ESTRO2006

ESTRO2006 fan coils technical manual

GB

COMPANY
WITH QUALITY SYSTEM
CERTIFIED BY DNV
=ISO 9001/2000=

Galletti
AIR CONDITIONING

INDEX

1	**MAIN FEATURES**	**2**
2	**VERSIONS AND MAIN COMPONENTS**	**3 - 4**
3	**AVAILABLE ACCESSORIES**	**5**
4	**RATED TECHNICAL FEATURES**	**6 - 7**
4.1	Fan coils with 1 heat exchanger (2 pipe system	6
4.2	FB-FBC low body fan coils (only 2 pipe systems)	6
4.3	Fan coils with 2 heat exchangers (4 pipe system)	7
4.4	Weight	7
5	**PERFORMANCES**	**8 - 21**
5.1	Cooling mode, models with 1 heat exchanger	8 - 9
5.2	Cooling mode FB - FB C low body (1 heat exchanger)	10 - 11
5.3	Cooling mode, models with 2 heat exchangers (4 pipe systems)	12 - 13
5.4	Heating mode, models with 1 heat exchanger	14 - 15
5.5	Heating mode FB - FB C low body (1 heat exchanger)	16 - 17
5.6	Heating mode models with 2 heat exchangers (4 pipe systems)	18 - 19
5.7	Ventilation features	20
5.8	Sound levels	21
6	**OVERALL DIMENSIONS**	**22 - 25**
7	**WIRING DIAGRAMS**	**26 - 29**
8	**ACCESSORIES**	**30 - 34**
9	**INSTALLATION SUGGESTIONS**	**35**
10	**MAINTENANCE**	**35**

DECLARATION OF CONFORMITY CE

Galletti S.p.A. with head office in via Romagnoli 12/a, 40010 Bentivoglio (BO) - Italy, declares herewith under its own responsibility that the estro fan coil units, models **FL**, **FU** and **FC,** terminal units for air-conditioning and heating systems, are produced in **accordance** with **EEC Directives 73/23, 89/392, 91/368, 93/44, 93/68, 89/336 ,98/37 and subsequent modifications**.
Bologna, 01/08/2001

Luigi Galletti

President

OPERATING LIMITS

- thermal fluid: water
- water temperature: from 5°C to 95°C
- maximum operating temperature: 10 bar
- air temperature: from 5°C to 43 °C
- power supply: +/- 10%

1 MAIN FEATURES

Relaying on the company's thirty-years experience acquired in the manufacture of fan coils, Galletti presents its new line ESTRO

New rounded shapes and new colors that are perfectly integrated with the current interior design criteria, fully complying with the architectural requirements.
New control panels for controlling and regulating the temperature by means of a microprocessor-based system, which adapts the operation of the fan coil automatically when room conditions change.

To carry out the ESTRO project, high quality materials have been selected, that together with the great care dedicated to the assembly of the main components grant the performances reliability and acoustic confort of the Galletti fan coil.

New constructive design that unifies the vertical mounted models with the horizontal mounted models:

- **F L** Wall mounted installation with decorative cabinet with vertical air outlet.
- **F A** Wall mounted installation, with decorative cabinet and inclined air outlet.
- **F U** Floor / ceiling installation with decorative cabinet, vertical air outlet and suction grille complete with filters.
- **F P** Ceiling installation with cabinet, with air outlet grilles and air suction from rear.
- **F B** Low-body (height 438 mm), floor standing with decorative cabinet with vertical air outlet and air suction grille complete with filters.
- **F BC** Low body concealed for horizontal and vertical installation, 412 mm height, air suction from front, heat insulated galvanised sheet casing. .
- **F C** Vertical and horizontal recessed, bearing structure made of thermally insulated galvanized steel sheet.
- **F F** Vertical or horizontal concealed with heat insulated galvanised sheet casing, front air suction.

The Galletti fan coil of the ESTRO series are certified by EUROVENT that grants the the reliability of the data reported in this technical catalogue.

The technical and dimensional data reported in this manual may be modified in view of any product improvement.

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2 VERSIONS AND MAIN COMPONENTS

FL wall mounted

- Covering cabinet made of thick steel sheet panel, (10/10 mm), with side parts and air outlet grille (orientable by 180°) made of ABS. The side doors allow the access to the technical space and to the control panel (option).
- Bearing structure made of thick galvanised steel sheet (up to 15/10 mm), insulated with self-extinguishing Class 1 heat insulating panels.
- High efficiency heat exchanger, made of copper pipe aluminium fins fixed to the pipes by means of mechanical expansion, equipped with brass manifolds and air purge valve. The units normally come with water connection on the left side, but the heat exchanger can be turned, on the field, by 180°.
- 3-speed electric motor installed on vibration damping-supports, complete with built in capacitor and thermal protection for the windings.
- 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.
- Washable air filter made of beehive polypropylene, installed on galvanized sheet frame with safety grille, easy to remove for maintenance operations. The filter is fitted to the covering cabinet by means of 1/4 round screws (not in size 12).

FA wall mounted

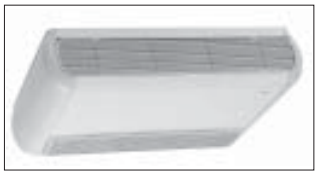
- Covering cabinet made of thick steel sheet panel, (10/10 mm), with side parts and air outlet grille (orientable by 180°) made of ABS. The side doors allow the access to the technical space and to the control panel (option).
- Bearing structure made of thick galvanised steel sheet (up to 15/10 mm), insulated with self-extinguishing Class 1 heat insulating panels.
- High efficiency heat exchanger, made of copper pipe aluminium fins fixed to the pipes by means of mechanical expansion, equipped with brass manifolds and air purge valve. The units normally come with water connection on the left side, but the heat exchanger can be turned, on the field, by 180°.
- 3-speed electric motor installed on vibration damping-supports, complete with built in capacitor and thermal protection for the windings.
- 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.
- Washable air filter made of beehive polypropylene, installed on galvanized sheet frame with safety grille, easy to remove for maintenance operations.

FP Ceiling installation

Supply and installation of GALLETTI model ESTRO FP floor/ceiling-mounted fan coil unit (air intake on rear, vertical air flow), mainly consisting of:

- 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 galvanised sheet steel (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 valves. The heat exchanger usually comes with water connections mounted on the left, but it can be turned by 180°.
- Three-speed electrical motor, mounted on vibration damping couplings, complete with permanently activated capacitor and winding thermal protection .
- 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.

FU Floor / ceiling installation



- Covering cabinet made of thick steel sheet panel, (10/10 mm), with side parts and air outlet grille (orientable by 180°) made of ABS. The side doors allow the access to the technical space and to the control panel (option).
- Bearing structure made of thick galvanised steel sheet (up to 15/10 mm), insulated with self-extinguishing Class 1 heat insulating panels. The unit is provided with a double system for the collection and discharge of the condensate;in case of horizontal installation the condensate is collected in a wide drip tray.
- High efficiency heat exchanger, made of copper pipe aluminium fins fixed to the pipes by means of mechanical expansion, equipped with brass manifolds and air purge valve. The units normally come with water connection on the left side, but the heat exchanger can be turned, on the field, by 180°.
- 3-speed electric motor installed on vibration damping-supports, complete with built in capacitor and thermal protection for the windings.
- 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.
- Washable air filter made of beehive polypropylene, made of modules included in the air suction grille on the front panel of the covering cabinet.

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2 VERSIONS AND MAIN COMPONENTS

FC Vertical / horizonta concealed installation

> Bearing structure built from galvanised sheet steel (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 valves. The heat exchanger usually comes with water connections mounted on the left, but it can be turned by 180°.
> Three-speed electrical motor, mounted on vibration damping couplings, complete with permanently activated capacitor and winding thermal protection .
> 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.

FF Vertical or horizontal concealed

Supply and installation of GALLETTI model ESTRO FF horizontal/vertical recess-mounted fan coil unit (air intake on front, vertical air flow), mainly consisting of:

> Bearing structure built from galvanised sheet steel (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 valves. The heat exchanger usually comes with water connections mounted on the left, but it can be turned by 180°.
> Three-speed electrical motor, mounted on vibration damping couplings, complete with permanently activated capacitor and winding thermal protection .
> 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.

FB Low body(438mm) floor standing

> Covering cabinet made of thick steel sheet panel, (10/10 mm), with side parts and air outlet grille (orientable by 180°) made of ABS. The side doors allow the access to the technical space and to the control panel (option).
> Bearing structure made of thick galvanised steel sheet (up to 15/10 mm), insulated with self-extinguishing Class 1 heat insulating panels.
> High efficiency heat exchanger, made of copper pipe aluminium fins fixed to the pipes by means of mechanical expansion, equipped with brass manifolds and air purge valve. The units normally come with water connection on the left side, but the heat exchanger can be turned, on the field, by 180°.
> 3-speed electric motor installed on vibration damping-supports, complete with built in capacitor and thermal protection for the windings.
> 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.
> Washable air filter made of beehive polypropylene, made of modules included in the air suction grille on the front panel of the covering cabinet.

FBC Low body(413mm) concealed for horizontal and vertical installation

> Bearing structure made of thick galvanised steel sheet (up to 15/10 mm), insulated with self-extinguishing Class 1 heat insulating panels.
> High efficiency heat exchanger, made of copper pipe aluminium fins fixed to the pipes by means of mechanical expansion, equipped with brass manifolds and air purge valve. The units normally come with water connection on the left side, but the heat exchanger can be turned, on the field, by 180°.
> 3-speed electric motor installed on vibration damping-supports, complete with built in capacitor and thermal protection for the windings.
> 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.
> Washable air filter made of beehive polypropylene, made of modules included in the air suction grille on the front panel of the covering cabinet.

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3 AVAILABLE ACCESSORIES

The wide and complete range of options define these terminal units in order to meet the most different requirements for possible installations.
The standard units come along without control panel.

Code	Description	Version
	Control panels and thermostats	
CB	Speed switch, installation on the unit	**FL-FA-FU-FB**
TB	Speed switch mounted on the unit and electromechanical thermostat	**FL-FA-FU-FB**
TIB	Speed switch mounted on the unit, thermostat and summer/winter selecting switch	**FL-FA-FU-FB**
MICRO	Microprocessor control on the unit: automatic control of fan coil unit	**FL-FA-FU-FB**
MICROPRO	Microprocessor control on the unit: automatic control of fan coil unit, valves and electric heating element	**FL-FA-FU-FB**
MICRONET	Microprocessor control ERGO solution	**ALL**
SW	Water temperature electronic sensor for MICRO, MICROPRO-D and MICRO-D controls	**ALL**
CSB	Control mounted on the unit for opening and closing the SM motor-driven regulating louver	**FL-FA**
TC	Electromechanical thermostat for minimum water temperature in heating mode, mounted on the heat exchanger	**ALL**
KP	Power interface for connecting in parallel up to 4 fan coil units to one control	**ALL**
CD	Recess wall-mounted speed switch	**ALL**
CDE	Wall-mounted speed switch	**ALL**
TD	Wall-mounted speed switch, electromechanical thermostat and summer-winter selecting switch	**ALL**
TDC	Wall-mounted speed switch and electromechanical thermostat	**ALL**
TD4T	Wall-mounted speed switch, electromechanical thermostat and summer-winter selecting switch for 2 or 4-pipe systems with valves	**ALL**
MICRO-D	Wall-mounted microprocessor control: automatic control of the fan coil unit	**ALL**
MICROPRO-D	Wall-mounted microprocessor control: automatic control of the fan coil unit, valves and electric heating element	**ALL**
CSD	Wall-mounted control for opening and closing the SM motor-driven regulating louver	**FL-FA-FP-FC**
TA	Electromechanical room thermostat	**ALL**
TA2	Electromechanical room thermostat with summer/winter selecting switch	**ALL**
	Additional heat exchanger	
DF	1 row additional heat exchanger for 4-pipe systems (hot water circuit)	**FL-FA-FU-FP-FC-FF**
	Feet and coverings	
ZA	Two support covering feet	**FA**
ZAG	Two support covering feet with front grille	**FA**
ZL	Two support covering feet	**FL**
ZLG	Two support covering feet with front grille	**FL**
D	Support spacers	**FC**
PVL	Rear painted panel for vertical installation fan coil units with cabinet	**FL-FU**
PVA	Rear painted panel for vertical installation fan coil units with cabinet	**FA**
PVB	Rear painted panel for vertical installation fan coil units with cabinet	**FB**
PH	Rear painted panel for horizontal installation fan coil units with cabinet	**FU**
	Motorised valve and drip tray	
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	**FL-FA-FU-FP-FC-FF**
GIVK	Valve stem 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	**FU-FP-FC-FF**
KSC	Condensate removal kit	**FC-FF**
	Additional electric heater	
RE	Electric heating element complete with installation kit, safety devices, power relay box, heat resistant grilles	**FL-FU-FP-FC-FF**
	Suction and outlet grilles	
GE+C	Anodised aluminium grille for external air intake, complete with subframe	**FL-FA-FU-FP-FC-FF**
GEF+C	Anodised aluminium grille for external air intake, complete with filter and subframe	**FC-FF-FBC**
GM+C	Anodised aluminium double-row finned air outlet grille, complete with subframe	**FC-FF-FBC**
	Inlet and outlet connectors	
RM90	Angular connector for air outlet	**FC-FF-FBC**
RMD	Straight connector for air outlet	**FC-FF-FBC**
RA90	Angular connector for air inlet	**FC-FBC**
RAD	Straight connector for air inlet	**FC-FBC**
	Fresh air intake with louver	
S	Manual external air intake louver	**FL-FA-FP-FC**
SM	Motor driven external air intake louver	**FL-FA-FP-FC**

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4 RATED TECHNICAL FEATURES

4.1 FAN COILS WITH 1 HEAT EXCHANGER (2 PIPE SYSTEM

ESTRO2006	Fan speed		1	2	3	4	5	6	7	8	9	95	10	11	12
Total cooling capacity [1]	(High)	kW	1,15	1,54	1,74	2,09	2,42	2,93	3,51	4,33	4,77	5,55	6,71	7,83	11,00
Sensible cooling capacity [1]	(High)	kW	0,87	1,20	1,30	1,51	1,88	2,11	2,75	3,15	3,65	3,99	4,91	6,38	8,07
Water flow		l/h	197	264	298	359	415	503	602	743	818	952	1152	1494	1879
Pressure drop		kPa	7	13	14	13	16	11	12	12	14	21	12	19	31
Heating capacity [2]	(High)	kW	1,55	2,14	2,38	2,79	3,20	3,81	4,78	5,63	6,36	6,45	7,83	11,10	14,50
Water flow		l/h	197	264	298	359	415	503	602	743	818	952	1152	1494	1879
Pressure drop		kPa	5	9	11	10	12	9	10	9	10	17	9	13	25
Coil water content		dm^3	0,5	0,5	0,5	0,7	0,7	1	1	1,4	1,4	1,7	2,1	2,1	2,6
Hydraulic connections		inches	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"
Air flow	(High)	m^3/h	231	319	344	344	442	442	640	706	785	814	1011	1393	1850
	(med)	m^3/h	189	233	271	271	341	341	450	497	605	615	771	1022	1317
	(low)	m^3/h	149	178	211	211	241	241	320	361	470	488	570	642	1010
Power supply		V/ph/Hz	230 / 1 / 50												
Max. current absorbed	(High)	A	0,15	0,17	0,24	0,24	0,25	0,25	0,44	0,44	0,44	0,44	0,80	1,12	1,52
Max. power input	(High)	W	32	37	53	53	57	56	98	98	98	99	182	244	310
Sound power [4]	(High)	dB(A)	40	45	49	50	48	47	51	52	56	57	61	66	71
	(med)	dB(A)	32	39	44	44	41	41	43	43	49	50	54	59	64
	(low)	dB(A)	27	33	36	36	34	33	34	35	43	44	47	49	60

4.2 FB-FBC LOW BODY FAN COILS (ONLY 2 PIPE SYSTEMS)

ESTRO2006 F B - F BC	Fan speed		1	2	3	4	5	6	7	8	9
Total cooling capacity [1]	(High)	kW	1,07	1,43	1,62	1,69	2,25	2,72	3,26	4,03	4,44
Sensible cooling capacity [1]	(High)	kW	0,81	1,12	1,21	1,26	1,79	1,97	2,61	2,95	3,49
Water flow		l/h	184	245	278	291	386	467	559	692	762
Pressure drop		kPa	7	12	13	9	31	10	11	11	13
Heating capacity [2]	(High)	kW	1,44	1,99	2,21	2,29	2,97	3,54	4,44	5,23	5,12
Water flow		l/h	184	245	278	333	386	467	559	692	762
Pressure drop		kPa	5	10	10	10	26	8	9	9	11
Coil water content		l	0,5	0,5	0,5	0,7	0,7	1	1	1,4	1,4
Hydraulic connections		inches	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Air flow	(High)	m^3/h	231	319	344	344	442	442	640	706	785
	(med)	m^3/h	189	233	271	271	341	341	450	497	605
	(low)	m^3/h	149	178	211	211	241	241	320	361	470
Power supply		V/ph/Hz	230 / 1 / 50								
Max. current absorbed	(High)	A	0,15	0,17	0,24	0,24	0,25	0,25	0,44	0,44	0,44
Max. power input	(High)	W	32	37	53	53	57	56	98	98	98
Sound power [4]	(High)	dB(A)	40	45	49	50	48	47	51	52	56
	(med)	dB(A)	32	39	44	44	41	41	43	43	49
	(low)	dB(A)	27	33	36	36	34	33	34	35	43

1 Water temperature 7/12°C, air temperature 27°C dry bulb, 19°C wet bulb (47% relative humidity)
2 Inlet water temperature 50°C, water flow rate same as in cooling mode, inlet air temperature 20°C
3 Water temperature 70/60°C, inlet air temperature 20°C
4 Sound power measured according to ISO 3741 and ISO 3742.

