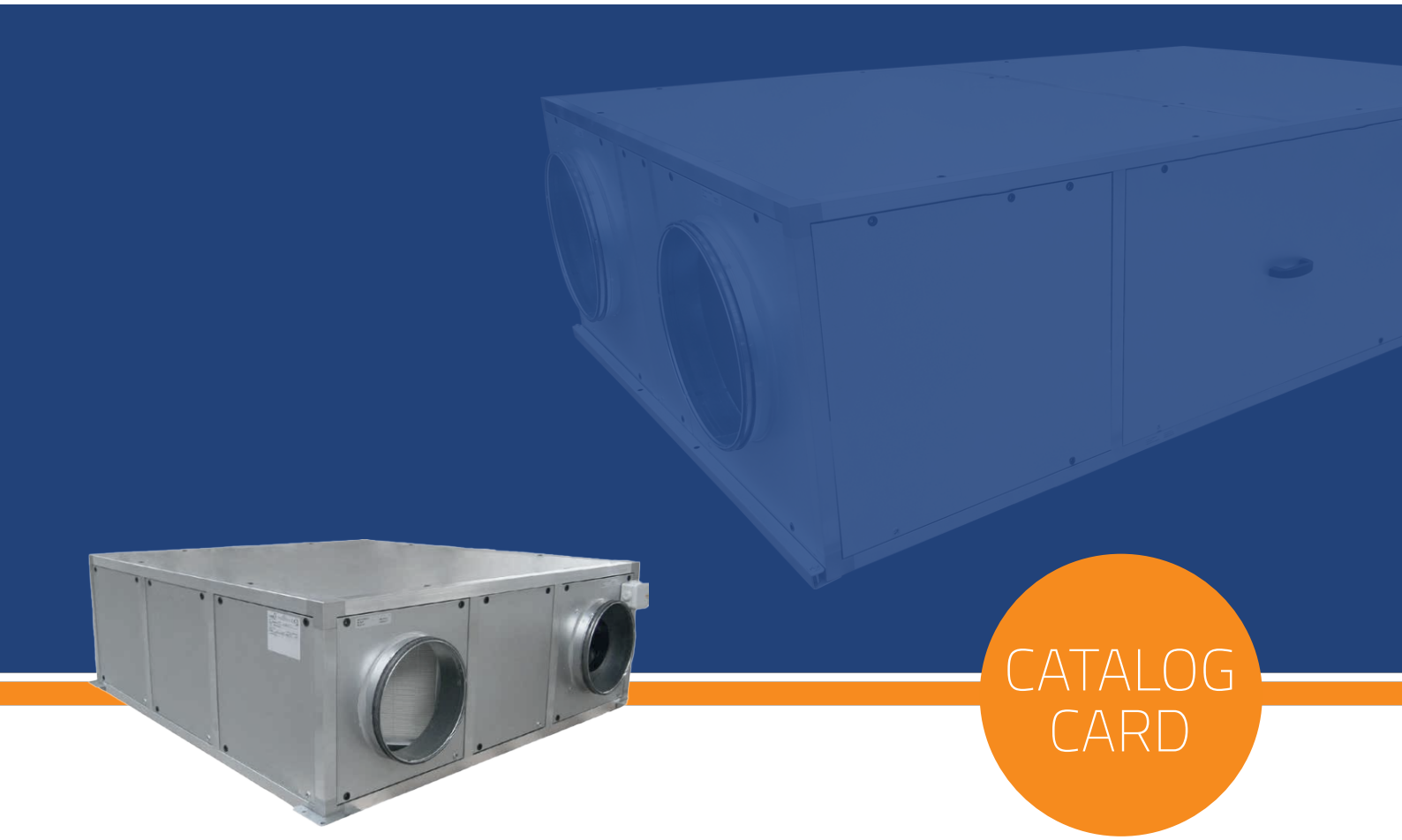
Energy-saving recuperators



CATALOG CARD

DUO-EC H

www.aerovent.pl

aeroVent
REKUPERATORY I WENTYLACJA

DUO-EC
Is a Non Residential Ventilation Unit (NRVU)

EQUIPPED

Equipped with medium efficiency counterflow heat exchanger (Eurovent certified) and EC fans with backward curved blades. Series partial bypass allows you to exploit favorable outside conditions for the building for free cooling (or free heating).

STRUCTURE

The DUO-EC is made of extruded aluminium profiles and double skin zinc magnesium panels, sandwiched on injected polyurethane foam insulation, thickness 25 mm and density 42 Kg/m³. The position of the ducting connections, made with circular spigots, are easily configurable simply by moving the ducting connection panels. 6 sizes are available in horizontal configuration, ceiling installation or floor installation, all equipped with automatic partial bypass and medium efficiency heat exchanger. Post heating devices (electric or water), post cooling/heating water coil, direct expansion coil and electrical pre heater device are integrated into the unit are available as additional external module. The filtering sections are: ePM1 70% (F7) filters for the fresh air flow and ePM10 50% (M5) filters for the extraction air flow.

CONTROLS

The DUO-EC is supplied with control system and easy connection to the power supply. It's also available the versions with simplified CTR08-PH control, the version with EVO-PH control and the version with EVOD-PH-IP control ready for integration in home automation systems (Modbus protocol with Ethernet connection or, upon request , with the addition of the RS485 connection). The new version of our control systems allows the user to shift from one control system to another very quickly and easily by replacing the remote panel even after the installation. It is available the version without control.

The CTR08-PH control allows the user to select three levels of fan speed or the possibility to stop them. It automatically manages the By-pass and prevents the heat exchanger freezing by programming the fan speed or, if specifically required, the electric pre-heater resistance (optional item to install inside the unit). The control advises the user if filters needs to be replaced (the filter clogging is monitred by a pair of differential pressure sensors) or any other fault. The EVO-PH control has a colored backlit touch screen interface, it gives an intuitive operating status of the unit and it allows programming the fan speed. This control has a weekly time schedule for automatic unit control, it can be controlled by an external switch to activate the booster and it can automatically adjust the air flow when connected to an air quality sensor.

It supports post-air treatment accessories and it advises the user if filters needs to be replaced (the filter clogging is monitored by a pair of differential pressure sensors) or if there is any other fault showing where it comes from.

The EVOD-PH-IP control has the same characteristics of the EVO-PH version with the addition of the Modbus communication protocol and it allows full control of the unit by the Home Automation software system. If the unit is in a Home Automation network, the webserver lets the user interact with it throughout a device connected to an Internet browser. On request it's also available the version without control system and without electrical cabinet (adjustable pressure switches for filter status and bypass actuator are installed)

NOTE: for the recuperators provided in the "plag & play" version with our CTR08-PH or EVO-PH control, the management of by-pass is automatic, with by-pass motor and temperature probes supplied and installed on board the machine.

CONTROL CTR-EASY (X539-U0.1)

. OFF, ON speed 1, speed 2, speed 3 if with CTR08-PH
. OFF, ON with modulating percentage if with EVO-PH
. ON /OFF by-pass
. 3 temperature inputs
. filters allarms (hour counter / pressure switches on digital input dedicated)

IMPORTANT

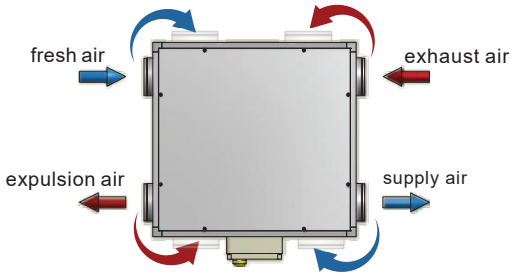
. The units put on the market from 1 January 2018 must be with pressure switches (ErP-2018)
. The by-pass can not be managed automatically: to do this provide temperature probes mounted in the unit and the control display CTR08-PH or EVO-PH with 3 temperature probes
. for remote management of the recuperator, add the CTR08-PH control display (2 indicators: service and filters) or EVO-PH (particular status vision of the unit and any alarms detail)

ACCESSORIES

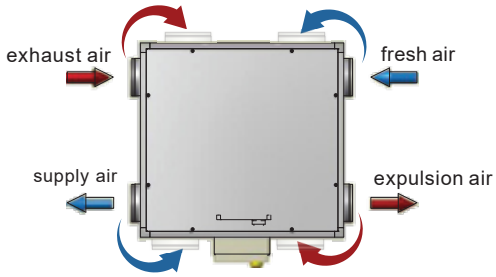
DUO-EC can be equipped with other accessories such as:
. R.H. of probe, CO_2 or CO_2 / VOC
. protection roof for outside instalalzione
. switch speed

For a more complete view of the characteristics of the control panels, please read the specific manuals.

