

HRS

Very high efficiency heat recovery units

WITH HIGH EFFICIENCY HEAT RECOUPERATOR

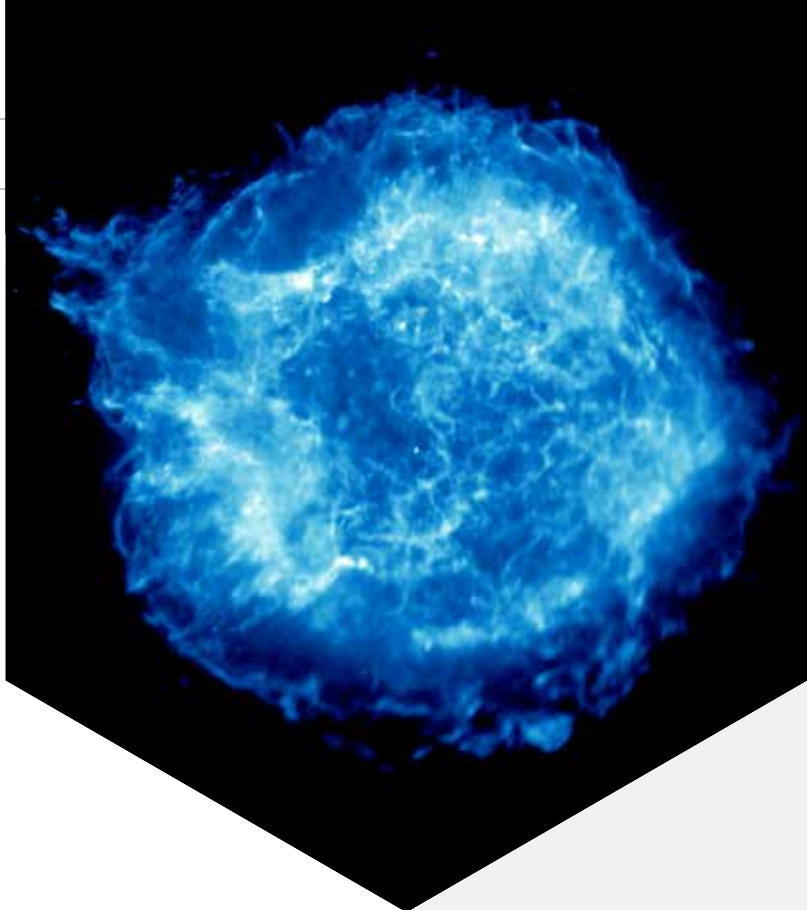
from 300 to 4.000 m³/h

Air-handling unit designed and manufactured for non-residential applications, which allows to combine the requirement for air change-over with the maximum energy saving. It is equipped with a counter-flow aluminium plates heat recovery unit, complying specifically with the requirements of the EU 1253/2014 norm. These units naturally integrate with traditional heating/cooling systems though, when equipped with the suitable accessories, they may also be used autonomously.

The series, in both horizontal and vertical execution, is divided into six sizes with air volumes from 300 to 4000 m³/h. The casing is made of 25 mm thick double skin panels, with external sheets in RAL 9002 prepainted galvanized steel and internal ones in galvanized metal sheet, internally insulated with thermo-acoustic fire-proof rockwool insulation. The heat recovery unit has extremely high efficiency (> 90%) in counter-flow aluminium plates, with integrated by-pass system for free-cooling operation.

Filters are M5 efficiency class on room air exhaust and F7 on fresh air intake, efficiency calculated according to EN 779:2012. Fans are backward-curved blades type, directly coupled with EC motors.

The units includes an integrated control board with electronic control of all the functions: ventilation and temperature control, monitoring of the status of the filters, week programming, defrost management and anti-freeze device, fire alarm and Modbus interface.



