

HRH

High efficiency heat recovery units

WITH HIGH EFFICIENCY HEAT RECOUPERATOR

from 300 to 4.300 m³/h

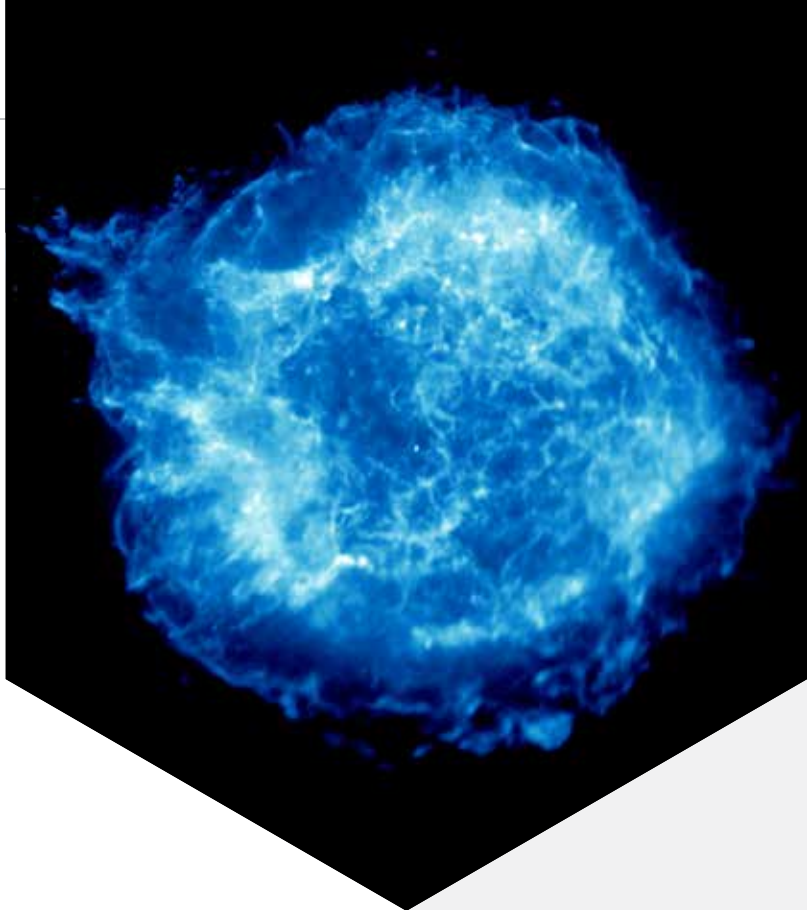
The HRH units have been designed for non-residential applications for which a forced and mechanical air change-over is requested. In accordance with the new EU 1253/2014 norm, they are equipped with a high efficiency counter-flow plate heat recovery unit (in dry conditions, superior to the minimum efficiency prescribed by the law of 67%), with filters with extremely low pressure drops (F7 on fresh air and M5 on room air exhaust, efficiency calculated according to EN 779:2012) and with backward-curved blades fans, directly coupled with EC motors, guaranteeing power absorptions well below the limits indicated by the norm.

The casing is made with double skin panels, with 25mm thick rockwool insulation with fire reaction class A2S1d0; external panels are in prepainted steel, internal panels in galvanized steel.

Integrated by-pass system with actuator, for free-cooling operations.

Access to fans and filters sections is ensured by doors with hinges and locking devices; additional access is given to the filters thanks to lift-off panels.

The units are complete with an electronic control box for the setting of the ventilation and temperature, monitoring of the status of the filters, week programming, defrost management and anti-freeze device for the additional water coil module.