DUO-EC – TOP VIEW Standard configuration = SH



DUO-EC – TOP VIEW Mirrored configuration = SY

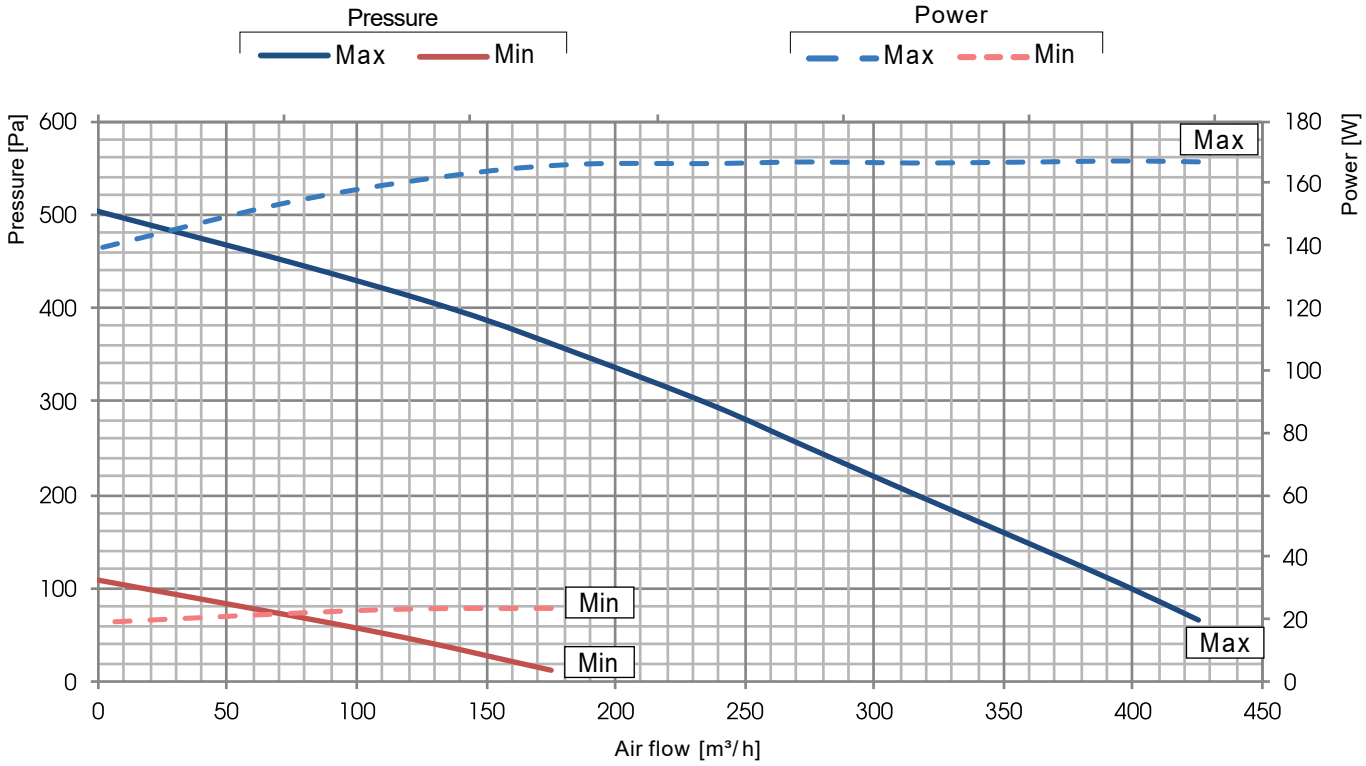


Counterflow heat exchanger made of aluminum manufactured by RECUTECH
RECUTECH participates in the Eurovent Certification Program

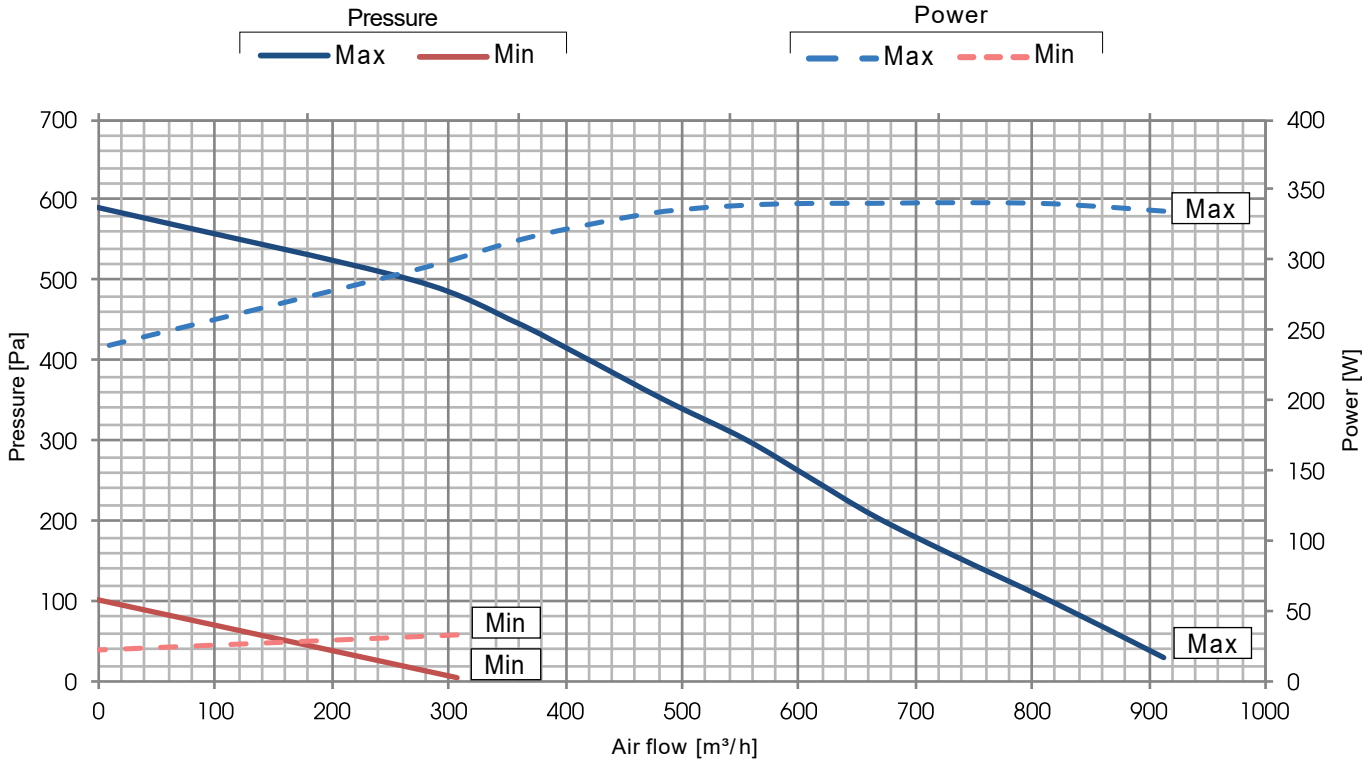
PERFORMANCE (UNI EN 13141-7)

The unit must be ducted properly: Santech authorizesthe use only according to itsperformance diagram shown into thiscatalogue
The declared performances are with CLEAN filters, and guaranteed ONLY with the original filters Santech low pressure drop.

