

# HRS

## Very high efficiency heat recovery units

WITH HIGH EFFICIENCY HEAT RECOUPERATOR

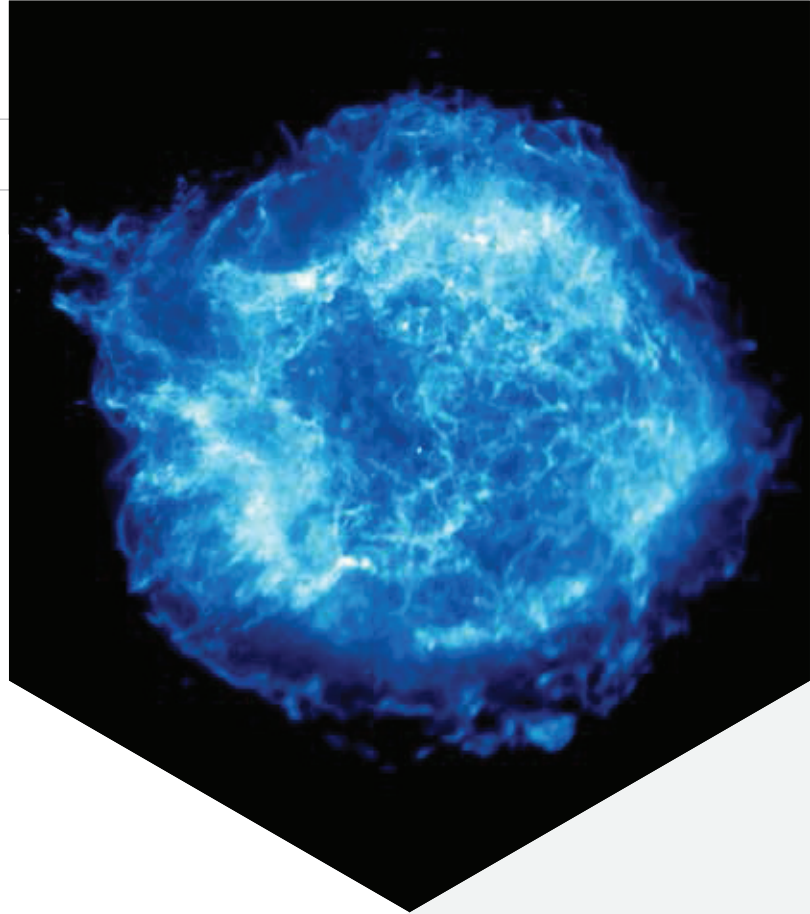
from 300 to 4.000 m<sup>3</sup>/h

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 m<sup>3</sup>/h. The casing is made of 42mm 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



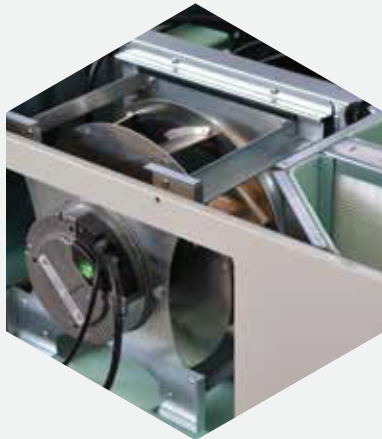
HORIZONTAL  
ORIENTATION



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	m <sup>3</sup> /h	450	800	1300	1900	2800	3800
		m <sup>3</sup> /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		-	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	1281	2065	2482	3259
Recovery efficiency (2)		%	91,6	91,4	90,7	90,5	90,3	90,4
Recovery capacity (2)		kW	4020	7330	11400	17280	25410	34520
Supply temperature (2)		°C	17,5	17,4	17,2	17,2	17,1	17,1
<b>CONFORMITY TO EU 1253/2014</b>								
Recovery efficiency (3)		%	83,2	80,0	80,5	80,0	82,5	82,3
Efficiency bonus		W/m <sup>3</sup> /s	486	390	405	390	465	459
Filter correction factor		-	0	0	0	0	0	0
SFP int limit		W/m <sup>3</sup> /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/m <sup>3</sup> /s	1666	1485	1545	1500	1516	1498
<b>WORKING LIMITS</b>								
Air temperature		°C	-20 ÷ 45					
Air relative humidity		%	10 ÷ 95					
Working environment			Not explosive, not corrosive, not chlorinated, not saline					
<b>SKE</b>								
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		
<b>CCS</b>								
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
<b>BCC</b>								
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 &amp; speed controller efficiency