EU 1253-2014
COMPLIANT



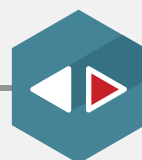
PLUG&PLAY



EC FANS



EFFICIENCY



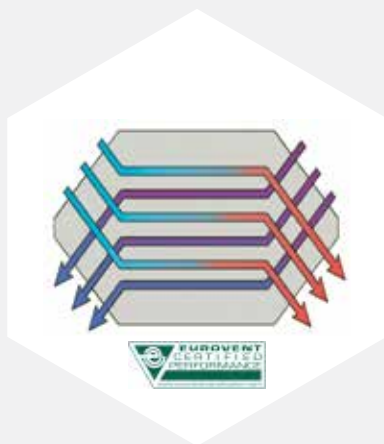
HORIZONTAL
ORIENTATION



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



ALUMINIUM PLATES HIGH EFFICIENCY
HEAT RECOVERY UNIT



INTEGRATED MULTIFUNCTIONAL
ELECTRONIC CONTROL



STEEL SUPPORT BEAM



INSIDE



FULL OUTSIDE

Models

HRH			05	10	15	20	30	40
Airflow rate	Nom	m³/h	450	800	1300	1900	2800	3800
		m³/s	0,125	0,222	0,361	0,528	0,778	1,056
External static pressure (1)	Nom	Pa	200	160	250	170	190	175
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	-		0÷10 V					
External leakage	max 3,5% @ -400 Pa (EN 13141-7)							
Internal leakage	%		max 5,5% @ +250 Pa (EN 13141-7)					
Yearly filter energy consumption	kWh		476	719	1332	2065	2482	3259
Recovery efficiency (2)	%		86,5	83,4	83,7	84,1	83,4	83,2
Recovery capacity (2)	kW		3520	6040	9840	14450	21120	28600
Supply temperature (2)	°C		16,3	15,5	15,6	15,7	15,5	15,5
CONFORMITY TO EU 1253/2014								
Recovery efficiency (3)	%		79,0	76,0	76,2	76,5	76,0	75,8
Efficiency bonus	W/m³/s		360	270	276	285	270	264
Filter correction factor	-		0	0	0	0	0	0
SFP int limit	W/m³/s		1541	1437	1422	1406	1353	1306
Total internal air pressure drop (3)	Pa		725	755	693	645	762	761
Overall fan static efficiency (4)	%		47,3	55,6	48,8	46,0	56,4	58,3
SFP int	W/m³/s		1533	1359	1420	1405	1351	1305
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	9,0	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	6,83	10,62	16,14	20,68
			1,35	2,41	3,76	5,84	8,72	11,37
Heating capacity (7)		kW	3,30	5,86	9,34	14,03	20,83	27,50
Water flow rate (6)		l/h	432	756	1188	1836	2772	3564
Water pressure drop (6)		kPa	12	18	9	13	19	15
Air pressure drop (6)		Pa	51	53	54	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

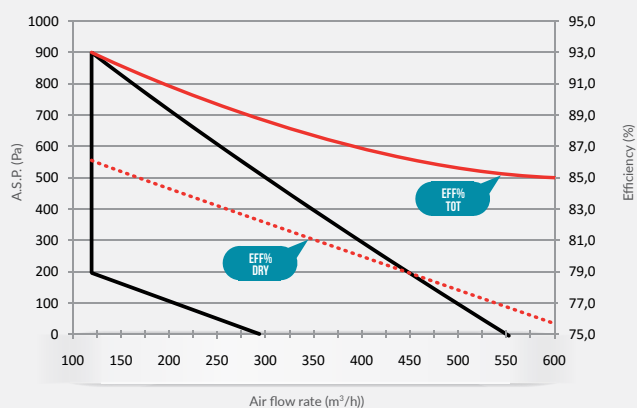
(5) At nominal airflow rate

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

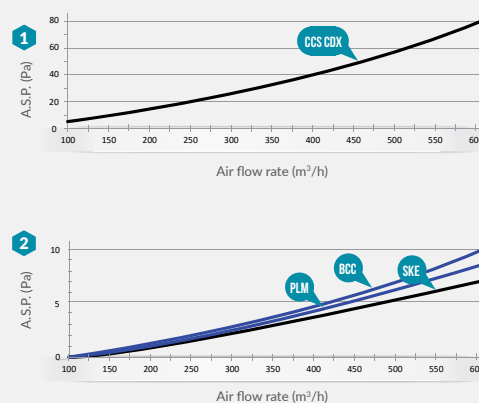
(7) Air inlet condition 13°C; in/out water temperature 45°/40°C