DUO-EC 1



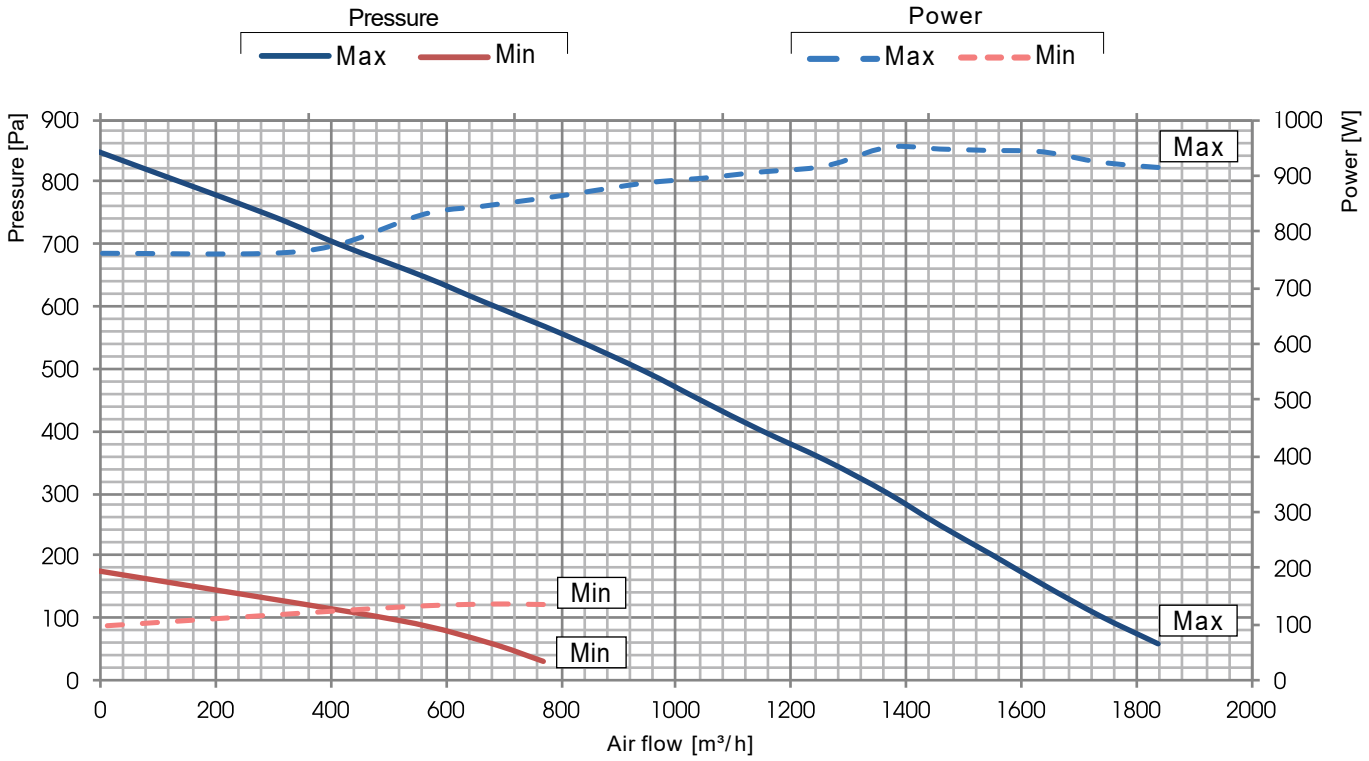
DUO-EC 2



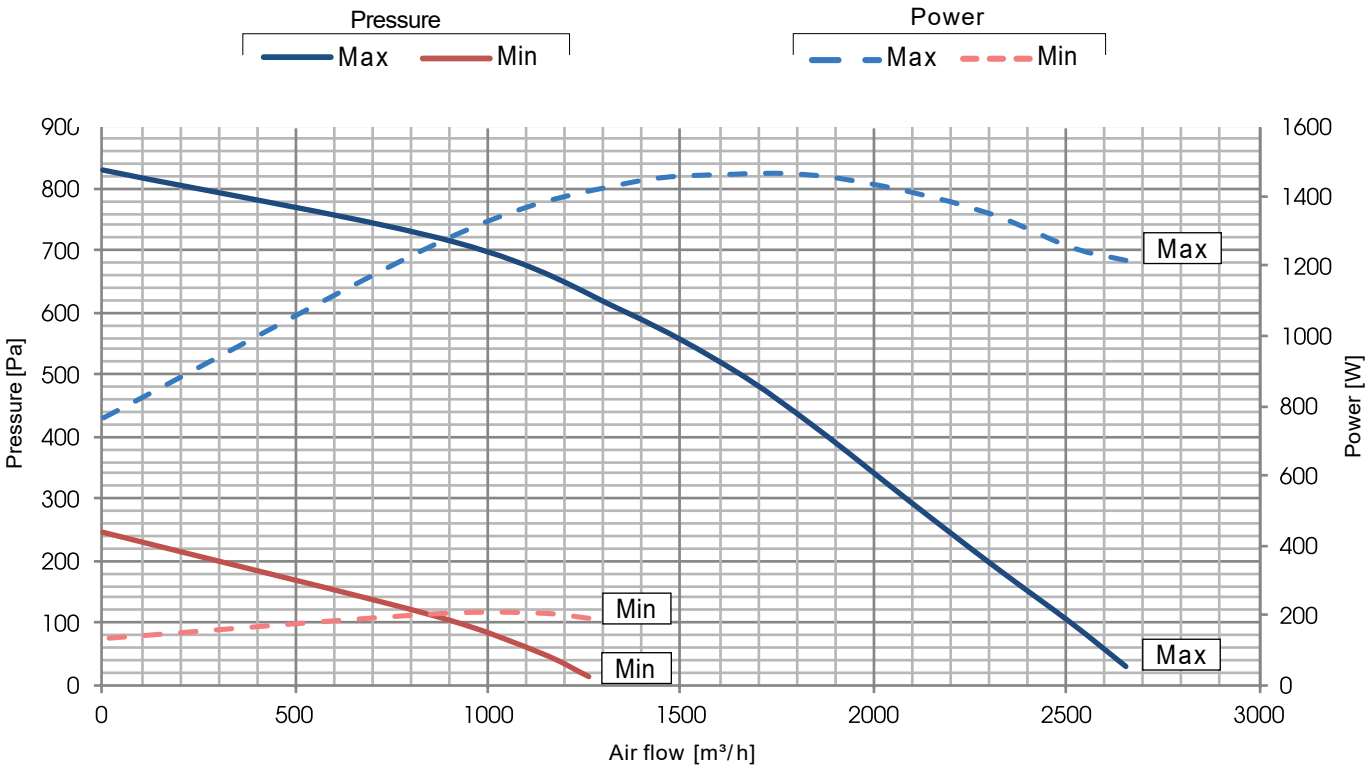
PERFORMANCE (UNI EN 13141-7)

The unit must be ducted properly: Santech authorizesthe use only according to itsperformance diagram shown into thiscatalogue.
The declared performances are with CLEAN filters, and guaranteed ONLY with the original filters Santech low pressure drop.

DUO-EC 3



DUO-EC 4

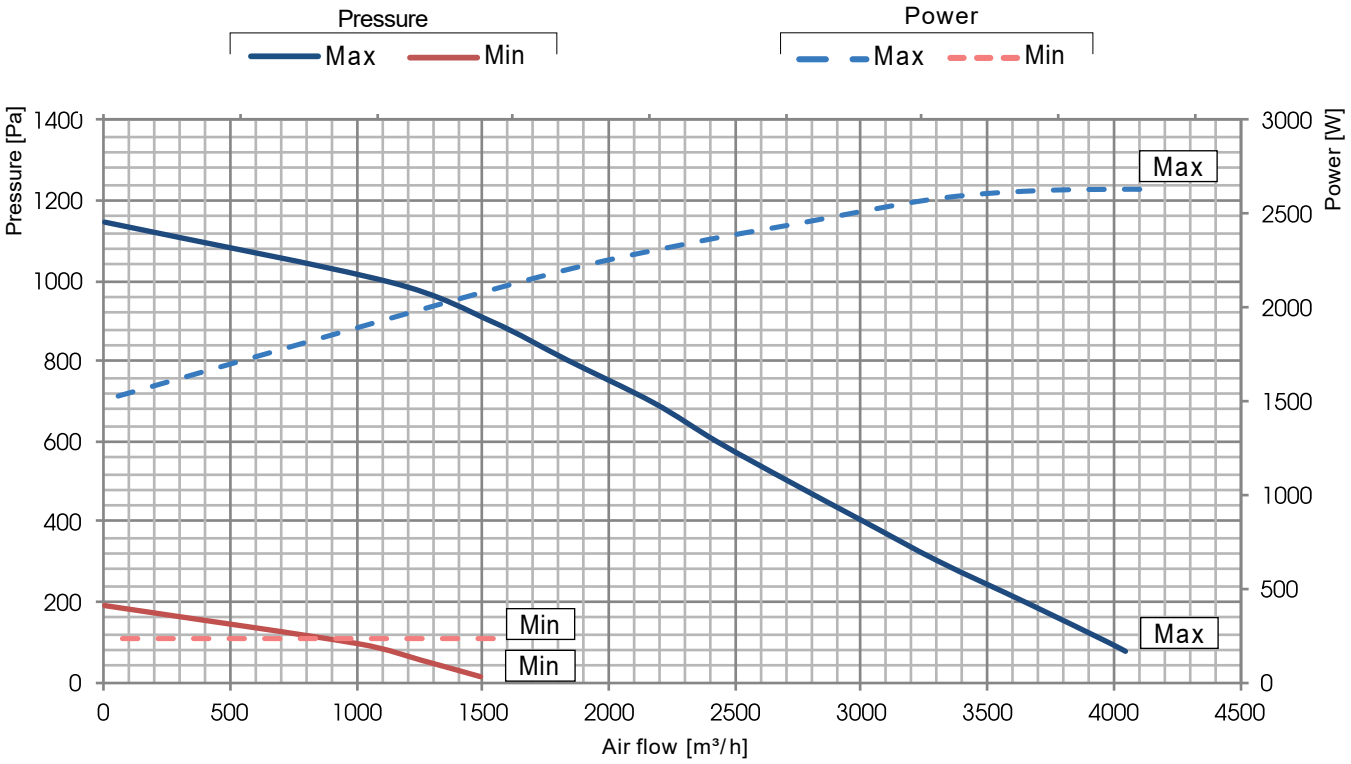


PERFORMANCE (UNI EN 13141-7)

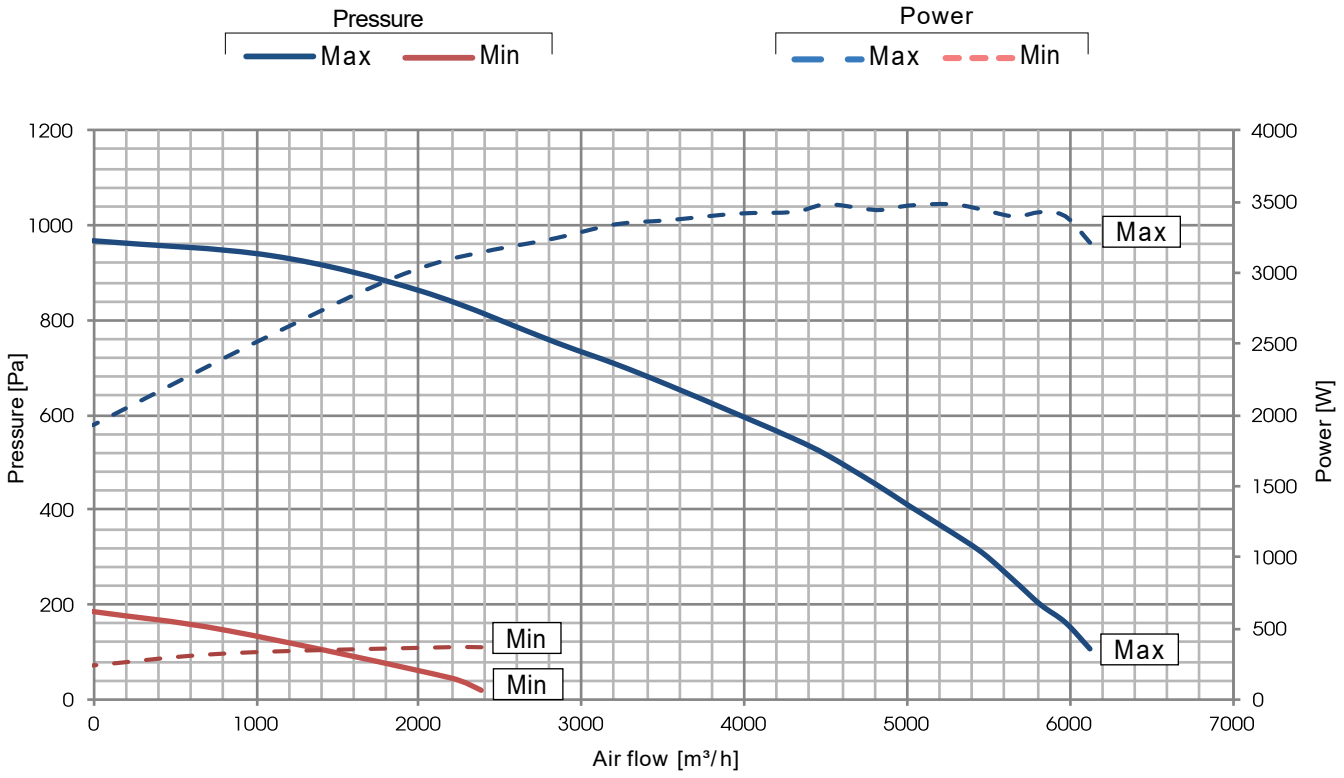
The unit must be ducted properly: Santech authorizesthe use only according to itsperformance diagram shown into thiscatalogue.