EU 1253-2014
COMPLIANT



PLUG&PLAY



EC FANS



EFFICIENCY



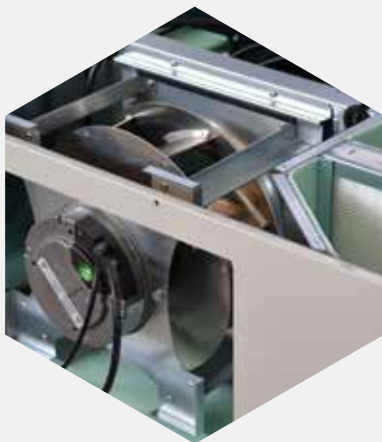
HORIZONTAL
ORIENTATION



VERTICAL
ORIENTATION

Accessories

Electric heater for PRE or POST heating	SKE
External module with water coil (change-over use)	CCS
External module with R410A direct expansion coil	CDX
Face/top/bottom air damper (only with PLM)	SKR1
Side air damper (only with PLM)	SKR2
ON/OFF damper actuator	SSE
Modulating 3-way valve with actuator	V33
Filters differential pressure switch	PSTD
Differential pressure transducer	DPS
Ductable CO2 probe	AQS
Roof cover for base unit (horizontal versions)	TPR-H
Roof cover for base unit (vertical versions)	TPR-V
Roof cover for CCS module (horizontal versions)	TPR-CH
Roof cover for CCS module (vertical versions)	TPR-CV
Flexible connection - upper/lower (only with PLM)	GAT 1
Flexible connection - side (only with PLM)	GAT 2
Round adapter for circular ducts - upper/lower (only with PLM)	BCC 1
Round adapter for circular ducts - side (only with PLM)	BCC 2
Plenum with multiple connections	PLM



EC FAN AND HIGH EFFICIENCY FILTER



DAMPER WITH ACTUATOR AND ACCESS DOOR FOR FILTERS WITHDRAWAL



CCS SECTION WITH WATER COIL



INSIDE



FULL OUTSIDE

Models

HRS			05	10	15	20	30	40
Airflow rate	Nom	m³/h	450	800	1300	1900	2800	3800
		m³/s	0,125	0,222	0,347	0,528	0,778	1,056
External static pressure (1)	Nom	Pa	175	110	250	130	140	105
1m sound pressure level	Nom	dB(A)	53	53	54	60	61	60
Overall power input	Nom	W	330	340	920	930	1820	1920
	Max		340	340	920	930	2000	2000
Overall input current	Nom	A	2,7	2,9	6,0	6,0	3,2	3,4
	Max		2,8	2,9	6,0	6,0	3,4	3,5
Power supply	V-Ph-Hz		230-1-50			400-3+N-50		
Fan speed control	-							
External leakage	0÷10 V							
Internal leakage	max 3,5% @ -400 Pa (EN 13141-7)							
Yearly filter energy consumption	%		max 5,5% @ +250 Pa (EN 13141-7)					
Recovery efficiency (2)	kWh		476	719	1281	2065	2482	3259
Recovery capacity (2)	%		91,6	91,4	90,7	90,5	90,3	90,4
Supply temperature (2)	kW		4020	7330	11400	17280	25410	34520
	°C		17,5	17,4	17,2	17,2	17,1	17,1
CONFORMITY TO EU 1253/2014								
Recovery efficiency (3)	%		83,2	80,0	80,5	80,0	82,5	82,3
Efficiency bonus	W/m³/s		486	390	405	390	465	459
Filter correction factor	-		0	0	0	0	0	0
SFP int limit	W/m³/s		1667	1556	1552	1510	1548	1500
Total internal air pressure drop (3)	Pa		788	826	743	690	855	873
Overall fan static efficiency (4)	%		47,3	55,6	48,1	46,0	56,4	58,3
SFP int	W/m³/s		1666	1485	1545	1500	1516	1498
WORKING LIMITS								
Air temperature	°C		-20 ÷ 45					
Air relative humidity	%		10 ÷ 95					
Working environment	Not explosive, not corrosive, not chlorinated, not saline							
SKE								
Capacity	kW		1,5	2,5	4,0	5,0	7,5	10,5
ΔT (5)	°C		9,8	9,2	9,5	7,7	7,9	8,1
Air pressure drop (5)	Pa		5	6	10	10	11	12
Power supply	V-Ph-Hz		230-1-50			400-3+N-50		
CCS								
Cooling capacity (6)	total sensible	kW	2,46	4,47	6,65	10,62	16,14	20,68
			1,35	2,41	3,66	5,84	8,72	11,37
Heating capacity (7)		kW	3,30	5,86	9,08	14,03	20,83	27,50
Water flow rate (6)		l/h	432	756	1152	1836	2772	3564
Water pressure drop (6)		kPa	12	18	9	13	19	15
Air pressure drop (6)		Pa	51	53	51	50	50	55
Weight		kg	28	31	35	42	52	58
BCC								
Nominal connection diameter	mm		250	315	315	400	500	500
Connection strip	mm		100	100	100	100	100	100
Nominal air pressure drop	Pa		7	7	16	10	9	16

