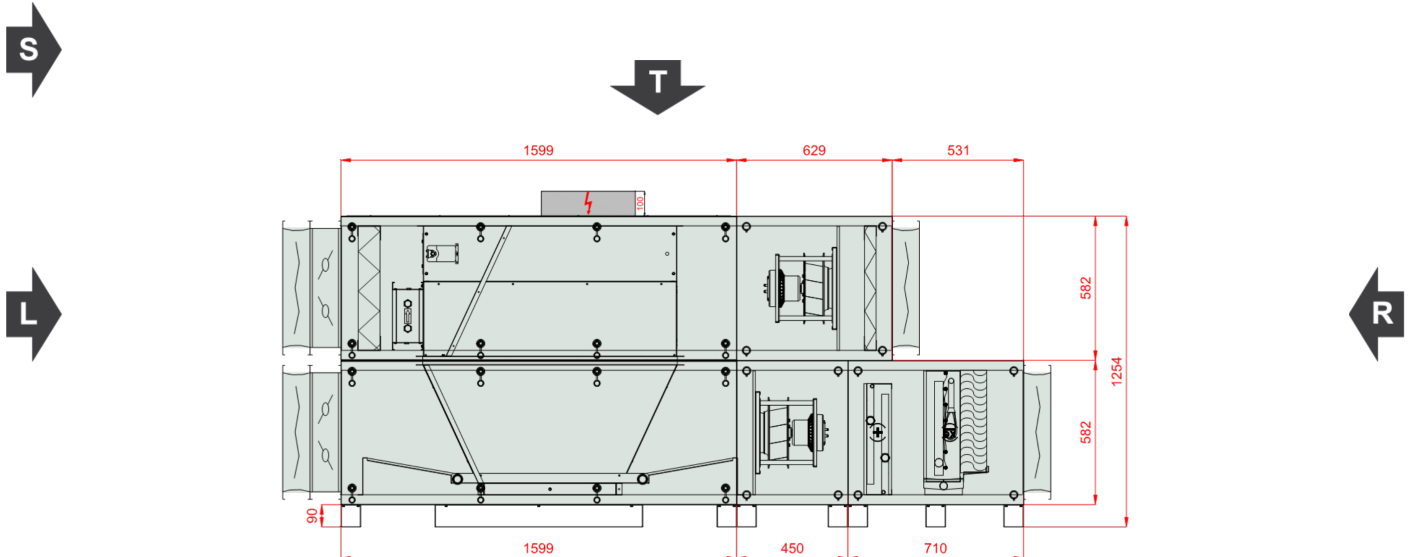


<b>Type</b>	RecoveryHexVerticalCompact
<b>Unit Type:</b>	Indoor
<b>Project Tag</b>	13577223
<b>Size</b>	VVS040c
<b>Set</b>	VVS040c-R-FPVHC/VVS040c-L-FVP_cd
<b>Insulation thickness</b>	40 mm
<b>Insulation</b>	Mineral Wool
<b>Weight of the set (+/- 10%)*</b>	525 Kg
<b>Supply airflow 2</b>	4400.00 m³/h
<b>External pressure</b>	300 Pa
<b>Exhaust airflow 2</b>	4400.00 m³/h
<b>External pressure</b>	300 Pa
<b>SFP Winter</b>	2.29 kW/m³/s
<b>SFP Summer</b>	2.35 kW/m³/s
<b>Ecodesign</b>	Yes (2018 +)
<b>Eurovent Energy efficiency class (Winter 2016 / Summer 2020)</b>	A+ 2016



