70 | 56,20 | 52,80 | 44,70 | 38,40 | 30,70 | 29,50 | 53 |
| | 450 | 53,70 | 60,20 | 56,80 | 48,70 | 42,40 | 34,70 | 33,50 | 57 |
| 3 | 196 | 16,50 | 31,40 | 32,80 | 26,90 | 21,30 | 13,80 | 13,60 | 36 |
| | 211 | 18,50 | 33,40 | 34,80 | 28,90 | 23,30 | 15,80 | 15,60 | 38 |
| | 271 | 39,70 | 46,40 | 43,70 | 36,20 | 9,70 | 20,70 | 18,50 | 44 |
| | 344 | 45,50 | 52,20 | 49,80 | 44,10 | 38,80 | 29,20 | 19,50 | 50 |
| | 380 | 48,50 | 55,20 | 52,80 | 47,10 | 41,80 | 32,20 | 22,50 | 53 |
| | 450 | 52,50 | 59,20 | 56,80 | 51,10 | 45,80 | 36,20 | 26,50 | 57 |
| 4 | 196 | 15,80 | 30,90 | 33,20 | 26,90 | 20,50 | 13,30 | 13,10 | 36 |
| | 211 | 17,80 | 32,90 | 35,20 | 28,90 | 22,50 | 15,30 | 15,10 | 38 |
| | 271 | 39,00 | 46,40 | 43,90 | 36,20 | 29,10 | 18,60 | 16,50 | 44 |
| | 344 | 44,90 | 51,30 | 49,00 | 43,60 | 38,10 | 28,90 | 18,30 | 50 |
| | 380 | 47,90 | 54,30 | 52,00 | 46,60 | 41,10 | 31,90 | 21,30 | 53 |
| | 450 | 51,90 | 58,30 | 56,00 | 50,60 | 45,10 | 35,90 | 25,30 | 57 |
| 4M | 196 | 15,80 | 30,90 | 33,20 | 26,90 | 20,50 | 13,30 | 13,10 | 36 |
| | 211 | 17,80 | 32,90 | 35,20 | 28,90 | 22,50 | 15,30 | 15,10 | 38 |
| | 271 | 39,00 | 46,40 | 43,90 | 36,20 | 29,10 | 18,60 | 16,50 | 44 |
| | 344 | 44,90 | 51,30 | 49,00 | 43,60 | 38,10 | 28,90 | 18,30 | 50 |
| | 380 | 47,90 | 54,30 | 52,00 | 46,60 | 41,10 | 31,90 | 21,30 | 53 |
| | 450 | 51,90 | 58,30 | 56,00 | 50,60 | 45,10 | 35,90 | 25,30 | 57 |
| 5 | 211 | 29,10 | 35,70 | 30,20 | 21,40 | 14,20 | 13,90 | 17,90 | 31 |
| | 241 | 32,10 | 38,70 | 33,20 | 24,40 | 17,20 | 16,90 | 20,90 | 34 |
| | 341 | 40,70 | 46,10 | 42,30 | 34,50 | 25,70 | 15,50 | 17,20 | 42 |
| | 442 | 43,10 | 49,00 | 45,90 | 40,00 | 34,50 | 28,80 | 30,20 | 47 |
| | 528 | 46,10 | 52,00 | 48,90 | 43,00 | 37,50 | 31,80 | 33,20 | 50 |
| | 579 | 48,10 | 54,00 | 50,90 | 45,00 | 39,50 | 33,80 | 35,20 | 52 |
| 6 | 211 | 29,70 | 35,40 | 30,00 | 20,00 | 14,00 | 13,00 | 14,70 | 31 |
| | 241 | 32,70 | 38,40 | 33,00 | 23,00 | 17,00 | 16,00 | 17,70 | 34 |
| | 341 | 40,10 | 45,60 | 42,10 | 34,00 | 25,50 | 18,40 | 18,70 | 42 |
| | 442 | 43,90 | 49,50 | 46,70 | 40,40 | 32,80 | 22,40 | 19,10 | 47 |
| | 528 | 46,90 | 52,50 | 49,70 | 43,40 | 35,80 | 25,40 | 22,10 | 50 |
| | 579 | 48,90 | 54,50 | 51,70 | 45,40 | 37,80 | 27,40 | 24,10 | 52 |
| 6M | 211 | 29,70 | 35,40 | 30,00 | 20,00 | 14,00 | 13,00 | 14,70 | 31 |
| | 241 | 32,70 | 38,40 | 33,00 | 23,00 | 17,00 | 16,00 | 17,70 | 34 |
| | 341 | 40,10 | 45,60 | 42,10 | 34,00 | 25,50 | 18,40 | 18,70 | 42 |
| | 442 | 43,90 | 49,50 | 46,70 | 40,40 | 32,80 | 22,40 | 19,10 | 47 |
| | 528 | 46,90 | 52,50 | 49,70 | 43,40 | 35,80 | 25,40 | 22,10 | 50 |
| | 579 | 48,90 | 54,50 | 51,70 | 45,40 | 37,80 | 27,40 | 24,10 | 52 |
| 7 | 320 | 28,70 | 37,20 | 32,00 | 19,40 | 14,60 | 17,30 | 14,70 | 32 |
| | 450 | 35,50 | 43,30 | 40,50 | 30,10 | 23,40 | 18,20 | 14,60 | 40 |
| | 640 | 45,00 | 51,20 | 48,50 | 42,50 | 37,90 | 28,50 | 18,40 | 49 |
| | 798 | 51,00 | 57,20 | 54,50 | 48,50 | 43,90 | 34,50 | 24,40 | 55 |
| | 855 | 53,00 | 59,20 | 56,50 | 50,50 | 45,90 | 36,50 | 26,40 | 57 |
| | 938 | 55,00 | 61,20 | 58,50 | 52,50 | 47,90 | 38,50 | 28,40 | 59 |