(1) Fresh air/supply air circuit

(2) At wet conditions : outside air temperature -7°C 80% RH, room air temperature 20°C 55% RH

(3) At dry conditions : outside air temperature 5°C, room air temperature 25°C

(4) Including motor & speed controller efficiency

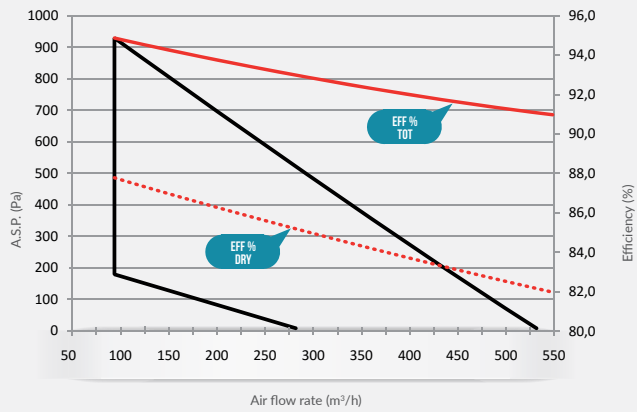
(5) At nominal airflow rate

(6) Air inlet condition 28,0°C 60% RH; in/out water temperature 7°/12°C

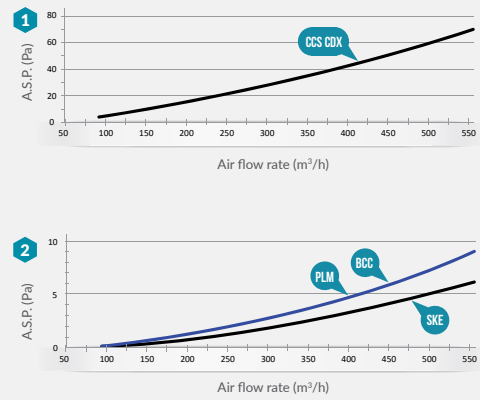
(7) Air inlet condition 13°C; in/out water temperature 45°/40°C

Performance

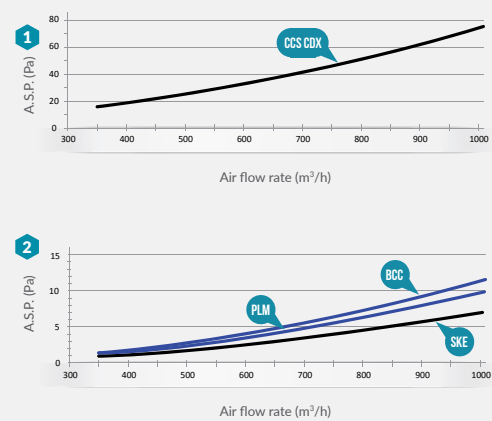
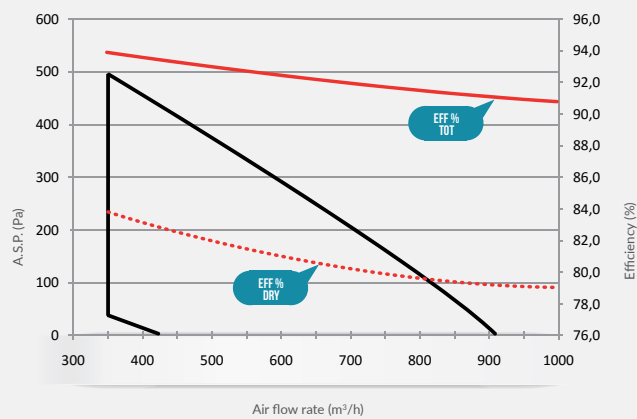
SUPPLY



