

Counterflow plate heat recovery exchanger



BASIC FEATURES

ALFA 95 FLAT 300

Energy efficient ceiling-mounted heat recovery unit designed for applications in commercial interiors, such as **shops, offices, coffee bars, restaurants and sport facilities.**

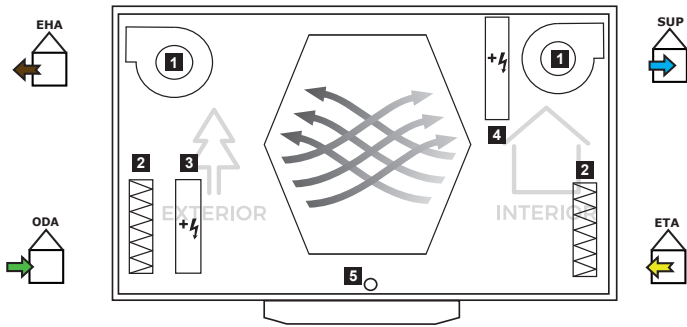
- 1 size with nominal airflow **3.200 m³/h** at 250Pa external pressure and **SPI 1,7 kW/(m³/s)**
- Ecodesign directive 1253/2014 compliant
- Aluminium counterflow exchanger with heat recovery efficiency of up to 92 % (EN308)
- Energy-efficient EC fans with low SFP and quiet operation
- Low installation height – only 598mm
- Electric pre-heater integrated (option)
- Electric / Water post-heater integrated (option)
- DX or C/O coils available as external modules
- AirGENIO Superior control system with an option of CAV, VAV or DCV mode, other supplementary modes, antifreeze protection, BMS control via ModBUS RTU, TCP or BACnet.

ALFA 95 FLAT 300 heat recovery unit is designed to be operated in a dry indoor environment (relative humidity not exceeding 70 %) and at an ambient temperature in the range from +5 °C up to +60 °C.

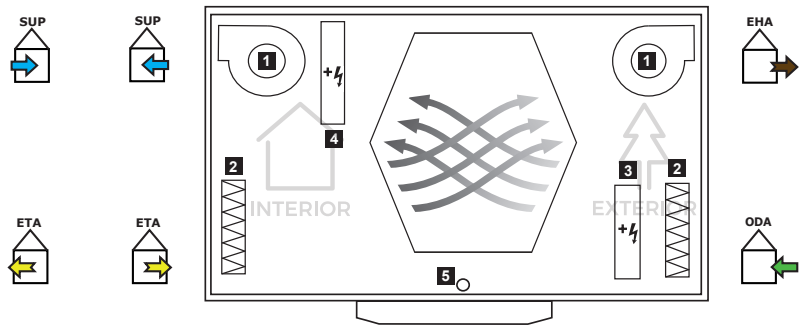
The unit is designed for transporting standard atmospheric air that is free of dust, grease, chemical emissions and other impurities. The transported air relative humidity must not exceed 90 %. The casing of the unit is made from sandwich panels. Bottom service door is painted, the other parts of the casing are in galvanised sheet. When unit installed in the duct system its IP rating is 20. The design of the ventilation project must be **always designed by a qualified HVAC designer, engineer or architect.**