The declared performances are with CLEAN filters, and guaranteed ONLY with the original filters Santech low pressure drop.

DUO-EC 5

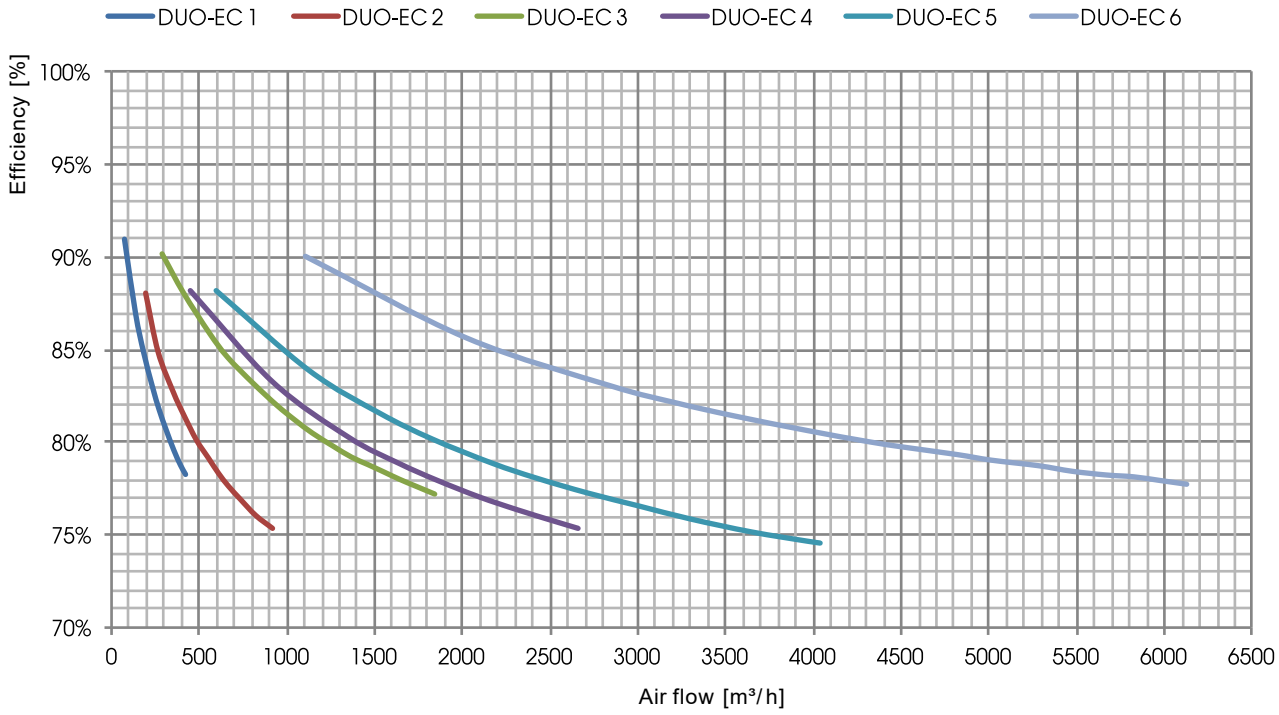


DUO-EC 6



HEAT RECOVERY PERFORMANCE (sensible efficiency)

Values refered to the following conditions (UNI EN 308:1998): Tbs external air 5°C; U.R. esternal 72%; Tbs enviorment 25°C; U. R. Enviorment 38%



ECODESIGN

MOD.	η_{t_nvru} [%]	q_{nom} [m³/s]	$\Delta p_{s,ext}$ [Pa]	P [kW]	SFPint [W/ (m³/ s)]	SFPint_lim 2016 [W/ (m³/ s)]	SFPint_lim 2018 [W/ (m³/ s)]	FRONTAL VELOCITY [m/s]	$\Delta p_{s,int}$ [Pa]	η_{Fan} [%]	LEAKAGE internal *[%]	LEAKAGE external *[%]
DUO-EC 1	78,8	0,11	100	0,17	836	1537	1257	1,30	419	50,4	6,5	8,5
DUO-EC 2	76,0	0,23	100	0,34	912	1437	1157	1,50	571	63,4	1,5	4,4
DUO-EC 3	79,8	0,35	350	0,92	1206	1530	1250	1,41	734	64,6	5,3	3,8
DUO-EC 4	77,5	0,55	350	1,44	1057	1432	1152	1,44	622	58,7	9,7	2,6
DUO-EC 5	77,3	0,75	500	2,63	1112	1397	1117	1,48	613	58,6	4,4	1,4
DUO-EC 6	80,1	1,18	560	3,45	1128	1417	1137	1,57	799	64,4	7,6	2,0

* Percentage of the nominal flow

VALUES ACCORDING UNI EN 1886: 2008

MOD.	CASING STRENGTH	CASING LEAKAGE	FILTER CLASS	THERMAL TRANSMITTANCE	THERMAL BRIDGE
DUO-EC 1	D1 (M)	L3 (M)	F7 (M)	T4 (M)	TB4 (M)
DUO-EC 2	D1 (M)	L3 (M)	F7 (M)	T4 (M)	TB4 (M)
DUO-EC 3	D1 (M)	L3 (M)	F7 (M)	T4 (M)	TB4 (M)
DUO-EC 4	D1 (M)	L3 (M)	F7 (M)	T4 (M)	TB4 (M)
DUO-EC 5	D1 (M)	L3 (M)	F7 (M)	T4 (M)	TB4 (M)
DUO-EC 6	D1 (M)	L3 (M)	F7 (M)	T4 (M)	TB4 (M)

TEST LEAKAGE (UNI EN 13141-7)

LEAKAGE	TEST CONDITIONS	DUO-EC 1	DUO-EC 2	DUO-EC 3	DUO-EC 4	DUO-EC 5	DUO-EC 6
ESTERNO	Positive pressure 400 Pa	A3	A2	A2	A1	A1	A2
ESTERNO	Negative pressure 400 Pa	A3	A2	A2	A1	A1	A2
INTERNO	Pressure difference 250 Pa	A3	A1	A2	A3	A2	A2

NOISE LEVEL

Lw Sound power level taken in accordance to UNI EN ISO 3747 - CLASS3

	NOISE FROM THE CASE (dB)							
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	L_w dB(A)
DUO-EC 1	60,0	64,6	60,7	53,9	46,4	41,3	43,9	61,2
DUO-EC 2	65,0	67,2	61,4	58,3	48,6	43,3	45,8	63,6
DUO-EC 3	70,1	75,5	67,4	57,1	50,6	45,1	43,8	69,3
DUO-EC 4	69,8	78,2	70,5	62,1	54,0	47,3	46,4	72,2
DUO-EC 5	76,3	81,0	73,8	63,5	57,2	48,6	48,2	75,2
DUO-EC 6	80,1	88,6	79,4	74,0	67,2	63,4	64,8	82,6

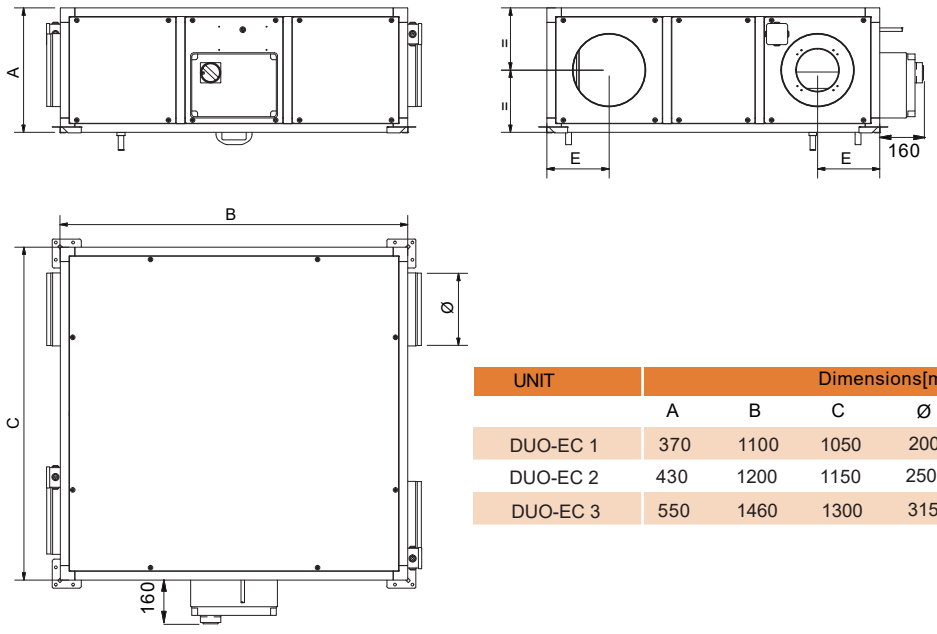
	NOISE IN THE SUPPLY AIR DUCTS (dB)							
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	L_w dB(A)
DUO-EC 1	65,1	69,4	67,9	58,2	59,8	56,8	64,9	69,6
DUO-EC 2	66,2	75,0	68,7	62,6	63,9	58,4	67,3	72,6
DUO-EC 3	74,2	85,1	79,7	73,3	71,2	65,4	70,8	81,5
DUO-EC 4	77,3	87,6	82,5	82,1	77,0	71,8	79,9	86,9
DUO-EC 5	79,2	85,0	82,9	81,4	76,6	75,0	79,5	86,5
DUO-EC 6	79,6	91,3	86,0	85,4	79,1	75,7	78,5	89,7