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4 RATED TECHNICAL FEATURES

4.3 FAN COILS WITH 2 HEAT EXCHANGERS (4 PIPE SYSTEM)

ESTRO2006 DF	Fan speed		1	2	3	4	5	6	7	8	9	95	10	11	12
Total cooling capacity [1]	(High)	kW	1,13	1,50	1,69	1,79	2,38	2,87	3,46	4,26	4,67	5,42	6,64	8,55	10,80
Sensible cooling capacity [1]	(High)	kW	0,86	1,17	1,27	1,46	1,85	2,07	2,71	3,09	3,57	3,89	4,85	6,26	7,94
Water flow		l/h	194	258	291	347	409	494	595	733	803	930	1142	1471	1856
Pressure drop		kPa	7	13	14	13	16	11	11,2	12	14	20	12	19	30
Heating capacity [3]	(High)	kW	1,89	2,23	1,97	2,07	3,27	2,91	4,80	4,51	5,30	5,62	7,91	9,30	11,50
Water flow		l/h	166	196	204	202	287	286	421	396	465	493	694	816	1010
Pressure drop		kPa	5	7	8	8	5	5	9	10	10	15	27	36	50
Cooling coil water content		dm^3	0,5	0,5	0,5	0,7	0,7	1,0	1,0	1,4	1,4	1,7	2,1	2,1	2,6
DF heating coil water content		dm^3	0,2	0,2	0,2	0,2	0,3	0,3	0,4	0,4	0,4	0,5	0,6	0,6	0,9
Max. operating pressure		bar	10	10	10	10	10	10	10	10	10	10	10	10	10
Cooling coil hydraulic connections		inches	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"
DF heating coil hydraulic connections		inches	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Air flow	(High)	m^3/h	226	307	330	327	432	431	628	690	763	792	998	1362	1814
	(med)	m^3/h	184	225	261	261	332	332	444	490	593	603	765	1007	1300
	(low)	m^3/h	146	174	205	205	237	238	316	356	460	478	565	636	999
Power supply		V/ph/H	230 / 1 / 50												
Max. current absorbed	(High)	A	0,15	0,17	0,24	0,24	0,25	0,25	0,44	0,44	0,44	0,44	0,80	1,12	1,52
Max. power input	(High)	W	32	37	53	53	57	56	98	98	98	99	182	244	310
Sound power [4]	(High)	dB(A)	40	45	49	50	48	47	51	52	56	57	59	66	71
	(med)	dB(A)	32	39	44	44	41	41	43	43	49	50	52	58	64
	(low)	dB(A)	27	33	36	36	34	33	34	35	43	44	44	48	61

1 Water temperature 7/12°C, air temperature 27°C dry bulb, 19°C wet bulb (47% relative humidity)
2 Inlet water temperature 50°C, water flow rate same as in cooling mode, inlet air temperature 20°C
3 Water temperature 70/60°C, inlet air temperature 20°C
4 Sound power measured according to ISO 3741 and ISO 3742.

4.4 WEIGHT

ESTRO2006		1	2	3	4	5	6	7	8	9	95	10	11	12
F L	Kg	19,1	19,1	20,1	20,1	24,8	24,8	30,4	30,4	30,9	31,0	41,3	41,3	50,4
F A	Kg	18,1	18,1	19,1	19,1	23,3	23,3	28,4	28,4	28,9	-	38,8	38,8	47,9
F C	Kg	14,1	14,1	15,1	15,1	18,8	18,8	22,9	22,9	23,4	24,0	31,8	31,8	38,8
F U	Kg	20,1	20,1	21,1	21,1	26,8	26,8	32,4	32,4	32,9	33,0	43,8	43,8	53,0
F B	Kg	15,5	15,5	16,5	16,5	20,9	20,9	25,6	25,6	26,4	-	-	-	-
FBC	Kg	14,5	14,5	15,5	15,5	19,0	20,0	24,0	24,0	24,5	-	-	-	-
F F	Kg	14,1	14,1	15,1	15,1	18,8	18,8	22,9	22,9	23,4	-	31,8	31,8	38,8
F P	Kg	20,1	20,1	21,1	21,1	26,8	26,8	32,4	32,4	32,9	-	43,8	43,8	53,0

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5 PERFORMANCES

5.1 COOLING MODE, MODELS WITH 1 HEAT EXCHANGER

Tbs_1 Inlet air temperature dry bulb
Tbu_1 Inlet air temperature wet bulb
Tw_1 Inlet water temperature
Tw_2 Outlet water temperature
Vr Fan speed:
- **max** high
- **med** medium
- **min** low

PFT Total cooling capacity
PFS Sensible cooling capacity
Qw Water flow rate
∆pw Pressure drop on water side

Tbs_1 / Tbu_1 (UR_1)		25°C / 18°C (51%)															
Tw_1 / Tw_2		6°C / 11°C				7°C / 12°C				8°C / 13°C				9°C / 14°C			
	Vr	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw
		kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa
F1	max	1,10	0,81	190	7	0,93	0,74	160	5	0,74	0,67	128	3	0,68	0,68	117	3
	med	0,88	0,65	151	5	0,74	0,59	127	3	0,63	0,55	107	3	0,57	0,57	98	2
	min	0,74	0,55	126	3	0,65	0,51	111	3	0,57	0,48	97	2	0,49	0,45	84	2
F2	max	1,48	1,11	254	13	1,26	1,03	217	9	1,02	0,94	175	6	0,92	0,92	158	5
	med	1,19	0,90	205	9	1,01	0,83	174	6	0,81	0,75	139	4	0,74	0,74	126	4
	min	1,00	0,74	172	6	0,85	0,67	145	5	0,68	0,61	117	3	0,62	0,62	107	3
F3	max	1,68	1,21	287	14	1,43	1,11	245	10	1,16	1,01	200	7	1,04	1,04	178	6
	med	1,46	1,06	251	11	1,25	0,98	215	8	1,02	0,89	174	6	0,90	0,90	155	4
	min	1,21	0,89	208	8	1,04	0,81	178	6	0,84	0,74	144	4	0,74	0,74	128	3
F4	max	2,02	1,41	346	13	1,75	1,30	300	10	1,45	1,19	250	7	1,12	1,06	193	4
	med	1,75	1,23	300	10	1,52	1,13	260	8	1,26	1,03	217	6	0,97	0,92	167	3
	min	1,40	0,98	240	7	1,21	0,91	208	5	1,00	0,82	172	4	0,82	0,75	141	3
F5	max	2,33	1,75	400	15	2,01	1,62	346	12	1,66	1,49	286	8	1,39	1,39	238	6
	med	1,96	1,46	336	11	1,69	1,35	289	9	1,38	1,24	237	6	1,16	1,16	199	4
	min	1,54	1,10	264	7	1,32	1,01	227	6	1,06	0,91	182	4	0,92	0,92	157	3
F6	max	2,82	1,97	484	11	2,44	1,82	419	8	2,01	1,64	345	6	1,66	1,66	284	4
	med	2,29	1,59	393	7	1,97	1,46	338	6	1,59	1,31	273	4	1,32	1,20	226	3
	min	1,69	1,18	290	4	1,46	1,08	251	3	1,30	1,02	224	3	1,14	0,95	196	2
F7	max	3,37	2,55	578	11	2,87	2,35	492	9	2,29	2,13	392	6	2,01	2,01	346	5
	med	2,52	1,89	432	7	2,10	1,73	361	5	1,63	1,63	280	3	1,50	1,50	257	3
	min	1,88	1,34	322	4	1,56	1,21	267	3	1,38	1,14	237	2	1,20	1,07	205	2
F8	max	4,17	2,94	715	12	3,59	2,71	617	9	2,94	2,45	504	6	2,44	2,44	418	4
	med	3,14	2,28	538	7	2,67	2,09	458	5	2,08	1,86	357	3	1,88	1,88	322	3
	min	2,39	1,67	410	4	2,06	1,54	354	3	1,83	1,44	315	3	1,60	1,35	274	2
F9	max	4,60	3,40	788	14	3,97	3,15	682	10	3,28	2,88	562	7	2,69	2,69	463	5
	med	3,72	2,72	639	9	3,20	2,51	549	7	2,58	2,27	443	5	2,16	2,16	371	4
	min	3,04	2,16	522	7	2,58	1,97	444	5	2,05	1,76	352	3	1,78	1,66	306	3
F95	max	5,34	3,74	916	20	4,71	3,48	808	16	4,02	3,20	690	12	3,24	2,90	556	8
	med	4,25	2,94	729	13	3,74	2,72	642	11	3,18	2,49	545	8	2,50	2,23	430	5
	min	3,47	2,33	595	9	3,04	2,15	522	7	2,55	1,95	438	5	1,99	1,73	343	3
F10	max	6,47	4,59	1109	11	5,59	4,23	960	9	4,59	3,83	788	6	3,73	3,73	640	4
	med	5,06	3,58	868	7	4,32	3,27	741	6	3,36	2,89	578	4	2,85	2,69	489	3
	min	3,78	2,64	649	4	3,23	2,41	554	3	2,87	2,27	492	3	2,50	2,12	429	2
F11	max	8,41	5,96	1441	18	7,32	5,52	1255	14	6,11	5,05	1049	10	4,90	4,90	842	7
	med	6,53	4,62	1121	12	5,65	4,25	970	9	4,64	3,85	797	6	3,77	3,77	647	4
	min	4,30	3,03	737	6	3,60	2,74	618	4	3,05	2,52	523	3	2,65	2,36	455	2
F12	max	10,59	7,55	1816	29	9,34	7,04	1602	23	7,98	6,51	1371	18	6,48	5,95	1113	12
	med	8,48	6,05	1454	20	7,48	5,63	1283	16	6,38	5,20	1095	12	5,13	4,71	880	8
	min	6,73	4,79	1154	13	5,91	4,45	1015	11	5,00	4,08	859	8	3,87	3,65	665	5

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5 PERFORMANCES

5.1 COOLING MODE, MODELS WITH 1 HEAT EXCHANGER

Tbs_1 Inlet air temperature dry bulb
Tbu_1 Inlet air temperature wet bulb
Tw_1 Inlet water temperature
Tw_2 Outlet water temperature
Vr Fan speed:
- **max** high
- **med** medium
- **min** low

PFT Total cooling capacity
PFS Sensible cooling capacity
Qw Water flow rate
∆pw Pressure drop on water side

Tbs_1 / Tbu_1 (UR_1)		27°C / 19°C (47%)															
Tw_1 / Tw_2		6°C / 11°C				7°C / 12°C				8°C / 13°C				9°C / 14°C			
	Vr	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw
		kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa
F 1	max	1,31	0,93	225	9	1,15	0,87	197	7	0,98	0,80	167	5	0,78	0,73	134	4
	med	1,05	0,75	181	6	0,92	0,70	158	5	0,77	0,65	133	4	0,64	0,60	109	3
	min	0,88	0,63	151	5	0,77	0,59	132	4	0,66	0,55	113	3	0,57	0,52	99	2
F 2	max	1,75	1,28	301	17	1,54	1,20	264	13	1,31	1,12	226	10	1,09	1,09	188	7
	med	1,41	1,04	242	12	1,24	0,97	213	9	1,06	0,90	181	7	0,88	0,88	151	5
	min	1,18	0,85	203	9	1,04	0,79	179	7	0,89	0,73	152	5	0,71	0,67	122	3
F 3	max	1,98	1,39	339	18	1,74	1,30	298	14	1,49	1,21	256	11	1,21	1,11	209	8
	med	1,72	1,22	296	14	1,52	1,14	261	11	1,30	1,06	223	9	1,06	0,97	182	6
	min	1,43	1,02	245	10	1,26	0,95	216	8	1,08	0,88	185	6	0,88	0,80	151	4
F 4	max	2,35	1,61	403	16	2,09	1,51	359	13	1,81	1,40	311	10	1,51	1,29	260	8
	med	2,03	1,40	348	13	1,81	1,31	311	10	1,57	1,22	270	8	1,32	1,12	226	6
	min	1,63	1,12	279	9	1,45	1,05	249	7	1,26	0,97	216	5	1,05	0,89	180	4
F 5	max	2,72	2,00	467	20	2,42	1,88	415	16	2,10	1,76	360	13	1,74	1,62	299	9
	med	2,29	1,67	392	15	2,03	1,57	348	12	1,76	1,46	301	9	1,45	1,35	249	7
	min	1,80	1,26	309	10	1,60	1,18	275	8	1,38	1,09	237	6	1,12	0,99	193	4
F 6	max	3,29	2,26	564	14	2,93	2,11	503	11	2,54	1,95	436	9	2,11	1,79	362	6
	med	2,67	1,82	459	10	2,38	1,70	408	8	2,06	1,57	353	6	1,68	1,42	289	4
	min	1,99	1,36	341	6	1,76	1,26	302	5	1,50	1,15	258	4	1,32	1,08	227	3
F 7	max	3,98	2,93	682	15	3,51	2,75	602	12	3,00	2,56	515	9	2,41	2,41	414	6
	med	3,00	2,19	514	9	2,63	2,04	451	7	2,22	1,88	381	5	1,80	1,80	309	4
	min	2,28	1,57	391	6	1,98	1,45	340	4	1,61	1,31	277	3	1,40	1,23	240	2
F 8	max	4,87	3,37	835	15	4,33	3,15	743	12	3,75	2,92	643	10	3,09	2,67	530	7
	med	3,69	2,62	632	9	3,27	2,45	561	8	2,80	2,26	481	6	2,23	2,05	383	4
	min	2,85	1,95	489	6	2,51	1,80	431	5	2,10	1,64	361	3	1,86	1,54	319	3
F 9	max	5,36	3,89	919	18	4,77	3,65	818	14	4,14	3,40	710	11	3,43	3,14	589	8
	med	4,35	3,12	747	12	3,87	2,92	664	10	3,34	2,71	574	8	2,73	2,48	469	5
	min	3,57	2,49	613	9	3,17	2,32	544	7	2,71	2,14	466	5	2,15	1,92	370	4
F 95	max	6,15	4,24	1055	25	5,55	3,99	952	21	4,91	3,73	842	17	4,20	3,45	722	13
	med	4,90	3,34	841	17	4,42	3,13	758	14	3,90	2,92	670	11	3,33	3,69	572	8
	min	4,00	2,65	687	12	3,61	2,48	619	10	3,18	2,30	545	8	2,69	2,11	462	6
F 10	max	7,52	5,25	1289	15	6,71	4,91	1152	12	5,83	4,56	1001	9	4,83	4,17	829	7
	med	5,93	4,11	1016	10	5,27	3,83	904	8	4,53	3,53	778	6	3,63	3,19	624	4
	min	4,51	3,07	774	6	3,97	2,84	681	5	3,31	2,57	569	4	2,91	2,42	500	3
F 11	max	9,74	6,80	1671	23	8,71	6,38	1494	19	7,60	5,94	1305	15	6,38	5,48	1096	11
	med	7,59	5,28	1302	15	6,78	4,94	1163	12	5,89	4,58	1011	10	4,88	4,20	838	7
	min	5,07	3,50	870	7	4,49	3,25	771	6	3,82	2,98	655	4	3,09	2,70	530	3
F 12	max	12,16	8,55	2085	37	10,95	8,07	1879	31	9,67	7,57	1660	25	8,28	7,05	1422	19
	med	9,72	6,86	1669	25	8,77	6,46	1505	21	7,75	6,05	1330	17	6,63	5,62	1139	13
	min	7,74	5,44	1328	17	6,97	5,12	1196	14	6,14	4,78	1054	11	5,21	4,42	895	8

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5 PERFORMANCES

5.2 COOLING MODE FB - FB C LOW BODY (1 HEAT EXCHANGER)

Tbs_1 Inlet air temperature dry bulb
Tbu_1 Inlet air temperature wet bulb
Tw_1 Inlet water temperature
Tw_2 Outlet water temperature
Vr Fan speed:
- **max** high
- **med** medium
- **min** low

PFT Total cooling capacity
PFS Sensible cooling capacity
Qw Water flow rate
∆pw Pressure drop on water side

Tbs_1 / Tbu_1 (UR_1)		25°C / 18°C (51%)															
Tw_1 / Tw_2		6°C / 11°C				7°C / 12°C				8°C / 13°C				9°C / 14°C			
	Vr	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw
		kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa
F 1 B - BC	max	1,03	0,75	176	6	0,86	0,69	148	4	0,68	0,62	117	3	0,64	0,64	111	3
	med	0,82	0,61	141	4	0,69	0,56	119	3	0,60	0,52	103	2	0,55	0,55	94	2
	min	0,70	0,52	120	3	0,62	0,49	106	3	0,54	0,46	94	2	0,47	0,43	81	2
F 2 B - BC	max	1,37	1,04	236	11	1,17	0,96	200	8	0,94	0,88	161	6	0,85	0,85	147	5
	med	1,11	0,85	190	8	0,93	0,78	160	6	0,75	0,75	128	4	0,68	0,68	117	3
	min	0,93	0,69	160	6	0,79	0,64	135	4	0,65	0,58	111	3	0,59	0,59	102	3
F 3 B - BC	max	1,56	1,12	267	12	1,33	1,03	228	9	1,07	0,94	184	6	0,97	0,97	166	5
	med	1,36	0,99	233	9	1,15	0,91	198	7	0,93	0,82	160	5	0,84	0,84	144	4
	min	1,13	0,83	193	7	0,96	0,76	164	5	0,76	0,69	131	3	0,69	0,69	119	3
F 4 B - BC	max	1,87	1,31	321	11	1,62	1,21	277	9	1,34	1,10	229	6	1,13	1,13	194	5
	med	1,62	1,15	278	9	1,40	1,06	240	7	1,16	0,96	199	5	0,97	0,97	167	3
	min	1,30	0,93	223	6	1,12	0,85	192	5	0,92	0,77	158	3	0,78	0,72	134	2
F 5 B - BC	max	2,17	1,66	372	13	1,86	1,54	320	10	1,53	1,41	263	7	1,29	1,29	222	5
	med	1,82	1,40	312	10	1,56	1,29	268	8	1,27	1,18	217	5	1,08	1,08	185	4
	min	1,43	1,05	245	7	1,22	0,96	209	5	0,97	0,86	167	3	0,87	0,87	150	3
F 6 B - BC	max	2,62	1,84	449	9	2,25	1,69	386	7	1,83	1,53	314	5	1,54	1,54	265	4
	med	2,12	1,48	364	7	1,81	1,36	311	5	1,46	1,22	250	3	1,26	1,14	217	3
	min	1,57	1,11	269	4	1,40	1,05	241	3	1,25	0,98	215	3	1,09	0,92	187	2
F 7 B - BC	max	3,13	2,42	536	10	2,64	2,23	453	7	2,05	2,05	352	5	1,87	1,87	321	4
	med	2,34	1,80	401	6	1,93	1,64	331	4	1,54	1,54	264	3	1,43	1,43	246	3
	min	1,74	1,24	298	4	1,51	1,15	258	3	1,33	1,08	229	2	1,16	1,02	198	2
F 8 B - BC	max	3,88	2,75	665	10	3,32	2,53	570	8	2,68	2,28	460	5	2,27	2,27	389	4
	med	2,91	2,18	499	6	2,45	1,99	420	5	2,00	1,82	343	3	1,79	1,79	308	3
	min	2,21	1,56	379	4	1,98	1,47	340	3	1,76	1,38	302	3	1,53	1,29	263	2
F 9 B - BC	max	4,27	3,25	733	12	3,68	3,01	631	9	3,00	2,75	515	6	2,51	2,51	431	5
	med	3,46	2,60	593	8	2,95	2,39	506	6	2,33	2,15	400	4	2,02	2,02	347	3
	min	2,82	2,05	484	6	2,37	1,86	406	4	1,97	1,71	339	3	1,71	1,61	294	2