Operational diagram

RIGHT VERSION
Top view



LEFT VERSION
Top view

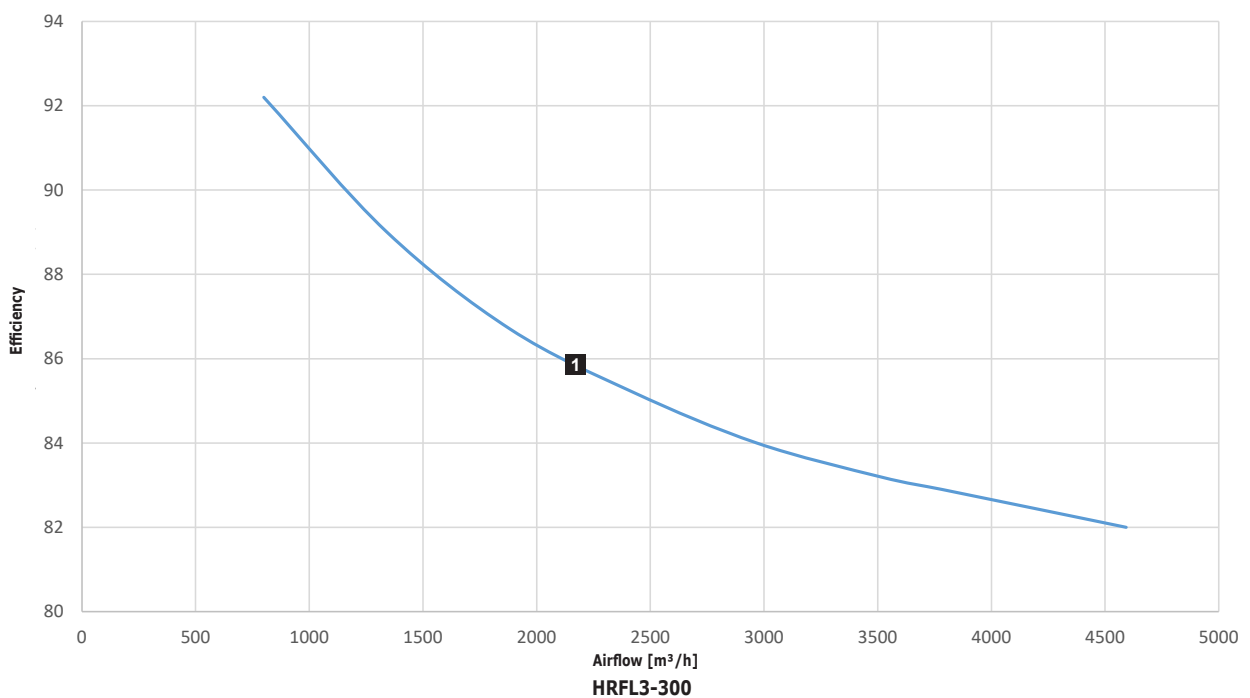


1	Fan
2	Filter
3	Preheater
4	Afterheater
5	Condensate drain
6	Heat exchanger with by-pass damper



Heat recovery efficiency EN308:

Outdoor air temperature is +5°C, relative humidity 72%
Indoor air temperature is +25°C, relative humidity 28%

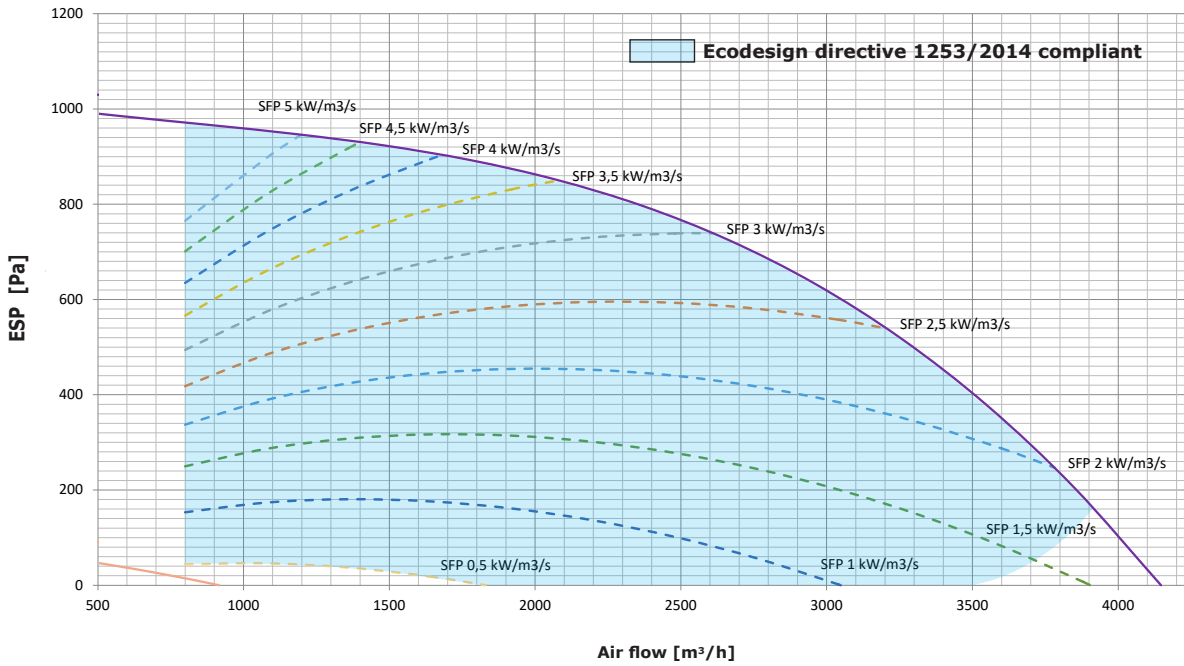




PRIMARY PARAMETERS

SFP=Unit Power input/supply airflow (kW/m³/s)

HRFL3-300



Noise specifications:

HRFL3-300

Airflow [m ³ /h]	Pressure [Pa]	Sound power level per frequency band								Overall	
		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	L _{WA} [dB]	L _{PA} [dB] at 3m
1200	250	64	67	59	47	46	42	34	28	55	32
2200		65	63	61	50	47	43	35	31	56	33
3200		76	63	64	53	50	46	38	33	59	36

Branch	Airflow [m ³ /h]	Pressure [Pa]	Sound power level per frequency band								Overall
			63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	L _{WA} [dB]
EHA	3200	250	84	78	80	71	68	67	62	67	76
SUP			84	78	80	71	68	68	62	67	76
ETA			79	66	60	56	51	43	41	34	59
ODA			81	67	60	56	51	44	41	35	60