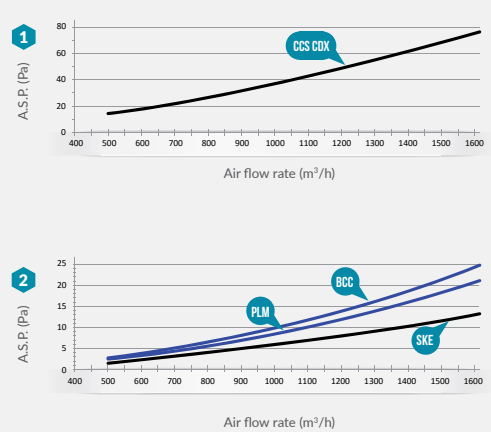
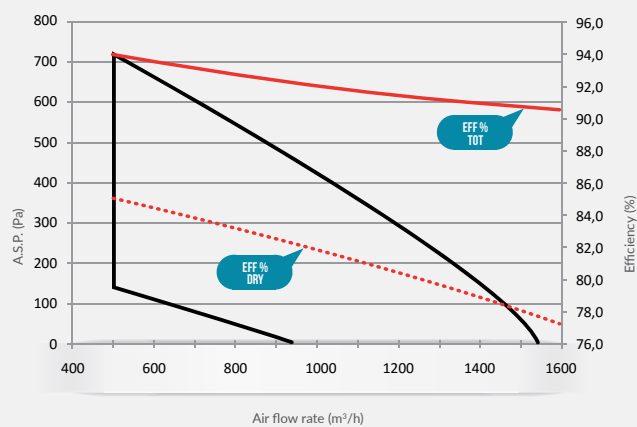
1 RETURN 2 ACCESSORIES PRESSURE DROPS



HRS 05



HRS 10



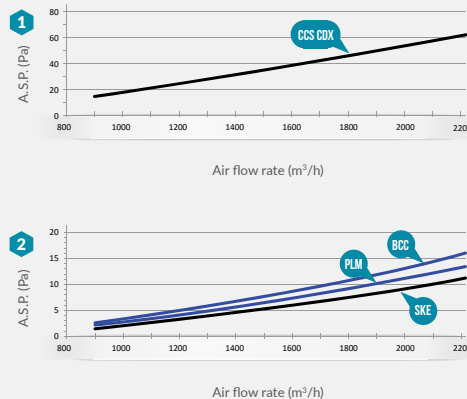
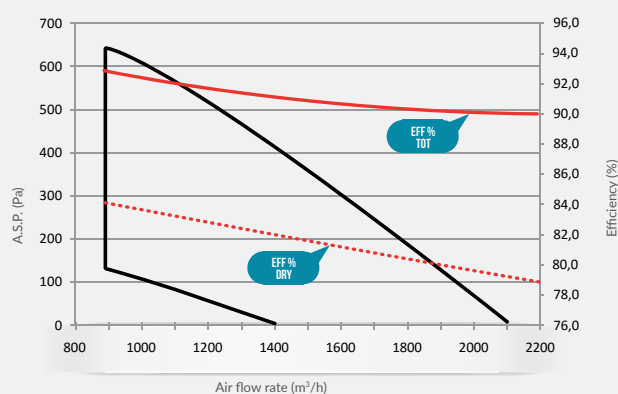
HRS 15

Performance

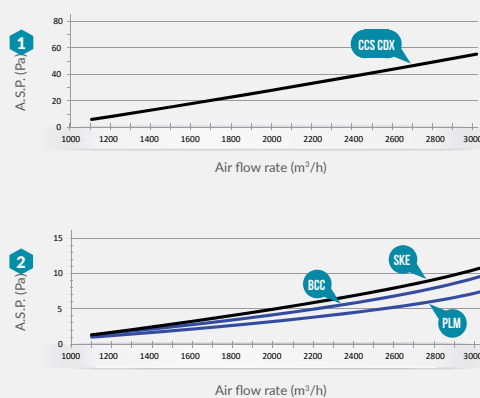
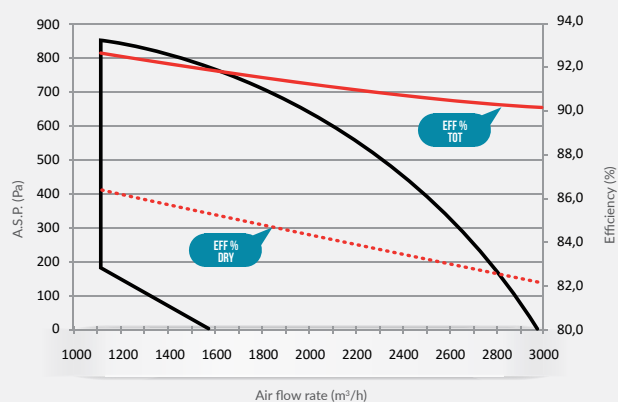
SUPPLY