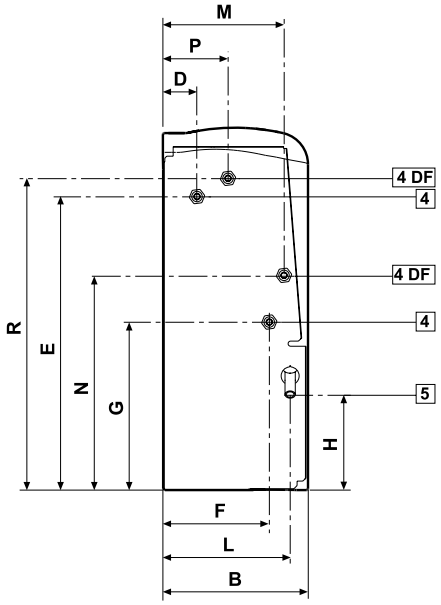
| Octave band | | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | GLOBAL |
|---|---|---|---|---|---|---|---|---|---|
| Model | Qa m3/h | Lw dB | Lw dB | Lw dB | Lw dB | Lw dB | Lw dB | Lw dB | Lw dB(A) |
| 8 | 361 | 34,90 | 41,40 | 35,70 | 25,40 | 17,00 | 16,50 | 17,50 | 35 |
| | 497 | 38,70 | 45,20 | 42,00 | 33,20 | 26,50 | 19,60 | 16,60 | 42 |
| | 637 | 44,80 | 51,00 | 47,90 | 42,40 | 37,50 | 28,00 | 17,30 | 48 |
| | 706 | 48,80 | 55,00 | 51,90 | 46,40 | 41,50 | 32,00 | 21,30 | 52 |
| | 855 | 53,80 | 60,00 | 56,90 | 51,40 | 46,50 | 37,00 | 26,30 | 57 |
| | 938 | 55,80 | 62,00 | 58,90 | 53,40 | 48,50 | 39,00 | 28,30 | 59 |
| 9 | 389 | 33,80 | 40,00 | 37,00 | 28,40 | 21,40 | 14,90 | 11,90 | 37 |
| | 470 | 37,80 | 44,00 | 41,00 | 32,40 | 25,40 | 18,90 | 15,90 | 41 |
| | 605 | 43,00 | 49,60 | 46,40 | 40,30 | 34,90 | 25,10 | 17,00 | 47 |
| | 785 | 51,20 | 56,90 | 53,60 | 49,60 | 45,20 | 37,10 | 24,80 | 55 |
| | 855 | 53,20 | 58,90 | 55,60 | 51,60 | 47,20 | 39,10 | 26,80 | 57 |
| | 938 | 55,20 | 60,90 | 57,60 | 53,60 | 49,20 | 41,10 | 28,80 | 59 |
| 9M | 389 | 33,80 | 40,00 | 37,00 | 28,40 | 21,40 | 14,90 | 11,90 | 37 |
| | 470 | 37,80 | 44,00 | 41,00 | 32,40 | 25,40 | 18,90 | 15,90 | 41 |
| | 605 | 43,00 | 49,60 | 46,40 | 40,30 | 34,90 | 25,10 | 17,00 | 47 |
| | 785 | 51,20 | 56,90 | 53,60 | 49,60 | 45,20 | 37,10 | 24,80 | 55 |
| | 855 | 53,20 | 58,90 | 55,60 | 51,60 | 47,20 | 39,10 | 26,80 | 57 |
| | 938 | 55,20 | 60,90 | 57,60 | 53,60 | 49,20 | 41,10 | 28,80 | 59 |
| 95 | 389 | 35,70 | 42,10 | 38,90 | 30,70 | 23,60 | 17,00 | 13,90 | 39 |
| | 488 | 40,70 | 47,10 | 43,90 | 35,70 | 28,60 | 22,00 | 18,90 | 44 |
| | 615 | 46,20 | 52,20 | 49,60 | 43,50 | 37,80 | 28,50 | 20,20 | 50 |
| | 814 | 54,30 | 59,80 | 56,70 | 52,40 | 48,00 | 40,20 | 27,70 | 58 |
| | 855 | 55,30 | 60,80 | 57,70 | 53,40 | 49,00 | 41,20 | 28,70 | 59 |
| | 938 | 57,30 | 62,80 | 59,70 | 55,40 | 51,00 | 43,20 | 30,70 | 61 |
| 11 | 530 | 39,90 | 46,80 | 43,00 | 37,60 | 32,90 | 23,60 | 18,00 | 44 |
| | 642 | 44,90 | 51,80 | 48,00 | 42,60 | 37,90 | 28,60 | 23,00 | 49 |
| | 846 | 49,60 | 55,30 | 53,00 | 48,50 | 45,30 | 39,30 | 30,80 | 54 |
| | 1.022 | 53,60 | 59,30 | 57,00 | 52,50 | 49,30 | 43,30 | 34,80 | 58 |
| | 1.280 | 58,60 | 64,60 | 61,30 | 58,40 | 55,20 | 50,60 | 45,40 | 64 |
| | 1.396 | 60,60 | 66,60 | 63,30 | 60,40 | 57,20 | 52,60 | 47,40 | 66 |
| 11M | 530 | 39,90 | 46,80 | 43,00 | 37,60 | 32,90 | 23,60 | 18,00 | 44 |
| | 642 | 44,90 | 51,80 | 48,00 | 42,60 | 37,90 | 28,60 | 23,00 | 49 |
| | 846 | 49,60 | 55,30 | 53,00 | 48,50 | 45,30 | 39,30 | 30,80 | 54 |
| | 1.022 | 53,60 | 59,30 | 57,00 | 52,50 | 49,30 | 43,30 | 34,80 | 58 |
| | 1.280 | 58,60 | 64,60 | 61,30 | 58,40 | 55,20 | 50,60 | 45,40 | 64 |
| | 1.396 | 60,60 | 66,60 | 63,30 | 60,40 | 57,20 | 52,60 | 47,40 | 66 |

## 6 OVERALL DIMENSIONS

### Overall dimensions of FLI/CLI, wall-mounted with cabinet, vertical air flow

**1** Clearance for water connection
**2** Slots for installation on the wall
**3** Clearance for electrical connections
**4** Standard heat exchanger water connections
**4DF** Water connection for 1-row additional heat exchanger model DF
**5** Drain outlet

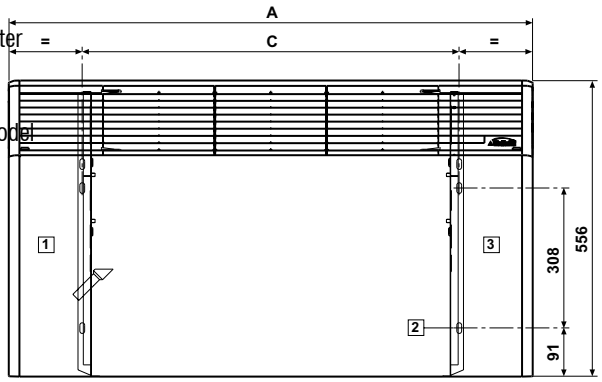


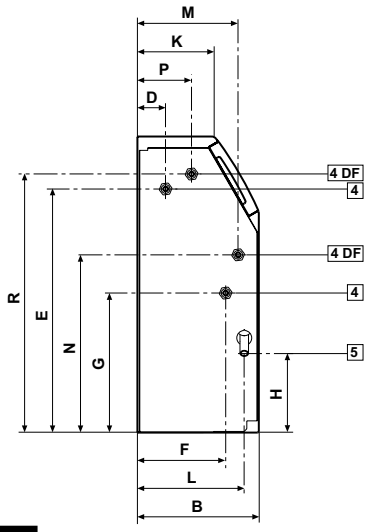




| ESTRO i FL | ESTRO i CL | A | B | C | D | E | F | G | H | L | M | N | P | R | 4 | 4DF | 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1 - 4M** | **1 - 4M** | 774 | 226 | 498 | 51 | 458 | 163 | 263 | 149 | 198 | 187 | 335 | 99 | 486 | 1 / 2" | 1 / 2" | 16 |
| **5 - 6M** | **5 - 6M** | 984 | 226 | 708 | 51 | 458 | 163 | 263 | 149 | 198 | 187 | 335 | 99 | 486 | 1 / 2" | 1 / 2" | 16 |
| **7 - 9M** | **7 - 9M** | 1194 | 226 | 918 | 51 | 458 | 163 | 263 | 149 | 198 | 187 | 335 | 99 | 486 | 1 / 2" | 1 / 2" | 16 |
| **95** | **ND** | 1194 | 251 | 918 | 48 | 497 | 185 | 259 | 155 | 220 | 195 | 348 | 120 | 478 | 3 / 4" | 1 / 2" | 16 |
| **11 - 11M** | **ND** | 1404 | 251 | 1128 | 48 | 497 | 185 | 259 | 155 | 220 | 195 | 348 | 120 | 478 | 3 / 4" | 1 / 2" | 16 |

### Overall dimensions of FA, wall-mounted with cabinet, inclined front air flow

**1** Clearance for water connections
**2** Slots for installation on the wall
**3** Clearance for electrical connections
**4** Standard heat exchanger water connections
**4DF** Water connection for 1-row additional heat exchanger model DF
**5** Drain outlet