Basic technical parameters of the heat recovery units:

Model without electric pre-heater:

Model without electric coil / with water heating coil / C-O coil / DX coil

Type	Voltage [V]	Frequency [Hz]	Rated input [kW]	Total current [A]
HRFL3-300	400	50	2,8	5,8

Model with electric coil (post-heater)

Type	Voltage [V]	Frequency [Hz]	Rated input [kW]	Total current [A]
HRFL3-300	400	50	10,7	17,3

Model with electric pre-heater:

Model without electric coil (post-heater) / with water heating coil / with change-over coil

Type	Voltage [V]	Frequency [Hz]	Rated input [kW]	Total current [A]
HRFL3-300	400	50	20,8	31,8

Model with electric preheater and post-heater

Type	Voltage [V]	Frequency [Hz]	Rated input [kW]	Total current [A]
HRFL3-300	400	50	28,7	43,3

Type	Weight of unit [kg]			Weight of accessories [kg]	
	Without heating	With pre or post heating	With pre and post heating	C/O module	DX module
HRFL3-300	428	430	432	63,5	61

Characteristics of electric motors (1 fan only)

Type	Voltage [V]	Frequency [Hz]	Rated input [W]	Total current [A]	Speed [r/min]	Protection IP	Insulation class
HRFL3-300	400	50	1100	1,7	3100	55	F

Characteristics of electric coil

Type	Voltage [V]	Frequency [Hz]	Rated input [kW]	ΔT [°C]
HRFL3-300	400	50	8	7,5

Characteristics of electric pre-heater

Type	Voltage [V]	Frequency [Hz]	Rated input [kW]	ΔT [°C]
HRFL3-300	400	50	18	16,9

Characteristics of water heating coil

Type	Rated capacity [kW]	Water pressure loss [kPa]	Air pressure loss [Pa]	Connection diameter	Air flow [m ³ /h]
HRFL3-300	24,5	11,7	32	1/2"	3200

* For water temperature gradient 90/70 and inlet air temperature 15°C.

Correction coefficients of the powers of the hot water coil*						
Air inlet temperature [°C]	Water regime					
	90/70	85/65	80/60	75/55	70/50	65/45
0	1,23	1,15	1,06	0,97	0,88	0,79
5	1,16	1,07	0,98	0,89	0,80	0,71
10	1,08	0,99	0,90	0,81	0,72	0,63
15	1,00	0,91	0,82	0,73	0,64	0,55
20	0,92	0,83	0,74	0,65	0,56	0,47

* To apply to the rated power in the characteristics of the LPHW coil.

Characteristics of water cooling / heating coil (C/O)

Type	Rated capacity [kW]	Water pressure loss [kPa]	Air pressure loss [Pa]	Connection diameter	Air flow [m ³ /h]
HRFL3-300	27,9	1,2	121	1	3200

* For water temperature gradient 60/40 and inlet air temperature 15°C.

Characteristics of water cooling / heating coil (C/O)

Type	Rated capacity [kW]	Water pressure loss [kPa]	Air pressure loss [Pa]	Connection diameter	Air flow [m ³ /h]
HRFL3-300	11,5	3,3	132	1	3200

* For water temperature gradient 7/12 and inlet air temperature 25°C with 70% of relative humidity.

Correction coefficients of the powers of the hot water coil (C/O)*				
Air inlet temperature [°C]	Water regime			
	60/40	55/50	45/40	35/30
0	1,53	1,75	1,40	1,05
5	1,35	1,58	1,23	0,88
10	1,18	1,41	1,06	0,71
15	1,00	1,25	0,90	0,54
20	0,78	1,08	0,73	0,37

* To apply to the rated power in the characteristics of the water coil.

Coefficients to correct the power at different water temperature ranges from 60°C/40°C and 15°C for the inlet air temperature.

Correction coefficients of the powers of the cool water coil (C/O)*			
Air inlet temperature [°C]	Water regime		
	7/12	6/11	5/10
24	0,89	0,99	1,10
25	1,00	1,12	1,25
28	1,53	1,74	1,97
32	2,48	2,61	2,78

* To apply to the rated power in the characteristics of the water coil.

Coefficients to correct the power at different water temperature ranges from 7°C/12°C and 25°C - RH 50 % for the inlet air temperature.

Characteristics of direct evaporator (DX)

Refrigerant R32

Type	Air flow [m ³ /h]	Rated capacity [kW]	Outlet air temperature [°C]	RH after coil [%]	Refrigerant pressure loss [kPa]	Air pressure loss [Pa]	Connection diameter of gas coil	Connection diameter of liquid coil
HRFL3-300	3200	19,5	13,9	85,5	82,6	100	7/8"	3/4"

* For inlet air temperature 27°C with 47% of relative humidity and evaporation temperature 5°C, refrigerant R32.