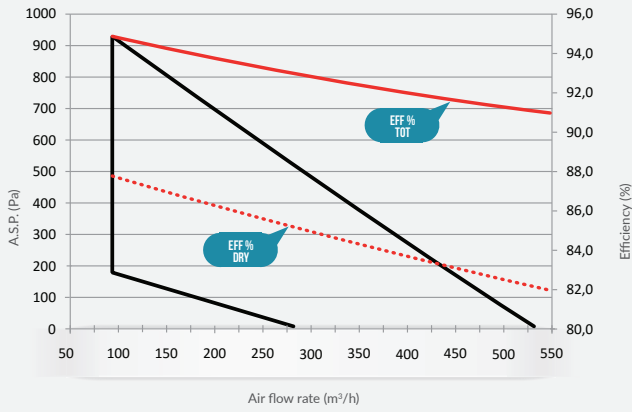
(5) At nominal airflow rate

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

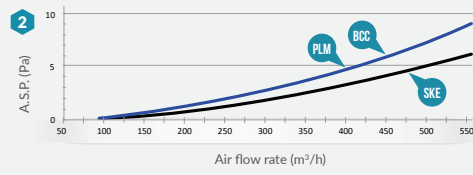
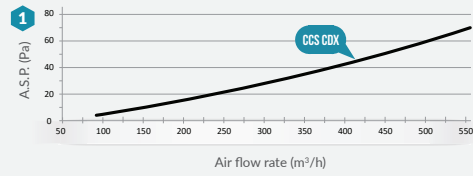
(7) Air inlet condition 13°C; in/out water temperature 45°/40°C

# Performance

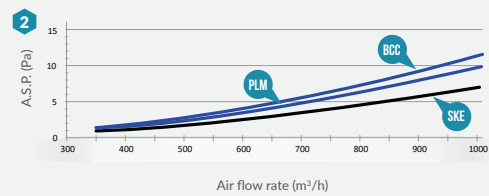
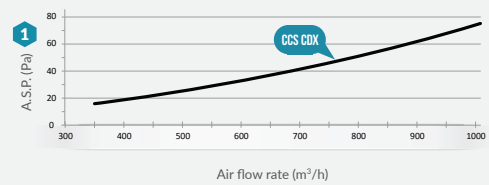
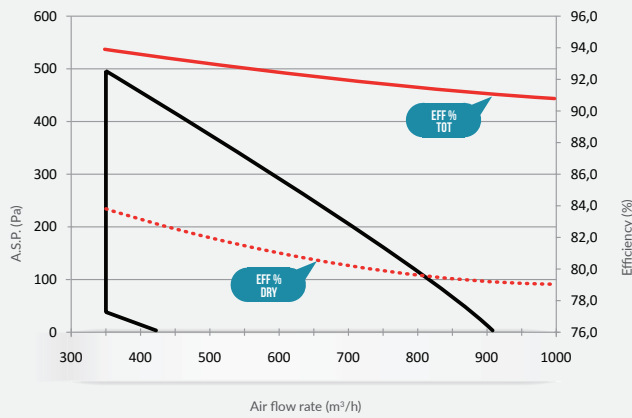
## SUPPLY



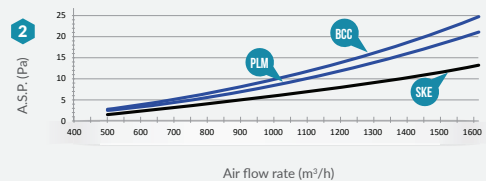
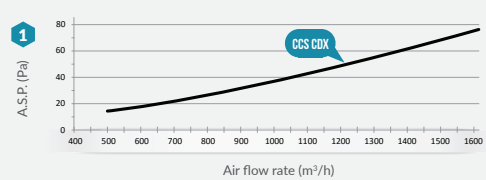
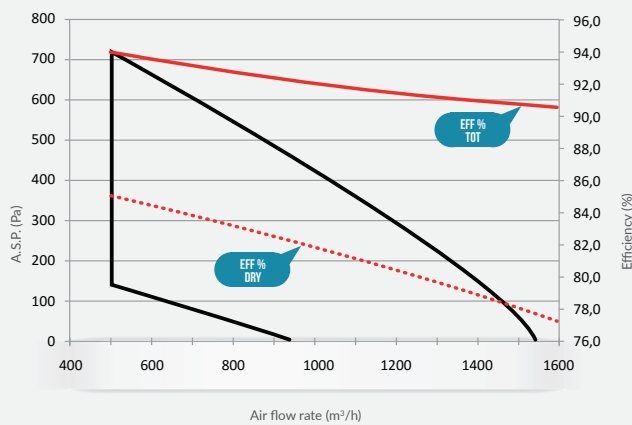
## 1 RETURN 2 ACCESSORIES PRESSURE DROPS



