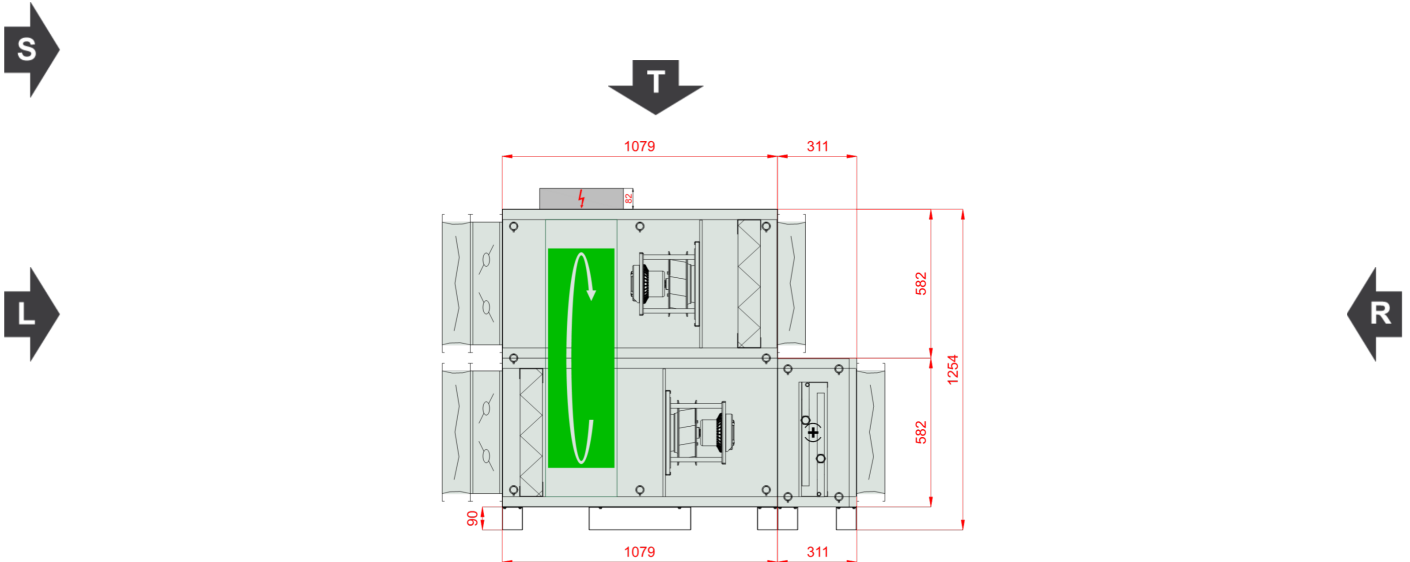


Type	RecoveryRotaryVerticalCompact
Unit Type:	Indoor
Project Tag	13577195
Size	VVS040c
Set	VVS040c-R-FRVH/VVS040c-L-FVR_cd
Insulation thickness	40 mm
Insulation	Mineral Wool
Weight of the set (+/- 10%)*	364 Kg
Supply airflow 2	5150.00 m³/h
External pressure	300 Pa
Exhaust airflow 2	5150.00 m³/h
External pressure	300 Pa
SFP Winter	2.27 kW/m³/s
SFP Summer	2.34 kW/m³/s
Ecodesign	Yes (2018 +)
Eurovent Energy efficiency class (Winter 2016 / Summer 2020)	B 2016



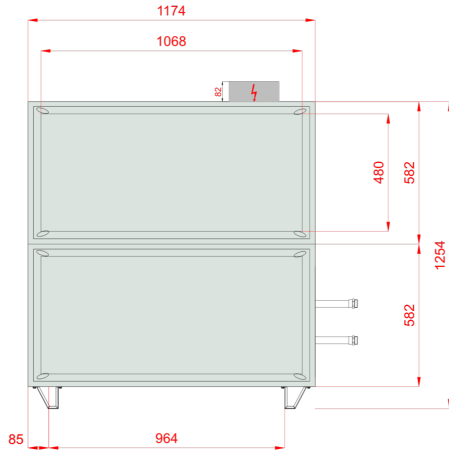
Inspection Panels



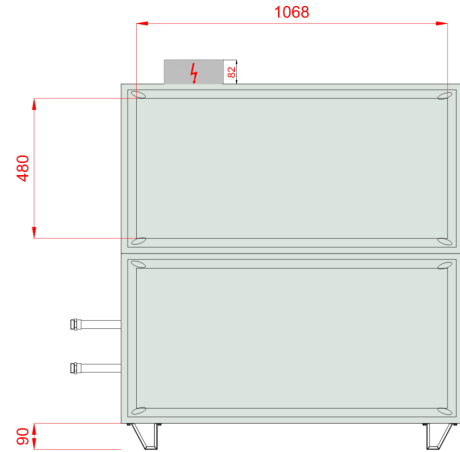
Comment 1:



