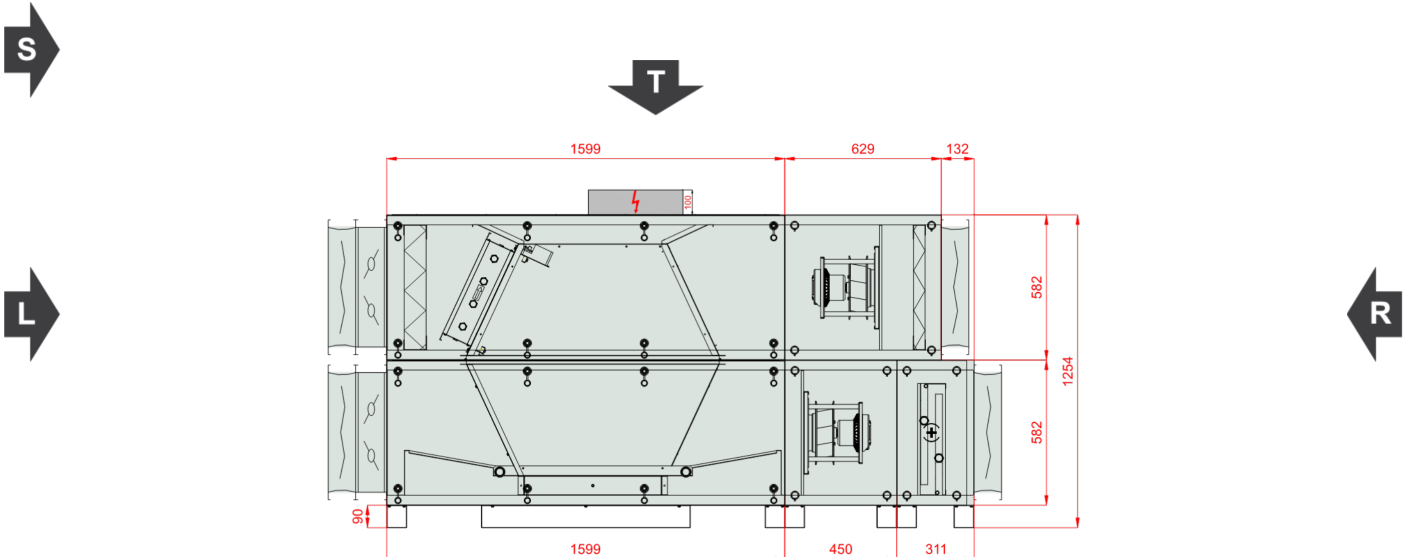


<b>Type</b>	RecoveryHexVerticalCompact
<b>Unit Type:</b>	Indoor
<b>Project Tag</b>	13577202
<b>Size</b>	VVS030c
<b>Set</b>	VVS030c-R-FPVH/VVS030c-L-FVP_cd
<b>Insulation thickness</b>	40 mm
<b>Insulation</b>	Mineral Wool
<b>Weight of the set (+/- 10%)*</b>	424 Kg
<b>Supply airflow 2</b>	3300.00 m³/h
<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>	2.07 kW/m³/s
<b>SFP Summer</b>	2.13 kW/m³/s
<b>Ecodesign</b>	Yes (2018 +)
<b>Eurovent Energy efficiency class (Winter 2016 / Summer 2020)</b>	A+ 2016



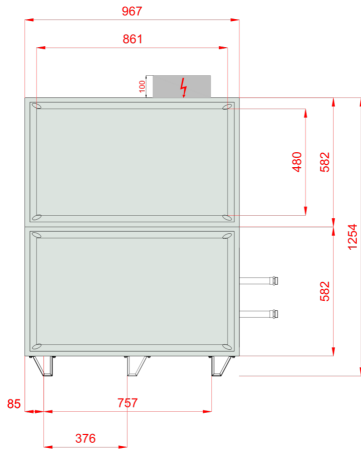
Inspection Panels



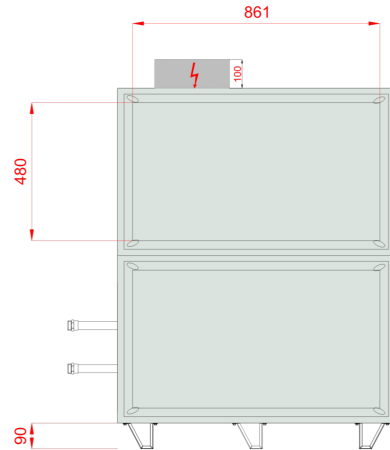
Comment 1:



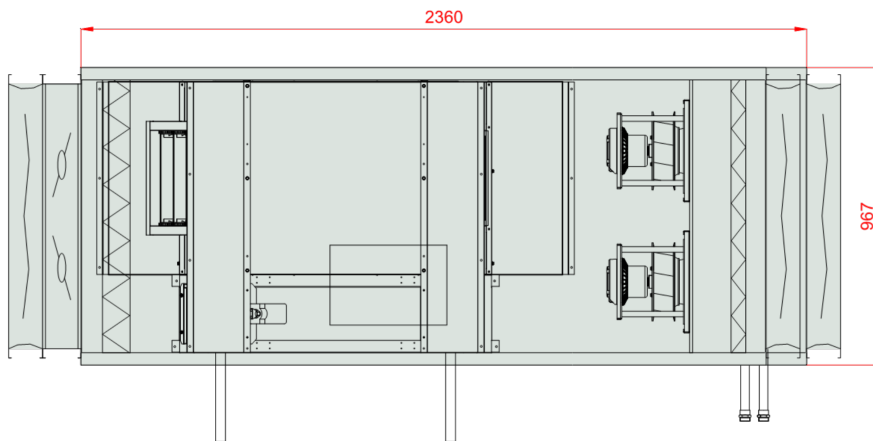
Front View (left)



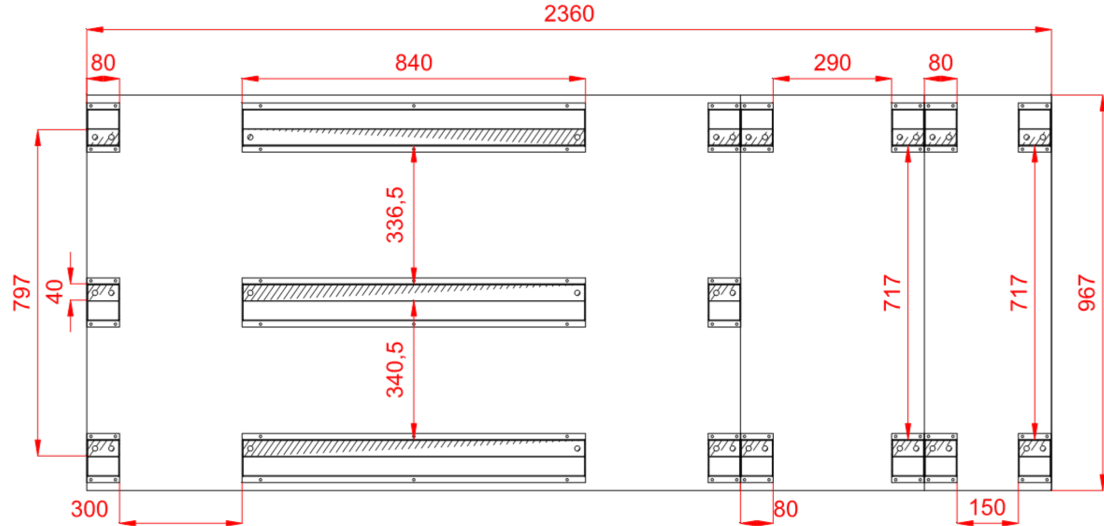
Front View (right)



Top View



**Frame Top View, within the AHU outline contour**



**Sizes [mm]**

<b>Air intake Supply</b> FF	861x480	<b>Lt</b> 2360	<b>Hi</b> 502	<b>Wi</b> 887
<b>Air outlet Supply</b> FF	861x480	<b>LtA</b> 2705	<b>H</b> 672	<b>W</b> 967
		<b>L1</b> 2360	<b>H2</b> 1254	
<b>Air inlet Exhaust</b> FF	861x480	<b>L2</b> 2228	<b>Hf</b> 90	
<b>Air outlet Exhaust</b> FF	861x480	<b>L22</b> 132		

**Unit design**

40mm insulated walls , double skin made of steel

Unit Power Supply 400V/3ph/50Hz

Casing anti-corrosion protection: Aluzinc AZ 150. Corrosion resistance (salt spary test): over 2400 hours

In case of delivery with controls a base unit fully wired, with pre-configured controller and EC motors drives

Energy recovery efficiency exceeding 86% (for EC 1253/2014 conditions)

