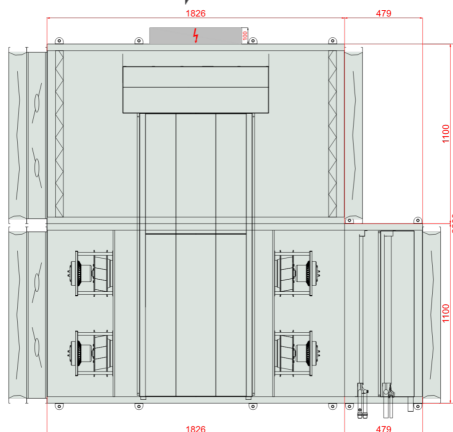


<b>Type</b>	RecoveryHexHorizontal
<b>Unit Type:</b>	Indoor
<b>Project Tag</b>	13577188
<b>Size</b>	VVS030s
<b>Set</b>	VVS030s-R-FPVHC/VVS030s-L-FPV_cd
<b>Insulation thickness</b>	40 mm
<b>Insulation</b>	Mineral Wool
<b>Weight of the set (+/- 10%)*</b>	450 Kg
<b>Supply airflow 2</b>	3300.00 m³/h
<b>External pressure</b>	300 Pa
<b>Exhaust airflow 2</b>	3300.00 m³/h
<b>External pressure</b>	300 Pa
<b>SFP Winter</b>	1.67 kW/m³/s
<b>SFP Summer</b>	1.71 kW/m³/s
<b>Ecodesign</b>	Yes (2018 +)
<b>Eurovent Energy efficiency class (Winter 2016 / Summer 2020)</b>	A+ 2016



Top View



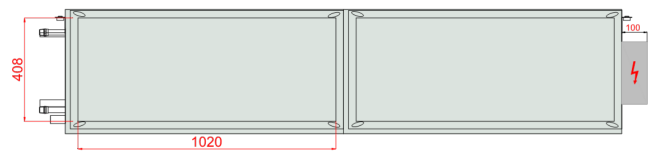
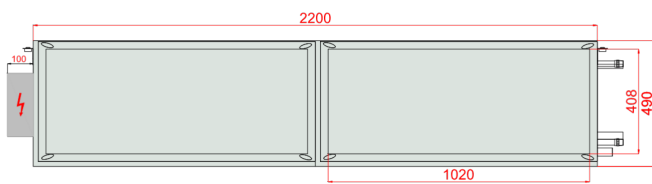
Comment 1:



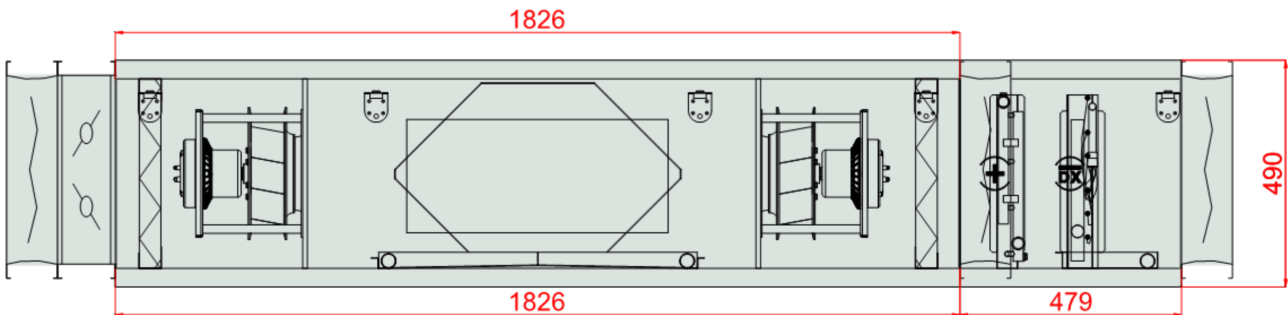
Front View (left)



Front View (right)