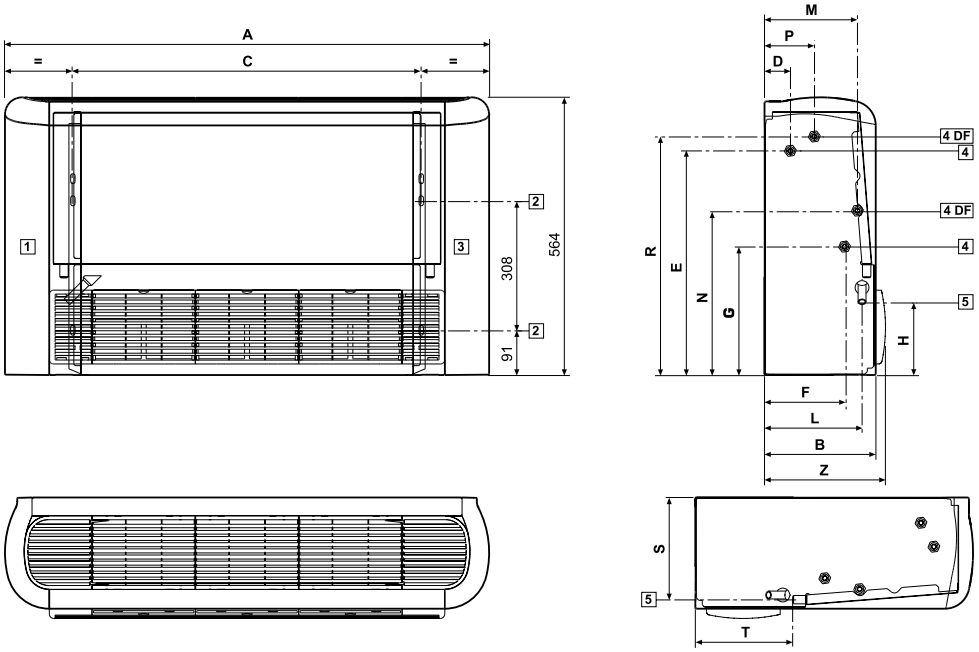




| ESTRO i FA | A | B | C | D | E | F | G | H | K | L | M | N | P | R | 4 | 4DF | 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1 - 4M** | 774 | 228 | 498 | 53 | 458 | 166 | 263 | 149 | 145 | 198 | 187 | 335 | 99 | 486 | 1 / 2" | 1 / 2" | 16 |
| **5 - 6M** | 984 | 228 | 708 | 53 | 458 | 166 | 263 | 149 | 145 | 198 | 187 | 335 | 99 | 486 | 1 / 2" | 1 / 2" | 16 |
| **7 - 9M** | 1194 | 228 | 918 | 53 | 458 | 166 | 263 | 149 | 145 | 198 | 187 | 335 | 99 | 486 | 1 / 2" | 1 / 2" | 16 |
| **11- 11M** | 1404 | 253 | 1128 | 50 | 497 | 188 | 259 | 155 | 155 | 220 | 195 | 348 | 120 | 478 | 3 / 4" | 1 / 2" | 16 |

## 6 OVERALL DIMENSIONS

### Overall dimensions of FU, floor/ceiling mounted

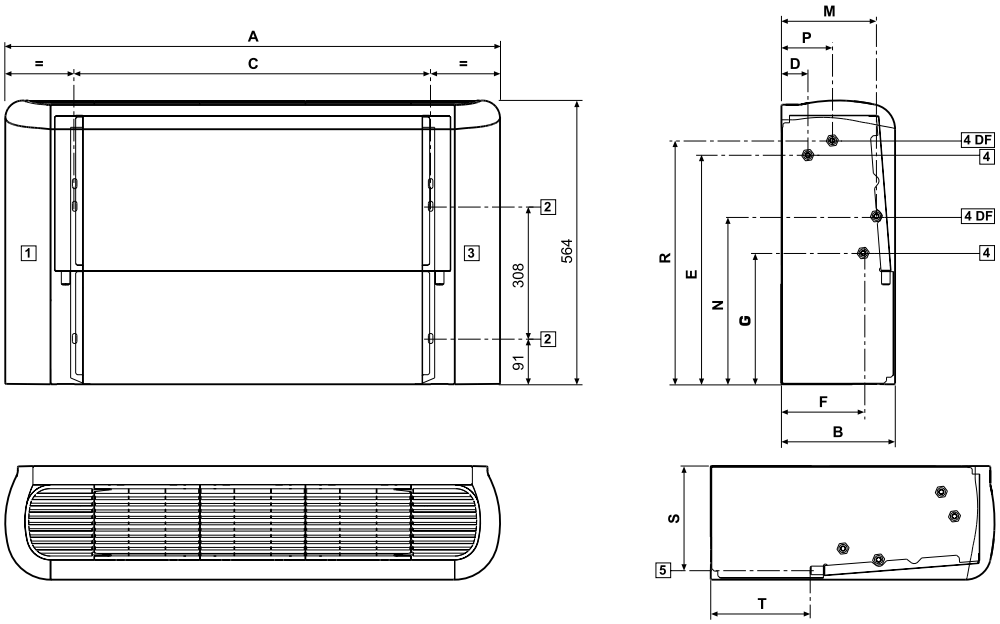
**1** Clearance for water connection
**2** Slots for installation on the wall
**3** Clearance for electrical connections
**4** Standard heat exchanger water connections
**4DF** Water connection for 1-row additional heat exchanger model DF
**5** Drain outlet




| ESTRO i FU | A | B | C | D | E | F | G | H | L | M | N | P | R | S | T | Z | 4 | 4DF | 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1 - 4M** | 774 | 226 | 498 | 51 | 458 | 163 | 263 | 149 | 198 | 187 | 335 | 99 | 486 | 208 | 198 | 246 | 1 / 2" | 1 / 2" | 16 |
| **5 - 6M** | 984 | 226 | 708 | 51 | 458 | 163 | 263 | 149 | 198 | 187 | 335 | 99 | 486 | 208 | 198 | 246 | 1 / 2" | 1 / 2" | 16 |
| **7 - 9M** | 1194 | 226 | 918 | 51 | 458 | 163 | 263 | 149 | 198 | 187 | 335 | 99 | 486 | 208 | 198 | 246 | 1 / 2" | 1 / 2" | 16 |
| **95** | 1194 | 251 | 918 | 48 | 497 | 185 | 259 | 155 | 220 | 195 | 348 | 120 | 478 | 234 | 208 | 271 | 3 / 4" | 1 / 2" | 16 |
| **11 - 11M** | 1404 | 251 | 1128 | 48 | 497 | 185 | 259 | 155 | 220 | 195 | 348 | 120 | 478 | 234 | 208 | 271 | 3 / 4" | 1 / 2" | 16 |

### Overall dimensions of FPI ceiling mounted with cabinet, rear air intake

**1** Clearance for water connections
**2** Slots for installation on the wall
**3** Clearance for electrical connections
**4** Standard heat exchanger water connections
**4DF** Water connection for 1-row additional heat exchanger model DF
**5** Drain outlet

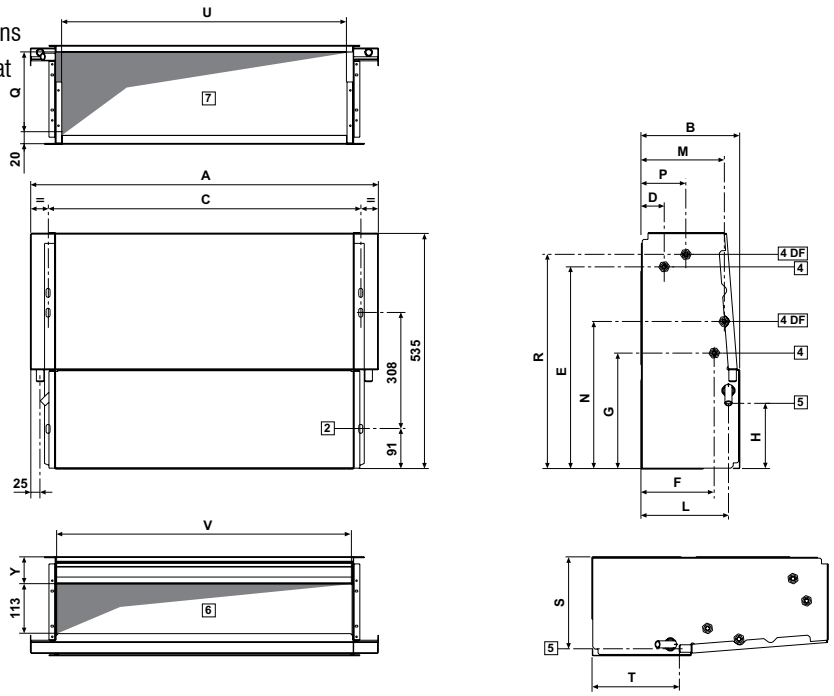



| ESTRO i FP | A | B | C | D | E | F | G | M | N | P | R | S | T | 4 | 4DF | 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1 - 4M** | 774 | 226 | 498 | 51 | 458 | 163 | 263 | 187 | 335 | 99 | 486 | 208 | 198 | 1 / 2" | 1 / 2" | 16 |
| **5 - 6M** | 984 | 226 | 708 | 51 | 458 | 163 | 263 | 187 | 335 | 99 | 486 | 208 | 198 | 1 / 2" | 1 / 2" | 16 |
| **7 - 9M** | 1194 | 226 | 918 | 51 | 458 | 163 | 263 | 187 | 335 | 99 | 486 | 208 | 198 | 1 / 2" | 1 / 2" | 16 |
| **95** | 1194 | 251 | 918 | 48 | 497 | 185 | 259 | 195 | 348 | 120 | 478 | 234 | 208 | 3 / 4" | 1 / 2" | 16 |
| **11 - 11M** | 1404 | 251 | 1128 | 48 | 497 | 185 | 259 | 195 | 348 | 120 | 478 | 234 | 208 | 3 / 4" | 1 / 2" | 16 |