1 RETURN 2 ACCESSORIES PRESSURE DROPS

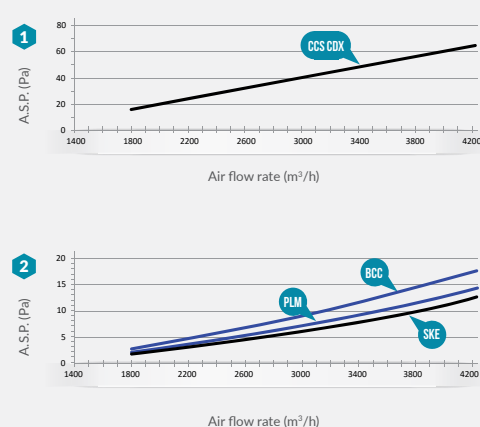
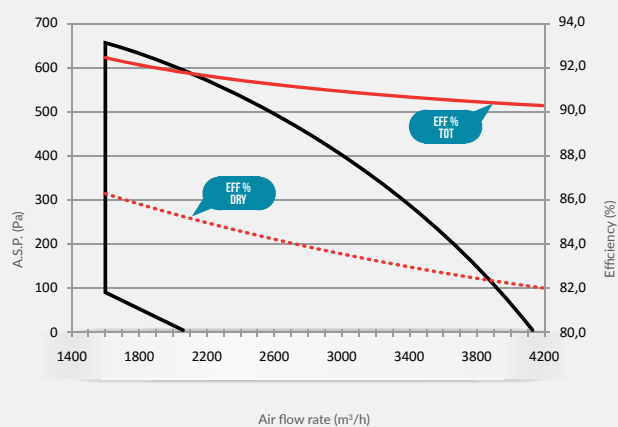
HRS 20



HRS 30



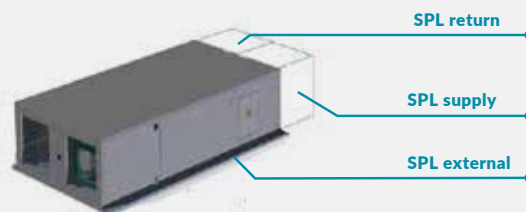
HRS 40



Noise levels

The table lists the sound power values (SWL) in octave bands and totals; it also indicates the values of sound pressure level (SPL) at 1 m, 5 m and 10 m at supply, return and at the outside of the unit.

All values refer to the operation of the ducted unit at FULL speed and at the nominal flow rate.

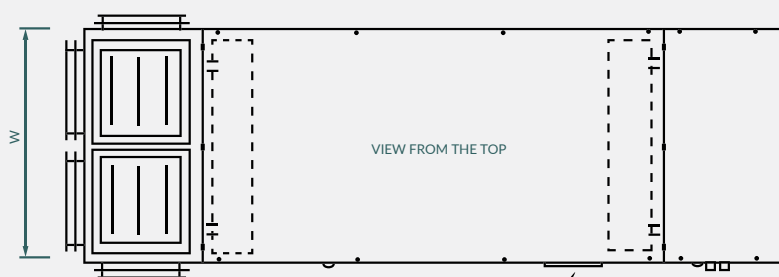
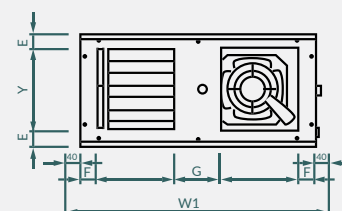
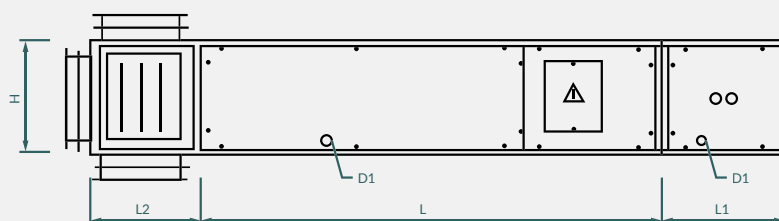