ELECTRICAL DATA

MATCHING	FANS				UNIT DUO-EC		
	Power [W]	Supply	Current max.[A]	Insulation class	Supply	Currente max.[A]	Insulation class
DUO-EC 1	2 x 83	230V 50 Hz 1F	2 x 0,8	IP54 class B	230V 50 Hz 1F	1,5	IP20
DUO-EC 2	2 x170	230V 50 Hz 1F	2 x 1,4	IP54 class B	230V 50 Hz 1F	2,9	IP20
DUO-EC 3	2 x 448	230V 50 Hz 1F	2 x 2,8	IP54 class B	230V 50 Hz 1F	5,7	IP20
DUO-EC 4	2 x 715	230V 50 Hz 1F	2 x 3,1	IP54 class B	230V 50 Hz 1F	6,3	IP20
DUO-EC 5	2 x 1270	230V 50 Hz 1F	2 x 5,6	IP54 class B	230V 50 Hz 1F	11,4	IP20
DUO-EC 6	2 x 1850	400V 50 Hz 3F	2 x 2,9	IP54 class B	400V 50 Hz 3F	6,0	IP20

DUO-EC 1/2/3

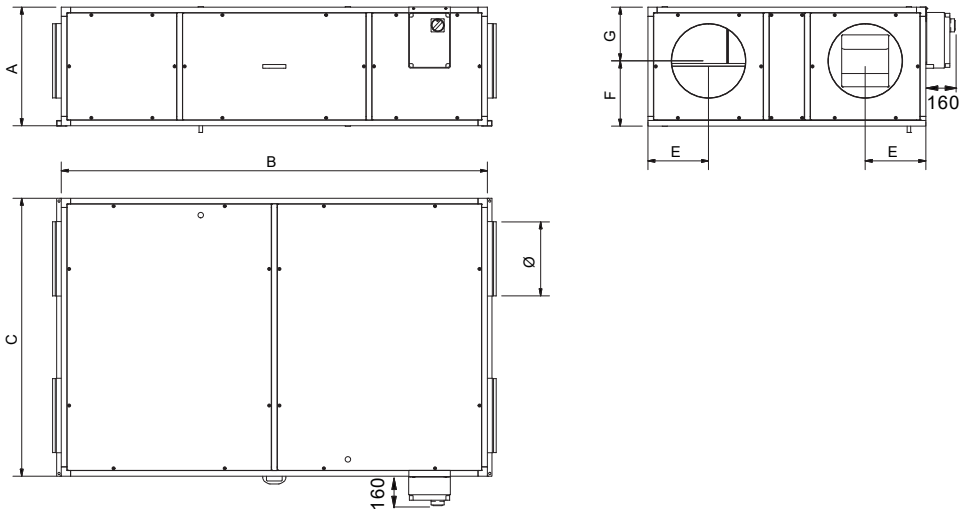
DIMENSIONS(mm) WEIGHT(kg)



UNIT	Dimensions[mm]					
	A	B	C	Ø	E	Weight [kg]
DUO-EC 1	370	1100	1050	200	185	73
DUO-EC 2	430	1200	1150	250	215	90
DUO-EC 3	550	1460	1300	315	283	147

DUO-EC4 and 5

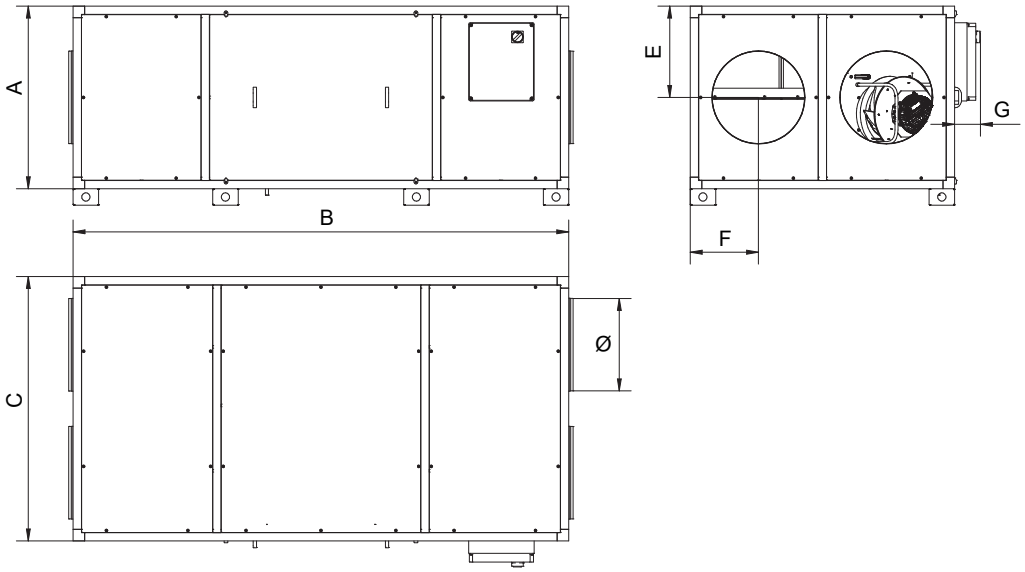
DIMENSIONS(mm) WEIGHT(kg)



UNIT	Dimensions[mm]							
	A	B	C	Ø	E	F	G	Weight [kg]
DUO-EC 4	640	2300	1500	400	327	350	290	261
DUO-EC 5	640	2300	1980	400	327	350	290	284

DUO-EC 6

DIMENSIONS(mm) WEIGHT(kg)



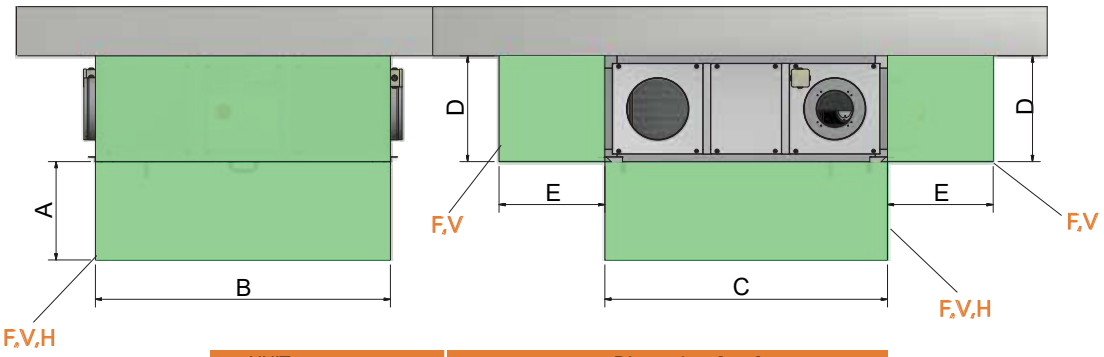
UNIT	Dimensions[mm]							
	A	B	C	Ø	E	F	G	Weight [kg]
DUO-EC 6	1105	3000	1600	560	552,5	413	157	465

INSTALLATION DUO-EC
from size 1 to size 3

CEILING INSTALLATION

Minimum required space for standard maintenance (mm)

F= filters, H=heat exchenger, V=ventilators

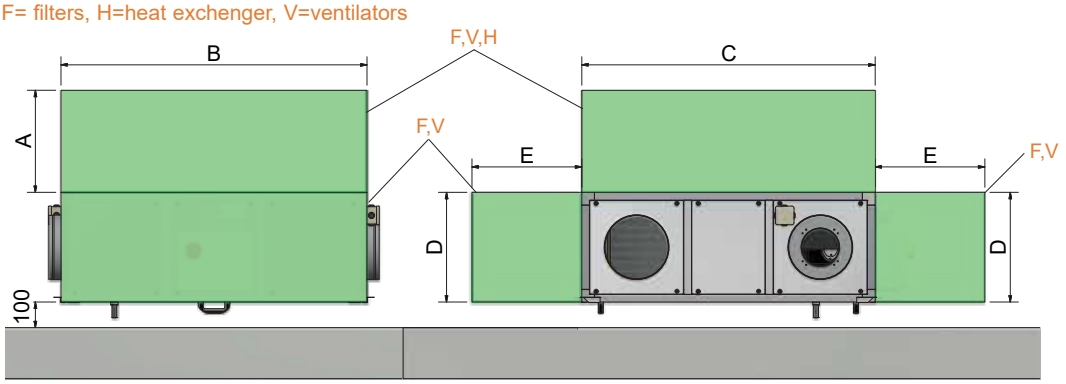


UNIT	Dimensions[mm]				
	A	B	C	D	E
DUO-EC 1	250	1100	1050	380	500
DUO-EC 2	350	1200	1150	430	500
DUO-ED 3	500	1460	1300	550	500

FLOOR INSTALLATION

Minimum required space for standard maintenance (mm)