### Inspection Panels



### Sizes [mm]

Air intake Supply FF	1020x408	Lt 2305	Hi 410	Wi 1020
Air outlet Supply FF	1020x408	LtA 2650	H 490	W 1100
		L1 2305		W2 2200
Air inlet Exhaust FF	1020x408	L2 1826		
Air outlet Exhaust FF	1020x408	L22 479		

### Unit design

Walls filled with MW 40mm, double skin made of steel, excluding silencer and electric heater sections

Down base unit inspection



Casing anti-corrosion protection: Aluzinc AZ 150.  
 Base unit with pre-configured EC motors drives  
 Energy recovery efficiency meet EC 1253/2014 requirements

### Temperature Conditions

	Reference atmospheric pressure 101325 Pa			Winter outdoor reference temperature -20.0 °C		
	External air			Return air		
	DBT	RH	DA	DBT	RH	DA
Summer	32.0 °C	45 %	1.2000 kg/m³	20.0 °C	65 %	1.2000 kg/m³
Winter	-20.0 °C	100 %	1.2000 kg/m³	20.0 °C	40 %	1.2000 kg/m³

### Supply

#### Panel Filter

Type F7/50.EU7MPleat.Int.Sld

ePM2,5 65% (ISO16890) - EFF CLASS E Flat Mini-Pleat Filter[27.0]

Filter Energy Performance Class E

#### Winter operation

50% Dirty Air Pressure Drop 132 Pa  
 Initial Air Pressure Drop 113 Pa  
 100% Dirty Air Pressure Drop 150 Pa  
 Air velocity 2.13 m/s

#### Summer operation

50% Dirty Air Pressure Drop 132 Pa  
 Initial Air Pressure Drop 113 Pa  
 100% Dirty Air Pressure Drop 150 Pa  
 Air velocity 2.13 m/s

#### Air Filter Sizes

P,FLT F7 1017x410x48 (1-2-0301-0282) 1,000 x Pcs



## Counter-Flow Recuperator (Hexagonal)

### Type PCR VVS030s Hex

HIPS or AL 3.0 (SR)

#### Winter operation

##### Supply

Intake air DBT / RH	-20.0 °C / 100 %
Discharge air DBT / RH	11.8 °C / 7 %
Air velocity	2.18 m/s
Pressure drop Wet / Dry Wet	63 Pa
Air Pressure	101325 Pa
Air Density	1.2000 kg/m <sup>3</sup>
Air Volume Flow	3300.00 m <sup>3</sup> /h
Recovery capacity Sensible / Total Total	35.2 kW
Actual efficiency / at balanced flow Real / BalancedFlow	79 % / 79 %
Dry efficiency in winter	73 %

#### Winter operation

##### Exhaust

Intake air DBT / RH	20.0 °C / 40 %
Discharge air DBT / RH	-2.7 °C / 94 %
Air velocity	2.18 m/s
Pressure drop Wet / Dry Wet	84 Pa
Air Pressure	101325 Pa
Air Density	1.2000 kg/m <sup>3</sup>
Air Volume Flow	3300.00 m <sup>3</sup> /h
Recovery Bypass	Yes
Air Damper	No
Counter-Flow (Hex)	
Max Internal Leakage	0.25%

#### Summer operation

##### Supply

Intake air DBT / RH	32.0 °C / 45 %
Discharge air DBT / RH	23.2 °C / 75 %
Air velocity	2.18 m/s
Pressure drop Wet / Dry Wet	90 Pa
Air Pressure	101325 Pa
Air Density	1.2000 kg/m <sup>3</sup>
Air Volume Flow	3300.00 m <sup>3</sup> /h
Recovery capacity Sensible / Total Total	-9.7 kW
Actual efficiency / at balanced flow Real	73 %

#### Summer operation

##### Exhaust

Intake air DBT / RH	20.0 °C / 65 %
Discharge air DBT / RH	27.7 °C / 41 %
Air velocity	2.18 m/s
Pressure drop Wet / Dry Wet	84 Pa
Air Pressure	101325 Pa
Air Density	1.2000 kg/m <sup>3</sup>
Air Volume Flow	3300.00 m <sup>3</sup> /h
Eco Design Class	Eco Design

### Recovery Additional Info

PlateExchangers

### Plug-Fan Set

#### Fan Section PLUG\_DD\_250\_0,70\_1.58

EC\_IE4\_F\_IMB14\_71\_1.58p\_T 771.3.570 250|0.7kW|1.58x1

Qty in section x 2

Fan Set Designed for wet operating conditions

The fan system effects is taken into account in the fan performances.