# 6 OVERALL DIMENSIONS

## Overall dimensions of FCI horizontal/vertical recess mounted

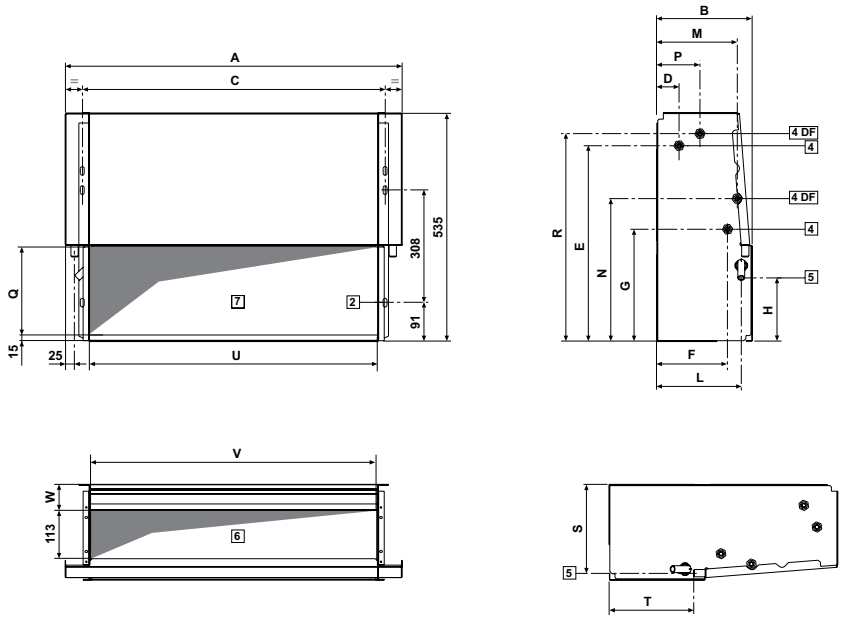
**2** Slots for installation on the wall
**4** Standard heat exchanger water connections
**4DF** Water connection for 1-row additional heat exchanger model DF
**5** Drain outlet
**6** Air outlet
**7** Air intake




| ESTRO i FC | A | B | C | D | E | F | G | H | L | M | N | P | Q | R | S | T | U | V | Y | 4 | 4DF | 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1 - 4M** | 584 | 224 | 498 | 51 | 458 | 163 | 263 | 149 | 198 | 187 | 335 | 99 | 189 | 486 | 208 | 198 | 436 | 464 | 61 | 1 / 2" | 1 / 2" | 16 |
| **5 - 6M** | 794 | 224 | 708 | 51 | 458 | 163 | 263 | 149 | 198 | 187 | 335 | 99 | 189 | 486 | 208 | 198 | 646 | 674 | 61 | 1 / 2" | 1 / 2" | 16 |
| **7 - 9M** | 1004 | 224 | 918 | 51 | 458 | 163 | 263 | 149 | 198 | 187 | 335 | 99 | 189 | 486 | 208 | 198 | 856 | 884 | 61 | 1 / 2" | 1 / 2" | 16 |
| **95** | 1004 | 249 | 918 | 48 | 497 | 185 | 259 | 155 | 220 | 195 | 348 | 120 | 215 | 478 | 234 | 208 | 856 | 884 | 67 | 3 / 4" | 1 / 2" | 16 |
| **11 - 11M** | 1214 | 249 | 1128 | 48 | 497 | 185 | 259 | 155 | 220 | 195 | 348 | 120 | 215 | 478 | 234 | 208 | 1066 | 1094 | 67 | 3 / 4" | 1 / 2" | 16 |

## Overall dimensions of FFI, horizontal / vertical recess mounted, front air intake

**2** Slots for installation on the wall
**4** Standard heat exchanger water connections
**4DF** Water connection for 1-row additional heat exchanger model DF
**5** Drain outlet
**6** Air outlet
**7** Air intake

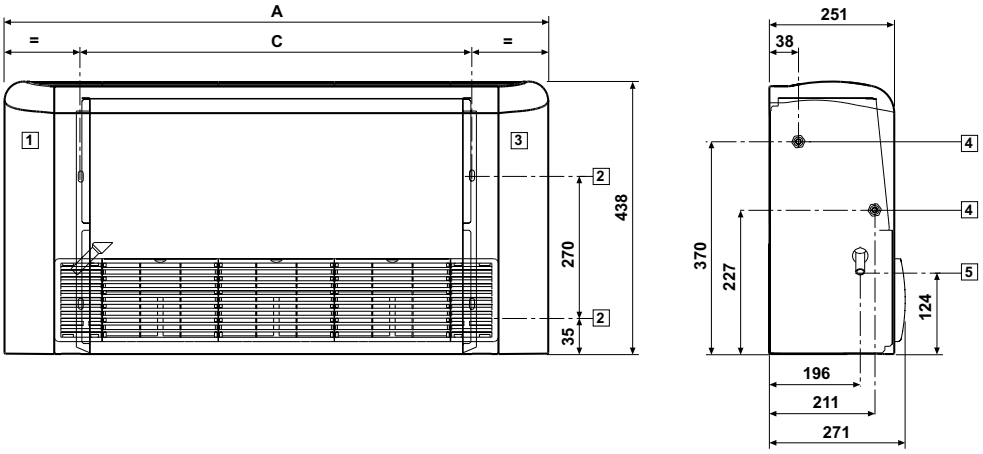



| ESTRO i FF | A | B | C | D | E | F | G | H | L | M | N | P | Q | R | S | T | U | V | Y | 4 | 4DF | 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1 - 4M** | 584 | 224 | 498 | 51 | 458 | 163 | 263 | 149 | 198 | 187 | 335 | 99 | 189 | 486 | 208 | 198 | 436 | 464 | 61 | 1 / 2" | 1 / 2" | 16 |
| **5 - 6M** | 794 | 224 | 708 | 51 | 458 | 163 | 263 | 149 | 198 | 187 | 335 | 99 | 189 | 486 | 208 | 198 | 646 | 674 | 61 | 1 / 2" | 1 / 2" | 16 |
| **7 - 9M** | 1004 | 224 | 918 | 51 | 458 | 163 | 263 | 149 | 198 | 187 | 335 | 99 | 189 | 486 | 208 | 198 | 856 | 884 | 61 | 1 / 2" | 1 / 2" | 16 |
| **95** | 1004 | 249 | 918 | 48 | 497 | 185 | 259 | 155 | 220 | 195 | 348 | 120 | 215 | 478 | 234 | 208 | 856 | 884 | 67 | 3 / 4" | 1 / 2" | 16 |
| **11 - 11M** | 1214 | 249 | 1128 | 48 | 497 | 185 | 259 | 155 | 220 | 195 | 348 | 120 | 215 | 478 | 234 | 208 | 1066 | 1094 | 67 | 3 / 4" | 1 / 2" | 16 |