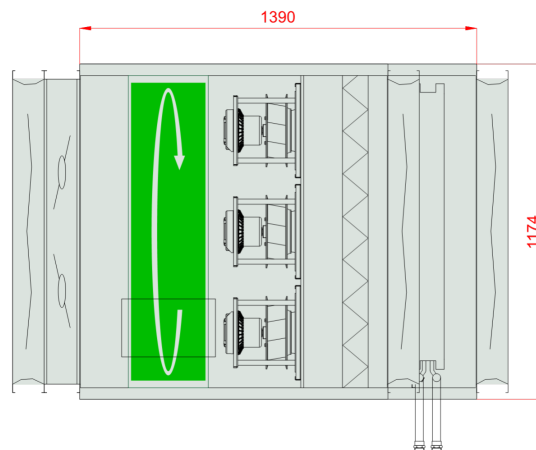
Front View (left)



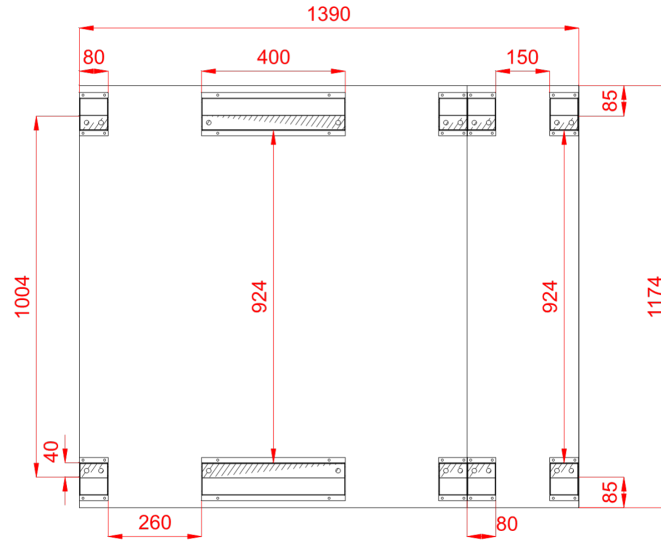
Front View (right)



Top View



Frame Top View, within the AHU outline contour



Sizes [mm]

Air intake Supply FF	1068x480	Lt 1390	Hi 502	Wi 1094
Air outlet Supply FF	1068x480	LtA 1735	H 672	W 1174
		L1 1390	H2 1254	
Air inlet Exhaust FF	1068x480	L2 1079	Hf 90	
Air outlet Exhaust FF	1068x480	L22 311		

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 ³	20.0 °C	65 %	1.2000 kg/m ³
Winter	-20.0 °C	100 %	1.2000 kg/m ³	20.0 °C	40 %	1.2000 kg/m ³



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/m³
Air Volume Flow	5150.00 m³/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/m³
Air Volume Flow	5150.00 m³/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/m³
Air Volume Flow	5150.00 m³/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/m³
Air Volume Flow	5150.00 m³/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	699 Pa	Impeller efficiency: Static / Total	69 %/76 %
Dynamic pressure	68 Pa	Shaft power	0.48 kW x 3
External pressure	300 Pa	Working revolutions	4100 1/min
Total Pressure	767 Pa		
Winter operation		Summer operation	
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	46 Hz
------------------------	-------

Winter operation		Summer operation	
EPC for mean contaminated filters	1.67 kW	EPC for mean contaminated filters	1.77 kW
EPC for clean filters	1.66 kW	EPC for clean filters	1.76 kW
SFP for clean filters	1.16 kW/m³/s	SFP for clean filters	1.23 kW/m³/s

Fan Section Power Supply Additional Info

C25/3

Hot Water Coil

Type WCL VVS040c 1R DT SH.St.St.Std	Number of rows 1	Connection Supply/Return: 1"/1"	
Standard Circuits	2,18 [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	3.09 m/s	Pressure drop Wet / Dry Wet	37 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	16.09 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)]	52.4	64.8	69.9	69.3	65.8	59.5	53.0	74.2
Outlet	[dB(A)]	57.8	64.8	50.1	54.9	48.7	46.9	42.2	66.2
Environment	[dB(A)]	41.9	53.2	51.2	45.5	37.8	30.3	16.7	56.0





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)]	34.9	46.2	44.2	38.5	30.8	23.3	9.7	49.0

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		Summer operation	
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 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

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|0|0|0|0|0|0|6|3|0|0|0|0|0|1
APP Code uPC3 (AR-129)
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-2,5	1

Transducers and Switches

Name	Code	Set
Frost Switch	FRST.SWITCH	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 ²

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
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	1.67 / 1.63
9	Internal Specific Fan Power (SFPint)	w/m ³ /s	597.74 / 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 Δps,int	Pa	357.71 / 356.65
13	Internal pressure drop of non-ventilation components Δps,add	Pa	40.98 / 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	56
18	Internet address for disassembly instructions		http://www.vtsgroup.com
19	Ecodesign Compliance		Yes (2018 +)

Section splits

Transport Sections Mass [Kg] LENGTH [mm] WIDTH [mm] HEIGHT [mm]



1	298	1079	1174	1254
2	40	311	1174	672

Transport Sections Dims