HRS 05



HRS 10

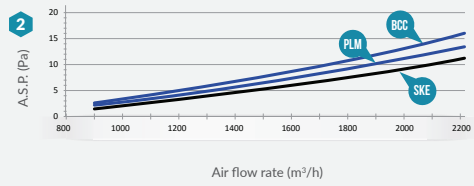
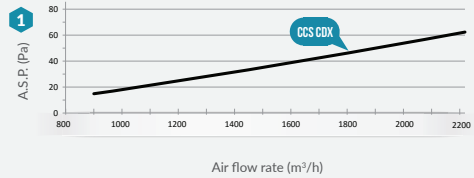
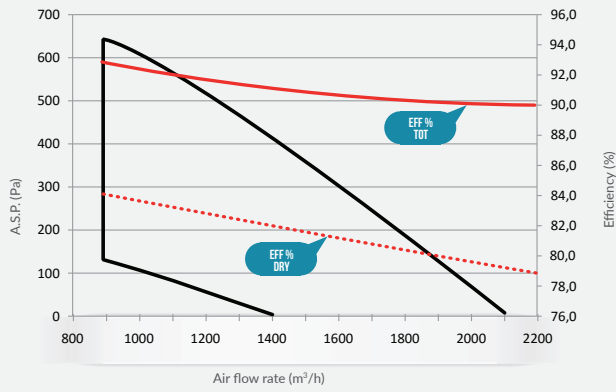


HRS 15

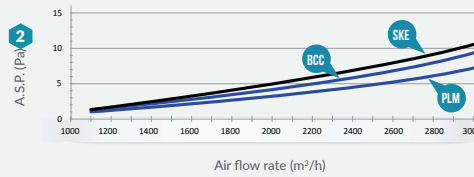
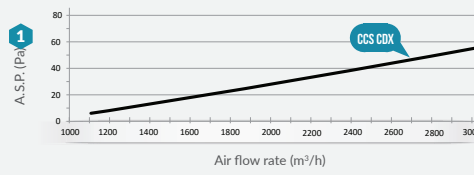
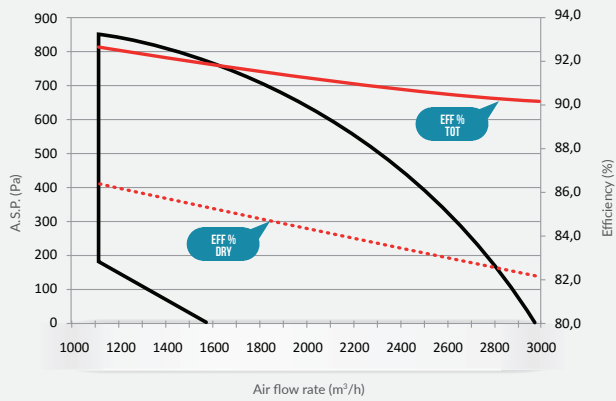
# Performance

**SUPPLY**      **1 RETURN**      **2 ACCESSORIES PRESSURE DROPS**

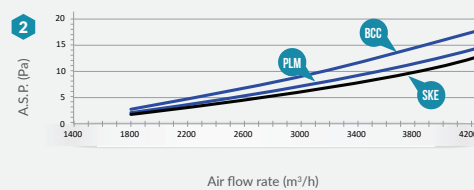
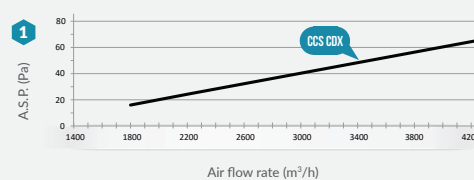
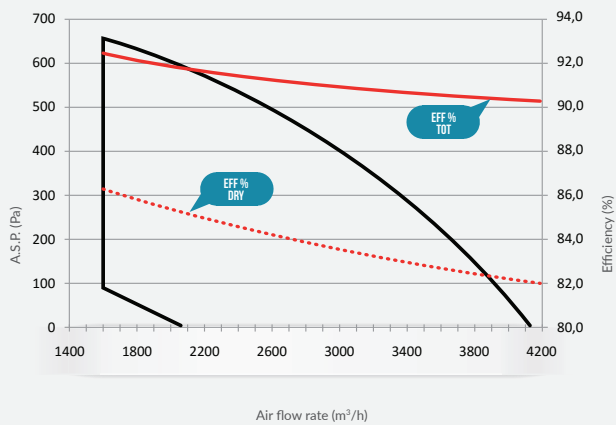
**HRS 20**