#### Fan PLUG\_VS\_250\_AF\_Px 2



Total Static Pressure	568 Pa	Impeller efficiency: Static / Total	71 %/76 %
Dynamic pressure	40 Pa	Shaft power	0.37 kW x 2
External pressure	300 Pa	Working revolutions	2999 1/min
Total Pressure	607 Pa		
<b>Winter operation</b>		<b>Summer operation</b>	
Air Volume Flow	3300.00 m³/h	Air Volume Flow	3300.00 m³/h

**Motor EC\_IE4\_F\_71\_IMB14\_1.58p\_0.7\_50x 2**

771.3.570	EC	50Hz	
FLA	4.7 A	MCA	5.9 A
MCB	10.0 A		
		Rated revolutions	4000 1/min
Operational Voltage	230 V/1 ph	Rated Power	0.70 kW x 2
Name plate RPM	230 V/1 ph/50 Hz		

**EC Motor Controller**

	_EC	_EC	
Motor Drive FLA (Full-Load Amperes)	4.7 A	Motor Drive MCA (Min. Circuit Ampacity)	5.9 A
Motor Drive MCB (Max. Circuit Breaker)	10.0 A		
EC Controller Settings	37 Hz		

<b>Winter operation</b>		<b>Summer operation</b>	
EPC for mean contaminated filters	0.85 kW	EPC for mean contaminated filters	0.88 kW
EPC for clean filters	0.82 kW	EPC for clean filters	0.86 kW
SFP for clean filters	0.89 kW/m³/s	SFP for clean filters	0.94 kW/m³/s

**Hot Water Coil**

<b>Type</b> WCL VVS030s 1R DT SH.St.St.Std	<b>Number of rows</b> 1	<b>Connection Supply/Return:</b> 3/4"/22	
Standard Circuits	1,31 [dm³]		
Medium	Water	Maximum working pressure	16 bar
Intake air DBT / RH	11.8 °C / 7 %	Discharge air DBT / RH	20.0 °C / 4 %
Air velocity	2.40 m/s	Pressure drop Wet / Dry Wet	20 Pa
Air Pressure	101325 Pa	Air Density	1.2000 kg/m³
Air Volume Flow	3300.00 m³/h		
Total heating capacity	9.1 kW	Medium temperature	70.0 °C/50.0 °C
Medium flow rate	0.39 m³/h	Medium pressure drop	3.18 kPa



## DX Cooling Coil

<b>Type</b> DXC VVS030s 2R-1 TD SH.Cu.St.Std	<b>Number of rows</b> 2	<b>Sections</b> 1	<b>Connection Supply/Return:</b> 5/8"/Ø28
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2,26 [dm<sup>3</sup>]

Medium	R410A	Maximum working pressure	38 bar
Intake air DBT / RH	23.2 °C / 75 %	Discharge air DBT / RH	20.0 °C / 83 %
Air velocity	2.46 m/s	Pressure drop Wet / Dry Wet / Dry	53 Pa / 27 Pa
Air Pressure	101325 Pa	Air Density	1.2000 kg/m <sup>3</sup>
Air Volume Flow	3300.00 m <sup>3</sup> /h		
Cooling capacity: Sensible / Total	3.6 kW/7.2 kW	Evaporation temperature	6.0 °C
Medium flow rate	0.12 m <sup>3</sup> /h		

## Acoustic data

Acoustic power level [dB(A)]	Frequency	125 [Hz]	250 [Hz]	500 [Hz]	1000 [Hz]	2000 [Hz]	4000 [Hz]	8000 [Hz]	Lw [dB(A)]
Inlet	[dB(A)]	54.0	60.1	58.0	52.9	49.4	53.0	50.1	64.0
Outlet	[dB(A)]	51.3	58.3	43.6	47.5	39.5	33.2	28.5	59.6
Environment	[dB(A)]	39.2	50.5	56.5	52.8	53.1	33.6	26.0	59.8