F= filters, H=heat exchenger, V=ventilators



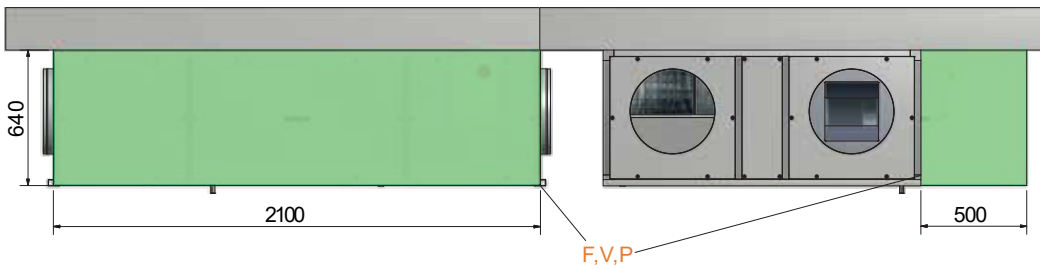
UNIT	Dimensions[mm]				
	A	B	C	D	E
DUO-ED 1	250	1100	1050	380	500
DUO-ED 2	350	1200	1150	430	500
DUO-ED 3	500	1460	1300	550	500

INSTALLATION DUO-EC 4 and 5

CEILING INSTALLATION

Minimum required space for standard maintenance (mm)

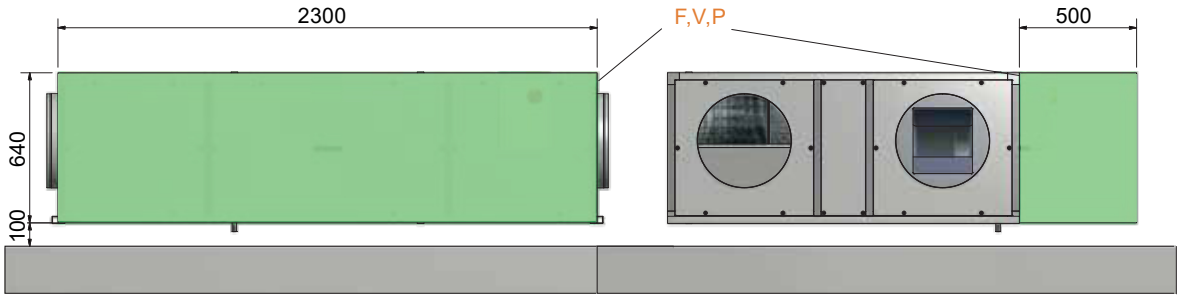
F= filters, H=heat exchenger, V=ventilators



FLOOR INSTALLATION

Minimum required space for standard maintenance (mm)

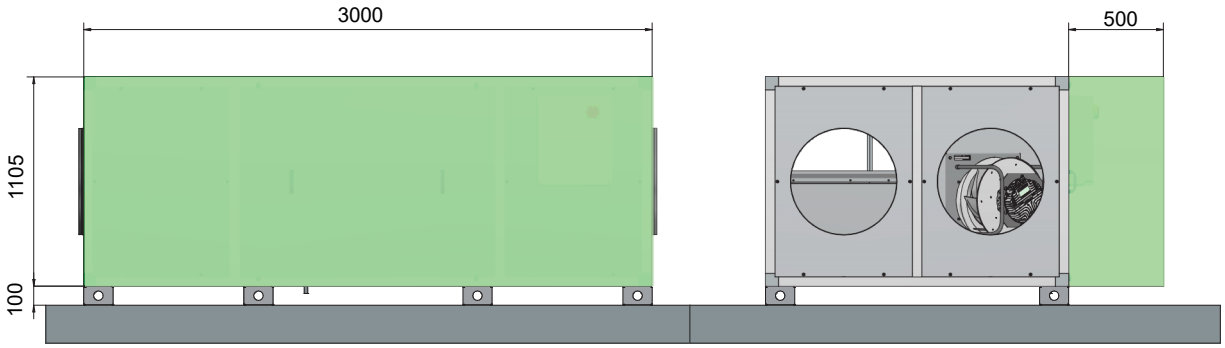
F= filters, H=heat exchenger, V=ventilators



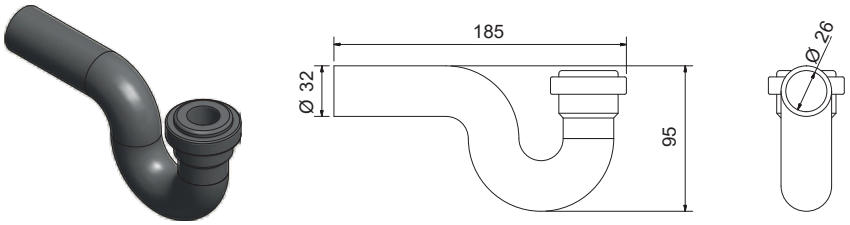
INSTALLATION DUO-EC 6

FLOOR INSTALLATION

Minimum required space for standard maintenance (mm)

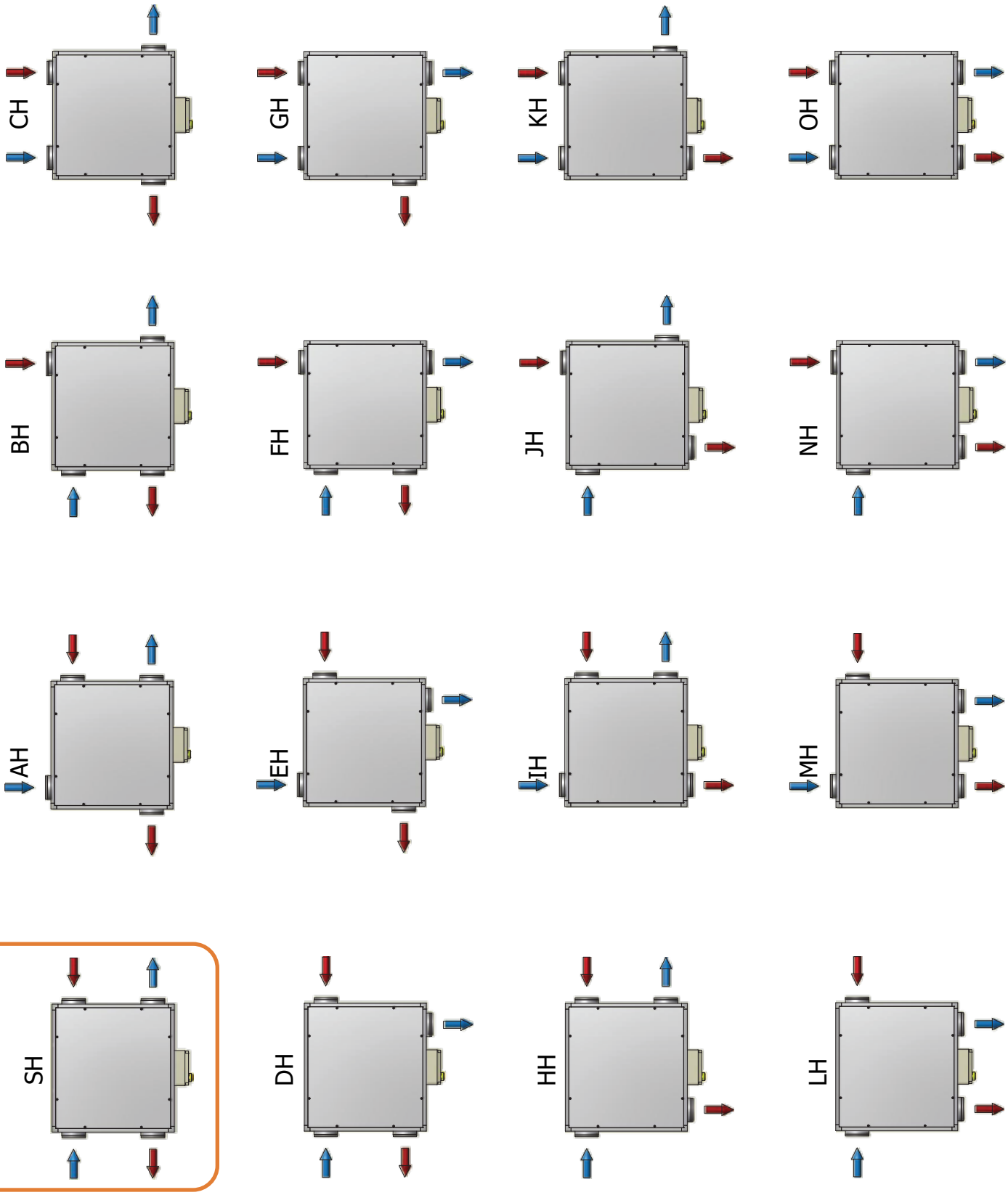


STANDARD SIPHON [mm]