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5 PERFORMANCES

5.2 COOLING MODE FB - FB C LOW BODY (1 HEAT EXCHANGER)

Tbs_1 Inlet air temperature dry bulb
Tbu_1 Inlet air temperature wet bulb
Tw_1 Inlet water temperature
Tw_2 Outlet water temperature
Vr Fan speed:
- **max** high
- **med** medium
- **min** low

PFT Total cooling capacity
PFS Sensible cooling capacity
Qw Water flow rate
∆pw Pressure drop on water side

Tbs_1 / Tbu_1 (UR_1)		27°C / 19°C (47%)															
Tw_1 / Tw_2		6°C / 11°C				7°C / 12°C				8°C / 13°C				9°C / 14°C			
	Vr	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw
		kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa
F 1 B - BC	max	1,22	0,87	210	8	1,07	0,81	184	7	0,90	0,75	155	5	0,72	0,68	124	3
	med	0,99	0,70	170	6	0,86	0,65	148	4	0,72	0,60	124	3	0,61	0,56	105	2
	min	0,83	0,60	142	4	0,72	0,55	124	3	0,63	0,52	108	3	0,55	0,49	95	2
F 2 B - BC	max	1,63	1,20	280	15	1,43	1,12	245	12	1,22	1,05	209	9	1,02	1,02	175	6
	med	1,31	0,98	225	10	1,15	0,92	198	8	0,98	0,85	168	6	0,82	0,82	141	4
	min	1,11	0,80	190	8	0,97	0,75	167	6	0,82	0,69	141	4	0,69	0,69	118	3
F 3 B - BC	max	1,84	1,29	316	16	1,62	1,21	278	13	1,38	1,12	237	10	1,12	1,03	193	7
	med	1,60	1,14	275	13	1,41	1,06	242	10	1,20	0,98	207	8	0,98	0,90	168	5
	min	1,33	0,96	228	9	1,17	0,89	201	7	1,00	0,83	171	5	0,80	0,76	138	4
F 4 B - BC	max	2,18	1,50	375	15	1,94	1,40	333	12	1,68	1,30	288	9	1,39	1,19	239	7
	med	1,89	1,31	324	11	1,68	1,23	288	9	1,45	1,14	250	7	1,21	1,04	207	5
	min	1,52	1,06	261	8	1,35	0,99	232	6	1,17	0,92	200	5	0,96	0,84	165	3
F 5 B - BC	max	2,54	1,90	435	18	2,25	1,79	386	14	1,94	1,67	333	11	1,54	1,54	264	7
	med	2,13	1,60	366	13	1,89	1,50	324	11	1,63	1,40	279	8	1,29	1,29	221	5
	min	1,68	1,20	289	9	1,49	1,12	256	7	1,28	1,04	219	5	1,02	0,94	176	4
F 6 B - BC	max	3,06	2,11	525	12	2,72	1,97	467	10	2,35	1,82	403	8	1,92	1,67	330	5
	med	2,49	1,71	428	9	2,21	1,59	379	7	1,90	1,46	326	5	1,52	1,32	262	4
	min	1,87	1,29	320	5	1,64	1,20	282	4	1,43	1,11	245	3	1,27	1,05	218	3
F 7 B - BC	max	3,71	2,79	636	13	3,26	2,61	559	11	2,77	2,43	476	8	2,25	2,25	387	6
	med	2,81	2,09	481	8	2,45	1,95	420	6	2,04	1,79	351	5	1,69	1,69	290	3
	min	2,14	1,47	367	5	1,84	1,35	316	4	1,53	1,23	262	3	1,35	1,16	232	2
F 8 B - BC	max	4,55	3,15	780	14	4,03	2,95	692	11	3,47	2,73	595	8	2,83	2,50	486	6
	med	3,45	2,51	591	8	3,04	2,35	522	7	2,58	2,17	443	5	2,04	2,04	350	3
	min	2,67	1,83	458	5	2,33	1,68	400	4	2,01	1,56	345	3	1,79	1,47	307	3
F 9 B - BC	max	5,00	3,71	858	16	4,44	3,49	762	13	3,83	3,26	658	10	2,99	2,99	514	6
	med	4,07	2,98	697	11	3,60	2,79	618	9	3,09	2,59	530	7	2,42	2,42	415	4
	min	3,35	2,36	574	8	2,95	2,20	506	6	2,50	2,03	429	5	2,00	1,84	343	3

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5 PERFORMANCES

5.3 COOLING MODE, MODELS WITH 2 HEAT EXCHANGERS (4 PIPE SYSTEMS)

Tbs_1 Inlet air temperature dry bulb
Tbu_1 Inlet air temperature wet bulb
Tw_1 Inlet water temperature
Tw_2 Outlet water temperature
Vr Fan speed:
- **max** high
- **med** medium
- **min** low

PFT Total cooling capacity
PFS Sensible cooling capacity
Qw Water flow rate
∆pw Pressure drop on water side

Tbs_1 / Tbu_1 (UR_1)		25°C / 18°C (51%)															
Tw_1 / Tw_2		6°C / 11°C				7°C / 12°C				8°C / 13°C				9°C / 14°C			
	Vr	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw
		kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa
F 1 DF	max	1,09	0,79	186	7	0,92	0,73	158	5	0,73	0,66	125	3	0,67	0,67	115	3
	med	0,87	0,64	149	5	0,73	0,58	124	3	0,62	0,54	106	2	0,57	0,57	97	2
	min	0,73	0,54	124	3	0,64	0,51	110	3	0,56	0,48	96	2	0,49	0,45	83	2
F 2 DF	max	1,45	1,08	248	12	1,23	1,00	211	9	0,99	0,91	171	6	0,89	0,89	154	5
	med	1,17	0,88	200	8	0,99	0,81	170	6	0,79	0,74	136	4	0,72	0,72	123	3
	min	0,98	0,72	169	6	0,83	0,66	143	5	0,67	0,60	115	3	0,62	0,62	106	3
F 3 DF	max	1,63	1,18	280	13	1,39	1,09	239	10	1,13	0,99	194	7	1,01	1,01	173	5
	med	1,43	1,03	245	10	1,22	0,95	209	8	0,99	0,86	170	5	0,88	0,88	151	4
	min	1,19	0,87	204	7	1,01	0,80	174	6	0,82	0,72	141	4	0,73	0,73	125	3
F 4 DF	max	1,95	1,36	334	12	1,69	1,26	289	9	1,40	1,15	241	7	1,08	1,03	186	4
	med	1,70	1,19	291	9	1,47	1,10	253	7	1,23	1,00	211	5	0,94	0,89	162	3
	min	1,37	0,96	235	6	1,18	0,88	203	5	0,98	0,80	168	4	0,81	0,74	139	3
F 5 DF	max	2,30	1,72	394	15	1,98	1,60	340	11	1,64	1,46	281	8	1,37	1,37	235	6
	med	1,93	1,44	331	11	1,66	1,33	285	8	1,36	1,21	234	6	1,14	1,14	196	4
	min	1,52	1,09	261	7	1,30	1,00	224	6	1,05	0,90	180	4	0,91	0,91	156	3
F 6 DF	max	2,77	1,93	474	10	2,39	1,78	410	8	1,97	1,61	337	6	1,62	1,62	278	4
	med	2,24	1,56	384	7	1,93	1,42	330	5	1,55	1,27	266	4	1,30	1,18	224	3
	min	1,66	1,16	285	4	1,45	1,07	249	3	1,29	1,00	222	3	1,13	0,94	194	2
F 7 DF	max	3,33	2,51	570	11	2,83	2,32	485	8	2,25	2,10	386	6	1,98	1,98	341	4
	med	2,49	1,87	428	7	2,08	1,71	357	5	1,61	1,61	277	3	1,49	1,49	256	3
	min	1,86	1,33	319	4	1,55	1,21	266	3	1,37	1,14	236	2	1,19	1,07	205	2
F 8 DF	max	4,10	2,89	703	11	3,53	2,66	606	9	2,88	2,41	494	6	2,39	2,39	411	4
	med	3,10	2,25	532	7	2,63	2,06	452	5	2,07	1,84	355	3	1,86	1,86	320	3
	min	2,36	1,65	405	4	2,05	1,52	351	3	1,82	1,43	313	3	1,59	1,34	273	2
F 9 DF	max	4,50	3,32	772	13	3,89	3,08	668	10	3,20	2,81	550	7	2,64	2,64	453	5
	med	3,66	2,67	628	9	3,15	2,46	540	7	2,53	2,22	435	5	2,12	2,12	365	3
	min	2,99	2,12	513	6	2,53	1,94	435	5	2,04	1,74	350	3	1,77	1,64	303	2
F 95 DF	max	5,22	3,65	895	19	4,60	3,39	789	15	3,93	3,12	674	11	3,16	2,82	543	8
	med	4,18	2,89	717	13	3,68	2,68	631	10	3,12	2,45	535	8	2,45	2,19	421	5
	min	3,40	2,29	583	9	2,98	2,11	511	7	2,50	1,91	429	5	1,97	1,71	339	3
F 10 DF	max	6,39	4,54	1097	11	5,53	4,18	949	9	4,53	3,78	778	6	3,68	3,68	633	4
	med	5,02	3,55	862	7	4,29	3,24	735	6	3,33	2,86	571	4	2,84	2,68	487	3
	min	3,74	2,62	642	4	3,21	2,39	551	3	2,86	2,25	490	3	2,49	2,11	427	2
F 11 DF	max	8,25	5,85	1416	18	7,18	5,42	1232	14	5,99	4,95	1029	10	4,81	4,81	826	7
	med	6,45	4,56	1106	11	5,58	4,20	957	9	4,58	3,80	786	6	3,72	3,72	638	4
	min	4,26	3,00	730	6	3,56	2,71	612	4	3,03	2,50	521	3	2,64	2,35	453	2
F 12 DF	max	10,43	7,43	1790	29	9,20	6,93	1579	23	7,86	6,41	1351	17	6,38	5,85	1096	12
	med	8,39	5,99	1440	20	7,40	5,57	1270	16	6,31	5,14	1084	12	5,07	4,66	870	8
	min	6,67	4,75	1145	13	5,86	4,41	1005	10	4,95	4,04	849	8	3,82	3,61	657	5

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5 PERFORMANCES

5.3 COOLING MODE, MODELS WITH 2 HEAT EXCHANGERS (4 PIPE SYSTEMS)

Tbs_1 Inlet air temperature dry bulb
Tbu_1 Inlet air temperature wet bulb
Tw_1 Inlet water temperature
Tw_2 Outlet water temperature
Vr Fan speed:
- **max** high
- **med** medium
- **min** low

PFT Total cooling capacity
PFS Sensible cooling capacity
Qw Water flow rate
∆pw Pressure drop on water side

Tbs_1 / Tbu_1 (UR_1)		27°C / 19°C (47%)															
Tw_1 / Tw_2		6°C / 11°C				7°C / 12°C				8°C / 13°C				9°C / 14°C			
	Vr	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw	PFT	PFS	Qw	∆ pw
		kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa
F 1 DF	max	1,29	0,92	221	9	1,13	0,86	194	7	0,96	0,79	165	5	0,77	0,72	132	4
	med	1,04	0,74	178	6	0,90	0,69	155	5	0,76	0,64	131	4	0,63	0,59	108	3
	min	0,87	0,62	149	5	0,76	0,58	130	4	0,65	0,54	112	3	0,57	0,51	98	2
F 2 DF	max	1,71	1,25	293	16	1,50	1,17	258	13	1,28	1,09	220	10	1,07	1,07	183	7
	med	1,38	1,01	236	11	1,21	0,95	208	9	1,03	0,88	177	7	0,86	0,86	147	5
	min	1,16	0,83	199	8	1,02	0,78	175	7	0,87	0,72	149	5	0,70	0,65	120	3
F 3 DF	max	1,92	1,36	330	17	1,69	1,27	291	14	1,45	1,17	249	10	1,18	1,08	203	7
	med	1,68	1,19	288	14	1,48	1,11	254	11	1,27	1,03	218	8	1,04	0,94	178	6
	min	1,40	1,00	240	10	1,24	0,93	212	8	1,06	0,86	182	6	0,86	0,79	147	4
F 4 DF	max	2,26	1,56	388	15	2,02	1,46	346	13	1,75	1,35	300	10	1,46	1,24	251	7
	med	1,97	1,36	338	12	1,76	1,27	302	10	1,53	1,18	262	8	1,28	1,05	219	6
	min	1,59	1,10	272	8	1,42	1,02	243	7	1,23	0,95	211	5	1,02	0,83	176	4
F 5 DF	max	2,68	1,97	460	20	2,38	1,85	409	16	2,06	1,73	354	12	1,71	1,60	294	9
	med	2,25	1,65	386	14	2,00	1,54	343	12	1,73	1,44	297	9	1,43	1,33	245	6
	min	1,78	1,25	305	10	1,58	1,17	272	8	1,36	1,08	234	6	1,11	0,98	191	4
F 6 DF	max	3,22	2,21	552	13	2,87	2,07	493	11	2,49	1,91	427	8	2,06	1,75	354	6
	med	2,61	1,78	449	9	2,33	1,66	400	8	2,01	1,53	345	6	1,64	1,39	282	4
	min	1,96	1,34	336	6	1,73	1,24	297	5	1,47	1,13	253	3	1,31	1,07	225	3
F 7 DF	max	3,92	2,89	673	15	3,46	2,71	594	12	2,96	2,51	507	9	2,38	2,38	408	6
	med	2,97	2,16	509	9	2,60	2,02	447	7	2,19	1,86	376	5	1,78	1,78	306	4
	min	2,26	1,56	388	6	1,96	1,44	336	4	1,59	1,29	273	3	1,39	1,22	239	2
F 8 DF	max	4,78	3,31	821	15	4,26	3,09	730	12	3,68	2,87	632	9	3,03	2,62	520	7
	med	3,64	2,59	625	9	3,23	2,42	554	7	2,76	2,23	474	6	2,20	2,02	377	4
	min	2,82	1,92	483	6	2,48	1,78	425	5	2,08	1,62	357	3	1,85	1,53	317	3
F 9 DF	max	5,25	3,80	900	17	4,67	3,57	802	14	4,05	3,32	696	11	3,36	3,06	577	8
	med	4,28	3,06	735	12	3,81	2,87	653	10	3,29	2,66	564	7	2,68	2,43	461	5
	min	3,51	2,44	603	8	3,11	2,28	534	7	2,66	2,10	457	5	2,10	1,88	361	3
F 95 DF	max	6,01	4,14	1031	24	5,42	3,89	930	20	4,79	3,64	823	16	4,11	3,37	705	12
	med	4,82	3,28	826	16	4,34	3,08	745	14	3,83	2,87	658	11	3,27	2,64	562	8
	min	3,93	2,60	674	12	3,54	2,43	607	10	3,11	2,26	535	8	2,64	2,07	453	6
F 10 DF	max	7,43	5,19	1275	15	6,64	4,85	1138	12	5,76	4,50	990	9	4,77	4,12	819	7
	med	5,88	4,08	1010	10	5,23	3,80	898	8	4,50	3,51	772	6	3,60	3,16	618	4
	min	4,47	3,05	767	6	3,93	2,82	675	5	3,27	2,55	562	3	2,90	2,40	497	3
F 11 DF	max	9,56	6,68	1641	23	8,55	6,26	1468	19	7,46	5,83	1281	15	6,26	5,38	1074	11
	med	7,50	5,21	1286	15	6,69	4,88	1148	12	5,81	4,52	998	9	4,81	4,14	827	7
	min	5,03	3,47	862	7	4,45	3,22	763	6	3,78	2,95	649	4	3,07	2,68	528	3
F 12 DF	max	11,98	8,42	2054	37	10,79	7,94	1852	30	9,52	7,45	1635	24	8,16	6,93	1401	18
	med	9,63	6,78	1651	25	8,68	6,39	1489	21	7,67	5,98	1316	17	6,56	5,56	1126	13
	min	7,67	5,39	1316	17	6,91	5,07	1185	14	6,08	4,74	1044	11	5,16	4,38	887	8

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5 PERFORMANCES

5.4 HEATING MODE, MODELS WITH 1 HEAT EXCHANGER

Tbs_1 Inlet air temperature dry bulb
Tw_1 Inlet water temperature
Tw_2 Outlet water temperature
Vr Fan speed:
- **max** high
- **med** medium
- **min** low

PT Heating capacity
Qw Water flow rate
Δpw Pressure drop on water side

Tbs_1	20°C												
Tw_1 / Tw_2		45 / 40°C			60°C / 50°C			70°C / 60°C			90°C / 70°C		
	Vr	PT	Qw	Δ pw	PT	Qw	Δ pw	PT	Qw	Δ pw	PT	Qw	Δ pw
		kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa
F1	max	1,32	229	8	2,05	179	5	2,68	235	8	3,57	157	4
	med	1,11	194	6	1,74	152	4	2,27	199	6	3,02	134	3
	min	0,95	166	5	1,49	130	3	1,94	171	4	2,60	115	2
F2	max	1,82	317	15	2,84	249	10	3,71	325	15	4,94	218	7
	med	1,48	256	11	2,31	201	7	2,99	263	10	4,01	177	5
	min	1,21	211	8	1,90	166	5	2,47	216	7	3,32	147	3
F3	max	2,02	352	16	3,15	276	10	4,11	361	15	5,48	242	7
	med	1,72	300	12	2,70	236	7	3,50	307	11	4,69	207	5
	min	1,45	252	9	2,27	198	6	2,93	257	8	3,95	174	4
F4	max	2,35	409	14	3,69	322	9	4,76	418	13	6,41	283	6
	med	1,95	340	10	3,07	268	6	3,95	346	10	5,34	236	5
	min	1,60	279	7	2,53	221	5	3,25	285	7	4,42	195	3
F5	max	2,70	469	17	4,22	369	10	5,47	480	16	7,32	323	8
	med	2,26	393	12	3,54	309	8	4,57	401	12	6,15	271	6
	min	1,74	302	8	2,73	239	5	3,52	308	7	4,76	210	4
F6	max	3,20	556	11	5,03	439	7	6,46	567	11	8,76	386	5
	med	2,58	449	8	4,07	356	5	5,22	458	7	7,11	314	4
	min	1,91	332	5	3,02	264	3	3,86	339	4	5,29	233	2
F7	max	4,05	704	13	6,33	553	8	8,21	720	13	11,00	486	6
	med	3,13	545	8	4,92	430	5	6,34	556	8	8,55	378	4
	min	2,39	415	5	3,76	328	3	4,83	424	5	6,57	290	2
F8	max	4,73	823	12	7,42	648	8	9,57	840	12	12,89	569	6
	med	3,61	628	8	5,69	497	5	7,30	641	7	9,91	437	4
	min	2,76	480	5	4,36	381	3	5,59	490	5	7,62	336	2
F9	max	5,36	932	15	8,41	735	9	10,85	952	14	14,62	645	7
	med	4,39	763	11	6,90	603	7	8,86	778	10	12,02	530	5
	min	3,57	620	7	5,63	491	5	7,20	632	7	9,81	433	3
F95	max	5,55	952	21	8,71	761	11	11,20	982	17	15,12	668	8
	med	4,4,1	758	14	6,93	606	7	8,89	780	11	12,05	532	6
	min	3,61	619	10	5,70	498	5	7,29	640	8	9,92	438	4
F10	max	7,15	1244	12	11,24	982	7	14,45	1268	11	19,55	863	5
	med	5,69	989	8	8,96	783	5	11,48	1008	7	15,61	689	4
	min	4,37	759	5	6,89	602	3	8,83	774	5	12,04	531	2
F11	max	9,31	1618	18	14,59	1275	11	18,83	1652	17	25,35	1119	8
	med	7,24	1258	12	11,37	994	7	14,63	1283	11	19,78	873	5
	min	4,86	845	6	7,67	670	4	9,82	862	6	13,39	591	3
F12	max	12,21	2123	32	19,15	1673	20	24,67	2164	30	33,23	1467	15
	med	9,29	1616	20	14,61	1277	12	18,75	1645	19	25,39	1121	9
	min	7,45	1295	13	11,75	1026	8	15,02	1317	13	20,43	902	6