**HRS 30**



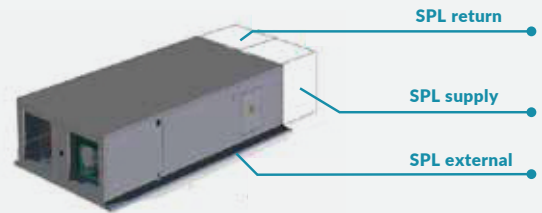
**HRS 40**



# 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.

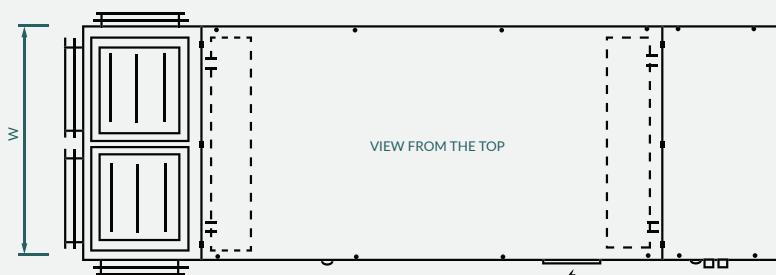
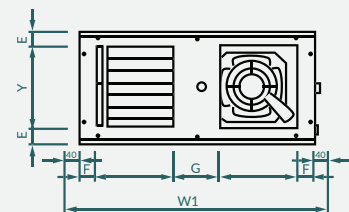
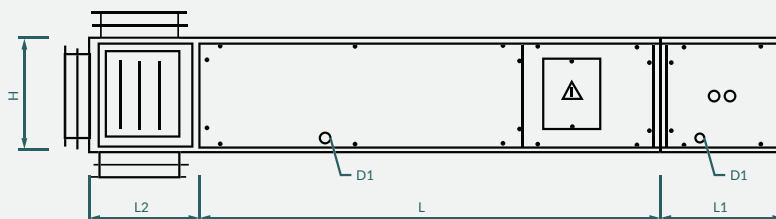


HRS	SWL [dB] OCTAVE BAND [HZ]								SWL		SPL SUPPLY			SPL RETURN			SPL OUTSIDE		
	63	125	250	500	1000	2000	4000	8000	dB	dB(A)	1 m	5 m	10 m	1 m	5 m	10 m	1 m	5 m	10 m
05	62	59	65	65	63	63	62	53	72	69	61	47	41	53	39	33	44	30	24
10	61	58	64	64	62	62	61	53	71	68	60	47	41	53	39	33	44	30	24
15	60	59	65	65	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