Performance

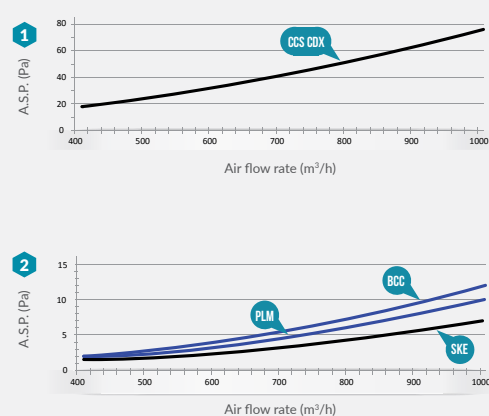
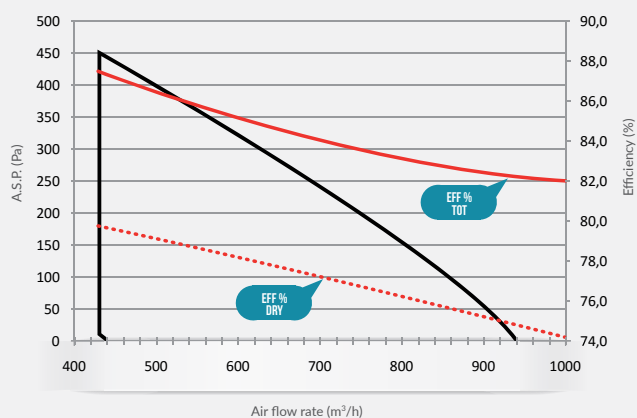
SUPPLY



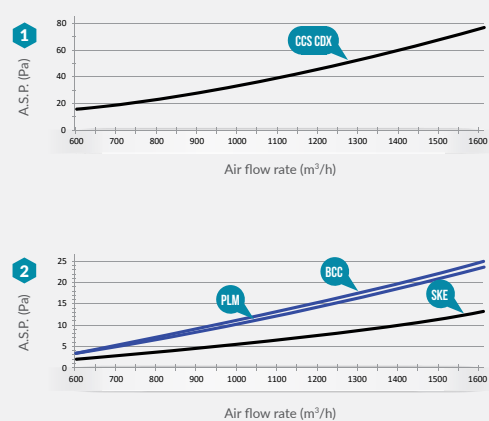
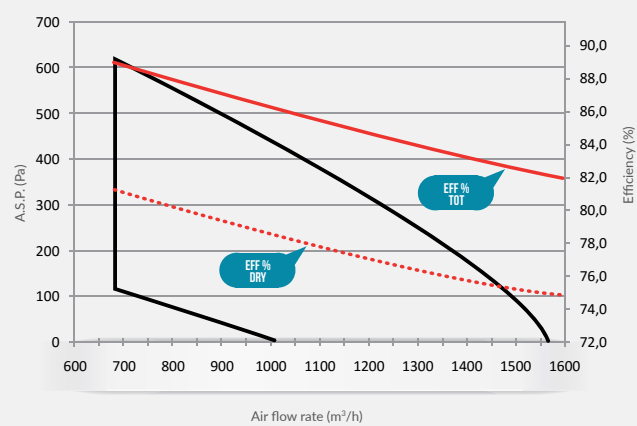
1 RETURN 2 ACCESSORIES PRESSURE DROPS