Acoustic pressure level at 1 meter distance [dB(A)]	Frequency	125 [Hz]	250 [Hz]	500 [Hz]	1000 [Hz]	2000 [Hz]	4000 [Hz]	8000 [Hz]	Lp [dB(A)]
	[dB(A)]	32.2	43.5	49.5	45.8	46.1	26.6	19.0	52.8

## Exhaust airflow 3

### Panel Filter

Type M5/50.EU5MPleat.Int.Sld

ePM10 40% - ISO 16890 - EFF CLASS E Flat Mini-Pleat Filter[26.0]

Filter Energy Performance Class E

#### Winter operation

50% Dirty Air Pressure Drop	118 Pa
Initial Air Pressure Drop	85 Pa
100% Dirty Air Pressure Drop	150 Pa
Air velocity	2.13 m/s

#### Summer operation

50% Dirty Air Pressure Drop	118 Pa
Initial Air Pressure Drop	85 Pa
100% Dirty Air Pressure Drop	150 Pa
Air velocity	2.13 m/s

#### Air Filter Sizes

P,FLT M5 1017x410x48 (1-2-0301-0278) 1,000 x Pcs

**Plug-Fan Set**

**Fan Section PLUG\_DD\_250\_0,38\_2.00**

EC_IE4_F_IMB14_71_2.00p_T	771.3.550-4	250 0.38kW 2.00x1
	Qty in section	x 2

Fan Set Designed for wet operating conditions  
 The fan system effects is taken into account in the fan performances.

**Fan PLUG\_VS\_250\_AF\_Px 2**

Total Static Pressure	502 Pa	Impeller efficiency: Static / Total	71 %/76 %
Dynamic pressure	40 Pa	Shaft power	0.33 kW x 2
External pressure	300 Pa	Working revolutions	2900 1/min
Total Pressure	542 Pa		
<b>Winter operation</b>		<b>Summer operation</b>	
Air Volume Flow	3300.00 m³/h	Air Volume Flow	3300.00 m³/h

**Motor EC\_IE4\_F\_71\_IMB14\_2.00p\_0.38\_50x 2**

771.3.550-4	EC	50Hz	
FLA	3.0 A	MCA	3.7 A
MCB	6.0 A		
		Rated revolutions	3000 1/min
Operational Voltage	230 V/1 ph	Rated Power	0.38 kW x 2
Name plate RPM	230 V/1 ph/50 Hz		

**EC Motor Controller**

	_EC	_EC	
Motor Drive FLA (Full-Load Amperes)	3.0 A	Motor Drive MCA (Min. Circuit Ampacity)	3.7 A
Motor Drive MCB (Max. Circuit Breaker)	6.0 A		
EC Controller Settings	48 Hz		

<b>Winter operation</b>		<b>Summer operation</b>	
EPC for mean contaminated filters	0.75 kW	EPC for mean contaminated filters	0.75 kW
EPC for clean filters	0.71 kW	EPC for clean filters	0.71 kW
SFP for clean filters	0.77 kW/m³/s	SFP for clean filters	0.77 kW/m³/s

**Acoustic data**

Acoustic power level [dB(A)]	Frequency	125 [Hz]	250 [Hz]	500 [Hz]	1000 [Hz]	2000 [Hz]	4000 [Hz]	8000 [Hz]	Lw [dB(A)]
Inlet	[dB(A)]	48.8	62.1	68.0	68.4	66.7	61.3	55.7	73.3
Outlet	[dB(A)]	51.5	64.8	70.7	71.1	69.4	64.9	59.3	76.1
Environment	[dB(A)]	38.5	49.8	55.7	52.1	52.4	32.9	25.3	59.1