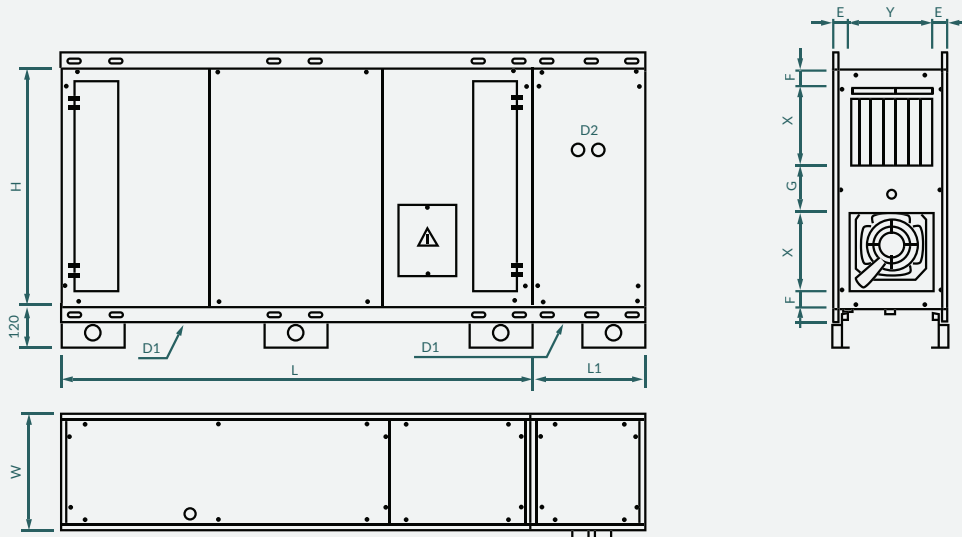
HRS		05	10	15	20	30	40
L	mm	1385	1505	1885	1885	2185	2185
W	mm	715	855	1065	1495	1495	1875
H	mm	365	405	490	490	625	625
W1	mm	795	935	1145	1575	1575	1955
X	mm	230	300	390	600	590	780
Y	mm	225	265	350	350	485	485
E	mm	70	70	70	70	70	70
F	mm	62,5	62,5	62,5	62,5	72,5	72,5
G	mm	130	130	158	170	170	170
D1	mm	½" M					
D2	mm	¾" M	¾" M	¾" M	¾" M	1" M	1" M
L1	mm	385	435	435	435	537	537
L2	mm	375	415	495	495	615	615
Weight	kg	90	115	190	260	330	395



# Dimensions and weights

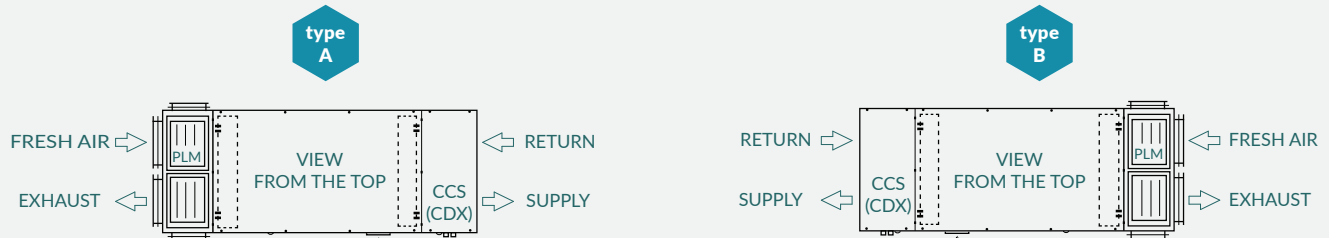
## VERTICAL VERSION

HRS		05	10	15	20	30	40	
L	mm	1385	1505	1885	1885	2185	2185	
W	mm	365	405	490	490	625	625	
H	mm	715	855	1065	1495	1495	1875	
X	mm	230	300	390	600	590	780	
Y	mm	225	265	350	350	485	485	
E	mm	70	70	70	70	70	70	
F	mm	62,5	62,5	62,5	62,5	72,5	72,5	
G	mm	130	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	385	435	435	435	537	537	
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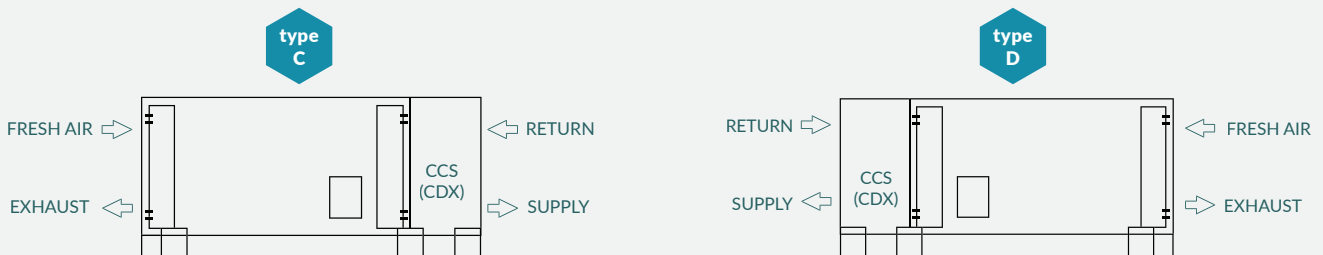


# Configurations

## 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			•
<b>Reference diagram</b>			<b>28</b>