**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/m <sup>3</sup>	20.0 °C	65 %	1.2000 kg/m <sup>3</sup>
Winter	-20.0 °C	100 %	1.2000 kg/m <sup>3</sup>	20.0 °C	40 %	1.2000 kg/m <sup>3</sup>

## 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 120 Pa  
 Initial Air Pressure Drop 89 Pa  
 100% Dirty Air Pressure Drop 150 Pa  
 Air velocity 2.08 m/s

#### Air Filter Sizes

P.FLT (1-2-0301-0214) 2,000 x Pcs

#### Summer operation

50% Dirty Air Pressure Drop 120 Pa  
 Initial Air Pressure Drop 89 Pa  
 100% Dirty Air Pressure Drop 150 Pa  
 Air velocity 2.08 m/s

## Counter-Flow Recuperator (Hexagonal)

#### Type PCR VVS030c Hex

HIPS 2.0 (SR)

#### Winter operation

##### Supply

Intake air DBT / RH -20.0 °C / 100 %  
 Discharge air DBT / RH 15.4 °C / 6 %  
 Air velocity 2.63 m/s  
 Pressure drop Wet / Dry Wet 206 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 39.2 kW  
 Actual efficiency / at balanced flow Real / BalancedFlow 88 % / 88 %  
 Dry efficiency in winter 80 %

#### Winter operation

##### Exhaust

Intake air DBT / RH 20.0 °C / 40 %  
 Discharge air DBT / RH -6.4 °C / 97 %  
 Air velocity 2.63 m/s  
 Pressure drop Wet / Dry Wet 238 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 23.8 °C / 74 %  
 Air velocity 2.63 m/s  
 Pressure drop Wet / Dry Wet 248 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 -10.7 kW

#### Summer operation

##### Exhaust

Intake air DBT / RH 20.0 °C / 45 %  
 Discharge air DBT / RH 29.9 °C / 36 %  
 Air velocity 2.63 m/s  
 Pressure drop Wet / Dry Wet 238 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\_225\_0,74\_1.33

EC_IE4_F_IMB14_71_1.33p_T	771.3.570-2	225 0.74kW 1.33x2
	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\_225\_AF\_Px 2

Total Static Pressure	654 Pa	Impeller efficiency: Static / Total	69 %/76 %
Dynamic pressure	63 Pa	Shaft power	0.43 kW x 2
External pressure	300 Pa	Working revolutions	3952 1/min
Total Pressure	717 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\_1.33p\_0.74\_50x 2

771.3.570-2	EC	50Hz	
	Rated revolutions	4500 1/min	
Operational Voltage	230 V/1 ph	Rated Power	0.74 kW x 2
Name plate RPM	230 V/1 ph/50 Hz		

## EC Motor Controller

EC Controller Settings 44 Hz

### Winter operation

EPC for mean contaminated filters	1.00 kW
EPC for clean filters	0.96 kW
SFP for clean filters	1.05 kW/m³/s

### Summer operation

EPC for mean contaminated filters	1.06 kW
EPC for clean filters	1.02 kW
SFP for clean filters	1.11 kW/m³/s

## Fan Section Power Supply Additional Info

C20/3

### Hot Water Coil

Type WCL VVS030c 1R DT SH.St.St.Std Number of rows 1 Connection Supply/Return: 1"/1"

Standard Circuits	1,52 [dm <sup>3</sup> ]		
Medium	Water	Maximum working pressure	16 bar
Intake air DBT / RH	15.4 °C / 6 %	Discharge air DBT / RH	20.0 °C / 4 %
Air velocity	2.62 m/s	Pressure drop Wet / Dry Wet	28 Pa
Air Pressure	101325 Pa	Air Density	1.2000 kg/m <sup>3</sup>
Air Volume Flow	3300.00 m <sup>3</sup> /h		
Total heating capacity	5.1 kW	Medium temperature	70.0 °C/50.0 °C
Medium flow rate	0.22 m <sup>3</sup> /h	Medium pressure drop	0.43 kPa

### 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)]	56.4	62.5	60.4	55.3	51.8	55.4	52.5	66.3
Outlet	[dB(A)]	55.5	62.5	47.8	52.6	46.4	44.6	39.9	63.9
Environment	[dB(A)]	39.6	50.9	48.9	43.2	35.5	28.0	14.4	53.7

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)]	32.6	43.9	41.9	36.2	28.5	21.0	7.4	46.7

### 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	108 Pa
Initial Air Pressure Drop	67 Pa
100% Dirty Air Pressure Drop	150 Pa
Air velocity	2.08 m/s

