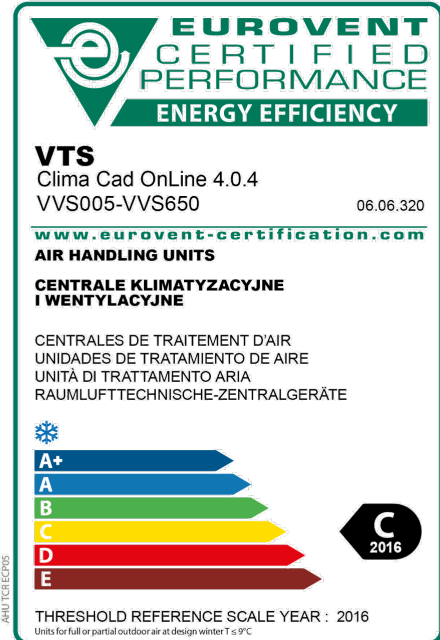
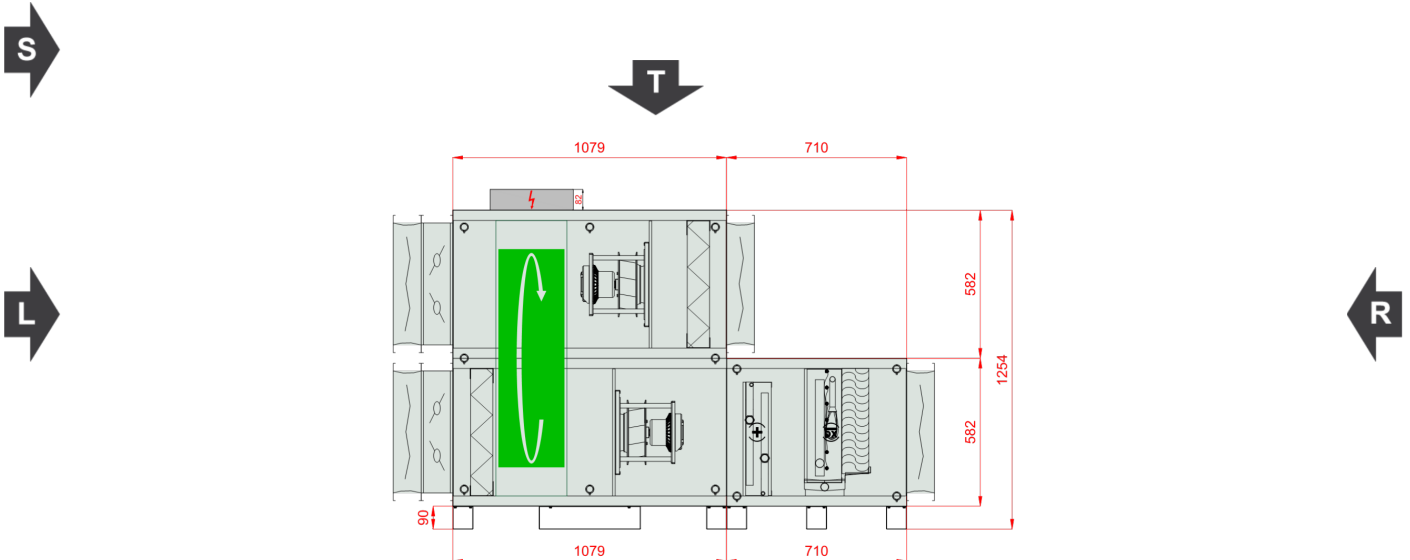


<b>Type</b>	RecoveryRotaryVerticalCompact
<b>Unit Type:</b>	Indoor
<b>Project Tag</b>	13577235
<b>Size</b>	VVS040c
<b>Set</b>	VVS040c-R-FRVHC/VVS040c-L-FVR_cd
<b>Insulation thickness</b>	40 mm
<b>Insulation</b>	Mineral Wool
<b>Weight of the set (+/- 10%)*</b>	410 Kg
<b>Supply airflow 2</b>	5150.00 m³/h
<b>External pressure</b>	300 Pa
<b>Exhaust airflow 2</b>	5150.00 m³/h
<b>External pressure</b>	300 Pa
<b>SFP Winter</b>	2.45 kW/m³/s
<b>SFP Summer</b>	2.52 kW/m³/s
<b>Ecodesign</b>	Yes (2018 +)
<b>Eurovent Energy efficiency class (Winter 2016 / Summer 2020)</b>	C 2016