HRH 05



HRH 10

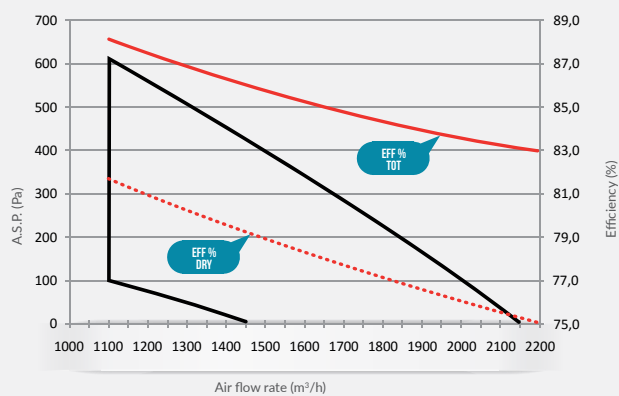


HRH 15

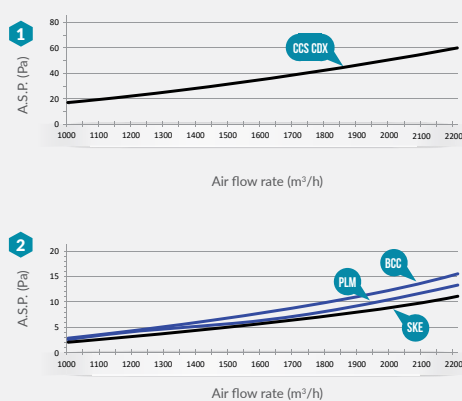
Performance

SUPPLY

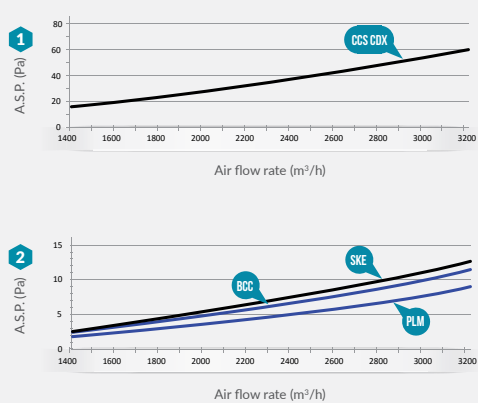
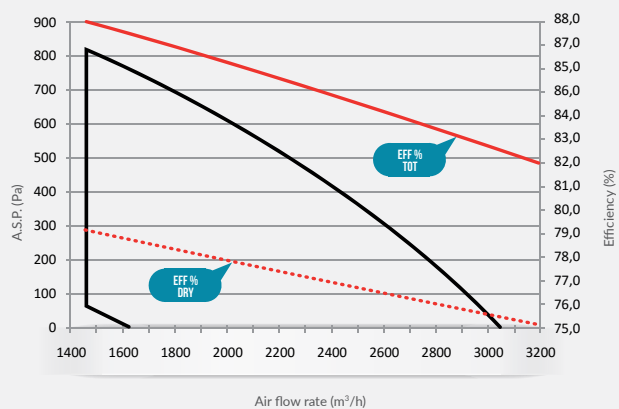
HRH 20



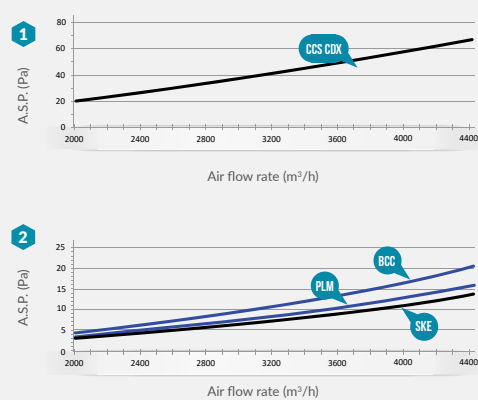
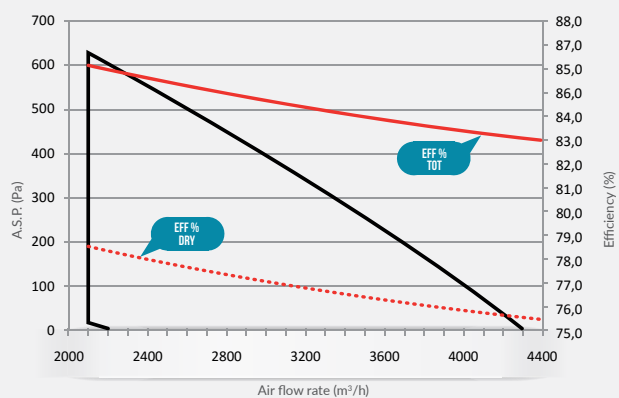
1 RETURN 2 ACCESSORIES PRESSURE DROPS



HRH 30



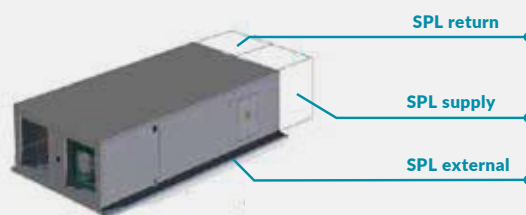
HRH 40



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.

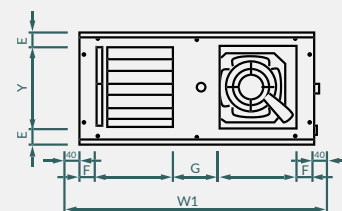
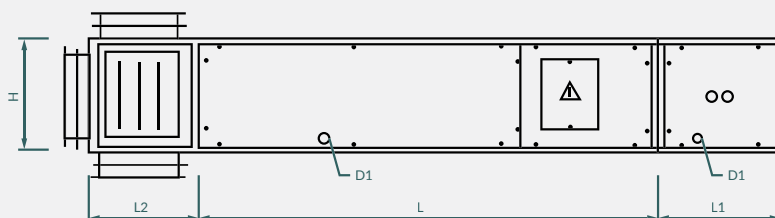


HRH	SWL [dB] OCTAVE BAND [HZ]								SWL		SPL SUPPLY			SPL RETURN			SPL OUTSIDE		
											1 m	5 m	10 m	1 m	5 m	10 m	1 m	5 m	10 m
	63	125	250	500	1000	2000	4000	8000	dB	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
05	62	59	65	65	63	63	62	53	72	69	61	47	41	53	39	33	44	30	24
10	61	58	64	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