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5 PERFORMANCES

5.4 HEATING MODE, MODELS WITH 1 HEAT EXCHANGER

Tbs_1 Inlet air temperature dry bulb
Tw_1 Inlet water temperature
Tw_2 Outlet water temperature
Vr Fan speed:
- **max** high
- **med** medium
- **min** low

PT Heating capacity
Qw Water flow rate
Δpw Pressure drop on water side

Tbs_1	22°C												
Tw_1 / Tw_2		45 / 40°C			60°C / 50°C			70°C / 60°C			90°C / 70°C		
	Vr	PT	Qw	Δ pw	PT	Qw	Δ pw	PT	Qw	Δ pw	PT	Qw	Δ pw
		kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa
F1	max	1,19	207	7	1,92	168	4	2,55	223	7	3,43	151	3
	med	1,01	175	5	1,63	142	3	2,16	190	5	2,91	128	3
	min	0,86	150	4	1,39	122	3	1,85	162	4	2,50	110	2
F2	max	1,65	287	13	2,67	233	8	3,53	310	13	4,75	210	7
	med	1,33	232	9	2,16	189	6	2,85	250	9	3,86	170	5
	min	1,10	191	6	1,78	156	4	2,35	206	7	3,19	141	3
F3	max	1,83	318	13	2,96	258	9	3,91	343	14	5,27	233	7
	med	1,56	272	10	2,53	221	7	3,33	292	11	4,51	199	5
	min	1,31	228	7	2,13	186	5	2,79	245	8	3,80	168	4
F4	max	2,13	371	12	3,46	303	8	4,53	398	12	6,18	273	6
	med	1,77	308	9	2,88	252	6	3,76	330	9	5,15	227	4
	min	1,46	253	6	2,37	208	4	3,09	271	6	4,26	188	3
F5	max	2,45	425	14	3,96	346	9	5,21	457	15	7,05	311	7
	med	2,05	356	10	3,32	290	7	4,35	381	11	5,92	261	5
	min	1,58	274	7	2,56	224	4	3,35	294	7	4,59	203	3
F6	max	2,90	505	9	4,73	413	6	6,15	540	10	8,43	372	5
	med	2,34	407	7	3,82	334	4	4,97	436	7	6,84	302	3
	min	1,73	302	4	2,84	248	3	3,67	322	4	5,09	225	2
F7	max	3,67	638	11	5,94	519	7	7,82	686	12	10,59	467	6
	med	2,84	494	7	4,62	403	5	6,04	529	7	8,24	364	4
	min	2,16	376	4	3,52	308	3	4,60	404	5	6,33	279	2
F8	max	4,29	746	10	6,97	609	7	9,11	799	11	12,41	548	5
	med	3,28	570	6	5,34	466	4	6,96	610	7	9,54	421	3
	min	2,50	436	4	4,09	357	3	5,32	467	4	7,33	324	2
F9	max	4,86	846	13	7,90	690	8	10,33	906	13	14,08	622	6
	med	3,98	693	9	6,49	567	6	8,44	740	9	11,57	511	5
	min	3,24	562	6	5,28	461	4	6,85	601	6	9,45	417	3
F95	max	5,04	875	15	8,18	715	10	10,66	36	15	14,57	643	8
	med	4,00	696	10	6,52	570	7	8,46	742	10	11,61	512	5
	min	3,28	571	7	5,35	468	5	6,94	609	7	9,56	422	4
F10	max	6,49	1129	10	10,56	923	7	13,76	1207	10	18,83	831	5
	med	5,16	897	7	8,41	735	4	10,93	960	7	15,03	664	3
	min	3,96	689	4	6,47	565	3	8,41	737	4	11,59	512	2
F11	max	8,44	1468	15	13,70	1197	10	17,92	1572	16	24,41	1077	8
	med	6,57	1142	10	10,69	934	7	13,92	1221	10	19,05	841	5
	min	4,41	767	5	7,20	629	3	9,35	821	5	12,90	569	3
F12	max	11,08	1926	27	17,98	1571	18	23,49	2060	28	32,00	1413	14
	med	8,44	1468	17	13,73	1200	11	17,85	1566	17	24,46	1080	9
	min	6,77	1177	11	11,04	965	8	14,30	1255	12	19,68	869	6

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5 PERFORMANCES

5.5 HEATING MODE FB - FB C LOW BODY (1 HEAT EXCHANGER)

Tbs_1 Inlet air temperature dry bulb
Tw_1 Inlet water temperature
Tw_2 Outlet water temperature
Vr Fan speed:
- **max** high
- **med** medium
- **min** low

PT Heating capacity
Qw Water flow rate
Δpw Pressure drop on water side

Tbs_1	20°C												
Tw_1 / Tw_2		45 / 40°C			60°C / 50°C			70°C / 60°C			90°C / 70°C		
	Vr	PT	Qw	Δ pw	PT	Qw	Δ pw	PT	Qw	Δ pw	PT	Qw	Δ pw
		kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa
F 1 B - BC	max	1,22	212	7	1,90	166	4	2,49	218	7	3,31	146	3
	med	1,03	180	5	1,61	141	3	2,11	185	5	2,80	124	2
	min	0,88	153	4	1,37	120	2	1,80	158	4	2,39	106	2
F 2 B - BC	max	1,70	295	14	2,64	231	8	3,45	303	13	4,58	202	6
	med	1,37	238	9	2,13	186	6	2,78	244	9	3,71	164	4
	min	1,13	197	7	1,77	154	4	2,30	202	6	3,08	136	3
F 3 B - BC	max	1,88	327	14	2,92	256	9	3,82	335	13	5,07	224	6
	med	1,60	279	11	2,50	219	7	3,26	286	10	4,35	192	5
	min	1,34	233	8	2,09	183	5	2,72	239	7	3,64	161	4
F 4 B - BC	max	2,19	380	12	3,42	299	8	4,43	388	12	5,94	262	6
	med	1,81	315	9	2,84	248	6	3,67	322	8	4,94	218	4
	min	1,49	259	6	2,34	204	4	3,02	265	6	4,08	180	3
F 5 B - BC	max	2,51	437	15	3,92	342	9	5,09	447	14	6,79	300	7
	med	2,10	365	11	3,28	287	7	4,25	373	10	5,70	251	5
	min	1,61	281	7	2,53	221	4	3,27	287	6	4,41	195	3
F 6 B - BC	max	2,97	516	10	4,66	407	6	6,01	527	9	8,09	357	5
	med	2,40	416	7	3,76	329	4	4,85	426	6	6,56	290	3
	min	1,77	308	4	2,78	243	3	3,59	315	4	4,86	215	2
F 7 B - BC	max	3,77	655	12	5,88	514	7	7,64	670	11	10,20	450	5
	med	2,91	506	7	4,56	398	5	5,90	518	7	7,92	350	3
	min	2,21	384	5	3,46	303	3	4,49	394	4	6,05	267	2
F 8 B - BC	max	4,40	765	11	6,88	601	7	8,90	781	10	11,94	527	5
	med	3,35	583	7	5,26	459	4	6,79	596	6	9,16	404	3
	min	2,56	445	4	4,02	351	3	5,20	456	4	7,02	310	2
F 9 B - BC	max	4,99	867	13	7,80	682	8	10,09	885	13	13,54	598	6
	med	4,07	708	9	6,39	558	6	8,24	722	9	11,10	490	4
	min	3,31	575	6	5,19	454	4	6,70	588	6	9,06	400	3

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5 PERFORMANCES

5.5 HEATING MODE FB - FB C LOW BODY (1 HEAT EXCHANGER)

Tbs_1 Inlet air temperature dry bulb
Tw_1 Inlet water temperature
Tw_2 Outlet water temperature
Vr Fan speed:
- **max** high
- **med** medium
- **min** low

PT Heating capacity
Qw Water flow rate
Δpw Pressure drop on water side

Tbs_1	22°C												
Tw_1 / Tw_2		45 / 40°C			60°C / 50°C			70°C / 60°C			90°C / 70°C		
	Vr	PT	Qw	Δ pw	PT	Qw	Δ pw	PT	Qw	Δ pw	PT	Qw	Δ pw
		kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa
F 1 B - BC	max	1,10	192	6	1,78	155	4	2,37	208	6	3,18	140	3
	med	0,93	162	4	1,51	132	3	2,01	176	5	2,69	119	2
	min	0,80	138	3	1,29	112	2	1,71	150	3	2,30	102	2
F 2 B - BC	max	1,54	267	11	2,48	216	7	3,28	288	12	4,41	195	6
	med	1,24	215	8	2,00	175	5	2,65	232	8	3,57	158	4
	min	1,02	178	6	1,65	145	4	2,19	192	6	2,96	131	3
F 3 B - BC	max	1,70	295	12	2,74	240	8	3,63	319	12	4,88	216	6
	med	1,45	253	9	2,35	205	6	3,10	272	9	4,18	185	5
	min	1,21	210	6	1,96	171	4	2,59	227	7	3,51	155	3
F 4 B - BC	max	1,98	344	10	3,21	280	7	4,21	370	11	5,72	252	5
	med	1,64	285	7	2,66	233	5	3,49	306	8	4,75	210	4
	min	1,35	234	5	2,19	192	4	2,87	252	5	3,92	173	3
F 5 B - BC	max	2,28	396	12	3,68	321	8	4,84	425	13	6,54	289	6
	med	1,90	331	9	3,08	269	6	4,05	355	9	5,48	242	5
	min	1,46	254	6	2,37	207	4	3,11	273	6	4,24	187	3
F 6 B - BC	max	2,69	468	8	4,37	382	6	5,72	502	9	7,79	344	4
	med	2,17	377	6	3,53	308	4	4,62	405	6	6,31	279	3
	min	1,60	279	3	2,61	228	2	3,42	300	3	4,68	207	2
F 7 B - BC	max	3,41	593	10	5,51	482	6	7,27	638	10	9,82	433	5
	med	2,64	458	6	4,27	373	4	5,61	493	7	7,63	337	3
	min	2,00	347	4	3,25	284	3	4,27	375	4	5,82	257	2
F 8 B - BC	max	3,99	693	9	6,46	564	6	8,47	743	9	11,49	508	5
	med	3,03	528	6	4,93	431	4	6,46	567	6	8,82	389	3
	min	2,32	403	4	3,77	329	2	4,95	434	4	6,76	298	2
F 9 B - BC	max	4,52	786	11	7,32	640	7	9,60	843	11	13,04	576	6
	med	3,69	642	8	6,00	524	5	7,84	688	8	10,69	472	4
	min	3,00	521	5	4,87	426	4	6,38	559	6	8,72	385	3

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5 PERFORMANCES

5.6 HEATING MODE MODELS WITH 2 HEAT EXCHANGERS (4 PIPE SYSTEMS)

Tbs_1 Inlet air temperature dry bulb
Tw_1 Inlet water temperature
Tw_2 Outlet water temperature
Vr Fan speed:
max high
med medium
min low
PT Heating capacity
Qw Water flow rate
Δpw Pressure drop on water side

Tbs_1	20°C												
Tw_1 / Tw_2		45 / 40°C			60°C / 50°C			70°C / 60°C			90°C / 70°C		
	Vr	PT	Qw	Δ pw	PT	Qw	Δ pw	PT	Qw	Δ pw	PT	Qw	Δ pw
		kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa
F 1 DF	max	0,92	160	6	1,41	124	3	1,89	166	5	2,47	109	2
	med	0,81	141	4	1,25	109	3	1,68	147	4	2,20	97	2
	min	0,70	122	3	1,08	95	2	1,45	128	3	1,90	84	2
F 2 DF	max	1,08	188	7	1,67	146	5	2,23	196	7	2,89	128	3
	med	0,92	160	6	1,41	124	3	1,89	166	5	2,47	109	2
	min	0,78	136	4	1,21	106	3	1,62	142	4	2,12	94	2
F 3 DF	max	1,13	196	8	1,73	152	5	2,32	204	8	3,01	133	3
	med	0,99	173	6	1,53	134	4	2,04	179	6	2,66	117	3
	min	0,87	151	5	1,34	117	3	1,79	157	5	2,34	103	2
F 4 DF	max	1,12	194	8	1,72	150	5	2,30	202	8	2,99	132	4
	med	0,99	172	6	1,53	133	4	2,04	179	6	2,65	117	3
	min	0,87	151	5	1,34	117	3	1,79	157	5	2,34	103	2
F 5 DF	max	1,56	271	5	2,39	209	3	3,27	287	5	4,21	186	2
	med	1,34	233	4	2,05	180	2	2,83	248	4	3,63	160	2
	min	1,09	190	3	1,68	146	2	2,31	203	3	2,97	131	1
F 6 DF	max	1,56	270	5	2,38	208	3	3,26	286	5	4,20	185	2
	med	1,34	234	4	2,06	180	2	2,83	249	4	3,63	160	2
	min	1,09	189	3	1,67	145	2	2,30	202	3	2,95	130	1
F 7 DF	max	2,34	406	9	3,61	315	5	4,80	421	9	6,25	276	4
	med	1,93	336	6	2,98	260	4	3,96	347	6	5,18	229	3
	min	1,56	270	4	2,41	210	3	3,21	282	4	4,22	186	2
F 8 DF	max	2,45	426	11	3,78	330	6	5,04	442	10	6,56	289	5
	med	2,04	355	8	3,15	275	5	4,19	367	7	5,47	242	3
	min	1,69	293	5	2,60	228	3	3,47	304	5	4,56	201	2
F 9 DF	max	2,58	448	10	3,97	347	6	5,30	465	10	6,89	304	5
	med	2,26	393	8	3,49	305	5	4,65	408	8	6,06	268	4
	min	1,97	343	6	3,05	266	4	4,04	355	6	5,29	234	3
F 95 DF	max	2,75	478	16	4,25	371	9	5,62	493	15	7,35	325	7
	med	2,39	415	12	3,69	323	7	4,87	428	12	6,40	282	5
	min	2,11	367	10	3,28	286	6	4,31	378	9	5,68	251	4
F 10 DF	max	3,89	675	28	6,02	526	17	7,91	694	27	10,41	460	12
	med	3,36	584	21	5,21	456	13	6,83	600	21	9,02	398	10
	min	2,80	486	16	4,35	380	10	5,69	499	15	7,54	333	7
F 11 DF	max	4,56	793	37	7,06	617	23	9,30	816	36	12,21	539	17
	med	3,91	679	28	6,05	529	17	7,95	698	27	10,47	462	13
	min	3,01	523	18	4,68	409	11	6,12	537	17	8,10	358	8
F 12 DF	max	5,97	1038	52	9,25	808	32	12,14	1065	50	15,97	705	23
	med	5,03	874	39	7,80	681	24	10,21	896	37	13,48	595	17
	min	4,34	755	30	6,75	589	18	8,82	773	29	11,66	515	13

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5 PERFORMANCES

5.6 HEATING MODE MODELS WITH 2 HEAT EXCHANGERS (4 PIPE SYSTEMS)

Tbs_1 Inlet air temperature dry bulb
Tw_1 Inlet water temperature
Tw_2 Outlet water temperature
Vr Fan speed:
- **max** high
- **med** medium
- **min** low

PT Heating capacity
Qw Water flow rate
∆pw Pressure drop on water side

Tbs_1	22°C												
Tw_1 / Tw_2		45 / 40°C			60°C / 50°C			70°C / 60°C			90°C / 70°C		
	Vr	PT	Qw	∆ pw	PT	Qw	∆ pw	PT	Qw	∆ pw	PT	Qw	∆ pw
		kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa
F 1 DF	max	0,82	143	5	1,32	115	3	1,80	158	5	2,37	105	2
	med	0,73	127	4	1,17	102	2	1,60	140	4	2,11	93	2
	min	0,63	109	3	1,01	88	2	1,38	121	3	1,82	80	1
F 2 DF	max	0,97	169	6	1,56	136	4	2,12	186	7	2,78	123	3
	med	0,82	143	5	1,32	115	3	1,80	158	5	2,37	105	2
	min	0,70	122	3	1,13	98	2	1,54	135	4	2,03	90	2
F 3 DF	max	1,01	176	6	1,62	141	4	2,20	193	7	2,89	128	3
	med	0,89	155	5	1,42	124	3	1,94	170	6	2,55	113	3
	min	0,78	135	4	1,25	109	3	1,70	149	4	2,25	99	2
F 4 DF	max	1,00	175	7	1,61	140	4	2,19	192	7	2,87	127	3
	med	0,89	155	5	1,42	124	3	1,94	170	6	2,55	113	3
	min	0,78	135	4	1,25	109	3	1,70	149	5	2,25	99	2
F 5 DF	max	1,39	241	4	2,21	193	3	3,10	272	5	4,03	178	2
	med	1,19	207	3	1,90	166	2	2,69	236	4	3,47	153	2
	min	0,97	169	2	1,55	135	1	2,19	192	3	2,84	125	1
F 6 DF	max	1,38	240	4	2,20	193	3	3,09	271	5	4,02	177	2
	med	1,19	208	3	1,91	166	2	2,69	236	4	3,48	154	2
	min	0,96	168	2	1,54	135	1	2,18	191	3	2,82	124	1
F 7 DF	max	2,10	366	7	3,37	294	5	4,56	400	8	6,01	265	4
	med	1,73	301	5	2,78	243	3	3,76	330	6	4,98	220	3
	min	1,39	242	4	2,24	196	2	3,05	268	4	4,05	179	2
F 8 DF	max	2,21	383	9	3,53	308	6	4,78	420	9	6,30	278	4
	med	1,83	319	6	2,94	257	4	3,98	349	7	5,26	232	3
	min	1,51	263	5	2,43	212	3	3,30	289	5	4,38	193	2
F 9 DF	max	2,48	431	13	3,98	347	8	5,34	469	14	7,08	312	6
	med	2,15	374	10	3,46	302	7	4,63	407	11	6,15	272	5
	min	1,91	332	8	3,07	268	5	4,10	360	7	5,46	241	4
F 95 DF	max	2,32	403	9	3,71	324	6	5,04	442	9	6,63	292	4
	med	2,04	354	7	3,26	285	4	4,42	387	7	5,83	257	3
	min	1,77	308	5	2,84	248	3	3,84	337	6	5,09	225	3
F 10 DF	max	3,51	610	23	5,64	493	15	7,53	660	24	10,02	443	12
	med	3,04	528	18	4,89	427	12	6,50	570	19	8,68	383	9
	min	2,53	440	13	4,08	356	9	5,41	475	14	7,26	320	7
F 11 DF	max	4,12	717	31	6,61	578	20	8,85	777	33	11,75	519	16
	med	3,53	614	24	5,67	495	16	7,57	664	25	10,08	445	12
	min	2,72	473	15	4,38	383	10	5,82	511	16	7,80	344	8
F 12 DF	max	5,40	939	44	8,67	758	29	11,55	1014	46	15,38	679	22
	med	4,55	791	32	7,31	639	21	9,72	853	34	12,98	573	16
	min	3,93	684	25	6,33	553	16	8,39	736	26	11,23	496	13

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5 PERFORMANCES

5.7 VENTILATION FEATURES

The correction factors refer to the ESTRO FC recessed mounted units complete with clean air filter.
Multiply the air flow rate by factor F_1 and the capacity by factor F_2.