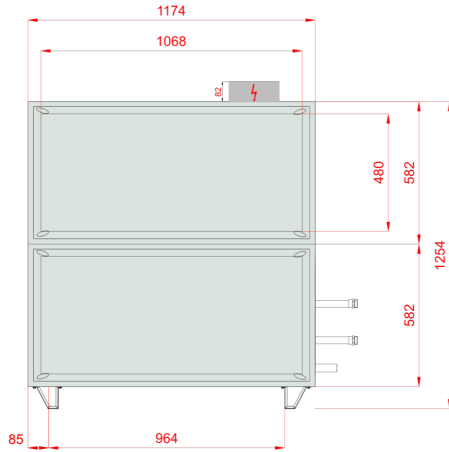
Inspection Panels



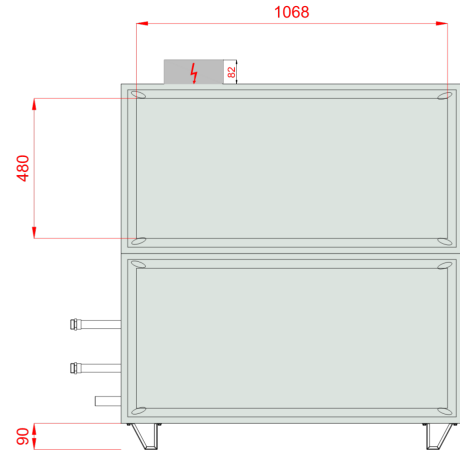
Comment 1:



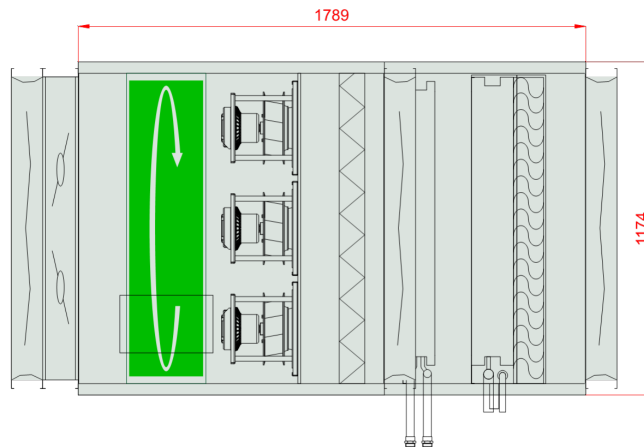
Front View (left)



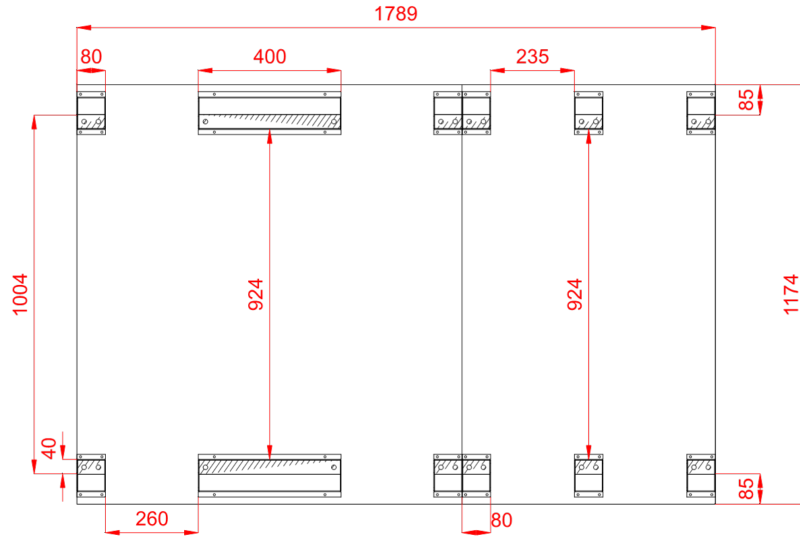
Front View (right)



Top View



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



**Sizes [mm]**

<b>Air intake Supply</b> FF	1068x480	<b>Lt</b> 1789	<b>Hi</b> 502	<b>Wi</b> 1094
<b>Air outlet Supply</b> FF	1068x480	<b>LtA</b> 2134	<b>H</b> 672	<b>W</b> 1174
		<b>L1</b> 1789	<b>H2</b> 1254	
<b>Air inlet Exhaust</b> FF	1068x480	<b>L2</b> 1079	<b>Hf</b> 90	
<b>Air outlet Exhaust</b> FF	1068x480	<b>L22</b> 710		

**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 147 Pa  
 Initial Air Pressure Drop 144 Pa  
 100% Dirty Air Pressure Drop 150 Pa  
 Air velocity 2.65 m/s