## 6 OVERALL DIMENSIONS

### Overall dimensions of FBI, floor /ceiling mounted with low cabinet, front air intake

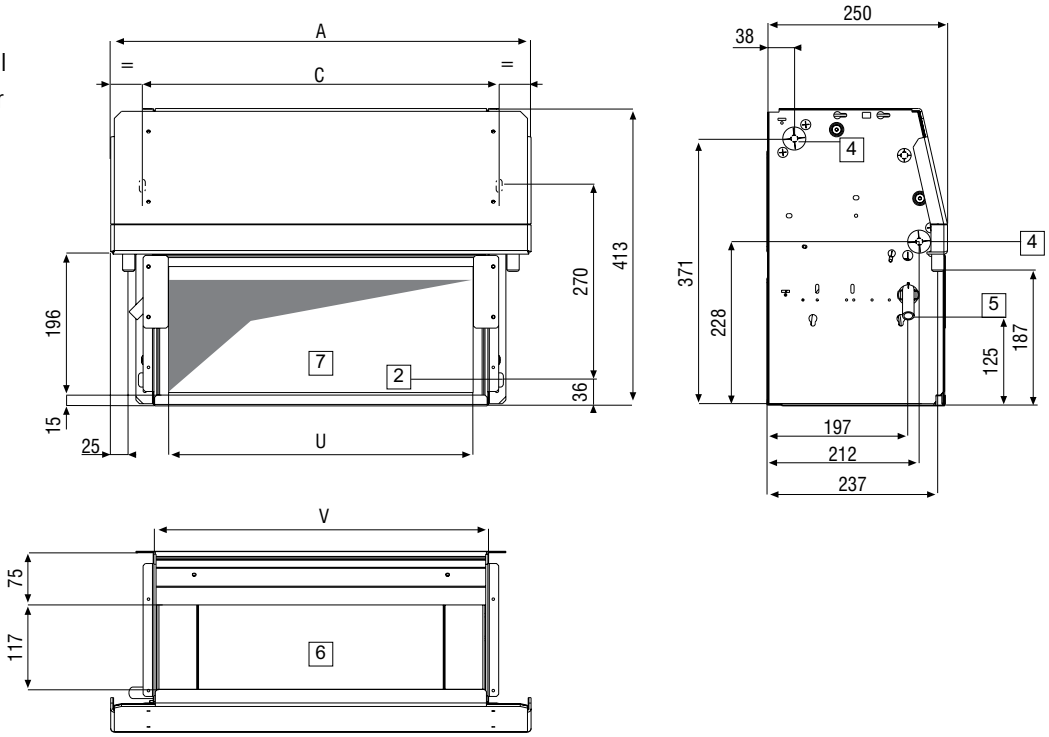
**1** Clearance for water connections
**2** Slots for installation on the wall
**3** Clearance for electrical connections
**4** Standard heat exchanger water connection
5 **Drain outlet**




| ESTRO i FB | A | C | 4 | 5 |
|---|---|---|---|---|
| **1 - 4M** | 774 | 498 | 1 / 2" | 16 |
| **5 - 6M** | 984 | 708 | 1 / 2" | 16 |
| **7 - 9M** | 1194 | 918 | 1 / 2" | 16 |

### Overall dimensions of FBCI, horizontal / vertical recess mounted, front air intake

**2** Slots for installation on the wall
**4** Standard heat exchanger water connection
**5** Drain outlet
**6** Air outlet
**7** Air intake



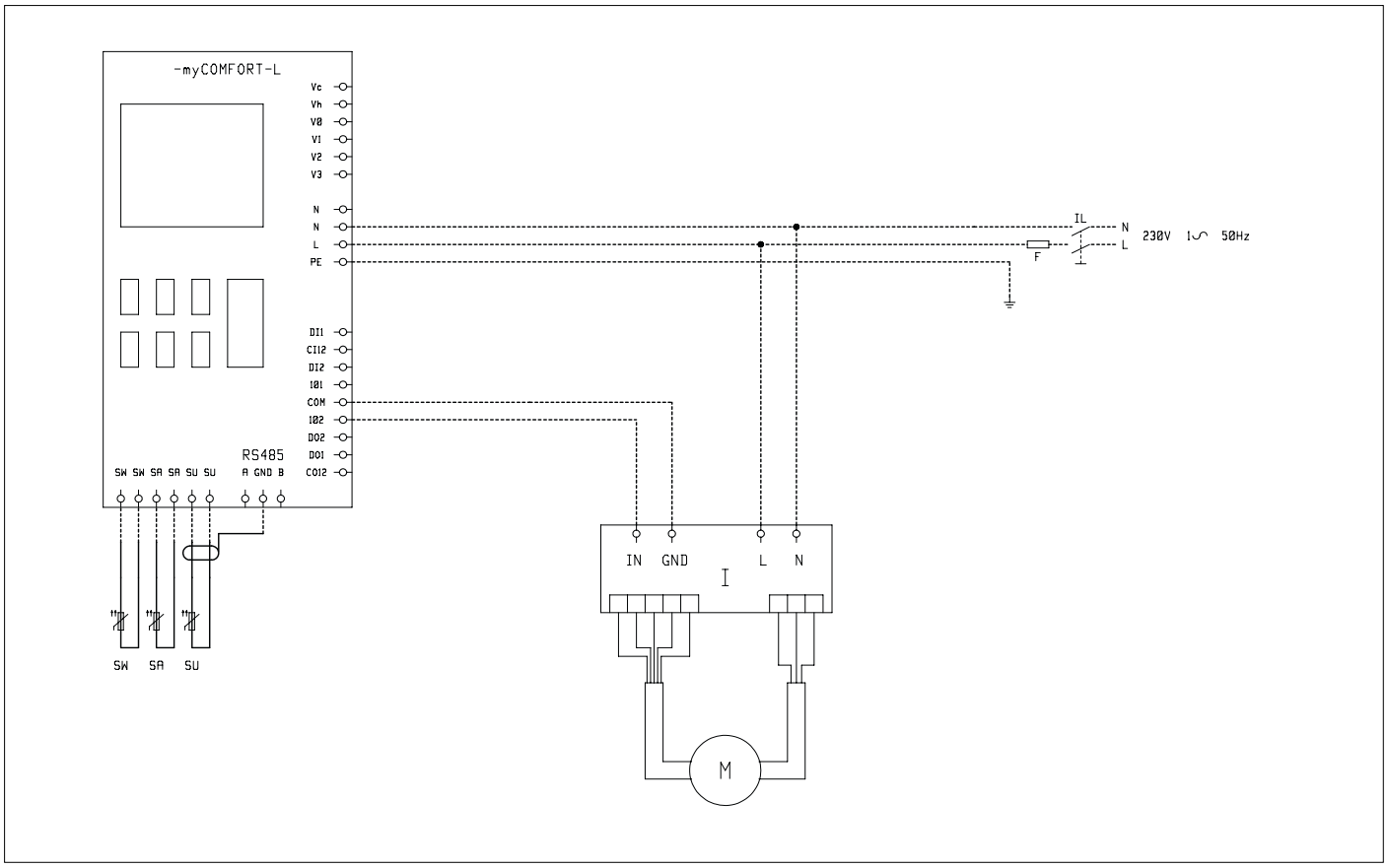

| ESTRO i FBC | A | C | U | V | 4 | 5 |
|---|---|---|---|---|---|---|
| **1 - 4M** | 584 | 498 | 423 | 464 | 1 / 2" | 16 |
| **5 - 6M** | 794 | 708 | 633 | 674 | 1 / 2" | 16 |
| 7 - 9M | 1004 | 918 | 843 | 884 | 1 / 2" | 16 |

# 7 WIRING DIAGRAMS

**MYCOMFORT LARGE**
Wall-mounted microprocessor control

Key to symbols used in wiring diagrams

| | |
|---|---|
| **Vo** | Extra low speed |
| **V1** | Minimum speed |
| **V2** | Medium speed |
| **V3** | Maximum speed |
| **L** | Phase |
| **PE** | Ground |
| **N** | Neutral |
| **RE** | Heating element |
| **SW** | Water sensor |
| **SA** | Air sensor |
| **SU** | Humidity sensor |
| **DI1** | Digital 1 input |
| **DI2** | Digital 2 input |
| **CI12** | Digital input common |
| **A/B/GND** | RS 485 |
| **F** | Fuse (not supplied) |
| **IL** | Circuit breaker (not supplied) |
| **VC** | Solenoid valve - Cooling |
| **VH** | Solenoid valve - Heating |
| **.....** | Electrical connections to be made by installer |
| **101** | 0-10V 1 Output |
| **COM** | 0-10V Output Common |
| **102** | 0-10V 2 Output |
| **DO2** | Digital 2 output |
| **DO1** | Digital 1 output |
| **CO12** | Digital output Common |