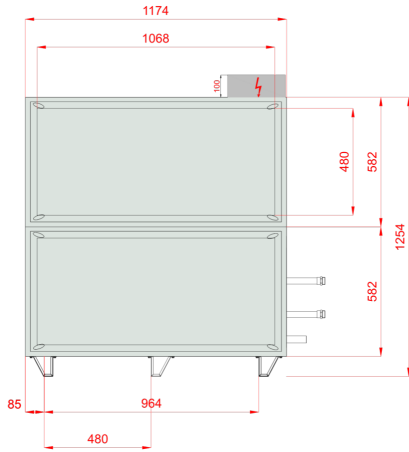
**Inspection Panels**



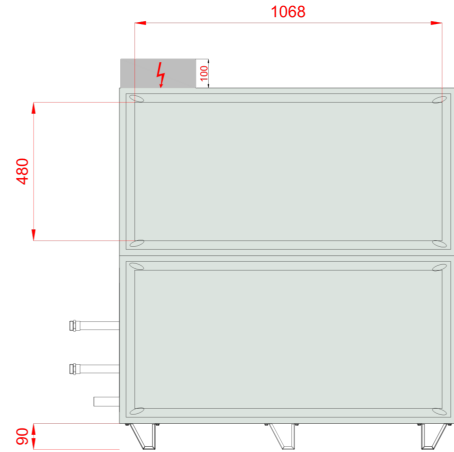
Comment 1:



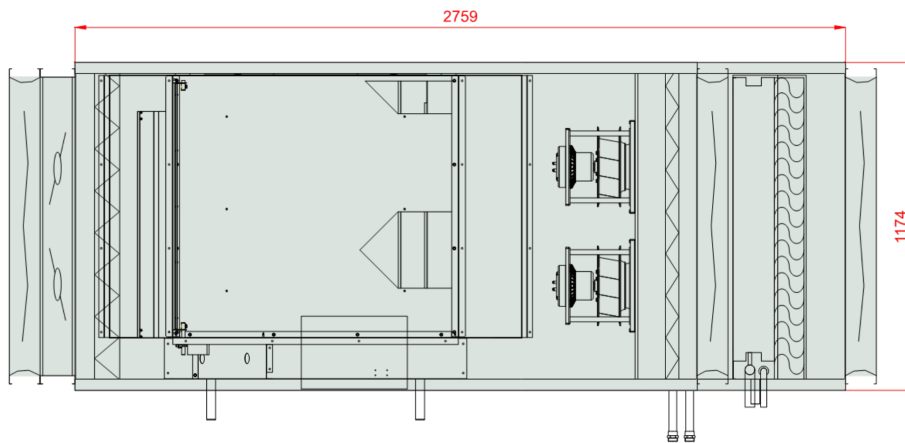
Front View (left)



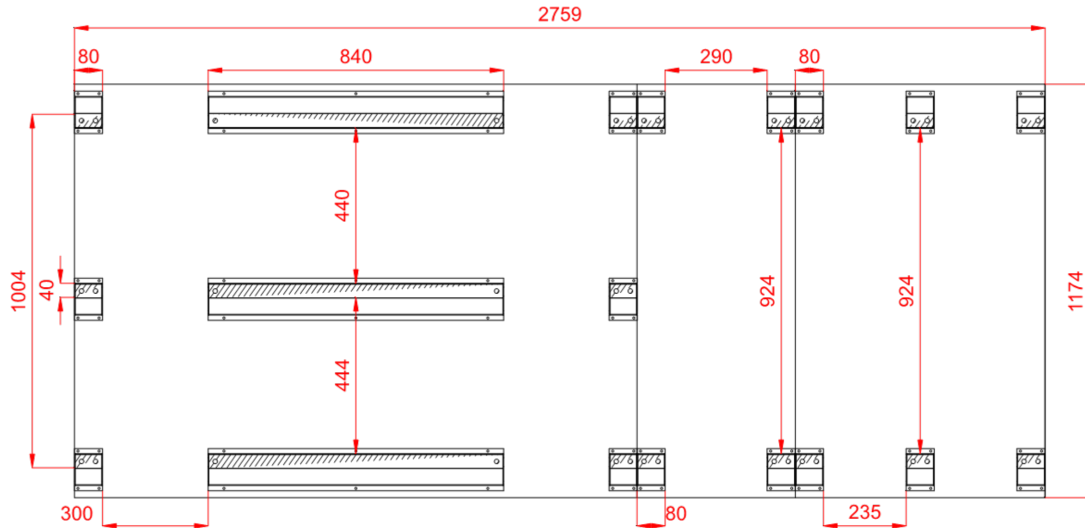
Front View (right)



Top View



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



**Sizes [mm]**

<b>Air intake Supply</b> FF	1068x480	<b>Lt</b> 2759	<b>Hi</b> 502	<b>Wi</b> 1094
<b>Air outlet Supply</b> FF	1068x480	<b>LtA</b> 3104	<b>H</b> 672	<b>W</b> 1174
		<b>L1</b> 2759	<b>H2</b> 1254	
<b>Air inlet Exhaust</b> FF	1068x480	<b>L2</b> 2228	<b>Hf</b> 90	
<b>Air outlet Exhaust</b> FF	1068x480	<b>L22</b> 531		