Refrigerant R410a

Type	Air flow [m ³ /h]	Rated capacity [kW]	Outlet air temperature [°C]	RH after coil [%]	Refrigerant pressure loss [kPa]	Air pressure loss [Pa]	Connection diameter of gas coil	Connection diameter of liquid coil
HRFL3-300	3200	18,6	14,2	85,5	129,7	99	7/8"	3/4"

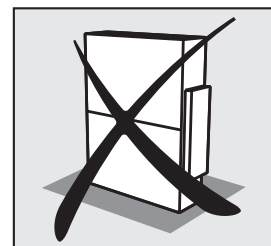
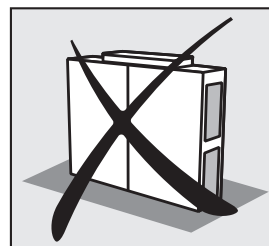
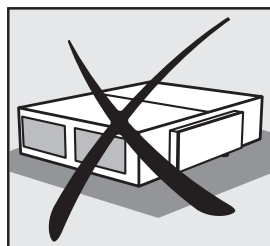
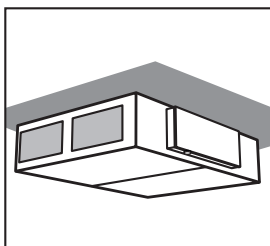
* For inlet air temperature 27°C with 47% of relative humidity and evaporation temperature 5°C, refrigerant R410A.



INSTALLATION AND ASSEMBLY

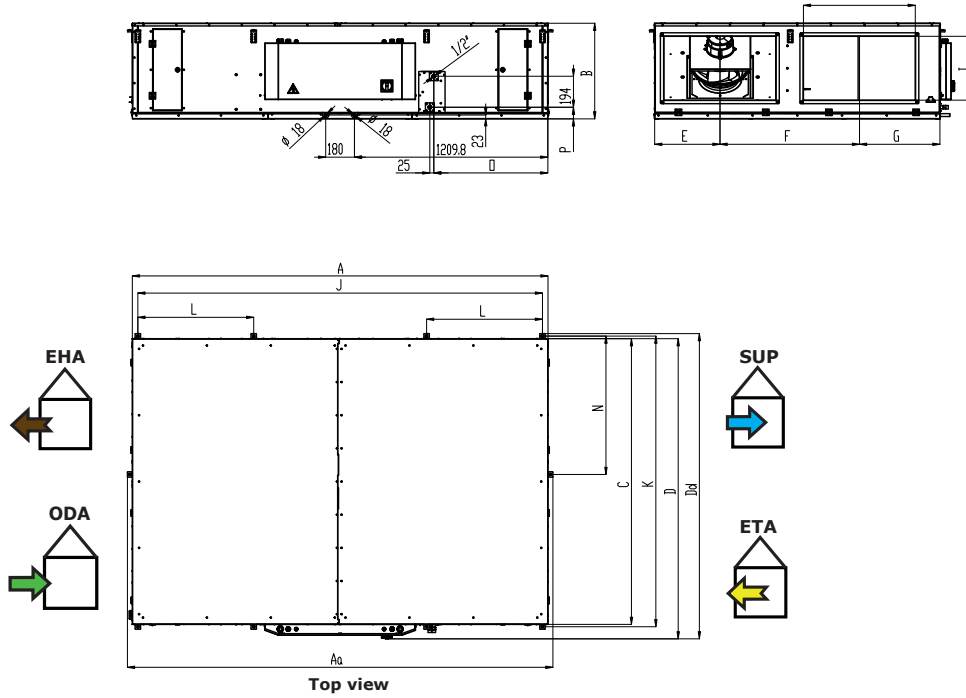
ALFA FLAT units must be installed according to the pictures (see below).

The unit must be installed in such a way that the direction of the air blown corresponds to the direction of air circulation in the distribution system. The unit must be installed so as to give free access for maintenance, service or dismantling. This is to allow access to service flaps and possibility to open them, access to the lid of the control panel, access to the lateral connections and access to the filter cover.