Psu Available static pressure
Vr Fan speed:
Max=maximum
Med=medium
Min=minimum
F_1 Air flow correction factor
F_2 Capacity correction factor

Psu	Pa	10		20		30		40		50		60	
	Vr	F_1	F_2	F_1	F_2	F_1	F_2	F_1	F_2	F_1	F_2	F_1	F_2
F1	max	0,84	0,89	0,65	0,74	0,41	0,52	-	-	-	-	-	-
	med	0,75	0,82	0,49	0,59	0,21	0,29	-	-	-	-	-	-
	min	0,65	0,72	0,27	0,34	-	-	-	-	-	-	-	-
F2	max	0,86	0,91	0,72	0,80	0,56	0,67	-	-	-	-	-	-
	med	0,78	0,84	0,56	0,65	0,33	0,41	-	-	-	-	-	-
	min	0,71	0,77	0,35	0,40	-	-	-	-	-	-	-	-
F3	max	0,88	0,92	0,76	0,83	0,65	0,74	0,53	0,64	0,42	0,53	0,31	0,41
	med	0,83	0,88	0,68	0,75	0,54	0,62	0,40	0,48	0,27	0,34	0,14	0,19
	min	0,79	0,84	0,59	0,65	0,38	0,44	0,17	0,21	-	-	-	-
F4	max	0,85	0,89	0,73	0,78	0,61	0,67	0,50	0,57	0,40	0,47	0,31	0,36
	med	0,82	0,85	0,63	0,68	0,45	0,50	0,27	0,30	-	-	-	-
	min	0,78	0,80	0,55	0,59	0,35	0,37	-	-	-	-	-	-
F5	max	0,91	0,94	0,81	0,86	0,69	0,77	0,56	0,66	0,40	0,50	0,18	0,24
	med	0,86	0,89	0,70	0,77	0,54	0,61	0,36	0,43	0,15	0,19	-	-
	min	0,80	0,83	0,55	0,60	0,22	0,25	-	-	-	-	-	-
F6	max	0,89	0,91	0,77	0,81	0,64	0,69	0,51	0,56	0,36	0,40	0,18	0,21
	med	0,82	0,84	0,64	0,67	0,47	0,50	0,29	0,32	-	-	-	-
	min	0,75	0,77	0,48	0,50	-	-	-	-	-	-	-	-
F7	max	0,93	0,95	0,85	0,89	0,76	0,82	0,66	0,73	0,54	0,62	0,37	0,45
	med	0,90	0,92	0,80	0,84	0,69	0,74	0,56	0,62	0,42	0,47	0,24	0,28
	min	0,83	0,86	0,67	0,70	0,49	0,53	0,31	0,34	-	-	-	-
F8	max	0,93	0,95	0,85	0,89	0,77	0,82	0,67	0,73	0,56	0,63	0,42	0,50
	med	0,91	0,93	0,81	0,84	0,71	0,75	0,59	0,64	0,46	0,51	0,31	0,35
	min	0,84	0,86	0,68	0,71	0,52	0,55	0,34	0,36	-	-	-	-
F9	max	0,93	0,95	0,85	0,89	0,77	0,81	0,67	0,73	0,56	0,62	0,41	0,47
	med	0,92	0,93	0,82	0,86	0,73	0,77	0,61	0,66	0,48	0,53	0,31	0,36
	min	0,86	0,88	0,71	0,74	0,56	0,59	0,40	0,43	0,23	0,25	-	-
F95	max	0,93	0,95	0,85	0,89	0,77	0,81	0,67	0,73	0,56	0,62	0,41	0,47
	med	0,92	0,93	0,82	0,86	0,73	0,77	0,61	0,66	0,48	0,53	0,31	0,36
	min	0,86	0,88	0,71	0,74	0,56	0,59	0,40	0,43	0,23	0,25	-	-
F10	max	0,96	0,96	0,91	0,92	0,86	0,88	0,80	0,83	0,74	0,78	0,67	0,71
	med	0,95	0,96	0,90	0,92	0,85	0,87	0,79	0,81	0,73	0,76	0,65	0,69
	min	0,91	0,92	0,81	0,82	0,71	0,73	0,60	0,62	0,49	0,51	0,37	0,39
F11	max	0,96	0,97	0,92	0,93	0,87	0,89	0,82	0,85	0,77	0,81	0,72	0,76
	med	0,95	0,96	0,90	0,91	0,84	0,86	0,78	0,81	0,71	0,75	0,64	0,68
	min	0,92	0,93	0,84	0,86	0,76	0,78	0,67	0,69	0,57	0,60	0,47	0,50
F12	max	0,96	0,97	0,93	0,94	0,89	0,91	0,85	0,88	0,80	0,84	0,76	0,80
	med	0,96	0,96	0,91	0,92	0,86	0,88	0,81	0,84	0,75	0,79	0,70	0,74
	min	0,94	0,95	0,87	0,89	0,80	0,83	0,73	0,76	0,66	0,69	0,58	0,62

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5 PERFORMANCES

5.8 SOUND LEVELS

Vr Fan speed:
Max=maximum
Med=medium
Min=minimum
Lw Octave band sound power level
Lw_A A - weighted sound power level
Lp_A A - weighted sound pressure level (1m distance, 4 directional factor)

		Lw								
ESTRO	**Vr**	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**8000 Hz**	**LwA**	**LpA**
		dB	**dB**	**dB**	**dB**	**dB**	**dB**	**dB**	**dB/A**	**dB/A**
F1	max	36,7	43,2	39,8	31,7	25,4	17,7	16,5	40	35
	med	30,5	37,2	30,0	20,0	15,2	15,5	16,4	32	27
	min	28,9	32,3	23,3	15,0	14,5	14,8	16,5	27	22
F2	max	40,9	47,7	44,9	38,4	32,5	20,6	16,7	45	41
	med	35,5	42,7	39,1	30,3	23,1	14,8	16,5	39	34
	min	29,7	38,3	32,2	22,0	15,0	14,2	16,3	33	28
F3	max	44,5	51,2	48,8	43,1	37,8	28,2	18,5	49	47
	med	39,7	46,4	43,7	36,2	,9,7	20,7	18,5	44	39
	min	16,5	31,4	32,8	26,9	21,3	13,8	13,6	36	31
F4	max	44,9	51,3	49,0	43,6	38,1	28,9	18,3	50	45
	med	39,0	46,4	43,9	36,2	29,1	18,6	16,5	44	39
	min	15,8	30,9	33,2	26,9	20,5	13,3	13,1	36	31
F5	max	44,1	50,0	46,9	41,0	35,5	29,8	31,2	48	43
	med	39,7	45,1	41,3	33,5	24,7	14,5	16,2	41	36
	min	32,1	38,7	33,2	24,4	17,2	16,9	20,9	34	29
F6	max	43,9	49,5	46,7	40,4	32,8	22,4	19,1	47	42
	med	39,1	44,6	41,1	33,0	24,5	17,4	17,7	41	36
	min	31,7	37,4	32,0	22,0	16,0	15,0	16,7	33	28
F7	max	47,0	53,2	50,5	44,9	39,9	30,5	20,4	51	46
	med	38,5	46,3	43,5	33,1	26,4	21,2	17,6	43	38
	min	30,7	39,2	34,0	21,4	16,6	19,3	16,7	34	29
F8	max	47,8	54,0	50,9	45,4	40,5	31,0	20,3	51	46
	med	39,7	46,2	43,0	34,2	27,5	20,6	17,6	43	38
	min	33,9	40,4	34,7	24,4	16,0	15,5	16,5	34	29
F9	max	52,2	57,9	54,6	50,6	46,2	38,1	25,8	56	51
	med	45,0	51,6	48,4	42,3	36,9	27,1	19,0	49	44
	min	39,8	46,0	43,0	34,4	27,4	20,9	17,9	43	38
F95	max	53,3	58,8	55,7	51,4	47,0	39,2	26,7	57	52
	med	46,2	52,5	49,6	43,5	37,8	28,5	20,2	50	45
	min	40,7	47,1	43,9	35,7	28,6	22,0	18,9	44	39
F10	max	54,1	60,8	57,0	52,7	49,6	43,4	34,3	59	54
	med	47,7	54,5	50,4	45,7	41,8	33,3	23,0	52	47
	min	40,8	47,3	42,3	37,3	31,3	21,8	19,2	44	39
F11	max	60,6	66,6	63,3	60,4	57,2	52,6	47,4	66	61
	med	53,6	59,3	57,0	52,5	49,3	43,3	34,8	58	53
	min	43,9	50,8	47,0	41,6	36,9	27,6	22,0	48	43
F12	max	66,6	72,0	69,0	66,9	61,9	56,5	50,1	71	66
	med	58,2	63,3	61,6	57,1	52,8	45,5	36,7	63	58
	min	52,2	57,9	57,7	50,7	45,4	36,3	27,4	57	52

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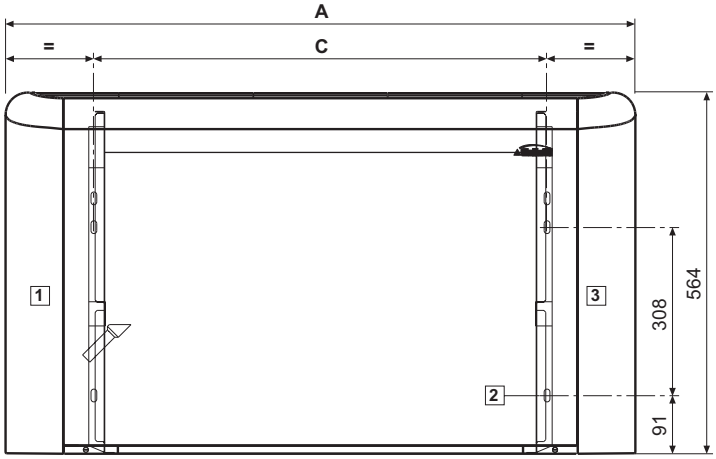
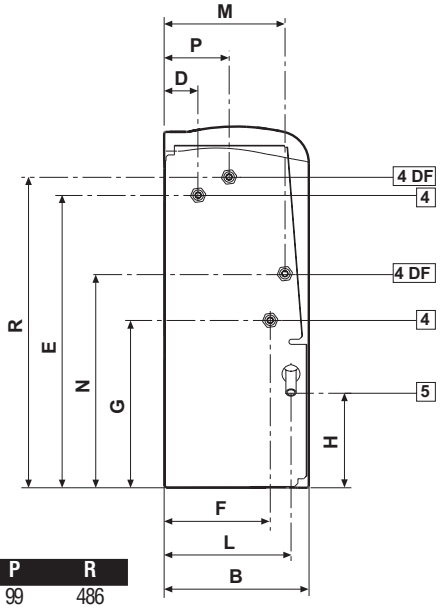
6 OVERALL DIMENSIONS

Overall dimensions for F L wall-mounted with cabinet, vertical air outlet

1 Space for hydraulic connections
2 Slots for wall-mounting
3 Space for electrical connections
4 Standard heat exchanger hydraulic connections
4DF DF 1-row additional heat exchanger hydraulic connections
5 Condensate discharge

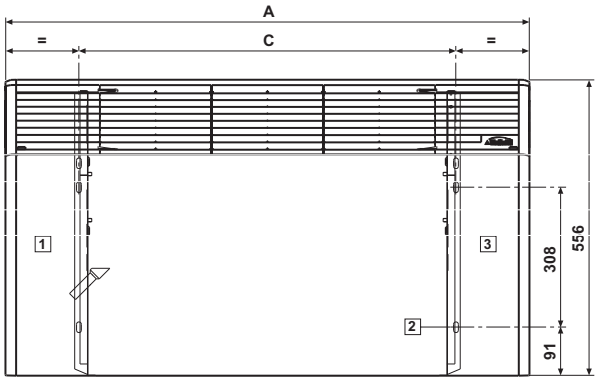


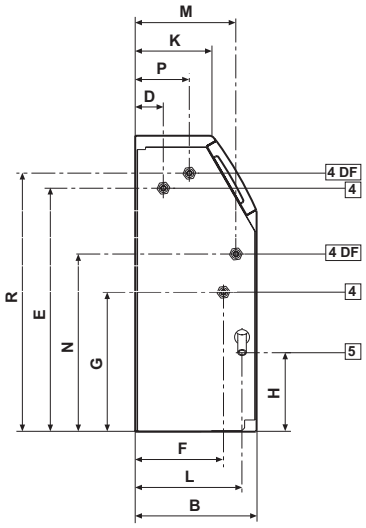


FL	A	B	C	D	E	F	G	H	L	M	N	P	R
1 - 4	774	226	498	51	458	163	263	149	198	187	335	99	486
5 - 6	984	226	708	51	458	163	263	149	198	187	335	99	486
7 - 9	1194	226	918	51	458	163	263	149	198	187	335	99	486
95	1194	251	918	48	497	185	259	155	220	195	348	120	478
10 - 11	1404	251	1128	48	497	185	259	155	220	195	348	120	478
12	1614	251	1338	48	497	185	259	155	220	195	348	120	478

Overall dimensions for F A wall-mounting with cabinet, inclined air outlet

1 Space for hydraulic connections
2 Slots for wall-mounting
3 Space for electrical connections
4 Standard heat exchanger hydraulic connections
4DF DF 1-row additional heat exchanger hydraulic connections
5 Condensate discharge





FA	A	B	C	D	E	F	G	H	K	L	M	N	P	R
1 - 4	774	228	498	53	458	166	263	149	145	201	189	334	102	486
5 - 6	984	228	708	53	458	166	263	149	145	201	189	334	102	486
7 - 9	1194	228	918	53	458	166	263	149	145	201	189	334	102	486
10 - 11	1404	253	1128	50	497	188	259	155	170	223	196	348	121	478
12	1614	253	1338	50	497	188	259	155	170	223	196	348	121	478

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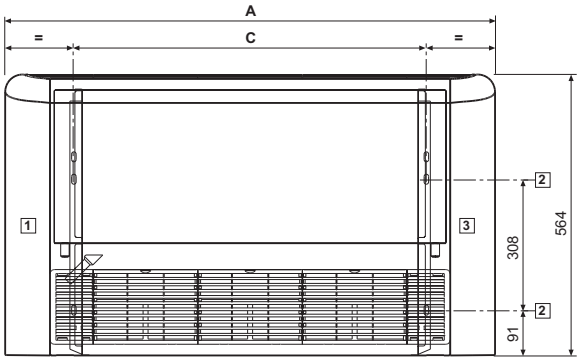
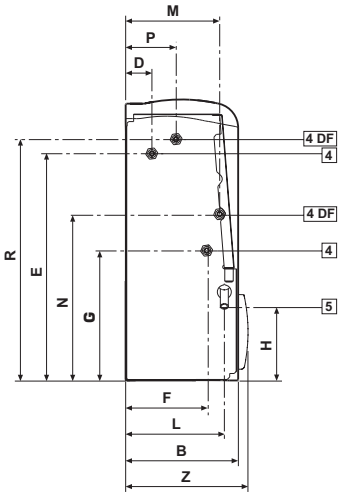
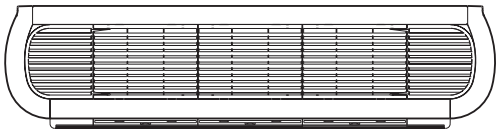
6 OVERALL DIMENSIONS

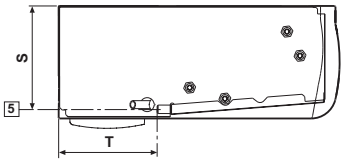
Overall dimensions for F U floor/ceiling with cabinet

1 Space for hydraulic connections
2 Slots for wall-mounting
3 Space for electrical connections
4 Standard heat exchanger hydraulic connections
4DF DF 1-row additional heat exchanger hydraulic connections
5 Condensate discharge





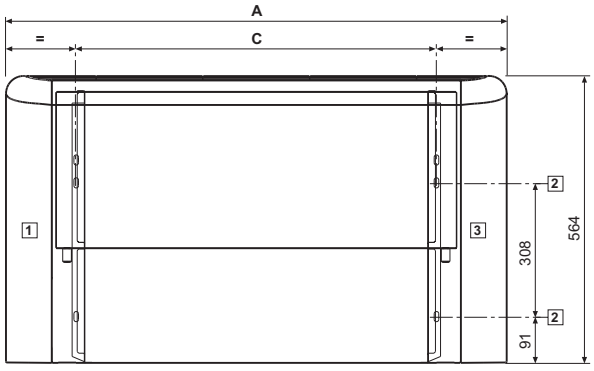


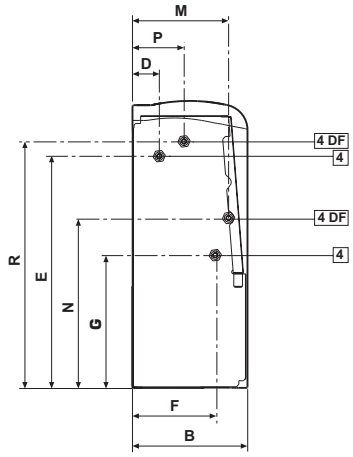


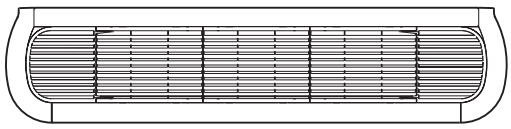
FU	A	B	C	D	E	F	G	H	L	M	N	P	R	S	T	Z
1 - 4	774	226	498	51	458	163	263	149	198	187	335	99	486	208	198	246
5 - 6	984	226	708	51	458	163	263	149	198	187	335	99	486	208	198	246
7 - 9	1194	226	918	51	458	163	263	149	198	187	335	99	486	208	198	246
95	1194	251	918	48	497	185	259	155	220	195	348	120	478	234	208	271
10 - 11	1404	251	1128	48	497	185	259	155	220	195	348	120	478	234	208	271
12	1614	251	1338	48	497	185	259	155	220	195	348	120	478	234	208	271