**Summer operation**

50% Dirty Air Pressure Drop 147 Pa  
 Initial Air Pressure Drop 144 Pa  
 100% Dirty Air Pressure Drop 150 Pa  
 Air velocity 2.65 m/s

**Air Filter Sizes**

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



**Rotary Wheel**

**Type RRG VVS040c NHG**

R2\_SR\_NHG

Rated voltage 230 V/1 ph/50 Hz

**Winter operation**

**Supply**

Intake air DBT / RH -20.0 °C / 100 %

Discharge air DBT / RH 9.4 °C / 52 %

Air velocity 3.97 m/s

Pressure drop Wet / Dry Wet / Dry 214 Pa / 249 Pa

Air Pressure 101325 Pa

Air Density 1.2000 kg/m<sup>3</sup>

Air Volume Flow 5150.00 m<sup>3</sup>/h

Recovery capacity Sensible / Total  
Sensible / Total 50.7 kW / 64.5 kW

Actual efficiency / at balanced flow Real /  
BalancedFlow 73 % / 73 %

Dry efficiency in winter 74 %

**Winter operation**

**Exhaust**

Intake air DBT / RH 20.0 °C / 40 %

Discharge air DBT / RH -7.6 °C / 95 %

Air velocity 3.97 m/s

Pressure drop Wet / Dry Wet / Dry 248 Pa / 249 Pa

Air Pressure 101325 Pa

Air Density 1.2000 kg/m<sup>3</sup>

Air Volume Flow 5150.00 m<sup>3</sup>/h

Recovery Bypass No

Rotary Regenerator

Max Internal Leakage 3%

**Summer operation**

**Supply**

Intake air DBT / RH 32.0 °C / 45 %

Discharge air DBT / RH 23.1 °C / 76 %

Air velocity 3.97 m/s

Pressure drop Wet / Dry Wet / Dry 259 Pa / 249 Pa

Air Pressure 101325 Pa

Air Density 1.2000 kg/m<sup>3</sup>

Air Volume Flow 5150.00 m<sup>3</sup>/h

Recovery capacity Sensible / Total  
Sensible / Total 15.3 kW / 15.3 kW

Actual efficiency / at balanced flow Real 74 %

**Summer operation**

**Exhaust**

Intake air DBT / RH 20.0 °C / 65 %

Discharge air DBT / RH 29.0 °C / 38 %

Air velocity 3.97 m/s

Pressure drop Wet / Dry Wet / Dry 248 Pa / 249 Pa

Air Pressure 101325 Pa

Air Density 1.2000 kg/m<sup>3</sup>

Air Volume Flow 5150.00 m<sup>3</sup>/h

Eco Design Class

Eco Design

**Recovery Additional Info**

RotaryExchangers

**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|1.33x3

Qty in section

x 3

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 3**





Total Static Pressure	822 Pa	Impeller efficiency: Static / Total	70 %/76 %
Dynamic pressure	68 Pa	Shaft power	0.56 kW x 3
External pressure	300 Pa	Working revolutions	4256 1/min
Total Pressure	890 Pa		
<b>Winter operation</b>		<b>Summer operation</b>	
Air Volume Flow	5150.00 m³/h	Air Volume Flow	5150.00 m³/h

**Motor EC\_IE4\_F\_71\_IMB14\_1.33p\_0.74\_50x 3**

771.3.570-2	EC	50Hz	
		Rated revolutions	4500 1/min
Operational Voltage	230 V/1 ph	Rated Power	0.74 kW x 3
Name plate RPM	230 V/1 ph/50 Hz		

**EC Motor Controller**

EC Controller Settings	47 Hz
------------------------	-------

<b>Winter operation</b>		<b>Summer operation</b>	
EPC for mean contaminated filters	1.93 kW	EPC for mean contaminated filters	2.03 kW
EPC for clean filters	1.93 kW	EPC for clean filters	2.03 kW
SFP for clean filters	1.35 kW/m³/s	SFP for clean filters	1.42 kW/m³/s

**Fan Section Power Supply Additional Info**

C25/3

**Hot Water Coil**

<b>Type</b> WCL VVS040c 2R DT SH.St.St.Std	<b>Number of rows</b> 2	<b>Connection Supply/Return:</b> 1"/1"	
Standard Circuits	3,25 [dm³]		
Medium	Water	Maximum working pressure	16 bar
Intake air DBT / RH	9.4 °C / 52 %	Discharge air DBT / RH	20.0 °C / 26 %
Air velocity	3.15 m/s	Pressure drop Wet / Dry Wet	74 Pa
Air Pressure	101325 Pa	Air Density	1.2000 kg/m³
Air Volume Flow	5150.00 m³/h		
Total heating capacity	18.5 kW	Medium temperature	70.0 °C/50.0 °C
Medium flow rate	0.80 m³/h	Medium pressure drop	1.08 kPa