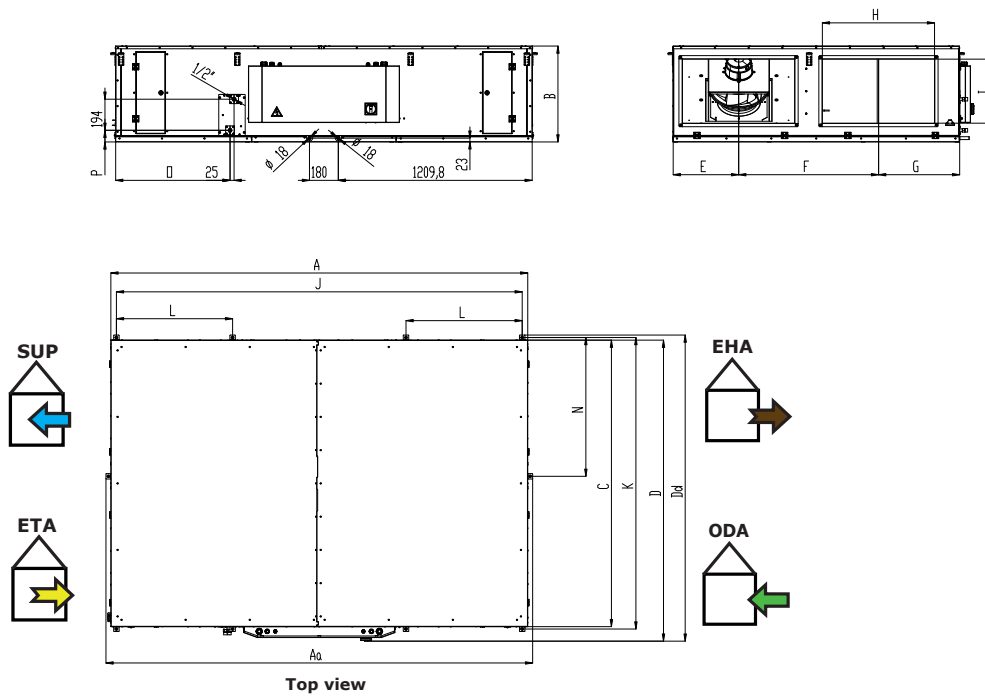


DIMENSIONS

Right version

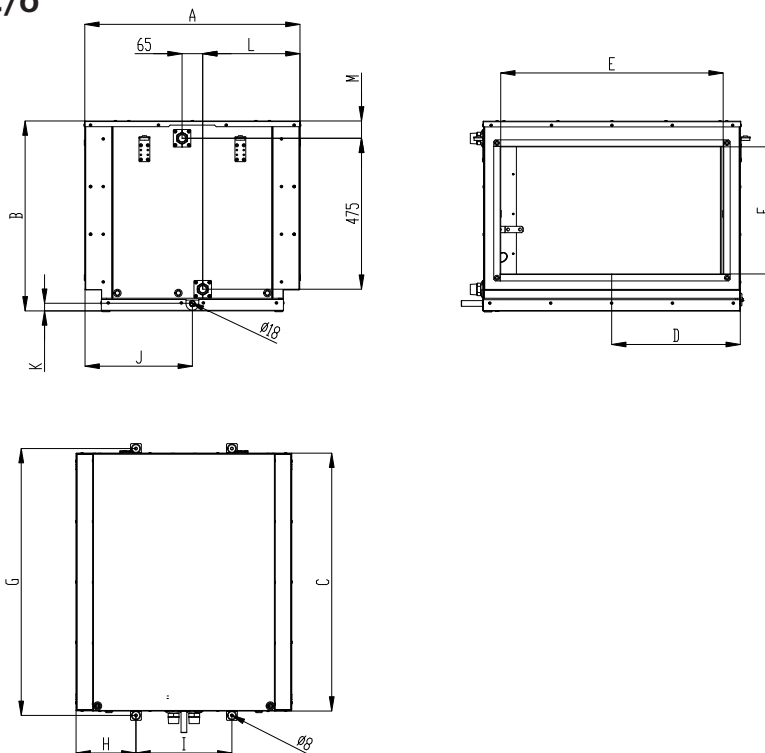


Left version

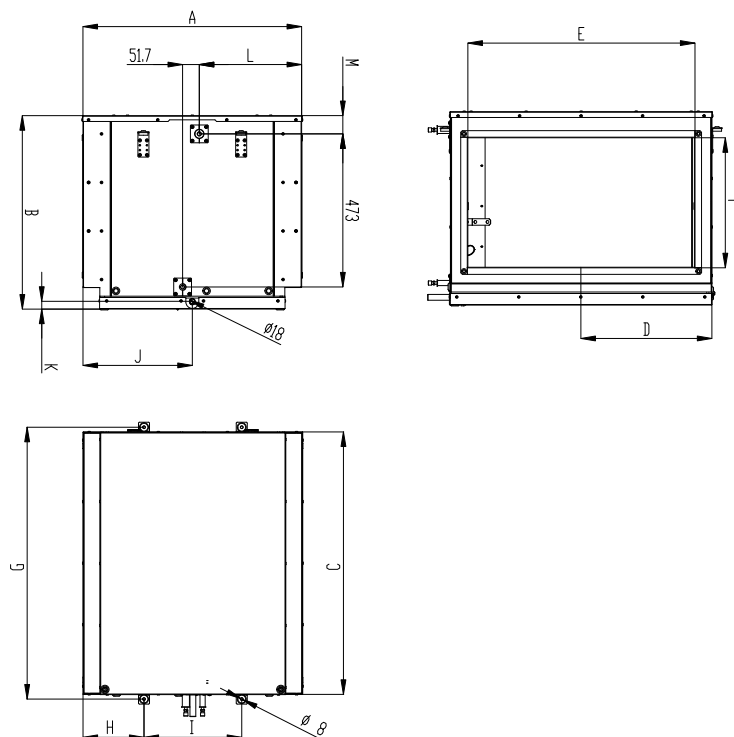


Type	A	Aa	B	C	D	Dd	E	F	G	H	I	J	K	L	M	N	O	P	condensation ø
300	2600	2663	598	1788	1878	1910	408	873	506	700	400	2530	1820	725	725	866	714	73	18