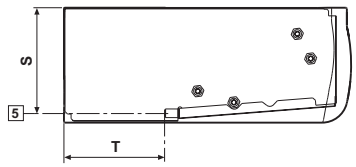
Overall dimensions for F P ceiling mounted with cabinet

1 Space for hydraulic connections
2 Slots for wall-mounting
3 Space for electrical connections
4 Standard heat exchanger hydraulic connections
4DF DF 1-row additional heat exchanger hydraulic connections
5 Condensate discharge









FP	A	B	C	D	E	F	G	M	N	P	R	S	T
1 - 4	774	226	498	51	458	163	263	187	335	99	486	208	198
5 - 6	984	226	708	51	458	163	263	187	335	99	486	208	198
7 - 9	1194	226	918	51	458	163	263	187	335	99	486	208	198
95	1194	251	918	48	497	185	259	195	348	120	478	234	208
10 - 11	1404	251	1128	48	497	185	259	195	348	120	478	234	208
12	1614	251	1338	48	497	185	259	195	348	120	478	234	208

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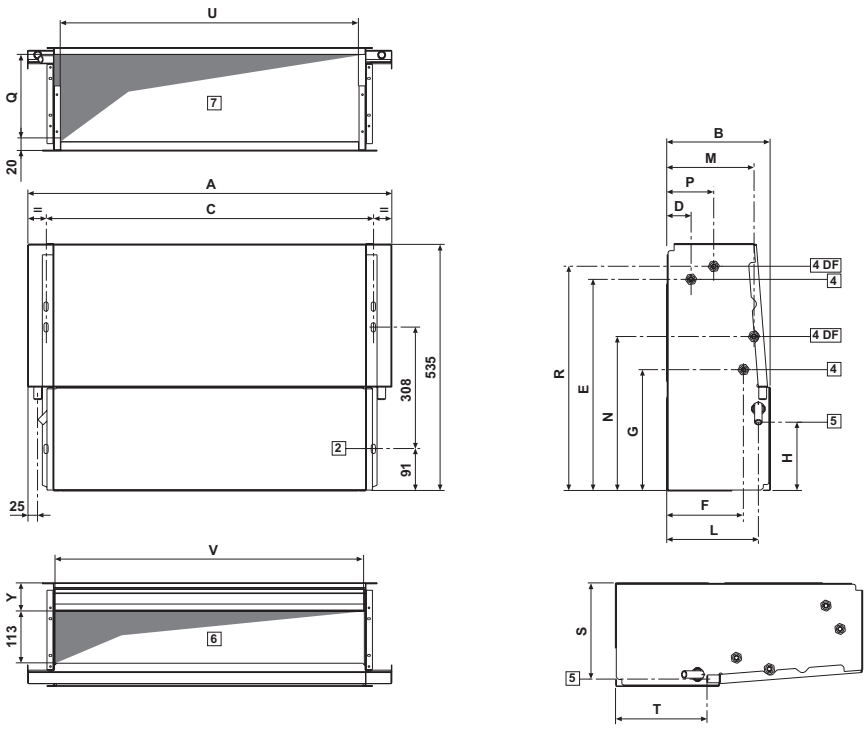
6 OVERALL DIMENSIONS

Overall dimensions for F C - vertical/horizontal concealed installation

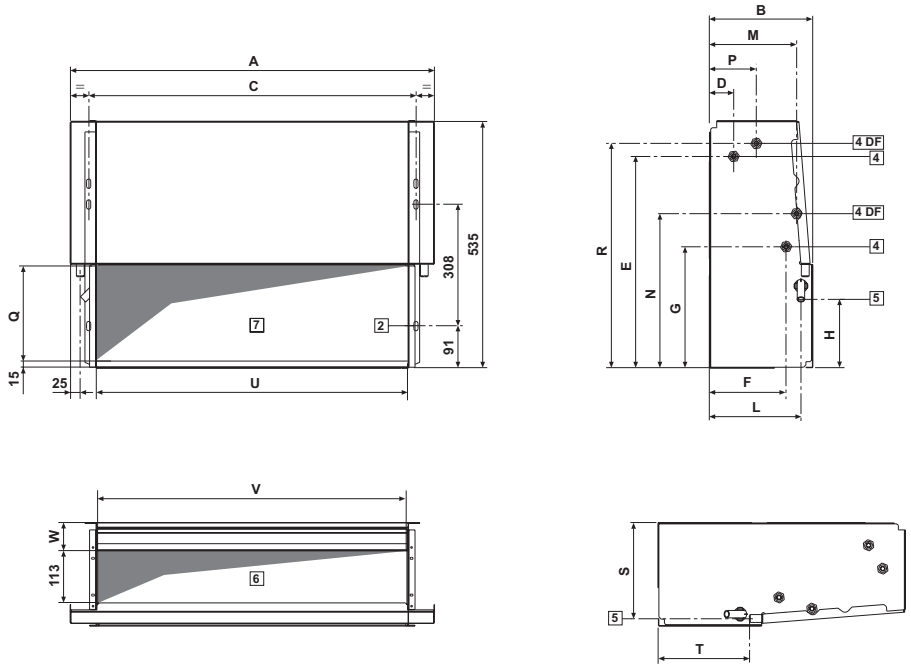
2 Slots for wall-mounting
4 Standard heat exchanger hydraulic connections
4DF DF 1-row additional heat exchanger hydraulic connections
5 Condensate discharge
6 Air outlet
7 Air intake



FC	A	B	C	D	E	F	G	H	L	M	N	P	Q	R	S	T	U	V	Y
1 - 4	584	224	498	51	458	163	263	149	198	187	335	99	189	486	208	198	436	464	61
5 - 6	794	224	708	51	458	163	263	149	198	187	335	99	189	486	208	198	646	674	61
7 - 9	1004	224	918	51	458	163	263	149	198	187	335	99	189	486	208	198	856	884	61
95	1004	249	918	48	497	185	259	155	220	195	348	120	215	478	234	208	856	884	67
10 - 11	1214	249	1128	48	497	185	259	155	220	195	348	120	215	478	234	208	1066	1094	67
12	1424	249	1338	48	497	185	259	155	220	195	348	120	215	478	234	208	1276	1304	67

Overall dimensions for F F - vertical / horizontal, front air intake

2 Slots for wall-mounting
4 Standard heat exchanger hydraulic connections
4DF DF 1-row additional heat exchanger hydraulic connections
5 Condensate discharge
6 Air outlet
7 Air intake



FF	A	B	C	D	E	F	G	H	L	M	N	P	Q	R	S	T	U	V	W
1 - 4	584	224	498	51	458	163	263	149	198	187	335	99	210	486	208	198	436	464	61
5 - 6	794	224	708	51	458	163	263	149	198	187	335	99	210	486	208	198	646	674	61
7 - 9	1004	224	918	51	458	163	263	149	198	187	335	99	210	486	208	198	856	884	61
10 - 11	1214	249	1128	48	497	185	259	155	220	195	348	120	220	478	234	208	1066	1094	67
12	1424	249	1338	48	497	185	259	155	220	195	348	120	220	478	234	208	1276	1304	67

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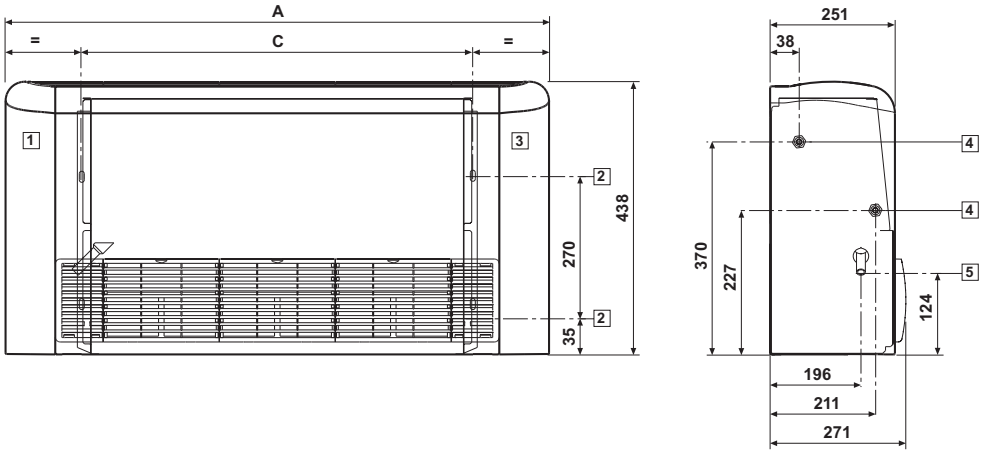
6 OVERALL DIMENSIONS

Overall dimensions for F B Low body fan coils, front air intake

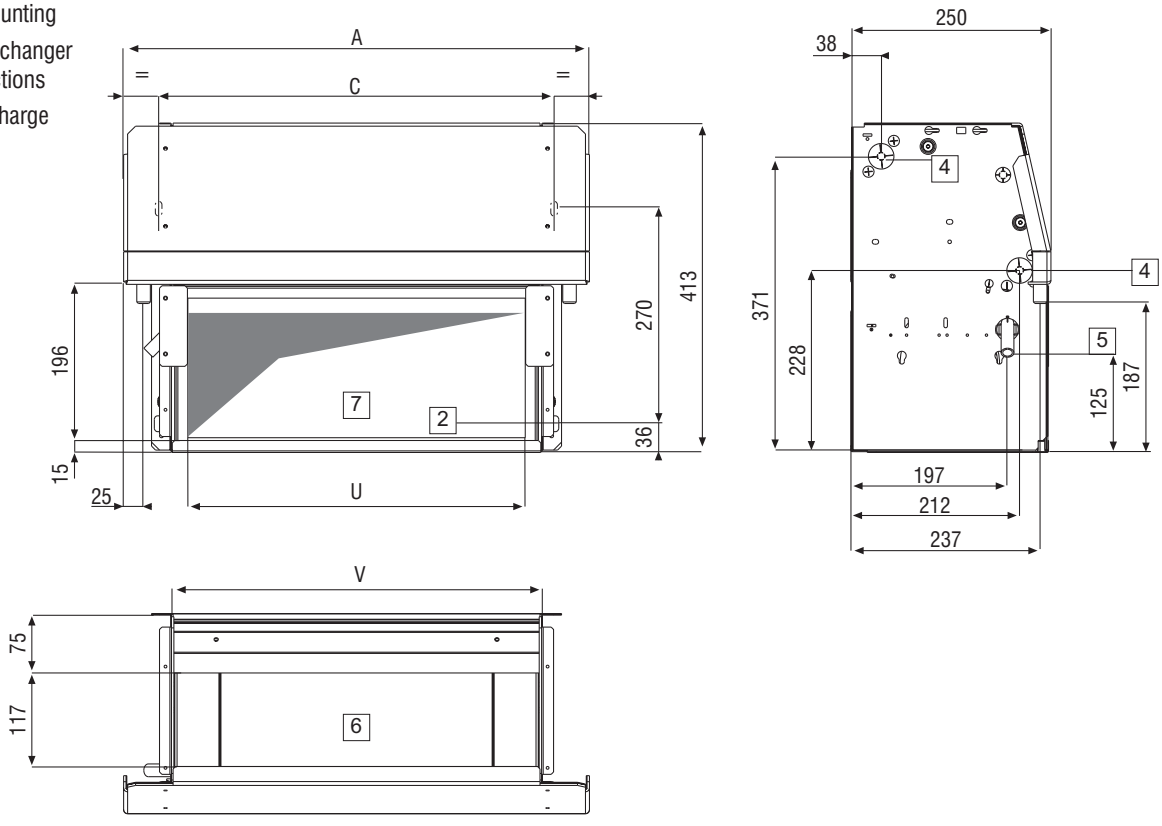
1 Space for hydraulic connections
2 Slots for wall-mounting
3 Space for electrical connections
4 Standard heat exchanger hydraulic connections
5 Condensate discharge



FB	A	C
1 - 4	774	498
5 - 6	984	708
7 - 9	1194	918

Overall for F BC - vertical / horizontal recess mounted with low cabinet

2 Slots for wall-mounting
4 Standard heat exchanger hydraulic connections
5 Condensate discharge
6 Air outlet
7 Air intake



FBC	A	C	U	V
1-4	584	498	423	464
5-6	794	708	633	674
7-9	1004	918	843	884

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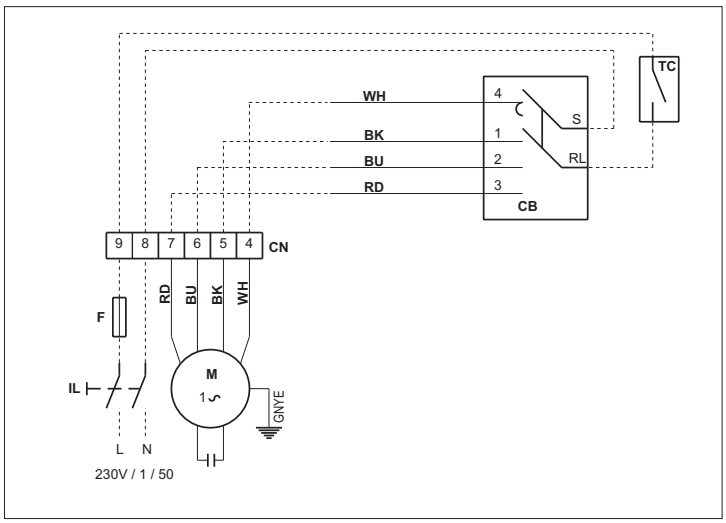
7 WIRING DIAGRAMS

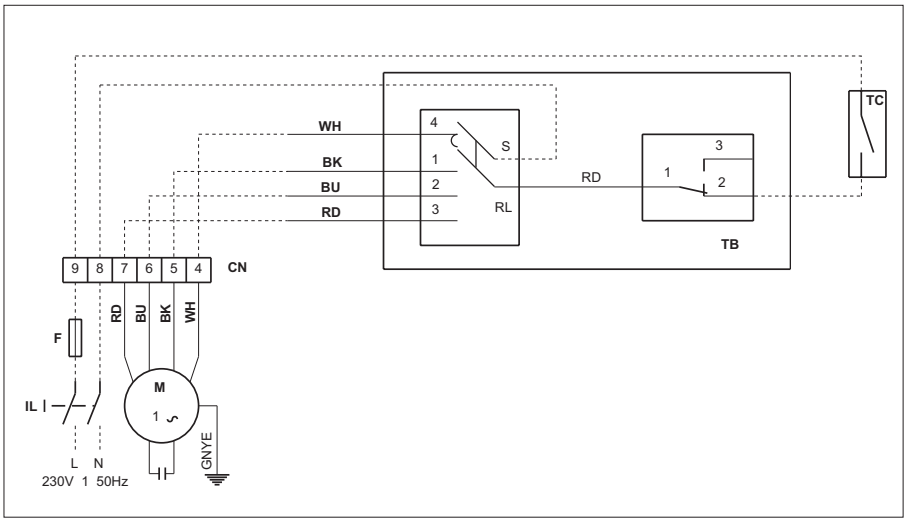
CB In built control panel with fan speed selector
The dashed lines connections must be carried out by the installer

BU Blue, medium speed
BK Black, maximum speed
CN Fast on connector
CB In built control panels with fan speed selector
F Protection fuse (not supplied)
IL Mains switch (not supplied)
RD Red, minimum speed
TC Fan stop thermostat (option)
WH White , common



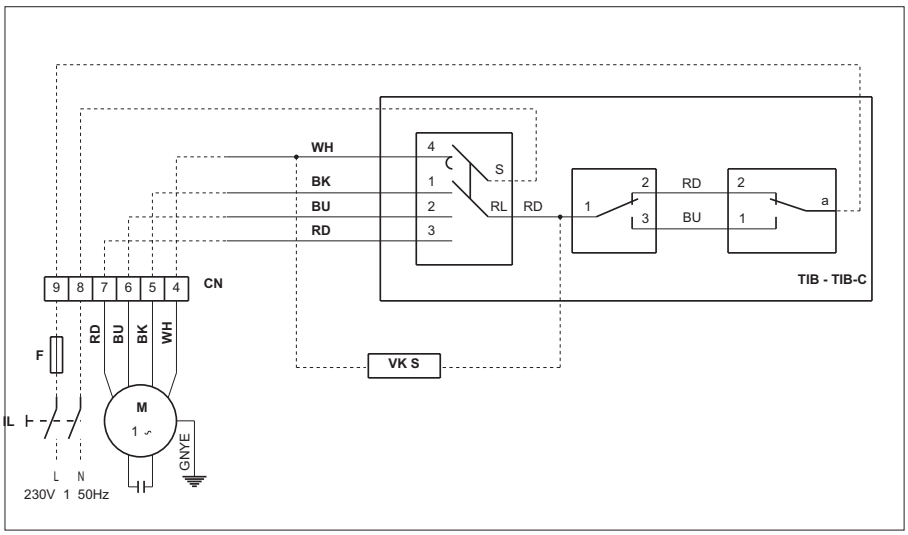
TB In built control panel with fan speed selector and electromechanical thermostat
The dashed lines connections must be carried out by the installer

BU Blue, medium speed
BK Black, maximum speed
CN Fast on connector
F Protection fuse (not supplied)
IL Mains switch (not supplied)
RD Red, maximum speed
TB In built control panels with fan speed selector and electromechanical thermostat
TC Fan stop thermostat (option)
WH White, common



TIB In build control panel with fan speed selector, thermostat and cooling/heating selector
The dashed lines connections must be carried out by the installer

BU Blue, medium speed
BK Black, high speed
CN Fast on connector
TIB In built control panel with fan speed selector, thermostat and cooling/ heating selector
F Protection fuse (not supplied)
IL Mains switch (not supplied)
RD Red, minimum speed
VK S Motor driven ON-OFF 3 way valve, standard heat exchanger (option)
WH White, common



Each fan-coil requires a switch (IL) on the feeder line with a distance of at least 3 mm between the opening contacts, and a suitable safety fuse (F).