HRS	SWL [dB] OCTAVE BAND [HZ]								SWL		SPL SUPPLY			SPL RETURN			SPL OUTSIDE		
	63	125	250	500	1000	2000	4000	8000	dB	dB(A)	1 m	5 m	10 m	1 m	5 m	10 m	1 m	5 m	10 m
05	62	59	65	65	63	63	62	53	72	69	61	47	41	53	39	33	44	30	24
10	61	58	64	64	62	62	61	53	71	68	60	47	41	53	39	33	44	30	24
15	60	59	65	65	63	63	63	55	72	70	61	48	42	54	40	32	45	31	25
20	66	64	74	73	69	68	68	67	79	76	68	54	48	60	46	40	51	37	31
30	69	66	74	76	72	71	67	67	80	77	69	55	49	61	47	41	52	38	32
40	68	69	72	73	69	70	66	65	79	76	68	54	48	60	46	40	51	37	31

Dimensions and weights

HORIZONTAL VERSION

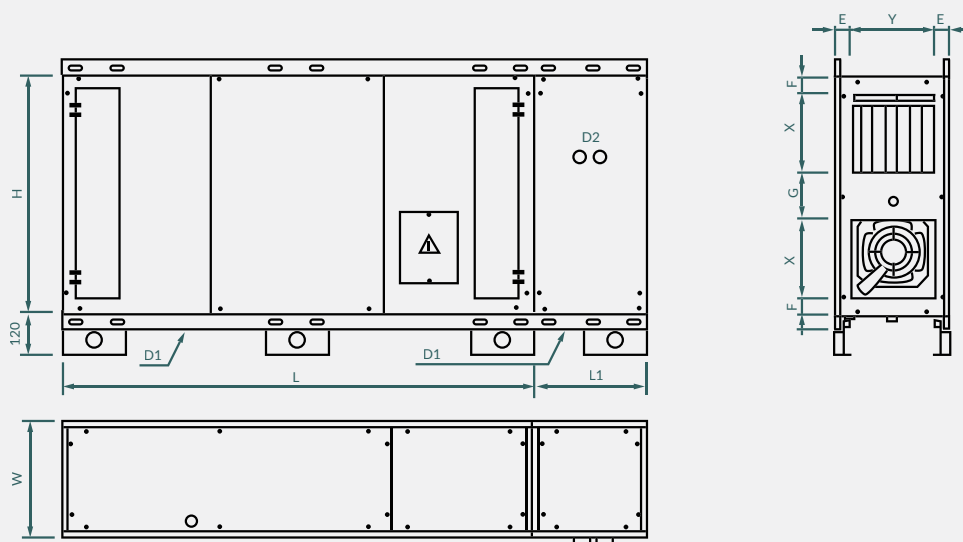
HRS		05	10	15	20	30	40
L	mm	1350	1470	1850	1850	2150	2150
W	mm	680	820	1030	1460	1460	1840
H	mm	330	370	455	455	590	590
W1	mm	760	900	1110	1540	1540	1920
X	mm	230	300	390	600	590	780
Y	mm	225	265	350	350	485	485
E	mm	52,5	52,5	52,5	52,5	52,5	52,5
F	mm	46	46	46	46	55	55
G	mm	128	130	158	170	170	170
D1	mm	½" M					
D2	mm	¾" M	¾" M	¾" M	¾" M	1" M	1" M
L1	mm	350	400	400	400	502	502
L2	mm	340	380	460	460	580	580
Weight	kg	86	106	181	236	297	367