External module C/O



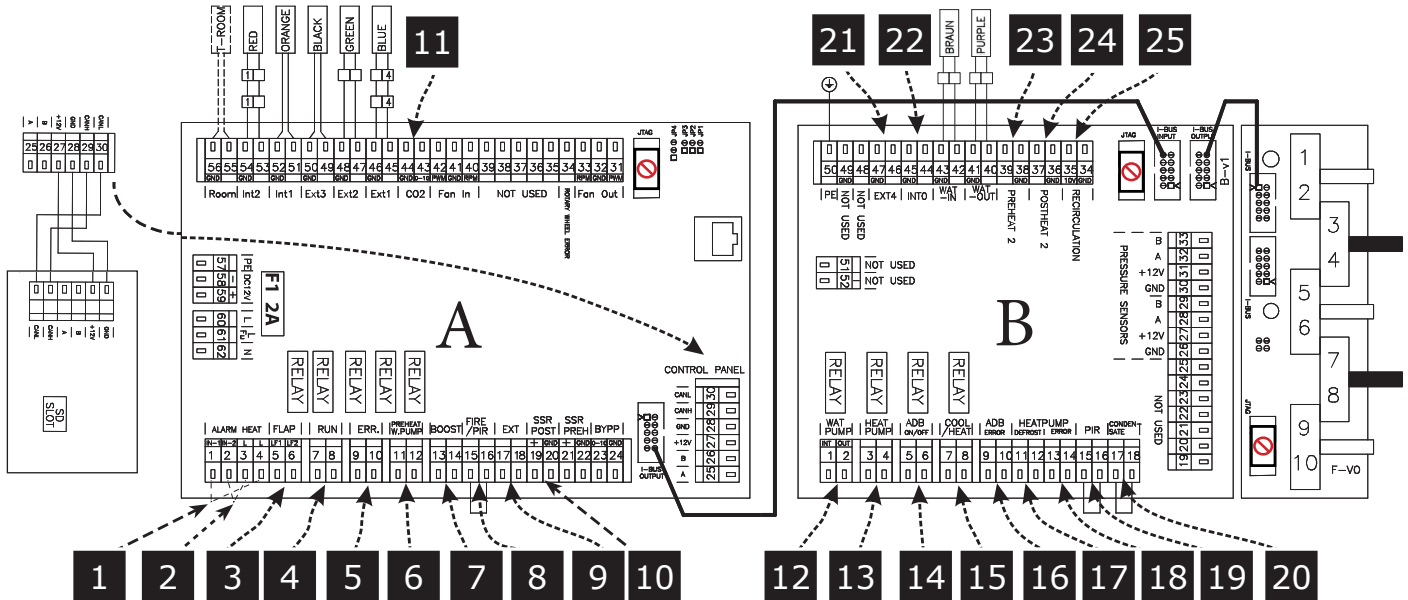
External module DX



Type	A	B	C	D	E	F	G	H	I	J	K	L	M	condensation ø
MOFL3-300	677	598	812	405	700	400	840	190	300	338	24	306	55	18



WIRING DIAGRAMS



EN		
1.	A (1,4)	SAFETY THERMOSTAT POSTHEATING
2.	A (2,3)	SAFETY PREHEATING THERMOSTAT
3.	A (5-6)	LF1 - FLAP INLET (output L-open), LF2 - FLAP OUTLET (output L-open)
4.	A (7-8)	RUN CONTACT (output - NO/NC settable)
5.	A (9-10)	ERROR CONTACT (output NO)
6.	A (11-12)	PREHEATER WATER PUMP (11 - Lint, 12 - Lout)
7.	A (13-14)	BOOST (input NO)
8.	A (15-16)	FIRE (input NC)
9.	A (17-18)	EXTERNAL CONTROL ON/OFF (input NC)
10.	A (19,20)	OUTPUT PERFORMANCE OF POSTHEATING (0-10V OR PWM)
11.	A (43-44)	AQS SENSOR 0-10V (input)
12.	B (1-2)	WATER PUMP (1 - Lint, 2 - Lout)
13.	B (3-4)	HEAT PUMP CONTROL settable (output - ON/OFF)
14.	B (5-6)	ADIABATIC MODULE (output - ON/OFF)
15.	B (7-8)	COOL / HEAT settable (CO = NC/NO - DX = output settable)
16.	B (9-10)	ADIABATIC MODULE ERROR (input NO)
17.	B (11-12)	HEAT PUMP DEFROST settable (input NC/NO)
18.	B (13-14)	HEAT PUMP ERROR settable (input NC/NO)
19.	B (15-16)	PIR (input NC)
20.	B (17-18)	CONDENSATE OVERFLOW (input NC)
21.	B (46-47)	EXTERNAL TEMPERATURE SENSOR (external postheater - input)
22.	B (44-45)	EXTERNAL TEMPERATURE SENSOR (adiabatic module / recirc. chamber - input)
23.	B (38-39)	EXTERNAL PREHEATER (output 0-10V)
24.	B (36-37)	EXTERNAL POSTHEATER (output 0-10V)
25.	B (34-35)	RECIRCULATION CHAMBER (output 0-10V)