**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 128 Pa  
 Initial Air Pressure Drop 105 Pa  
 100% Dirty Air Pressure Drop 150 Pa  
 Air velocity 2.26 m/s

#### Air Filter Sizes

P.FLT (1-2-0301-0215) 2,000 x Pcs

#### Summer operation

50% Dirty Air Pressure Drop 128 Pa  
 Initial Air Pressure Drop 105 Pa  
 100% Dirty Air Pressure Drop 150 Pa  
 Air velocity 2.26 m/s

## Counter-Flow Recuperator (Hexagonal)

#### Type PCR VVS040c 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 2.66 m/s  
 Pressure drop Wet / Dry Wet 210 Pa  
 Air Pressure 101325 Pa  
 Air Density 1.2000 kg/m<sup>3</sup>  
 Air Volume Flow 4400.00 m<sup>3</sup>/h  
 Recovery capacity Sensible / Total Total 52.2 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 2.66 m/s  
 Pressure drop Wet / Dry Wet 243 Pa  
 Air Pressure 101325 Pa  
 Air Density 1.2000 kg/m<sup>3</sup>  
 Air Volume Flow 4400.00 m<sup>3</sup>/h  
 Recovery Bypass Yes  
 Air Damper Yes

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 2.66 m/s  
 Pressure drop Wet / Dry Wet 253 Pa  
 Air Pressure 101325 Pa  
 Air Density 1.2000 kg/m<sup>3</sup>  
 Air Volume Flow 4400.00 m<sup>3</sup>/h  
 Recovery capacity Sensible / Total Total -14.2 kW

#### Summer operation

##### Exhaust

Intake air DBT / RH 20.0 °C / 45 %  
 Discharge air DBT / RH 29.9 °C / 36 %  
 Air velocity 2.66 m/s  
 Pressure drop Wet / Dry Wet 243 Pa  
 Air Pressure 101325 Pa  
 Air Density 1.2000 kg/m<sup>3</sup>  
 Air Volume Flow 4400.00 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|1.58x2

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	761 Pa	Impeller efficiency: Static / Total	70 %/76 %
Dynamic pressure	71 Pa	Shaft power	0.67 kW x 2
External pressure	300 Pa	Working revolutions	3718 1/min
Total Pressure	831 Pa		
<b>Winter operation</b>		<b>Summer operation</b>	
Air Volume Flow	4400.00 m³/h	Air Volume Flow	4400.00 m³/h

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

771.3.570                      EC                      50Hz

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 Controller Settings                      46 Hz

<b>Winter operation</b>		<b>Summer operation</b>	
EPC for mean contaminated filters	1.54 kW	EPC for mean contaminated filters	1.62 kW
EPC for clean filters	1.50 kW	EPC for clean filters	1.58 kW
SFP for clean filters	1.23 kW/m³/s	SFP for clean filters	1.29 kW/m³/s

#### Fan Section Power Supply Additional Info

C20/3

**+** Hot Water Coil

**Type** WCL VVS040c 2R DT SH.St.St.Std      **Number of rows** 2      **Connection Supply/Return:** 1"/1"

Standard Circuits	3,25 [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	2.72 m/s	Pressure drop Wet / Dry Wet	58 Pa
Air Pressure	101325 Pa	Air Density	1.2000 kg/m <sup>3</sup>
Air Volume Flow	4400.00 m <sup>3</sup> /h		
Total heating capacity	6.8 kW	Medium temperature	70.0 °C/50.0 °C
Medium flow rate	0.30 m <sup>3</sup> /h	Medium pressure drop	0.34 kPa

**-** DX Cooling Coil w/ Droplet Eliminator

**Type** DXC VVS040c 2R-1 TD SH.Cu.St.Std      **Number of rows** 2      **Sections** 1      **Connection Supply/Return:** Ø22/Ø35