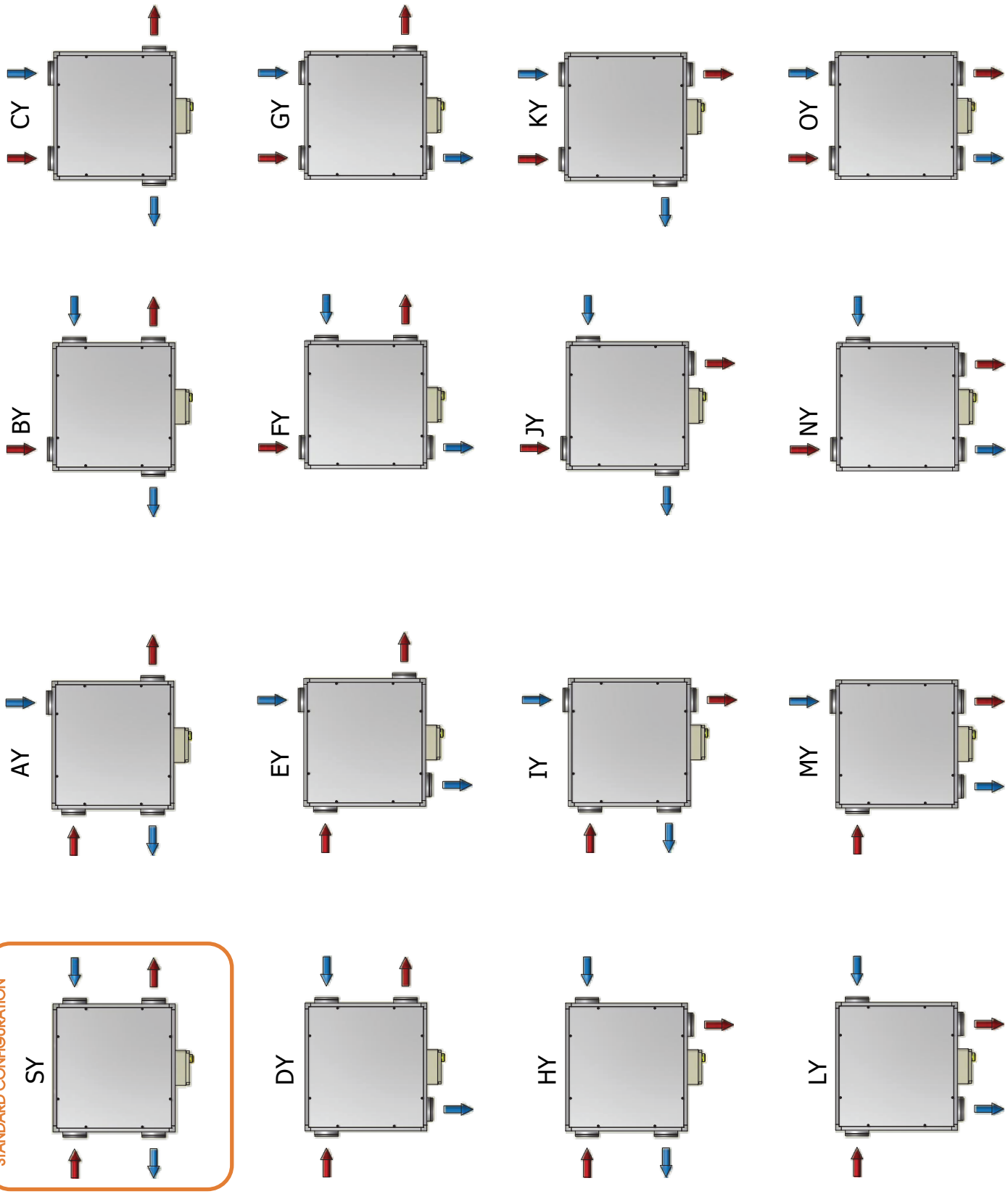


N.B .: predict 1 additional siphon if there isthe cold water coil BA-AF/ AC or DX gas(duct)

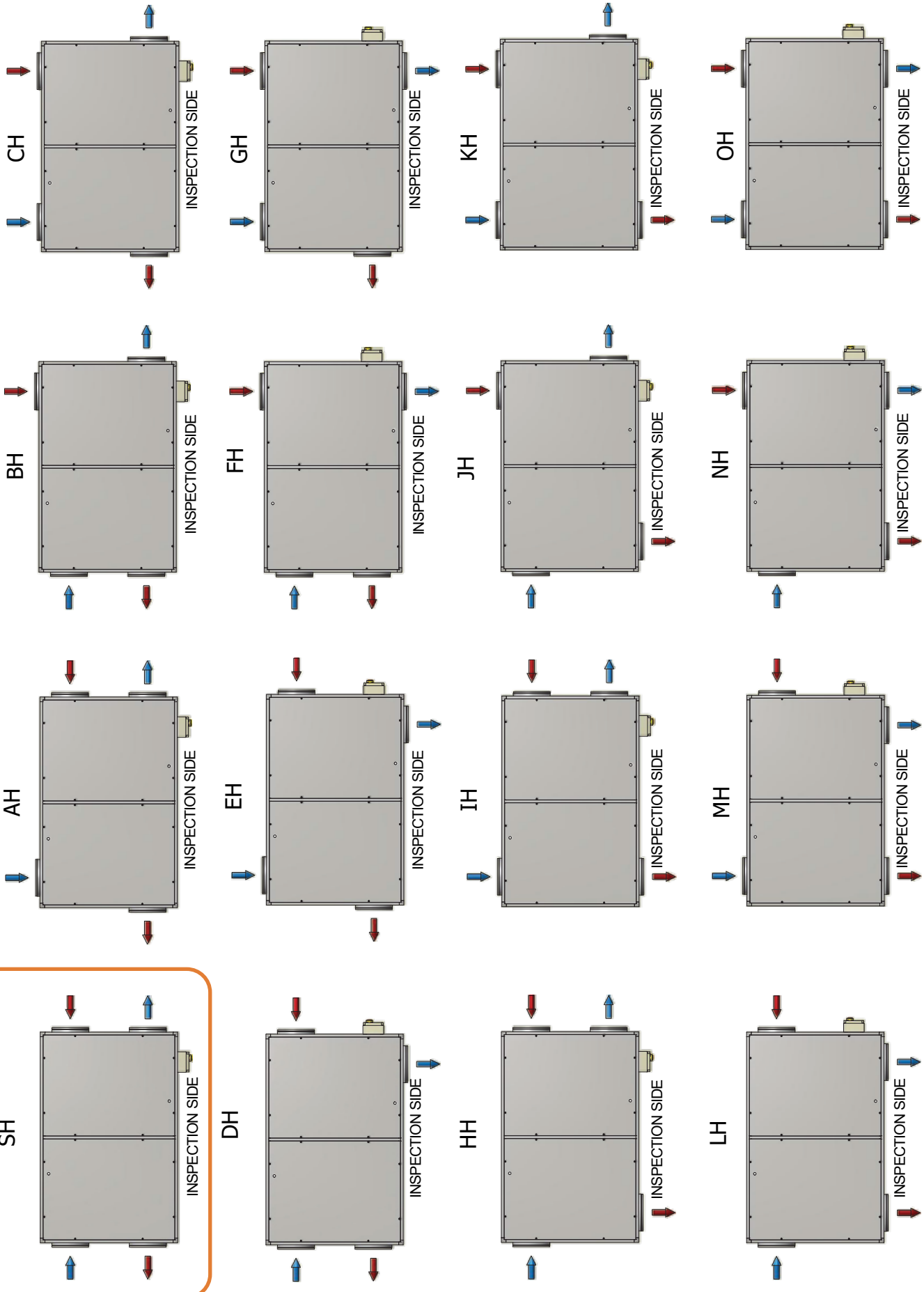
CONFIGURATIONS DUO-EC 1/2 E 3
VIEW FROM ABOVE



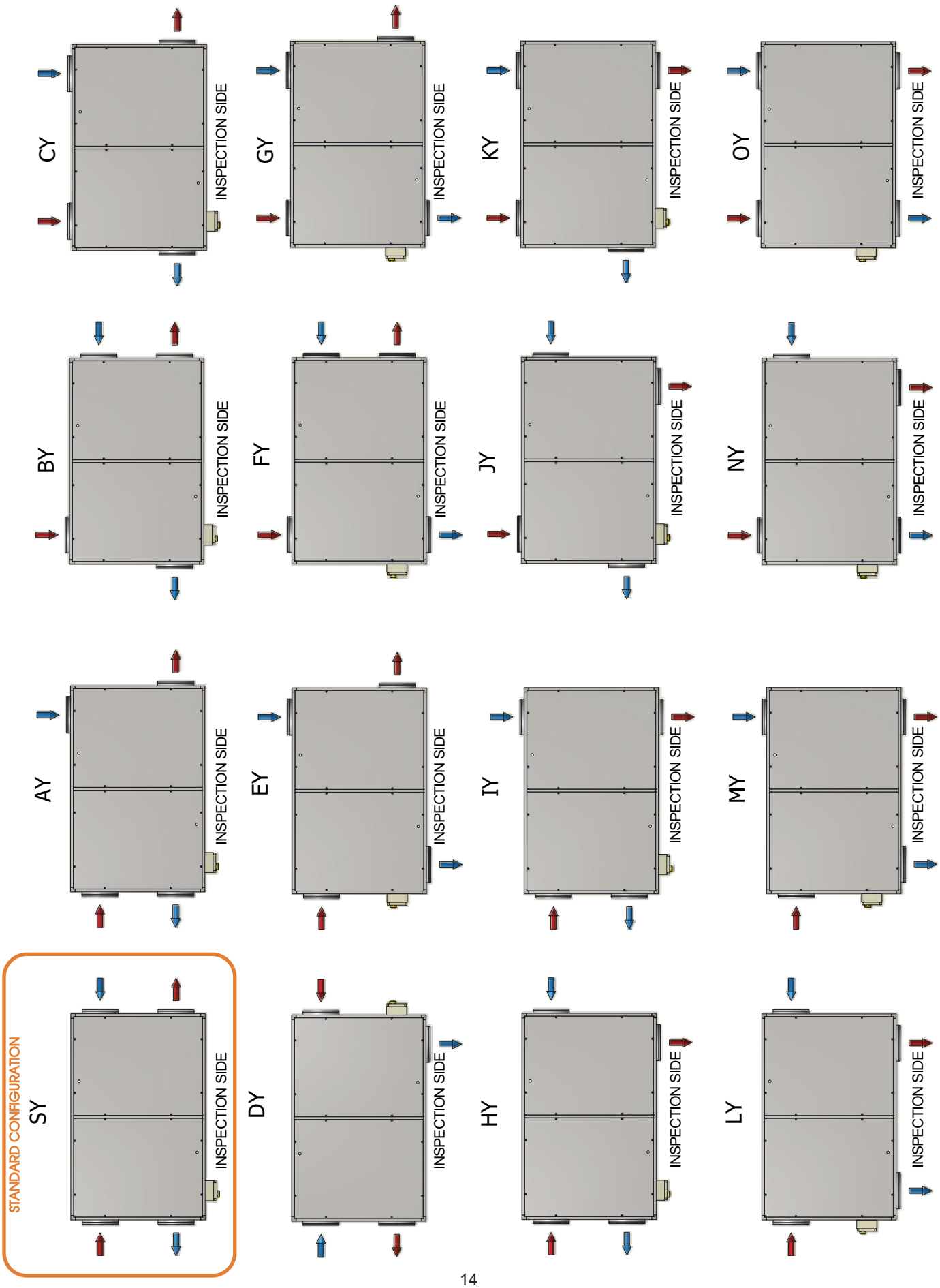
CONFIGURATIONS size 1/2/3
MIRRORED VERSIONS VIEW FROM ABOVE