CONTROL



AirGENIO SUPERIOR - Main control functions

- Touch-screen control panel for easy control and complete overview of device operational status (recommended connecting data cable to control panel is UTP cable and it should not exceed 50m length).
- Manual stepless fans control (PWM)
- CAV, VAV or DCV ventilation in automatic mode
- BOOST mode - intensive airflow for a pre-set time period
- Freecooling mode - night ventilation (cooling)
- Occupancy mode - reducing ventilation intensity according to the PIR sensor
- FIRE protection mode with settable logic
- Stepless by-pass control (temperature control: freecooling, antifreeze protection)
- Integrated timer (day, week, year)
- Optional connection of sensors: CO2, RH, VOC (0-10)
- Clogged filter indication by pressure sensors
- Stepless pre-heating control and post-heating control
- Electric coil control (PWM) and LPHW coil control (0-10V)
- Change-over control with automatic detection of the heating / cooling (0-10V)
- Wide choice of different ways for DX coil control*
- Possible control of external pre-heater and post-heater
- Offset fan adjustment (over-pressure / underpressure)
- BMS control via Modbus RTU / TCP or BACnet
- Remote control via smart device

2VV AirGENIO Application:

- Product control on your smartphone
- Info about operation status
- Notifications – request for service, filter exchange, error status, etc.
- Download the 2VV AirGENIO APP and control it remotely from your smart phone!



2VV Service software:

- Easy and quick commissioning from your computer
- Error log – error display and identification
- Easy service (device status loading/reset to backup setting)
- Fast FW update
- OFFLINE version



*AirGENIO SUPERIOR control system allows a different ways of DX coil control

- ON-OFF
- 0-10V
- 0-10V - 0-10V signal control
- ON/OFF - ON/OFF switching
- OFF/ON - OFF/ON switching
- 0-10V + ON/OFF - ON/OFF switching + 0-10V signal control
- 0-10V + OFF/ON - OFF/ON switching + 0-10V signal control

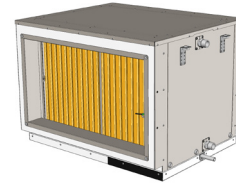
With reverse control cycle (heating - cooling mode)

- 10-0V + ON/OFF - ON/OFF switching + 0-10V signal control cooling, heating 10-0V
- 10-0V OFF/ON - OFF/ON switching + 0-10V signal control cooling, heating 10-0V



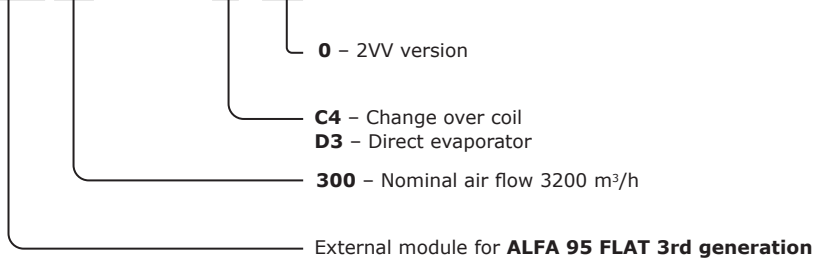
ACCESSORIES

External modul – Additional heating/cooling modul for HRFL3 unit



Type	HRFL3 + modul C/O	HRFL3 + DX module
HRFL3-300H...E75-EE1S-...	✓	✓
HRFL3-300H...E75-ES0S-...	✓	✓
HRFL3-300H...E75-EV1S-...	not possible	✓
HRFL3-300H...E75-XE1S-...	✓	✓
HRFL3-300H...E75-XS0S-...	✓	✓
HRFL3-300H...E75-XV1S-...	not possible	✓

MOFL3-300XX00000-XC4X-0A0

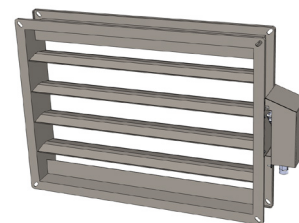


Four-sided closing flap with servo drive

The **MLKR** rectangular control flap is designed for controlling and closing the HVAC systems. The flap is designed for operation in the basic environment for conveying air free of rough dust, grease, chemical fumes, and other contaminants. The flanged damper frame and blades are made of galvanized plate.