Dimensions and weights

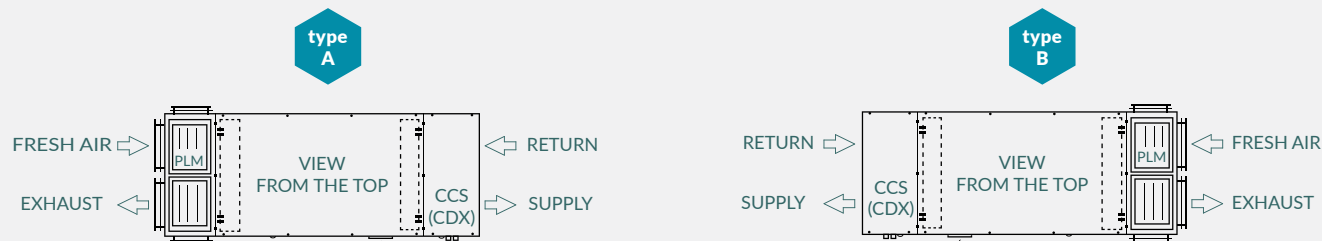
VERTICAL VERSION

HRS		05	10	15	20	30	40
L	mm	1350	1470	1850	1850	2150	2150
W	mm	330	370	455	455	590	590
H	mm	680	820	1030	1460	1460	1840
X	mm	230	300	390	600	590	780
Y	mm	225	265	350	350	485	485
E	mm	52,5	52,5	52,5	52,5	52,5	52,5
F	mm	46	46	46	46	55	55
G	mm	128	130	158	170	170	170
D1	mm	$\frac{1}{2}$ " M					
D2	mm	$\frac{3}{4}$ " M	$\frac{3}{4}$ " M	$\frac{3}{4}$ " M	$\frac{3}{4}$ " M	1" M	1" M
L1	mm	350	400	400	400	502	502
L2	mm	340	380	460	460	580	580
Weight	kg	86	106	181	236	297	367

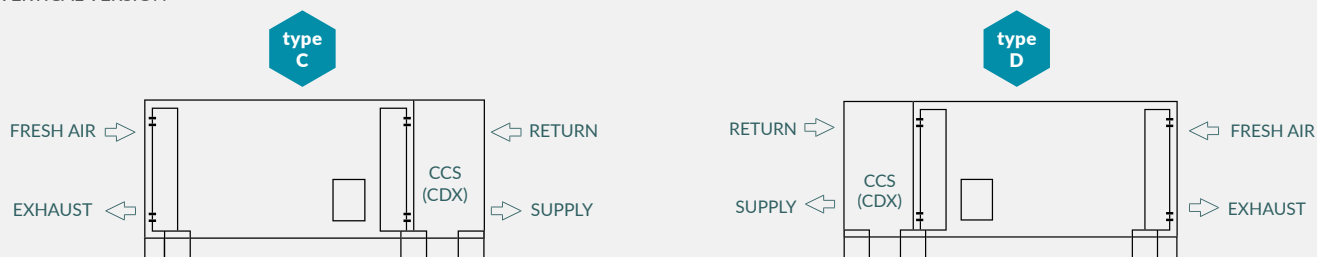


Configurations

HORIZONTAL VERSION



VERTICAL VERSION



Controls

Automatic / manual speed selection		•
EC fans management		•
Manual ON/OFF		•
Management of cold / change-over valve	CCS+V33	•
Management of hot valve	CCS+V33	•
0-10v control of direct expansion coil	CDX	•
Management of heat recuperator defrost		•
Management of water coil anti-freeze device		•
ON/OFF control of pre-heating battery	SKE	•
Modulating control of pre-heating battery	SKE	•
Management of free-cooling damper		•
Management of filters differential pressure switch	PSTD	•
Management of ventilation with CO2 probe	AQS	•
Management of ventilation with 1 pressure sensor	DPS	•
Management of ventilation with PIR occupancy detector		•
Management of motorized dampers	SKR+SSE	•
Management of Boost by keyboard		•
Alarms management		•
Post ventilation		•
Weekly programming		•
Remote ON/OFF		•
Fire alarm digital input		•
Mode change (heating/cooling) from digital input		•
Digital input for PIR occupancy		•
Remote display with built-in sensor		•
BMS Modbus protocol RS485		•
Reference diagram		28