CONFIGURATIONS size 4, 5 and 6
VIEW FROM ABOVE



CONFIGURATION size 4, 5 and 6
MIRRORED CONFIGURATIONS VIEW FROM ABOVE



DX coil- DUO-EC 1

DIRECT EXPANSION COIL (R410A						
Air flow [m³/h]	Tin [°C]	R.H. in [%]	Power [kW]	Tout [°C]	R.H. out [%]	Air pressure drop [Pa]
396	25	50	1,96	13,6	86	16

Ø connection[mm]	Fin pitch [mm]	N. Rows	Int.Vol.[dm³]	Tevap [°C]	Tcond [°C]
22-16	3,0	3	1,0	5	50

DX coil- DUO-EC 2

DIRECT EXPANSION COIL (R410A						
Air flow [m³/h]	Tin [°C]	R.H. in [%]	Power [kW]	Tout [°C]	R.H. out [%]	Air pressure drop [Pa]
828	25	50	3,59	15,4	78,7	53

Ø connection[mm]	Fin pitch [mm]	N. Rows	Int.Vol.[dm³]	Tevap [°C]	Tcond [°C]
18-12	2,5	3	1,1	5	50

DX coil- DUO-EC 3

DIRECT EXPANSION COIL (R410A						
Air flow [m³/h]	Tin [°C]	R.H. in [%]	Power [kW]	Tout [°C]	R.H. out [%]	Air pressure drop [Pa]
1260	25	50	6,18	14,1	83,6	50

Ø connection[mm]	Fin pitch [mm]	N. Rows	Int.Vol.[dm³]	Tevap [°C]	Tcond [°C]
18-12	2,5	3	2,3	5	50

DX coil- DUO-EC 4

DIRECT EXPANSION COIL (R410A						
Air flow [m³/h]	Tin [°C]	R.H. in [%]	Power [kW]	Tout [°C]	R.H. out [%]	Air pressure drop [Pa]
1980	25	50	8,01	15,9	77,3	32

Ø connection[mm]	Fin pitch [mm]	N. Rows	Int.Vol.[dm³]	Tevap [°C]	Tcond [°C]
18-12	2,5	2	2,6	5	50

DX coil- DUO-EC 5

DIRECT EXPANSION COIL (R410A						
Air flow [m³/h]	Tin [°C]	R.H. in [%]	Power [kW]	Tout [°C]	R.H. out [%]	Air pressure drop [Pa]
2700	25	50	10,93	16	76,7	36

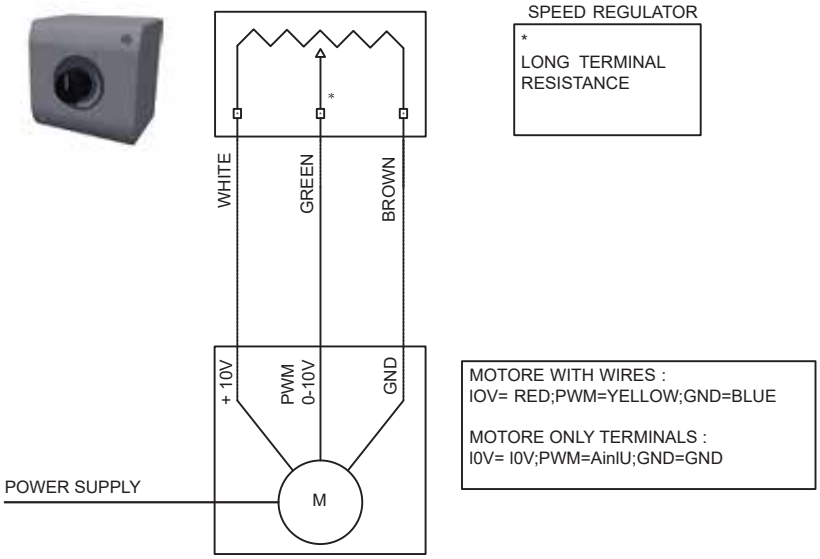
Ø connection[mm]	Fin pitch [mm]	N. Rows	Int.Vol.[dm³]	Tevap [°C]	Tcond [°C]
22-12	2,5	2	3,2	5	50

DX coil- DUO-EC 6

DIRECT EXPANSION COIL (R410A						
Air flow [m³/h]	Tin [°C]	R.H. in [%]	Power [kW]	Tout [°C]	R.H. out [%]	Air pressure drop [Pa]
4248	25	50	20	15	79	19

Ø connection[mm]	Fin pitch [mm]	N. Rows	Int.Vol.[dm³]	Tevap [°C]	Tcond [°C]
28-28	3	3	8,5	5	50

CVR VARIABLE RESISTANCE SPEED REGULATOR



A	Manufacturer's name Santech					
B	Manufacturer'smodel identifier	DUO-EC 1 BP EVO-PH SH	DUO-EC 2 BP EVO-PH SH	DUO-EC 3 BP EVO-PH SH	DUO-EC 4 BP EVO-PH SH	DUO-EC 5 BP EVO-PH SH
C	Declared typology	UVNR / UVB	UVNR / UVB	UVNR / UVB	UVNR / UVB	UVNR / UVB
D	Type of drive installed	Variable speed drive	Variable speed drive	Variable speed drive	Variable speed drive	Variable speed drive
E	Type of HRS	other	other	other	other	other
F	Thermal efficiency of heat recovery [%]	78,8	76,0	79,8	77,5	77,3
G	Nominal NRVU flow rate [m³/s]	0,11	0,23	0,35	0,55	0,75
H	Effective electric power input [kW]	0,17	0,34	0,92	1,44	2,63
I	SPFint W/[m³/s]	836	912	1206	1057	1112
J	Face velocity at design flow rate [m/s]	1,3	1,5	1,4	1,4	1,5
K	Nominal external pressure [Pa]	100	100	350	350	500
L	Internal pressure drop of ventilation components[Pa]	419	571	734	622	613
M	Optional: internal pressure drop of non-ventilation components	-	-	-	-	-
N	Static efficiency of fansused in accordance with Regulation (EU) No 327/2011 [%]	50,4	63,4	64,6	58,7	58,6
O	Declared maximum external leakage rate of the casing of ventilation units [%]	8,5	4,4	3,8	2,6	1,4
	Declared maximum internal leakage rate of bidirectional ventilation unitsor carry over (for regenerative heat exchan-gers only) [%]	6,5	1,5	5,3	9,7	4,4
P	Energy performance, preferably energy classification, of the filters (declared information about the calculated annual energy consumption	ePM1 70% (F7) ePM10 50%(M5)	ePM1 70% (F7) ePM10 50%(M5)	ePM1 70% (F7) ePM10 50%(M5)	ePM1 70% (F7) ePM10 50%(M5)	ePM1 70% (F7) ePM10 50%(M5)
Q	Position and description of visual filter warning for RVUs intended for use with filters, including text pointing out the importance of regular filter changes for performance and energy efficiency of the unit	Position and description of visual filter warning for RVUs intended for use with filters, including text pointing out the importance of regular filter changesfor performance and energy efficiency of the unit				
R	Casing sound power level (LWA) [dB]	61	64	69	72	75

A	Manufacturer's name Santech	
B	Manufacturer'smodel identifier	DUO-EC 6 BP EVO-PH SH
C	Declared typology	UVNR / UVB
D	Type of drive installed	Variable speed
E	Type of HRS	other
F	Thermal efficiency of heat recovery [%]	80,1
G	Nominal NRVU flow rate [m³/s]	1,18
H	Effective electric power input [kW]	3,45
I	SPFint W/[m³/s]	1128
J	Face velocity at design flow rate [m/s]	1,57
K	Nominal external pressure [Pa]	560
L	Internal pressure drop of ventilation components[Pa]	799
M	Optional: internal pressure drop of non-ventilation components	-
N	Static efficiency of fansused in accordance with Regulation (EU) No 327/2011 [%]	64,4
O	Declared maximum external leakage rate of the casing of ventilation units [%]	2,0
	Declared maximum internal leakage rate of bidirectional ventilation unitsor carry over (for regenerative heat exchan-gers only) [%]	7,6
P	Energy performance, preferably energy classification, of the filters (declared information about the calculated annual energy consumption	ePM1 70% (F7) ePM10 50%(M5)
Q	Position and description of visual filter warning for RVUs intended for use with filters, including text pointing out the importance of regular filter changes for performance and energy efficiency of the unit	Position and description of visual filter warning for RVUs intended for use with filters, including text pointing out the importance of regular filter changes for performance and energy efficiency of the unit
R	Casing sound power level (LWA) [dB]	83