Unit type	Four-sided closing flap with servo drive
HRFL3-300	MLKR-0700-0400-SR*
HRFL3-300	MLKR-0700-0400-SX*

* **SR** - servodrive with spring, **SX** - servodrive without spring



Electric heater

EOKO – The heater output is controlled by the HRFL3 unit control system via 0-10V

Recommended combinations:

Unit type	Type of el. Pre-heater
HRFL3-300	EOKO2-500-18,0-3-D



Adapter four-sided to circular

PR-O – adapter from four-sided to circular pipes made from a galvanized metal sheet

Unit type	Circular adapter
HRFL3-300	PR-O-0700X400-D500-L400



Filtration inserts (VDI 6022, ISO16890)

replacement filtration inserts of various filtration classes and configurations.



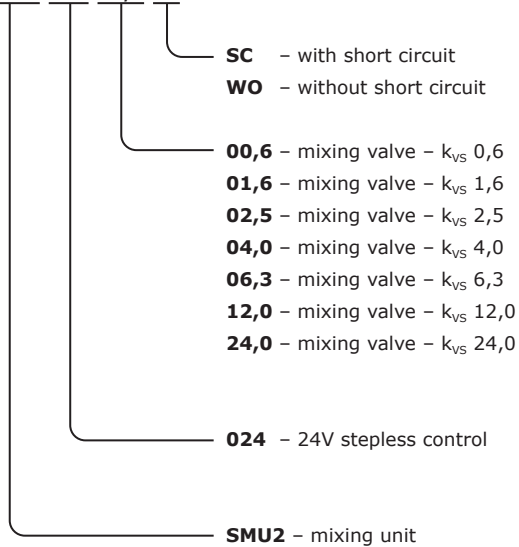
Unit type	Filter ePM10 50%	Filter ePM1 60%	Filter ePM1 80%
HRFL3-300	HRFL3-300H-FI-M5-0A0	HRFL3-300H-FI-F7-0A0	HRFL3-300H-FI-F9-0A0

Mixing valve

The **SMU** mixing unit is designed for controlling the heat-output of water-type heat exchangers. It is used especially for controlling standalone water-type air heaters, heaters inbuilt into the ventilation units.

Recommended values for individual types of the **ALFA 95 FLAT** units:

SMU2-024-06,3-SC



Duct sensor CO₂
CI-EE850-C3XXFP-002

The transmitter is ideally suited for duct mounting in the fields of building management and demand controlled ventilation. The elegant, compact housing enables easy installation directly at the ventilation duct using a mounting flange.



Duct sensor of relative humidity
CI-LCN-FTK140VV

Duct sensor for measuring relative humidity in air-conditioning systems.



Spatial sensor CO₂
CI-CO2-R

Sensor combines CO₂. The snap-in mounting concept stands for easy installation.



Spatial sensor RH
CI-RH-R

Capacitive relative humidity sensor with 0-10V analog and relay output.



Signal combiner
CI-AQS-COMBI

Signal combiner for AQS sensors uses 0-10V logic which you can connect up to 10 different sensors. The input signal with the highest voltage will be the signal that is on the output terminal.



PIR sensor

CI-PS 1003

Spatial infrared sensor for automatic ventilation based on presence of people in the ventilated area.

Power supply of this sensor must be outsourced. Unit doesn't support this kind of power supply (15-24V DC).



Condensate pump

SET-ASPEN-MAXI-ORANGE

Pump is designed to be installed in false ceilings.

Note:

Use of pump is recommended where gravity assisted condensate collection is not achievable.

Accessory supplied loose for fitting on site.

Pipework from pump not included.



Siphon for condensate

SK-HL138

Siphon with a ball for installation on the wall or flush mounting.





KEY TO CODING

HRFL3-300 H P CB E 75-X S0 S-0 A 0

- 0 2V Version**
- A Standard packing**
- 0 Standard version**
- S Control**
S AirGENIO Superior controls
- S0 After heater**
S0 Without after heater
E1 Electric after heater
V1 Water after heater
- X Preheater**
X Without preheater
E Electric preheater
- 75 Filtration (inlet / outlet)**
7 inlet ePM 1 60% (F7)
5 outlet ePM 10 50% (M5)
- E Type of fans**
E EC fans
- CB By-pass**
CB Counterflow plate heat exchanger with bypass
- P Version of access**
P Right access
L Left access
- H Installation**
Horizontal installation
- 300 Size**
300 Nominal flow rate 3200 m³/h
- HRFL3 Unit Type**
Heat recovery unit **ALFA 95 FLAT 3rd** generation