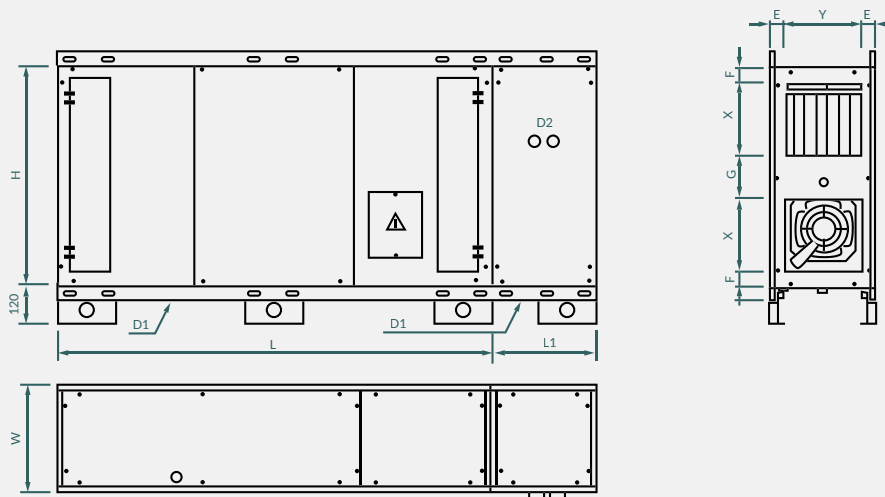
HRH		05	10	15	20	30	40
L	mm	1350	1470	1850	1850	2150	2150
W	mm	680	820	1030	1460	1460	1840
H	mm	330	370	455	455	590	590
W1	mm	760	900	1110	1540	1540	1920
X	mm	230	300	390	600	590	780
Y	mm	225	265	350	350	485	485
E	mm	52,5	52,5	52,5	52,5	52,5	52,5
F	mm	46	46	46	46	55	55
G	mm	128	130	158	170	170	170
D1	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	85	105	175	230	290	360



Dimensions and weights

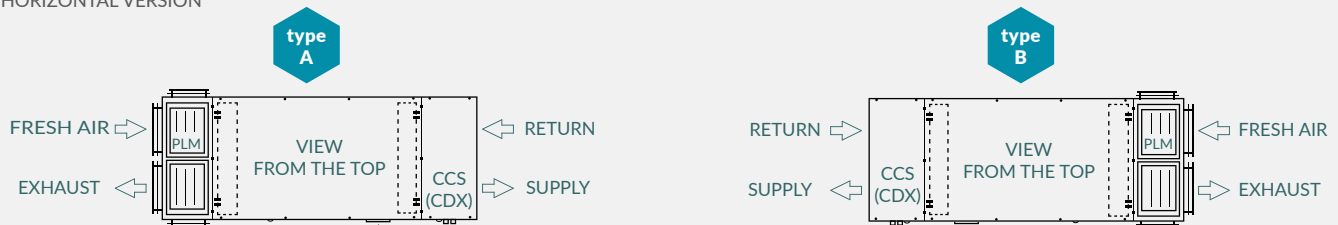
VERTICAL VERSION

HRH		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	85	105	175	230	290	360

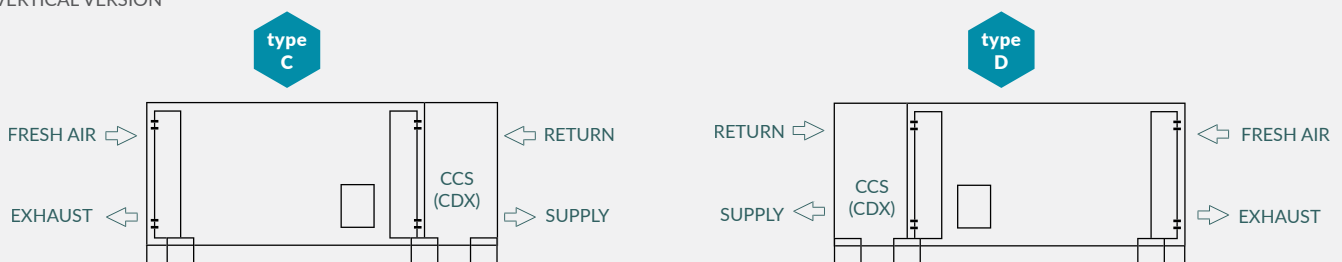


Configuration

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