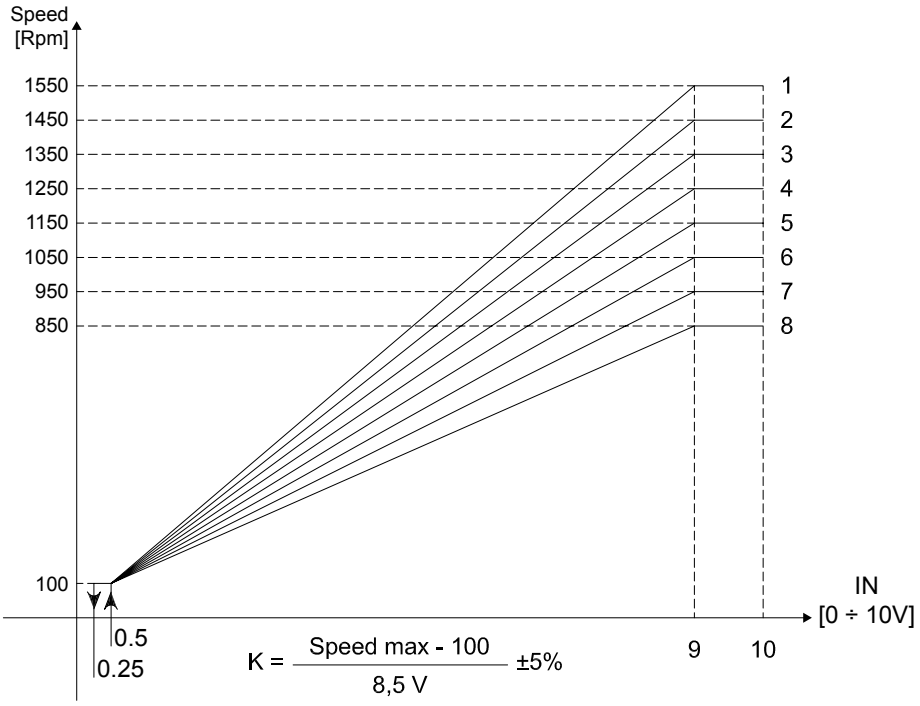



For each fan coil a switch (IL) should be mounted on the power supply, with opening contacts at a distance of at least 3 mm and a suitable protection fuse (F) .

# 8 VERSIONS WITH SEPARATE INVERTER

## 8.1 INVERTER REGULATION PROCEDURE

The curve setting can be performed in the factory (and modified on site, if necessary) by arranging the dip switched as shown in the following figure:

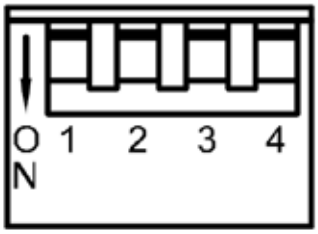



$$K = \frac{\text{Speed max} - 100}{8{,}5\ \text{V}} \pm 5\%$$

Speed = (Vin - 0.5)* K+100

**TABLE OF SPEED RAMP SELECTION**

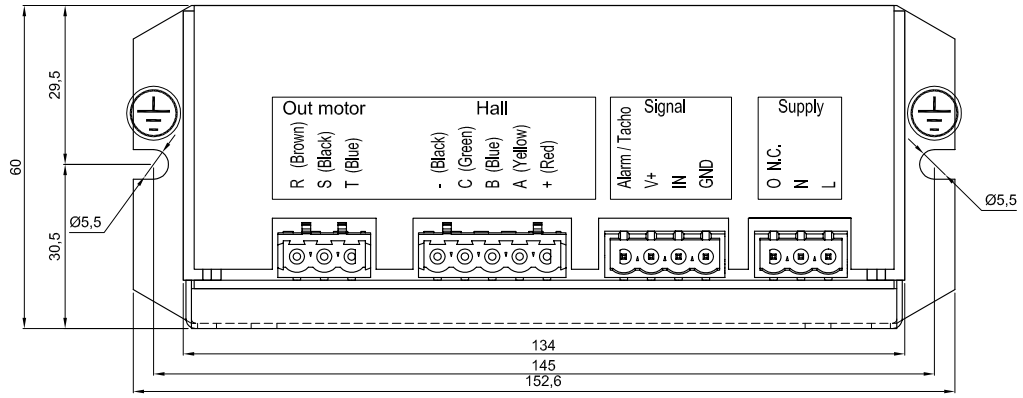
| No. | MAX speed | DIP 1 | DIP 2 | DIP 3 | DIP 4 |
|---|---|---|---|---|---|
| 1 | 1550 rpm | OFF | OFF | OFF | - |
| 2 | 1450 rpm | ON | OFF | OFF | - |
| 3 | 1350 rpm | OFF | ON | OFF | - |
| 4 | 1250 rpm | ON | ON | OFF | - |
| 5 | 1150 rpm | OFF | OFF | ON | - |
| 6 | 1050 rpm | ON | OFF | ON | - |
| 7 | 950 rpm | OFF | ON | ON | - |
| 8 | 850 rpm | ON | ON | ON | - |

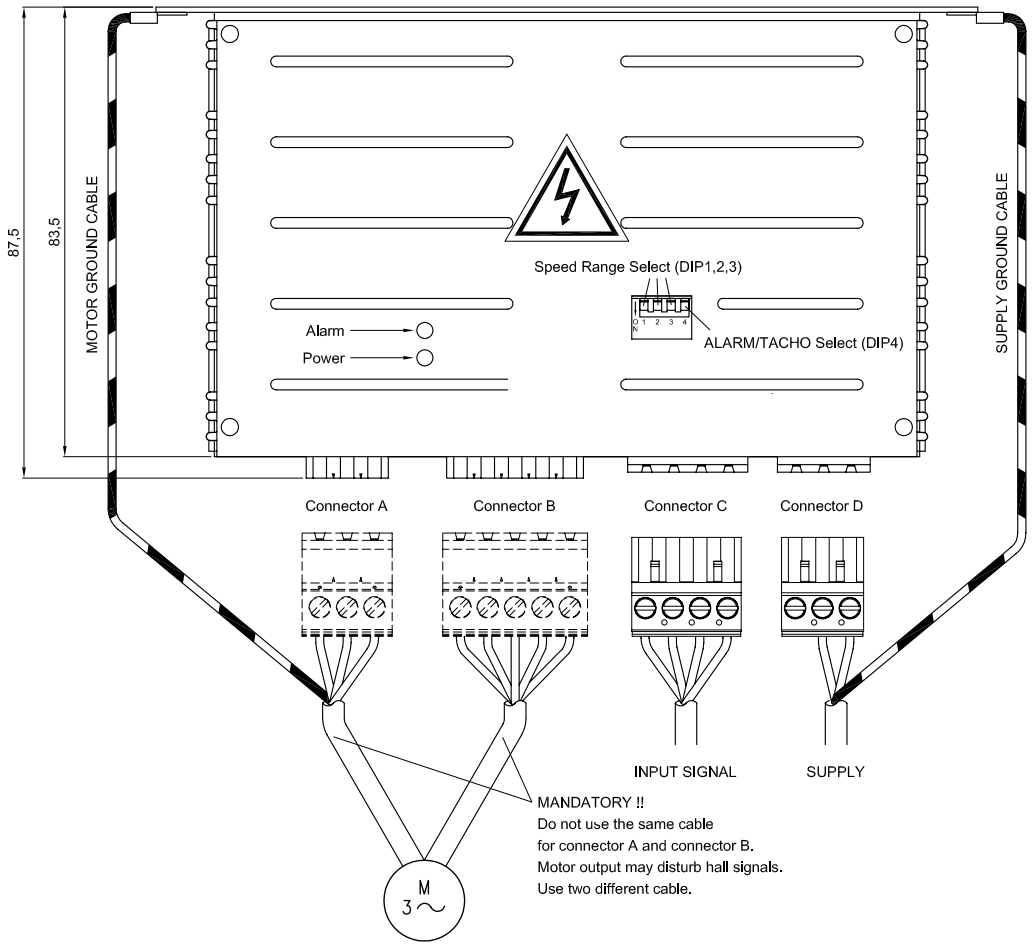



**Note:** Generally the max. speed (1550 rpm) is not used

# 8 VERSIONS WITH SEPARATE INVERTER

## 8.2 INVERTER BOARD




## 8.3 ALARMS

Alarm indication Table

| ALARM TYPES | LED INDICATIONS | ALARM INDICATIONS DIP4 = OFF | ACTIONS | NOTES |
|---|---|---|---|---|
| OVER TEMPERATURE | Blink Alarm led 3s ON 0,5s OFF | Blink Alarm output 3s ON 0,5s OFF | MOTOR OFF | Autorestart Alarm. After about 1,5 min of persistance condition the Alarm is set permanently: led ON and Alarm ON and system is in STOP mode |
| OVER VOLTAGE | | | | |
| UNDERVOLTAGE | | | | |
| OVER CURRENT | | | | |
| OVER LOAD | Blink Alarm led 0,5s ON 0,5s OFF | Blink Alarm output 0,5s ON 0,5s OFF | SPEED REDUCTION | POWER LIMITING |
| SAFETY CONTROL | | | | TEMPERATURE LIMITING |
| STOP | ALARM LED ON PERMANENTLY | ALARM OUT ON PERMANENTLY | MOTOR OFF | SET 0V ON INPUT TO RESET THE ALARMS |