Acoustic pressure level at 1 meter distance [dB(A)]	Frequency	125 [Hz]	250 [Hz]	500 [Hz]	1000 [Hz]	2000 [Hz]	4000 [Hz]	8000 [Hz]	Lp [dB(A)]
	[dB(A)]	31.5	42.8	48.7	45.1	45.4	25.9	18.3	52.1

**AHU Discharge and intake Opening Sizes & Unit Accessories**

Controls Selection Mode: Functional set

	Supply	Exhaust
<b>AHU Discharge and Intake Opening Sizes</b>		
Air Inlet	Front 1020x408	Front 1020x408
Air Outlet	Front 1020x408	Front 1020x408
<b>Air Damper</b>		
Air Inlet	Provided 990x380	Not Provided
Air Outlet	Not Provided	Provided 990x380
<b>Flexible Connection</b>		
Air Inlet	Provided 990x380	Provided 990x380
Air Outlet	Provided 990x380	Provided 990x380

**Control application**

Functional Code AP|1|2|0|0|0|0|0|6|3|0|0|0|0|0|1

APP Code uPC3 (AP-169)

Main Temp. Sensor Duct Exhaust

**Human Machine Interface**

**Options**

BMS	Yes	Differential Pressure Transducer	CAV
HMI Advanced (Settings)	Yes		
HMI Basic (User)	Yes		
Control Box	Yes		

**Air damper actuators**

Name	Code	Set
Air Damper Actuator ON-OFF S 10Nm	ADMP.ACT.SET ON-OFF S 10Nm	1
Air Damper Actuator ON-OFF 10Nm	ADMP.ACT.SET ON-OFF 10Nm	1
Air Damper Actuator 0-10 2Nm	ADMP.ACT.SET 0-10 2Nm	1

**Temperature sensor**

Name	Code	Set
Strap-on temperature sensor NTC 10k	Temp. Sensor NTC10k (Strap-on)	1
Duct temperature sensor NTC 10k	Temp. Sensor NTC10k (Duct)	1
Resp_Controls_TempSensors_Temp. Sensor NTC10k (Outdoor)	Temp. Sensor NTC10k (Outdoor)	3

**Hydronic Coils Controls**

Name	Code	Set
3-way Valve	VLV.SET-3W-2,5	1

**Transducers and Switches**

Name	Code	Set
Frost Switch	FRST.SWITCH	1
Differential Pressure Transducer CAV	PRSS.TRDC_CAV	1

**DECLARATION OF PERFORMANCE - Product information - (EU) 1253/2014 annex V as referred to in art. 4(2)**

No.	Parameter	Unit	Value
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1	Manufacturer's name		VTS sp. z o.o.
2	Manufacturer's product code		VVS030s-F-P-V-H-C
3	Declared type		NRVU, BVU
4	Type of drive installed		VFD(AC) or Controller(EC)
5	Type of energy recovery		Other
6	Thermal efficiency of heat recovery	%	74.00
7	Nominal NRVU flow rate		0.92 / 0.92
8	Effective electric power input	kW	0.85 / 0.75
9	Internal Specific Fan Power (SFPint)	w/m <sup>3</sup> /s	286.54 / 276.07
10	Face velocity	m/s	2.35
11	Nominal external pressure	Pa	300.00 / 300.00
12	Internal Pressure Drop of ventilation components $\Delta p_{s,int}$	Pa	176.26 / 168.74
13	Internal pressure drop of non-ventilation components $\Delta p_{s,add}$	Pa	91.40 / 33.13
14	Maximum Leakage Rate	%	0.01 / 0.01
15	Energy performance of filters (declared information about the calculated annual energy consumption)		EU7MPleat / F7 / - / EU5MPleat / M5 / -
16	Description of visual filter warning for NRVUs		Supported by control application
17	Casing sound power level LWA	dBA	60
18	Internet address for disassembly instructions		<a href="http://www.vtsgroup.com">http://www.vtsgroup.com</a>
19	Ecodesign Compliance		Yes (2018 +)

### Section splits

Transport Sections	Mass [Kg]	LENGTH [mm]	WIDTH [mm]	HEIGHT [mm]
1	391	1826	2200	490
2	54	479	1100	490

Transport Sections Dims