### DX Cooling Coil w/ Droplet Eliminator

<b>Type</b> DXC VVS040c 2R-1 TD SH.Cu.St.Std	<b>Number of rows</b> 2	<b>Sections</b> 1	<b>Connection Supply/Return:</b> 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	23.1 °C / 76 %	Discharge air DBT / RH	20.0 °C / 84 %
Air velocity	3.51 m/s	Pressure drop Wet / Dry Wet / Dry	86 Pa / 44 Pa
Air Pressure	101325 Pa	Air Density	1.2000 kg/m <sup>3</sup>
Air Volume Flow	5150.00 m <sup>3</sup> /h		
Cooling capacity: Sensible / Total	5.5 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)]	53.2	65.6	70.7	70.1	66.6	60.3	53.8	75.0
Outlet	[dB(A)]	55.0	62.0	46.4	50.3	39.6	27.9	21.4	63.1
Environment	[dB(A)]	42.7	54.0	52.0	46.3	38.6	31.1	17.5	56.8

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)]	35.7	47.0	45.0	39.3	31.6	24.1	10.5	49.8

### 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 129 Pa  
 Initial Air Pressure Drop 108 Pa  
 100% Dirty Air Pressure Drop 150 Pa  
 Air velocity 2.65 m/s

#### Summer operation

50% Dirty Air Pressure Drop 129 Pa  
 Initial Air Pressure Drop 108 Pa  
 100% Dirty Air Pressure Drop 150 Pa  
 Air velocity 2.65 m/s

#### Air Filter Sizes

P.FLT (1-2-0301-0203) 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|1.33x3  
 Qty in section                      x 3

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 3**

Total Static Pressure	679 Pa	Impeller efficiency: Static / Total	69 %/76 %
Dynamic pressure	68 Pa	Shaft power	0.47 kW x 3
External pressure	300 Pa	Working revolutions	4075 1/min
Total Pressure	747 Pa		

**Winter operation**

Air Volume Flow                      5150.00 m³/h

**Summer operation**

Air Volume Flow                      5150.00 m³/h

**Motor EC\_IE4\_F\_71\_IMB14\_1.33p\_0.74\_50x 3**

771.3.570-2                      EC                      50Hz  
 Rated revolutions                      4500 1/min  
 Operational Voltage                      230 V/1 ph                      Rated Power                      0.74 kW x 3  
 Name plate RPM                      230 V/1 ph/50 Hz

**EC Motor Controller**

EC Controller Settings                      45 Hz

**Winter operation**

EPC for mean contaminated filters                      1.63 kW  
 EPC for clean filters                      1.58 kW  
 SFP for clean filters                      1.11 kW/m³/s

**Summer operation**

EPC for mean contaminated filters                      1.63 kW  
 EPC for clean filters                      1.58 kW  
 SFP for clean filters                      1.11 kW/m³/s

**Fan Section Power Supply Additional Info**

C25/3

**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)]	54.0	67.4	73.3	73.6	72.0	66.5	60.9	78.6
Outlet	[dB(A)]	56.7	70.1	76.0	76.3	74.7	70.1	64.5	81.3
Environment	[dB(A)]	41.7	53.1	51.0	45.3	37.7	30.1	16.5	55.9

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)]	34.7	46.1	44.0	38.3	30.7	23.1	9.5	48.9





AHU Discharge and Intake Opening Sizes & Unit Accessories	Supply	Exhaust
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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 AR|1|2|0|0|0|0|0|6|3|0|0|0|0|0|1  
 APP Code uPC3 (AR-137)  
 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

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-6,3	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	4.44 kW	Full Load Amps	22.0 A
Power Connection	3x400V AC +N+PE	Power Cord	5 x 4,00 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-R-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		1.43 / 1.43
8	Effective electric power input	kW	1.93 / 1.63
9	Internal Specific Fan Power (SFPint)	w/m <sup>3</sup> /s	588.50 / 598.05
10	Face velocity	m/s	2.65
11	Nominal external pressure	Pa	300.00 / 300.00
12	Internal Pressure Drop of ventilation components $\Delta ps_{int}$	Pa	357.71 / 356.65
13	Internal pressure drop of non-ventilation components $\Delta ps_{add}$	Pa	164.02 / 22.06
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	57
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	298	1079	1174	1254
2	84	710	1174	672

Transport Sections Dims