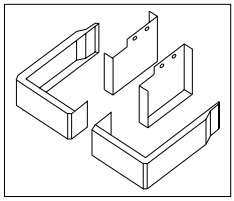
## 9 ACCESSORIES

**MYCOMFORT LARGE - Wall-mounted microprocessor control, GALLETTI model MYCOMFORT LARGE** having the following main features:

- room air temperature reading and adjustment
- room humidity reading and adjustment
- water temperature reading (water sensor as an optional)
- manual and automatic adjustment of fan speed
- manual and automatic switching of heating and cooling mode depending on the water temperature within the heat exchanger or on the room temperature, with a neutral zone that can be selected in the range from 2° to 5°C
- clock and hourly timer-programmed operation
- 2 analogue outputs for controlling modulating devices 0-10V
- 2 digital outputs for controlling (On/Off) external devices (no-voltage contacts)
- serial port for Bus connection

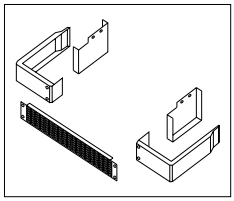
The controller is equipped with a large display (3”) to show and set all the functions of the unit.
Using the installation kit available, myComfort can be mounted on the unit.

**ZA - Pair of support covering feet for FAI models**



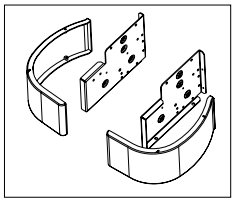
The ZA covering feet, designed for the installation on éstro FAI models are supplied in pairs and comprise supports for fastening to the base unit and outer coverings for fastening to the cabinet. They are used to conceal the plumbing (pipes leading up from the floor) and in cases where the fan coil unit cannot be anchored to the wall. The height of covering feet is 100 mm.

**ZAG - Pair of support covering feet with front grille for FA models**



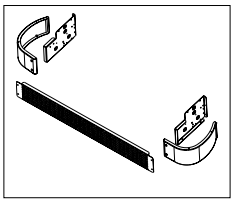
The ZAG covering feet, designed for the installation on éstro FAI models are supplied in pairs and comprise supports for fastening to the base unit, outer coverings for fastening to the cabinet and the front covering grille. They are used to conceal the plumbing (pipes leading up from the floor) and in cases where the fan coil unit cannot be anchored to the wall. The height of covering feet is 100 mm.

**ZL / ZC Pair of support covering feet for FLI, CLI models**



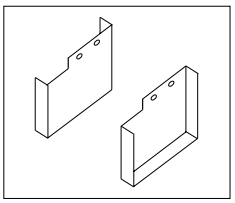
The ZL, ZC covering feet, designed for the installation on éstro FLI, CLI models are supplied in pairs and comprise supports for fastening to the base unit and outer coverings for fastening to the cabinet.
They are used to conceal the plumbing (pipes leading up from the floor) and in cases where the fan coil unit cannot be anchored to the wall. The height of covering feet is 100 mm.

**ZLG / ZCG - Pair of support covering feet with front grille for FLI, CLI models**



The ZLG, ZCG covering feet, designed for the installation on éstro FLI, CLI models are supplied in pairs and comprise supports for fastening to the base unit, outer coverings for fastening to the cabinet and the front covering grille.
They are used to conceal the plumbing (pipes leading up from the floor) and in cases where the fan coil unit cannot be anchored to the wall. The height of covering feet is 100 mm.

**D - Support brackets for FCI vertical installation models**

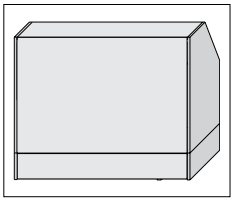


The D support brackets are supplied in pairs and combined to the recess wall mounted éstro fan coils FCI in cases where the fan coil unit cannot be anchored to the wall.
The height of the support brackets is 100 mm.

**KBESTE KIT for on-board installation on ESTRO BLDC (1 air probe + bracket + on-board LCD controller frame + wiring kit)**

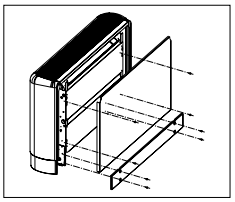
- The LCD controller can be installed directly (on both sides) on ESTRO BLDC units using the controller kit provided, which contains:
- Remote air temperature probe (cable length 1.5 m)
- LCD frame (to be added or replaced in case of flap)
- Support for installation on the indoor unit
- Frame
- Sensor holder trap and clamp

**PVA - Painted rear covering panel for FAI models**



This panel is suitable for wall mounted FAI fan coils with apparent rear part. For instance: installation against glass walls. The kit includes an upper rear covering panel and a lower rear covering panel. The fan coils using a PVA rear covering panel cannot be wall mounted.

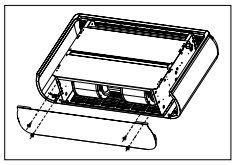
**PVL / PVC - Painted rear covering panel for FLI, CLI and FUI models**



This panel is suitable for wall mounted FAI, CLI and FUI fan coils with apparent rear part. For instance: installation against glass walls. The kit includes an upper rear covering panel and a lower rear covering panel. The fan coils using a PVL-PVC rear covering panel cannot be wall mounted.

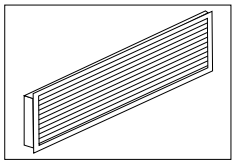
## 9 ACCESSORIES

**PH - Painted rear covering panel for horizontal installation models FUI**



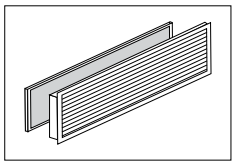
The painted rear panel PH is supplied exclusively for ceiling mounted éstro FUI fan coils with apparent rear part in order to cover the technical compartments (plumbing and electrical). It is used to cover the technical compartments. The fan coils with rear panel can work in heating mode only.

**GE+C - Aluminium air intake grille with subframe**



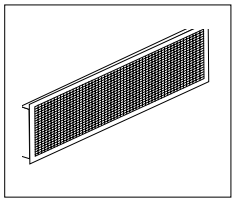
The external air intake louver with anodised aluminium fixed fins, complete with anodised aluminium subframe is usually combined with external air intake louvers and is designed for wall mounting.

**GEF+C - Aluminium air intake grille with subframe and filter**



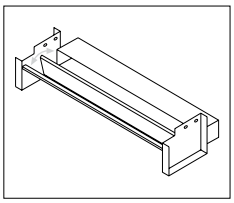
The air intake louvers with anodised aluminium fixed fins complete with washable acrylic fibre filter and galvanised sheet subframe, is usually combined with recess mounted fan coils.

**GM+C - Anodised aluminium double-row finned air outlet grille, complete with subframe**



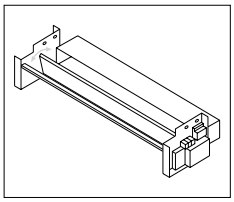
Anodized aluminium air outlet grille with 2-row swinging fins complete with galvanized sheet steel subframe. It is usually combined with recessed mounted fan coils.

**S / SC - Manual external air intake louver**



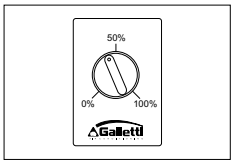
The manual external air intake louver is designed to allow frequent air renewals directly from the fan coil. The quantity of renewal air is filtered and heat treated by the fan coil and manually adjusted by means of the flap located inside. This louver can be used on all éstro BLDC models except the floor mounted FU version. The installation of a pair of covering feet (ZL for FLI fan coils and ZA for FAI fan coils) is required, when the louver is mounted on fan coil units with cabinet (FLI, FAI and FPI ceiling mounted).