	1,81 [dm <sup>3</sup> ]		DX VVS040c 2R-1 SH.Cu.St.Std 516
Medium	R410A	Maximum working pressure	38 bar
Intake air DBT / RH	23.8 °C / 73 %	Discharge air DBT / RH	20.0 °C / 82 %
Air velocity	3.00 m/s	Pressure drop Wet / Dry Wet / Dry	65 Pa / 34 Pa
Air Pressure	101325 Pa	Air Density	1.2000 kg/m <sup>3</sup>
Air Volume Flow	4400.00 m <sup>3</sup> /h		
Cooling capacity: Sensible / Total	5.7 kW/10.8 kW	Evaporation temperature	6.0 °C
Medium flow rate	0.18 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)]	58.0	64.2	62.0	56.9	53.5	57.0	54.1	68.0
Outlet	[dB(A)]	53.5	60.6	44.9	48.8	38.2	26.4	19.9	61.7
Environment	[dB(A)]	41.2	52.6	50.5	44.8	37.2	29.6	16.0	55.4

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)]	34.2	45.6	43.5	37.8	30.2	22.6	9.0	48.4



### 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 114 Pa  
 Initial Air Pressure Drop 79 Pa  
 100% Dirty Air Pressure Drop 150 Pa  
 Air velocity 2.26 m/s

##### Summer operation

50% Dirty Air Pressure Drop 114 Pa  
 Initial Air Pressure Drop 79 Pa  
 100% Dirty Air Pressure Drop 150 Pa  
 Air velocity 2.26 m/s

##### Air Filter Sizes

P.FLT (1-2-0301-0203) 2,000 x Pcs

#### 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|1.58x2

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	658 Pa	Impeller efficiency: Static / Total	69 %/76 %
Dynamic pressure	71 Pa	Shaft power	0.59 kW x 2
External pressure	300 Pa	Working revolutions	3602 1/min
Total Pressure	729 Pa		

##### Winter operation

Air Volume Flow 4400.00 m³/h

##### Summer operation

Air Volume Flow 4400.00 m³/h

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

771.3.570 EC 50Hz

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 Controller Settings 45 Hz

**Winter operation**

EPC for mean contaminated filters 1.36 kW  
 EPC for clean filters 1.29 kW  
 SFP for clean filters 1.06 kW/m³/s

**Summer operation**

EPC for mean contaminated filters 1.36 kW  
 EPC for clean filters 1.29 kW  
 SFP for clean filters 1.06 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)]	52.9	66.2	72.2	72.5	70.8	65.4	59.8	77.4
Outlet	[dB(A)]	55.6	68.9	74.9	75.2	73.5	69.0	63.4	80.2
Environment	[dB(A)]	40.6	51.9	49.9	44.2	36.5	29.0	15.4	54.7

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)]	33.6	44.9	42.9	37.2	29.5	22.0	8.4	47.7

**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 1068x480	Front 1068x480
Air Outlet	Front 1068x480	Front 1068x480
Air Damper	Supply	Exhaust
Air Inlet	Provided	Not Provided
Air Outlet	Not Provided	Provided
Flexible Connection	Supply	Exhaust
Air Inlet	Provided	Provided
Air Outlet	Provided	Provided

**Control application**

Functional Code AP|1|2|0|0|0|0|0|6|3|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
Air Damper Actuator 0-10 10Nm	ADMP.ACT.SET 0-10 10Nm	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-4	1

#### Transducers and Switches

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

#### AHU Connection Box

##### AHU Connection Box

Rated Power	2.80 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		VVS040c-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	%	80.00
7	Nominal NRVU flow rate		1.22 / 1.22
8	Effective electric power input	kW	1.54 / 1.36
9	Internal Specific Fan Power (SFPint)	w/m <sup>3</sup> /s	522.09 / 543.03
10	Face velocity	m/s	2.26
11	Nominal external pressure	Pa	300.00 / 300.00
12	Internal Pressure Drop of ventilation components $\Delta p_{s,int}$	Pa	314.91 / 321.95
13	Internal pressure drop of non-ventilation components $\Delta p_{s,add}$	Pa	145.81 / 36.36
14	Maximum Leakage Rate	%	0.01 / 0.01
15	Energy performance of filters (declared information about the calculated annual anergy consumption)		EU7MPleat / F7 / - / EU5MPleat / M5 / -
16	Description of visual filter warning for NRVUs		Supported by control application
17	Casing sound power level LWA	dBA	55
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	276	1599	1174	1254
2	60	450	1174	672
3	84	710	1174 <td 672	
4	73	629	1174	582

Transport Sections Dims