#### Summer operation

50% Dirty Air Pressure Drop	108 Pa
Initial Air Pressure Drop	67 Pa
100% Dirty Air Pressure Drop	150 Pa
Air velocity	2.08 m/s

#### Air Filter Sizes

P.FLT (1-2-0301-0202) 2,000 x Pcs

### Plug-Fan Set

Fan Section PLUG\_DD\_225\_0,74\_1.33

EC\_IE4\_F\_IMB14\_71\_1.33p\_T 771.3.570-2 225|0.74kW|1.33x2

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\_225\_AF\_Px 2

Total Static Pressure	647 Pa	Impeller efficiency: Static / Total	69 %/76 %
Dynamic pressure	63 Pa	Shaft power	0.43 kW x 2
External pressure	300 Pa	Working revolutions	3943 1/min
Total Pressure	710 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\_1.33p\_0.74\_50x 2

771.3.570-2	EC	50Hz	
		Rated revolutions	4500 1/min
Operational Voltage	230 V/1 ph	Rated Power	0.74 kW x 2
Name plate RPM	230 V/1 ph/50 Hz		

### EC Motor Controller

EC Controller Settings	44 Hz
------------------------	-------

<b>Winter operation</b>		<b>Summer operation</b>	
EPC for mean contaminated filters	0.99 kW	EPC for mean contaminated filters	0.99 kW
EPC for clean filters	0.94 kW	EPC for clean filters	0.94 kW
SFP for clean filters	1.02 kW/m³/s	SFP for clean filters	1.02 kW/m³/s

### Fan Section Power Supply Additional Info

C20/3

### 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)]	51.8	65.2	71.1	71.4	69.8	64.3	58.7	76.4
Outlet	[dB(A)]	54.5	67.9	73.8	74.1	72.5	67.9	62.3	79.1
Environment	[dB(A)]	39.5	50.9	48.8	43.1	35.5	27.9	14.3	53.7

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)]	32.5	43.9	41.8	36.1	28.5	20.9	7.3	46.7

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

#### Supply

#### Exhaust

Controls Selection Mode: Functional set

AHU Discharge and Intake Opening Sizes	Supply	Exhaust
Air Inlet	Front 861x480	Front 861x480
Air Outlet	Front 861x480	Front 861x480
AirDamper	Supply	Exhaust
Air Inlet	Provided	Not Provided



Air Outlet	Not Provided	Provided
<b>Flexible Connection</b>	Supply	Exhaust
Air Inlet	Provided	Provided
Air Outlet	Provided	Provided

### Control application

<b>Functional Code</b>	AP 1 0 0 0 0 0 0 6 3 0 0 0 0 1
<b>APP Code</b>	uPC3 (AP-161)
<b>Main Temp. Sensor</b>	Duct Exhaust

### Human Machine Interface

BMS	Yes
HMI Advanced (Settings)	Yes
HMI Basic (User)	Yes
Control Box	Yes

### Options

Differential Pressure Transducer	CAV
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### 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
Resp_Controls_TempSensors_Temp. Sensor NTC10k (Outdoor)	Temp. Sensor NTC10k (Outdoor)	3
Duct temperature sensor NTC 10k	Temp. Sensor NTC10k (Duct)	1
Strap-on temperature sensor NTC 10k	Temp. Sensor NTC10k (Strap-on)	1

### Hydronic Coils Controls

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

### Transducers and Switches

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

### AHU Connection Box

#### AHU Connection Box

Rated Power	2.96 kW	Full Load Amps	19.0 A
Power Connection	3x400V AC +N+PE	Power Cord	5 x 2,50 mm <sup>2</sup>

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

No.	Parameter	Unit	Value
1	Manufacturer's name		VTS sp. z o.o.
2	Manufacturer's product code		VVS030c-F-P-V-H
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	%	80.00
7	Nominal NRVU flow rate		0.92 / 0.92
8	Effective electric power input	kW	1.00 / 0.99
9	Internal Specific Fan Power (SFPint)	w/m³/s	491.70 / 509.62
10	Face velocity	m/s	2.08
11	Nominal external pressure	Pa	300.00 / 300.00
12	Internal Pressure Drop of ventilation components Δps,int	Pa	294.68 / 305.05
13	Internal pressure drop of non-ventilation components Δps,add	Pa	59.04 / 42.27
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	54
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	236	1599	967	1254
2	55	450	967	672
3	35	311	967	672
4	67	629	967	582

### Transport Sections Dims