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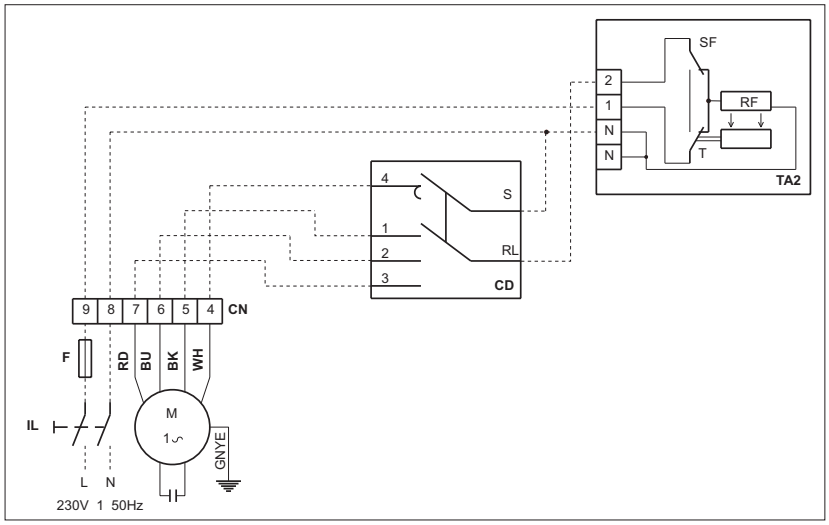
7 WIRING DIAGRAMS

CD+TA2 - Flush wall mounted fan speed selector and room thermostat

The dashed lines connections must be carried out by the installer

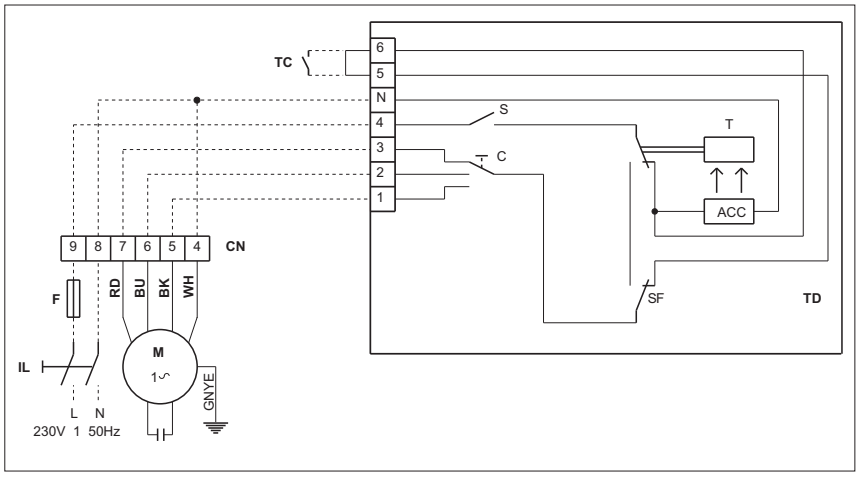
BU	Blue, medium speed
BK	Black, high speed
CN	Fast on connector
F	Protection fuse (not supplied)
IL	Mains switch (not supplied)
RD	Red, low speed
TA2	Wall mounted room thermostat (cooling-heating)
WH	White, common



TD - Wall mounted control panel with fan speed selector,thermostat and heating cooling / heating mode selector

The dashed lines connections must be carried out by the installer

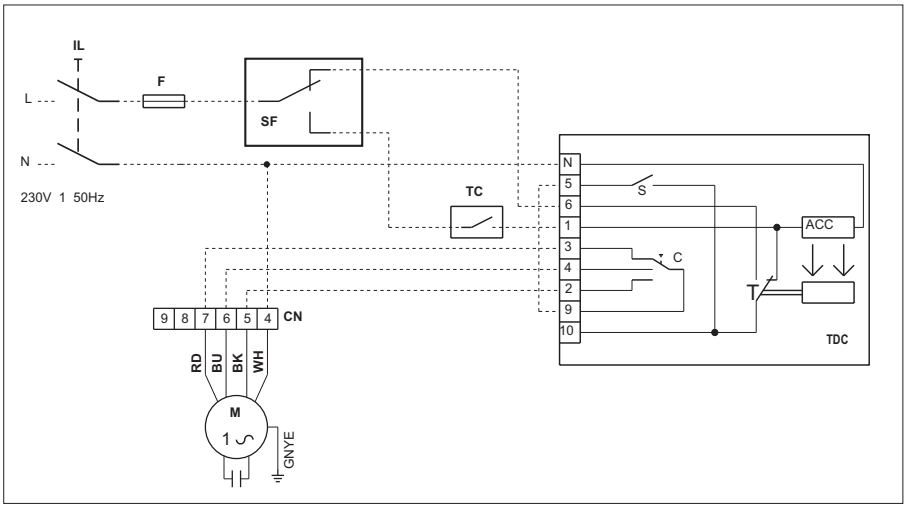
BU	Blue, medium speed
BK	Black, maximum speed
CN	Fast on connector
TD	Wall mounted control panel with fan speed selector, thermostat and cooling / heating mode selector
F	Protection fuse (not supplied)
IL	Mains switch (not supplied)
RD	Red, minimum speed
TC	Fan stop thermostat (option)
WH	White, common



TDC - Wall mounted control panel with fan speed selector and thermostat

The dashed lines connections must be carried out by the installer

BU	Blue, medium speed
BK	Black, maximum speed
CN	Fast on connector
TDC	Wall mounted control panel with fan speed selector and thermostat
F	Protection fuse (sot supplied)
IL	Mains switch (not supplied)
RD	Red, minimum speed
SF	Centralized cooling/heating mode selector (not supplied)
TC	Fan stop thermostat (option)
WH	White, common



Each fan-coil requires a switch (IL) on the feeder line with a distance of at least 3 mm between the opening contacts, and a suitable safety fuse (F).

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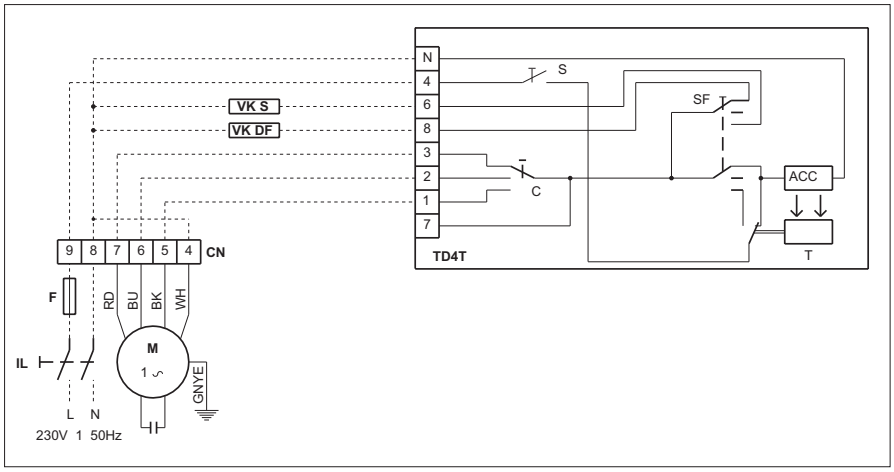
7 WIRING DIAGRAMS

TD4T - Wall mounted control panel with fan speed selector,thermostat and cooling / heating mode selector, for the control of the fan coil and valves (2 and 4 pipe systems)

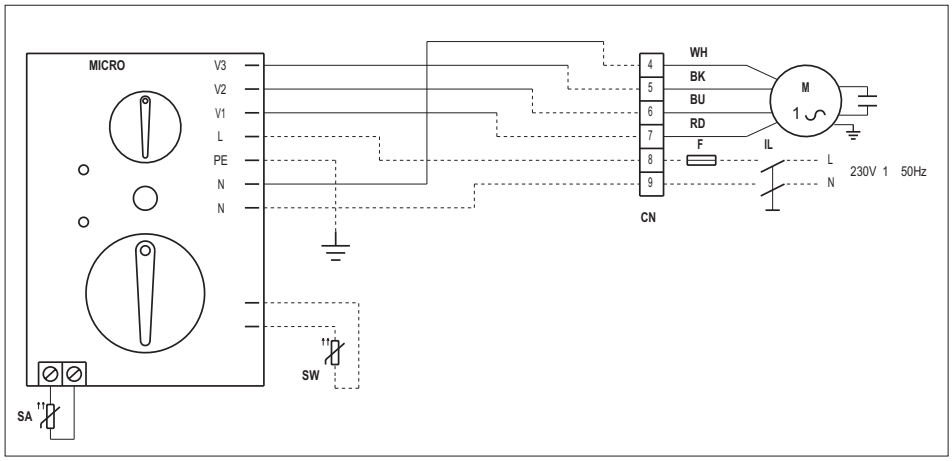
The dashed lines connections must be carried out by the installer



BU Blue, medium speed
BK Black, maximum speed
CN Fast on connector
TD4T Wall mounted control panel with fan speed selector, thermostat and cooling / heating mode selector for the control of the fan coil and valves (2 and 4 pipe systems)
F Protection fuse (not supplied)
IL Mains switch (not supplied)
RD Red, minimum speed
VK S Motor driven 3 way ON-OFFvalve (option), standard heat exchanger, cooling mode
VK DF Motor driven 3 way ON-OFFvalve (option), DF additional heat exchanger, heating mode
WH White, common

MICRO - Microprocessor in built control panel, for the automatic control of the fan coil

The dashed lines connections must be carried out by the installer



BU Blue, medium speed
BK Black, maximum speed
CN Fast on connector
F Protection fuse (not supplied)
IL Mains switch (not supplied)
MICRO Microprocessor in built control panel for the automatic control of the fan coil
RD Red, minimum speed
SA Room temperature probe for automatic fan speed selection
SW Water temperature probe (option), for the automatic cooling/ heating mode selection.
WH White, common

Each fan-coil requires a switch (IL) on the feeder line with a distance of at least 3 mm between the opening contacts, and a suitable safety fuse (F).

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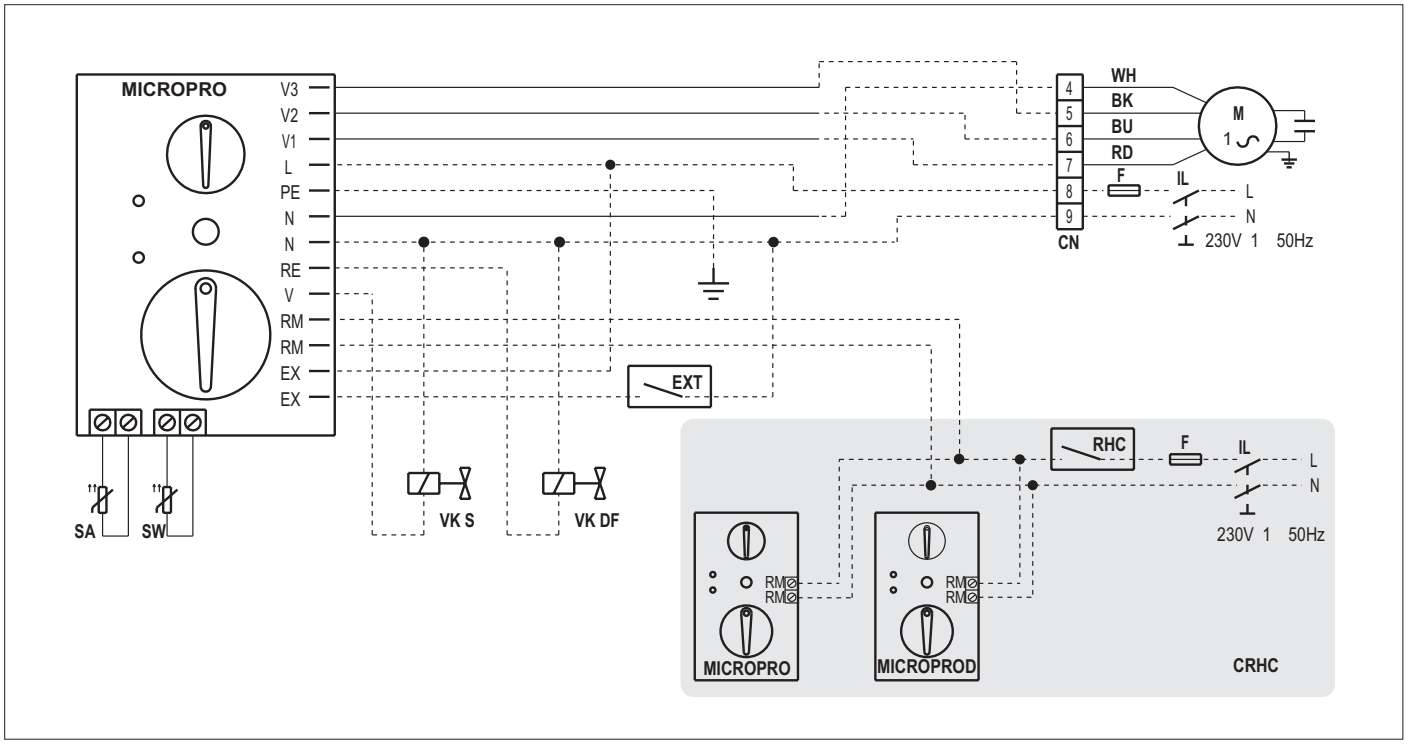
7 WIRING DIAGRAMS

MICROPRO **Microprocessor in built control panel, for the automatic control of the fan coil, valves and electric heater**

The dashed lines connections must be carried out by the installer

BU	Blue, medium speed
BK	Black, maximum speed
CN	Fast on connector
CRHC	Group of controls connected to the centralised switch RCH
EXT	External reed contact for the automatic switch ON and OFF af the unit (not supplied)
F	Protection fuse (not supplied)
IL	Mains switch (not supplied)
MICROPRO	In built microprocessor control panel
MICROPROD	Wall mounted microprocessor control panel
RCH	Remote switch for the centralized cooling / heating mode selection (not supplied)
RD	Red, minimum speed
SA	Room temperature probe for automatic fan speed selection
SW	Water temperature probe (option for the MICROPROD control), for the automatic cooling/heating mode selection.
VK S	Motor driven,ON-OFF 3 way valve (option), standard heat exchanger cooling mode
VK DF	Motor driven, ON-OFF 3 way valve (option) , DF additional heat exchanger, heating mode
WH	White, common



Each fan-coil requires a switch (IL) on the feeder line with a distance of at least 3 mm between the opening contacts, and a suitable safety fuse (F).

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8 ACCESSORIES

CB In built speed selector

In built control panel, complete with a 4 positions (3 speed + stop) rotation selector.
This control panel, that can be installed on the éstro F L, F A (for this model use the covering frame), F U, F B versions, allows the ON/OFF and fan speed selection of the fan coil unit.
The control panel comes complete with cables for the connection to the terminal board of the fan coil unit.

TB - In built control with speed selector and thermostat

In built control panel, complete with fan speed selector and electromechanical thermostat.
Fan speed selection and room temperature regulation:

- fan speed manual selection;
- room temperature regulation in the heating mode by means of fan start/stop at a manually set speed and if installed by means of the opening and closing of the regulating valve.
- room temperature regulation in heating and cooling modes with centralised mode selection by means of fan start/stop at a manually set speed and if installed, by means of the opening and closing of the regulating valve.

This control panel can be installed on the éstro F L, F A (for this model use the covering frame), F U, F B versions, is provided with a 4 positions (3 speed + stop) rotation selector and an electromechanical thermostat with a fluid expansion probe (operation range +6/+30°C).
The control panel comes complete with cables for the connection to the terminal board of the fan coil unit.

TIB In built control with speed selector,thermostat and summer-winter selector

In built control panel, complete with fan speed selector, electromechanical thermostat and cooling / heating mode selector.
Fan speed selection, room temperature regulation and heating / cooling mode selection.

- fan speed manual selection;
- room temperature regulation in cooling and heating mode, by means of fan start/stop, at a manually set speed.
- room temperature regulation in cooling and heating mode by means fan start/stop at a manually set speed and, if installed by means of opening and closing of the regulating valve.

This control panel can be installed on the éstro F L, F A (for this model use the covering frame), F U, F B versions, is provided with a 4 positions (3 speed + stop) rotation selector, an electromechanical thermostat with a fluid expansion probe (operation range +6/+30°C) and cooling/ heating mode selector.
The control panel comes complete with cables for the connection to the terminal board of the fan coil unit and with an adhesive probe-holder.

CD - Flush wall-mounted speed selector

Flush wall mounted control panel is provided with a 4 positions (3 speed + stop) rotation selector.
This control panel, that can be matched with all the èstro versions, allows the ON/OFF and fan speed selection of the fan coil unit.

CDE - Wall-mounted speed selector

Wall mounted control panel is provided with a 3 positions (3 speed) and switch ON/OFF .
This control panel, that can be matched with all the ESTRO2006 versions,allows the ON/OFF and fan speed selection of the fan coil unit.

TD - Wall mounted control with speed selector,thermostat and summer-winter selector

Wall mounted control panel complete with fan speed selector, electromechanical thermostat and cooling / heating mode selector.
Fan speed control, regulation of the room temperature and cooling / heating mode selection:
- manual setting of the fan speed;
- room temperature regulation both in cooling / heating mode, by means of fan start/stop, at a manually set temperature.

This wall mounted control panel can be matched with all the éstro versions.

TDC - Wall mounted control with speed selector and thermostat

Wall mounted control panel complete with fan speed selector, electromechanical thermostat and cooling / heating mode selector.
Fan speed control, regulation of the room temperature and cooling / heating mode selection:
- manual setting of the fan speed;
- room temperature regulation both in cooling / heating mode, by means of fan start/stop, at a manually set temperature.

This wall mounted control panel can be matched with all the éstro versions.

TD4T - Wall mounted control with speed selector,thermostat and summer-winter selector, for 2/4 pipe sistem with valves

Wall mounted control panel provided with fan speed selector, electromechanical thermostat, and cooling / heating mode selector; if installed it controls regulating valves.
Fan speed control and regulation of the room temperature:
- manual setting of the operation fan speed;
- regulation of the room temperature for 2 and 4 pipe systems, both in heating and cooling mode, by means of fan start/stop at a manually set temperature and by means of opening and closing of the regulating valve.

This wall mounted control panel can be matched with all the éstro versions.

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8 ACCESSORIES

TA - Wall mounted room thermostat

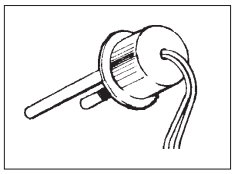
Automatic regulation of the the room temperature:
- only in the heating mode working on the fan motor assembly and on the regulating valve, if installed (ON/OFF operation);
- only in the cooling mode working on the fan motor assembly and on the regulating valve, if installed (ON/OFF operation);
- both in cooling and heating mode, with remote mode selection working on the fan motor assembly and on the regulating valve, if installed (ON/OFF operation).

This wall mounted room thermostat can be matched with all the éstro versions.