**SM / SM-C - Motor-driven external air intake louver**



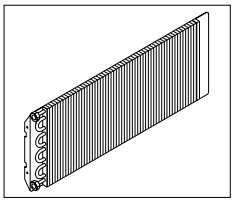
The motor driven external air intake louver is designed to allow frequent air renewals directly from the fan coil. The quantity of filtered and heat treated external air is proportionally controlled from 0 to 100% by means of a servomotor located inside.
The SM - SM-C kit is complete with servomotor (protection rating IP54, 24 V supply voltage) and 230V - 24V transformer. The automatic closure and opening of the louver can be obtained by means of external auxiliary contacts (not supplied) as anti-freeze thermostats, timers, etc. by connecting in parallel several servomotors to a single opening-closing control. The louver should be coupled to one of the following control panels (optional): CSB - CSB-C (installation on the unit) and CSD (wall recess mounted), permitting to close and open the louver from 0 to 100%.
This louver can be used on all éstro BLDC models except the floor mounted FUI version. The installation of a pair of covering feet (ZL - ZC for FLI and CLI fan coils and ZA for FAI fan coils) is required, when the louver is mounted on fan coil units with cabinet (FLI, CLI, FAI and FPI ceiling mounted).

**CSD - Recess mounted control for opening and closing the SM motor-driven regulating valve**



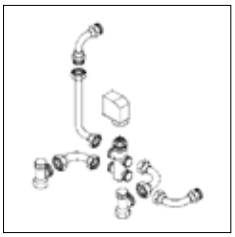

Designed for wall recess mounting on the opposite side of the fan coil control panel, it controls the proportional opening and closing of the motor-driven regulating louver SM - SM-C (from 0 to 100%).

**DF - Additional heat exchanger for 4-pipe systems (hot water circuit)**



Additional heat exchanger made with copper piping and aluminium fins: it is suitable for 4-pipe systems and is connected to the heating circuit.
The heat exchanger comes complete with air vent valves on the system connection openings.
The kit comes compete with locking bracket to avoid the manifold rotation during plumbing connection opereations. The performances of the heat exchanger mounted on the éstro BLDC fan coils are certified by Eurovent which guarantees the reliability of the data shown on this manual.

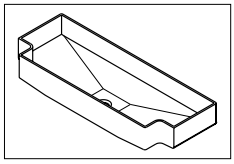
**VK - ON-OFF 3-way motor driven valve, with hydraulic kit**



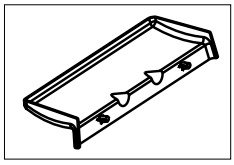
The ON/OFF motor driven VK 3-way valve/4 connections kit connected to the control panel for éstro fan coils, controls the room temperature by stopping the water flow through the heat exchanger. VK kit is available in various configurations for all models of éstro fan coils with standard (VK S) or additional DF (VK DF) heat exchanger, as shown in the table below:
The kit includes:
brass 3-way valve / 4 connections with built-in by-pass, maximum operating pressure 16 bar;
electrothermal actuator with the ON/OFF functions (total opening time 4 minutes), 230 V power supply;
Hydraulic kit for installing the valve on the heat exchanger, complete with 2 holders for balancing and regulating the fan coil unit.

## 9 ACCESSORIES

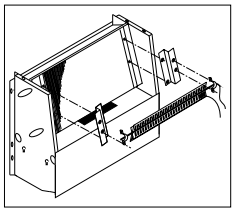
**BV - Auxiliary water drip tray for vertical installation units**
The auxiliary drip tray is used to collect the condensate from the valve and the pressure regulator. It can be used on all éstro fan coils.



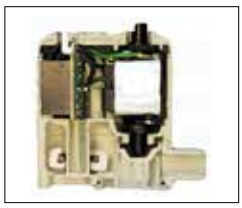
**BH - Auxiliary water drip tray for horizontal installation units**
The BH auxiliary drip tray is suitable for horizontal installation fan coils to collect the condensate from the ON/OFF 3-way valve (VK S accessory).



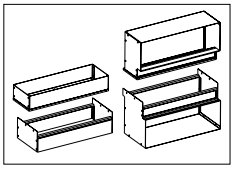
**RE - Electric heating element complete with installation kit, safety devices and power relay box**
Designed to meet the needs of supplement conventional water heating systems,the kit includes armoured electric heating elements, safety thermostats (with automatic/manual resetting) and power relay set.
The additional heating element should be coupled to the MYCOMFORT LARGE control panel.



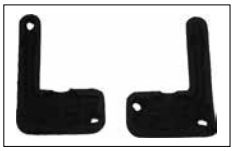
**KSC - Condensate drainage pump kit**
It permits the drainage of condensate in case of height differences. The pump is equipped with a check valve on the drain pipe and is capable to drain up to 8 l/h of water.



**RA / RM - Inlet and outlet connectors**
These accessories are designed for éstro BLDC FCI, FFI fan coils and are used for room ducts when the basic unit (éstro BLDC FCI) is placed within false ceilings and/or recess wall mounted. For each configuration, the inlet and outlet connectors are available in straight version and in 90° jointed version.



**GIVK - Valve insulation shell**
The GIVK valve insulation shell avoids the creation of condensate within the valve body. The plumbing connections are provided either on the right side or the left side.



**MCSWE - Water temperature sensor for microprocessor controls model MYCOMFORT**
Directly connected to the microprocessor control model **MYCOMFORT** to measure the water temperature through the heat exchanger.
If the temperature detected is less than 17°C, the unit will operate in the cooling mode and the controller will use the summertime temperature scale (19 - 31°C); if the temperature detected is greater than 37°C the unit will function in the heating mode and the controller will use the wintertime temperature scale (14 / 26°C). If the temperature detected by the probe is in the range of 17°C to 37°C, the controller will inhibit operation of the fan coil unit.

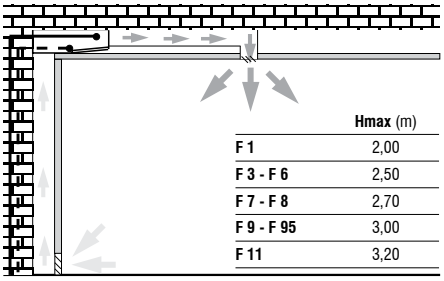
**MCSUE - Humidity sensor for on-board microprocessor controls model MYCOMFORT LARGE.**

## 10 INSTALLATION REQUIREMENTS

The fan coils should be installed in a position where the room can be cooled or heated evenly, on walls or ceilings able to withstand their weight.
It is advisable to install any accessories on the standard unit prior to positioning the latter.
For installation and use of accessories, please refer to the relative technical sheets.
To guarantee the proper functioning of the unit and access for routine and extraordinary maintenance purposes, it is necessary to comply with the minimum installation clearance requirements (see "overall dimensions" section).
In case of recess mounted units an access panel should be provided.

In order to avoid hot air stratification in rooms heated with ceiling mounted fan coils, it is recommended:
- not to exceed the "H" installation heights referred to the maximum operating speed as shown on the diagram;
- supply the units with moderately hot water (water inlet 50/60°C);
- provide the air intake from the lower part of the room, if possible.

Install any remote control panel in an easily accessible position allowing the user to set the functions while ensuring an accurate reading of the ambient temperature, if provided . You should avoid:



| | Hmax (m) |
|---|---|
| F 1 | 2,00 |
| F 3 - F 6 | 2,50 |
| F 7 - F 8 | 2,70 |
| F 9 - F 95 | 3,00 |
| F 11 | 3,20 |

- positions directly exposed to sunlight;
- positions exposed to direct currents of warm or cold air;
- placing obstacles that impede an accurate temperature reading.

During wintertime periods of quiescence, drain water from the system, to prevent ice from forming. If anti-freeze solutions are used, check for their freezing point using the table below.

| Glycol by weight (%) | Freezing temperature (°C) | Capacity adjustment | Pressure drop adjustment |
|---|---|---|---|
| 0 | 0 | 1,00 | 1,00 |
| 10 | -4 | 0,97 | 1,05 |
| 20 | -10 | 0,92 | 1,10 |
| 30 | -16 | 0,87 | 1.15 |
| 40 | -24 | 0,82 | 1,20 |

## 11 MAINTENANCE

ESTRO type fan coils do not have particular maintenance requirements: it is sufficient to periodically clean the air filter.
The motor requires no maintenance since it has self-lubricating bearings.
It is recommended to replace the air filter once a year, using an original replacement filter; the fan coil unit model is specified on the identification plate on the inside of the side panel.
Always consult the "Installation, use and maintenance manual" provided with the unit when undertaking maintenance and cleaning.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