TA2 - Wall mounted room thermostat with summer / winter selector

Wall mounted room thermostat with cooling/ heating mode selector.
Automatic regulation of the room temperature both in heating and cooling mode, working on the fan motor assembly and on the regulating valve, if installed.
This wall mounted room thermostat can be matched with all the éstro versions.

TC - Fan stop thermostat: electromechanical thermostat for minimum water temperature during heating

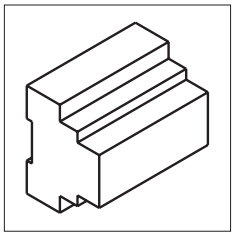


Fan stop thermostat with automatic resetting, it stops the fan motor assembly when the water temperature in the heat exchanger decreases under the set value (42°C).
Useful only in the heating mode for installation on the finned pack of the heat exchanger.
This fan stop thermostat can be matched with all the éstro versions.

MICRO - MICRO-D Microprocessor control (in built or wall mounted) - automatic control of the fan coil

Microprocessor control panel for in built (micro) or wall (MICROD) installation, complete with fan speed selector, electronic thermostat and heating / cooling mode selector; for the automatic control of the fan coil unit.
Fan speed control, regulation of the room temperature and cooling/heating mode selection.
- Regulation of the room temperature both in the cooling and heating mode, by means of fan start /stop, at a manually set temperature ;
- Regulation of the room temperature both in the cooling and in the heating mode, by means of the automatic regulation of the fan speed;
- Timer function (not available for the Micro-D)
- Cooling/heating mode selection in the following ways:
- manual in built;
- automatic according to the water temperature (with the SW water probe, option);

KP - Power interface for connection of up to 4 fan coils to a single control panel



The KP master sleeve can be installed to control with a single control panel up to 4 fan coil units (connected in parallel).
This accessory is designed for installation on a DIN drive, usually placed on electric board, can be matched with all the èstro fan coil versions.

MICROPRO - MICROPRO-D Microprocessor control (in built or wall mounted) - automatic control of the fan coil, valves, electric heater

Microprocessor control panel for in built (MICROPRO) and wall (MICROPRO-D) installation complete with fan speed selector, electronic thermostat and cooling/heating mode selector; for the automatic control of the fan working on the valves and electric heater, if installed.
Fan speed control, room temperature regulation and cooling/heating mode selection.
- Room temperature regulation both in the cooling and heating mode, by means of fan start/stop, at a manually set speed.
- Room temperature regulation both in the cooling and heating mode, by means of the automatic regulation of the fan speed.
- timer function (not available for the MICROPRO-D)
- Cooling / heating mode selection in the following way:manual in built; manual remote (centralized);
  automatic according to the water temperature (with the SW water probe, option for the MICROPRO-D, included in the MICROPRO kit);
  automatic according to the room temperature (with air temperature probe, option).
- Control of the on-off valves for 2 or 4 pipe systems.
- Control of the electric heater as integration or subtitution of the heating circuit with delayed stop of the fan (2 min.).

The Micropro / Micropro-D control panels are provided also with:
- contacts for external signals in order to enable or disable the unit operation;

MICRONET- Advanced microprocessor control panels for ergo solution

MICRONET is the control panel suitable for the connection to the ERGO SOLUTION. Microprocessor control panels for wall installation complete with fan speed selector, electronic thermostat and cooling / heating mode selector; for the automatic control of the fan working on the valves and electric heater, if installed.
Fan speed control, room temperature regulation and cooling / heating mode selection:
- room temperature regulation both in the cooling and heating mode, by means of fan start/stop, at a manually set speed;
- room temperature regulation both in the cooling and heating mode, by means of the automatic regulation of the fan speed;
- timer function (not available for MICROPRO-D);
- cooling / heating mode selection in the following way:
- manual in built;
- automatic according to the water temperature;
- automatic according to the room temperature;
- control of the ON/OFF valves for 2 or 4 pipe system;
- control of the electric heater as integration or replacement of the hot water heat exchanger with delayed stop of the fan (2 min.).

The MICRONET control panels are provided also with contacts for external signals in order to enable or disable the unit operation.
- terminals for the connections with external signals in order to enable or disable the unit operation;
- terminals for the connections with external signals in order to enable or disable the ECONOMY set point (only if combined with ERGO software)
- air temperature probe
- water temperature probe
- RS485
- built-in MODBUS communication protocol
- Built-in Polarity and termination resistance

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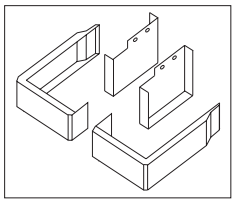
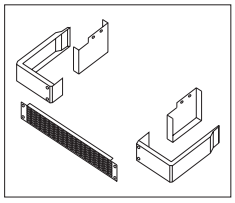
8 ACCESSORIES

ZA - Pair of covering feet for F A models



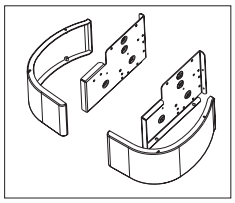
The ZA covering feet, designed for the installation on the FA éstro series, are supplied in pairs and include both the supports for fixing them to the bearing structure and the external coverings for fixing them to the cover cabinet.
They can be used either to cover the hydraulic pipes (coming from the floor) or when it is not possible to mount the fan coil unit on the wall.
The height of the covering feet is 100 mm.

ZAG - Pair of covering feet with front grille for F A models



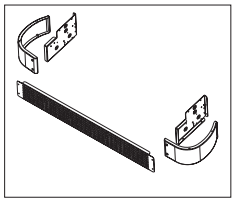
The ZAG covering feet, designed for the installation on the FA éstro series, are supplied in pairs and include both the supports for fixing them to the bearing structure, the external coverings for fixing them to the cover cabinet and the front covering grille.
They can be used either to cover the hydraulic pipes (coming from the floor) or when it is not possible to mount the fan coil unit on the wall.
The height of the covering feet is 100 mm.

ZL Pair of covering feet for F L models



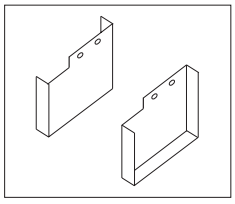
The ZL covering feet, designed for the installation on the FL éstro series, are supplied in pairs and include both the supports for fixing them to the bearing structure and the external coverings for fixing them to the cover cabinet.
They are to be used either for covering the hydraulic pipes (coming from the floor) or when it is not possible to mount the fan coil unit on the wall.
The height of the covering feet is 100 mm.

ZLG Pair of covering feet with front grille for F L models



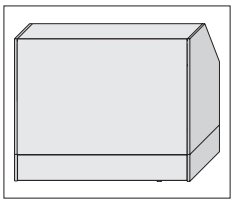
The ZLG covering feet, intended for being assembled on the FL éstro series, are supplied in pairs and comprise both the supports for fixing them to the bearing structure, the external coverings for fixing them to the cover cabinet.
They are to be used either for covering the hydraulic pipes (coming from the floor) or when it is not possible to mount the fan coil unit on the wall.
The height of the covering feet is 100 mm.

D - Supporting brackets for F C models vertically mounted



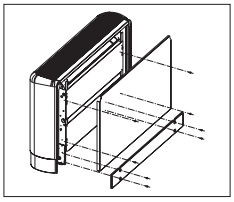
The D supporting brakets, are supplied in pairs and can be installed on wall mounted recessed fan coil units éstro F C when it is not possible to fix the unit onto the wall.
The height of the supporting brackets is 100 mm.

PVA- Rear painted covering panel for FA models



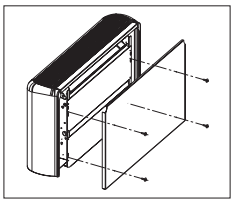
This accessory is designed for the installation of the FA fan coil unit on the rear of glass walls.
The kit includes an upper and a lower rear panels.
The fan coil unit with the PVA rear panel cannot be fixed on the wall.

PVL Rear painted covering panel for FL and F U models



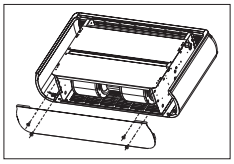
This accessory is designed for installation of the FL and FU on the rear of glass walls.
The kit includes an upper and a lower rear panels.
The fan coil unit with the PVL rear panel cannot be fixed on the wall.

PVB - Rear painted covering panel for FB models



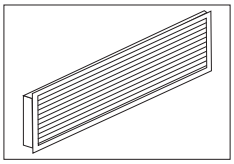
This accessory is designed for installation of the FB on the rear of glass walls.
The fan coil unit with the PVB rear panel cannot be fixed on the wall.

PH - Rear painted covering panel for FU models horizontally mounted



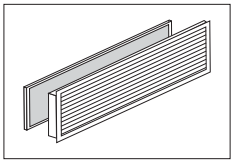
The rear painted panel PH is designed for the éstro FU only for ceiling installation, with the back side of the unit at sight in order to cover the technical spaces (hydraulic and electric)
The fan coil with the PH rear panel can operate only in heating mode.

GE+C - Anidized aluminium grille for air intake complete with counter-frame



Fresh air intake grille with fixed anodised aluminium fins complete with a galvanised metal sheet counterframe, it is usually combined with the fresh air intake louvers and designed for wall installation.

GEF+C - Anidized aluminium grille for air intake complete with counter-frame and filter



Air suction grille with fixed anodised aluminium fins, is complete with washable acrylic fibre filter and galvanised metal sheet counterframe; it is usually combined with recessed-mounted fan coils.

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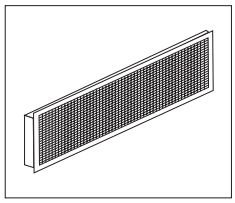
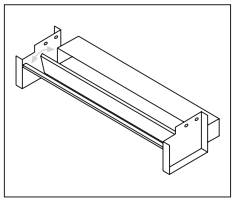
8 ACCESSORIES

GM+C - Double row anidized aluminium grille complete with counter-frame



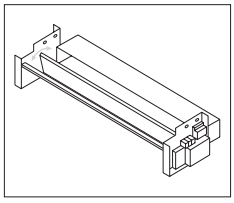
Air outlet grille with a double row of adjustable anodised aluminium fins, complete with galvanised metal sheet counterframe ; it is usually combined with recessed-mounted fan coils.

S Manual fresh air intake louver



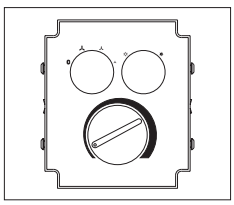
The manual fresh air intake louver allows to carry out the renewal of the room air directly from the fan coil unit.
The quantity of fresh air, filtered and thermally treated by the fan coil, is regulated by setting manually the flap placed inside the louver.
The fresh air intake louver can be installed on all the éstro versions with the exception of the FB and of the FU only if used for floor installation.
This accessory, if installed on fan coil with cabinet (FL, FA and FP ceiling mounted) has to be matched to the proper covering feet (ZL for FL fan coils and ZA for FA fan coils).

SM Motor driven fresh air intake louver



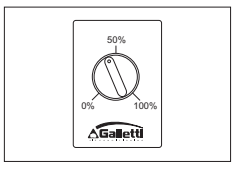
The motor driven fresh air intake louver allows to carry out the renewal of the room air directly from the fan coil unit.
The quantity of fresh air, filtered and thermally treated by the fan coil, is regulated proportionally from 0 to 100% by means of a servomotor placed inside the louver.
The SM kit is complete with a servomotor (IP54 protection degree, power supply 24V) and a power supply transformer 230V - 24V.
The automatic opening and closing of the louver is possibile on signal from auxiliary external contacts (not supplied) such anti-freeze thermostat, timer etc., with possible connection in parallel of more than one servomotor to a single position transducer.
This accessory has to be matched with one of the control panel available as option, CSB (in built installation) and CSD (wall mounted installation), that allow the opening and closing of the louver from 0 to100%.The motor driven fresh air intake louver can be installed on all the éstro versions with the exception of the FB and of the FU only if used for floor installation.
This accessory, if installed on fan coil with cabinet (FL, FA and FP ceiling mounted) has to be matched to the proper covering feet (ZL for FL fan coils and ZA for FA fan coils).

CSB in built control for proportional opening and closing of the SM motor driver air louver



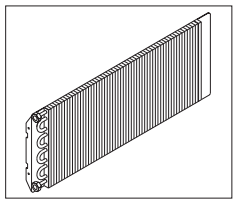
Designed for in built installation, on the opposite side of the fan coil control panel it allows the proportional opening and closing from 0 to 100% of the SM motor driven fresh air intake louver.
It is not possible to use the control panel CSB in case of installation of the DF additional heat exchanger (option for 4 pipe systems); in this case the opening of the SM motor driven air intake louver must be controlled by the CSD remote control panel.

CSD - Wall mounted control for proportional opening and closing of the SM motor driver air louver



Designed for wall installation, it allows the proportional opening and closing from 0 to 100% of the SM motor driven fresh air intake louver.

DF- Additional heat exchan ger for 4-pipe system (hot water circuit)

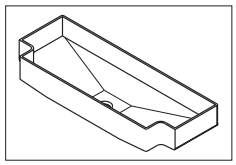


Additional heat exchanger made of copper pipe and aluminium fins, is used for 4 pipe systems and has to be connected to the heating circuit.
The heat exchanger is complete with air purge valve placed on the hydraulic connections.
The mounting kit is complete with a fixing bracket designed to avoid the rotation of the manifolds during the connection of the heat exchanger to the unit.
The performances of the heat exchanger fitted on the éstro fan coil units are certified by EUROVENT that guarantee the reliability of the data indicated in this manual.

VK - 3-way valve with ON-OFF motor and hydraulic kit

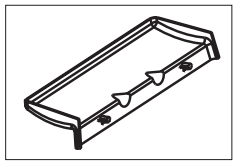
The VK motor driven 3 way / 4 ports ON/OFF valve kit, connected to the control panels for éstro fan coil units allows the regulation of the room temperature stopping the water flow into the heat exchanger.
The VK kit is available in various versions for all the éstro fan coils both for the standard (VK S) and for the additional DF (VK DF) heat exchangers.
The kit is made of:
3 way /4 ports valve with incorporated by-pass , made of brass, with maximum operation pressure 16 bar.
Electrothermal actuator with ON/OFF action (total opening period 4 min.), power supply 230 V
Hydraulic connections kit for the connection of the valve onto the heat exchanger, complete with 2 holders for the balancing and the interception of the fan coil unit.

BV - Auxiliary drip tray for vertical-mounting units



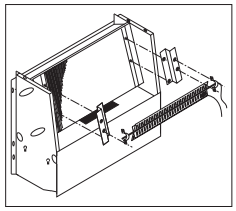
This accessory is designed to collect any condensate that may form on the valve and the holder. It can be fitted on the all éstro series.

BH - Auxiliary drip tray for horizontal-mounting units



The BH drip tray, can be used for horizontal installation fan coils to collect the eventual condensate that may form on the ON/OFF 3 way valve (option VK S).

RE - Additional electric heater with assembly kit , safety devices and power relay box



Useful as heating integration to the hot water system, the RE kit is made of an electric heater with safety thermostat (automatic and manual resetting) and power relay.
The RE electric heater kit has to be matched with the MICROPRO or MICROPRO-D control panel.

KSC - Condensate removal kit

This device allows to overcome displacements in the condensate drain.
The pump can drain water up to 8 l/h and it is completed by a non return valve on the discharge side.

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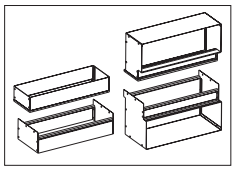
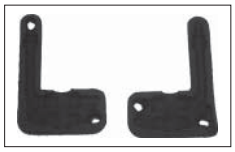
8 ACCESSORIES

RA / RM - Inlet and outlet connectors



These accessories are designed for éstro FC, FF, F BC fan coils and are used for room ducts when the basic unit (éstro FC) 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 steam insulation shell



The GIVK valve steam insulation shell it avoids forming itself of condenses in to valve.
The hydraulic attacks are previewed are to right are on the left.

SW - Water temperature electronic probe for MICRO, MICRO-D and MICROPRO-D controls

Water probe for the MICRO, MICRO-D and MICROPRO-D control panels: automatic selection of the cooling/heating operation mode.
Connected directly to the microprocessor control panels, this probe measures the water temperature inside the heat exchanger.
If the temperature registered is lower than 17°C the unit works in cooling mode and the temperature range of the control panel will be referred to the cooling mode (19 / 31°C); if the temperature registered is higher than 37°C the unit works in heating mode and the temperature range of the control panel will be referred to the heating mode (14 / 26°C).
If the temperature registered is between 17°C e 37°C the control panel will disable the unit operation.
The SW water probe is included in the MICROPRO and MICRONET kit.

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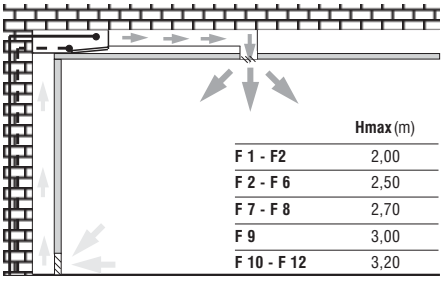
9 INSTALLATION SUGGESTIONS

Fan coil units should be installed in a position where they heat and cool the room evenly, on walls or ceilings that can bear their weight.
Fit any accessories on the standard unit before installing it.
Read the relevant technical sheets for the installation and use of the accessories.
Keep free space around the fan coil to allow proper operation and ordinary and extraordinary maintenance (see the "overall dimensions" chapter)
Provide a panel to reach the unit in case of recessed mounting (FC models).To avoid excessive stratification of the air in the rooms heated with a ceiling mounted fan coil you should :
- not exceed installation heights "H" shown in the table at the side referred to maximum operating speed;
- feed the fan coil unit with not excessively hot water (inlet water 50/60°C);
- if possible, place the air intake in the lower part of the room (installation diagram shown on the right).



	Hmax (m)
F 1 - F2	2,00
F 2 - F 6	2,50
F 7 - F 8	2,70
F 9	3,00
F 10 - F 12	3,20

Install the remote control panel, if any, in a position that can easily be reached by the user to set the functions and that is suitable for the proper detection of the temperature, if provided.
Therefore avoid :
- positions directly exposed to sunlight;
- positions exposed to hot or cold draughts;
- obstacles preventing the proper temperature detection

If the system is shut down during the winter months, drain off the water from the system to prevent damage due to freezing; if antifreeze solutions are used, check the freezing point using the table shown at the foot of the page.

Glycol percentage in weight	Freezing temperature (°C)	Capacity correction factor	Pressure drop correction factor
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

10 MAINTENANCE

Estro fan coils do not require special maintenance: it is enough to clean the air filter periodically.
The motor does not need maintenance as it is fitted with self-lubricating bearings. Replace the air filter once a year, using original spare parts ; the fan coil model can be seen on the ID plate on the internal side-panel.
Refer to the "installation, use and maintenance" manual supplied with the product for all cleaning and maintenance operations.

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