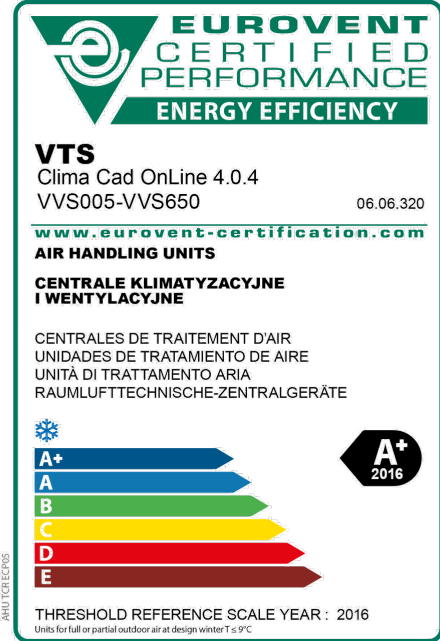
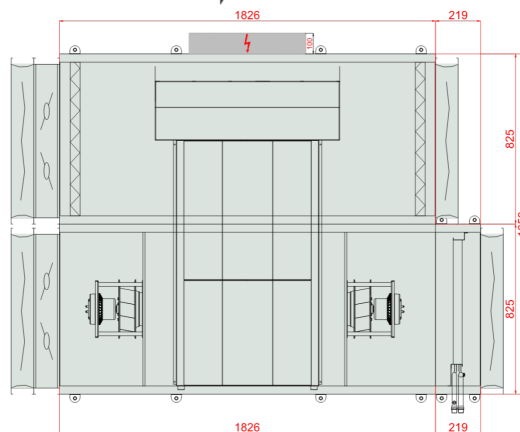


Type	RecoveryHexHorizontal
Unit Type:	Indoor
Project Tag	13577183
Size	VVS020s
Set	VVS020s-R-FPVH/VVS020s-L-FPV_cd
Insulation thickness	40 mm
Insulation	Mineral Wool
Weight of the set (+/- 10%)*	333 Kg
Supply airflow 2	2200.00 m³/h
External pressure	300 Pa
Exhaust airflow 2	2200.00 m³/h
External pressure	300 Pa
SFP Winter	1.69 kW/m³/s
SFP Summer	1.73 kW/m³/s
Ecodesign	Yes (2018 +)
Eurovent Energy efficiency class (Winter 2016 / Summer 2020)	A+ 2016



Top View

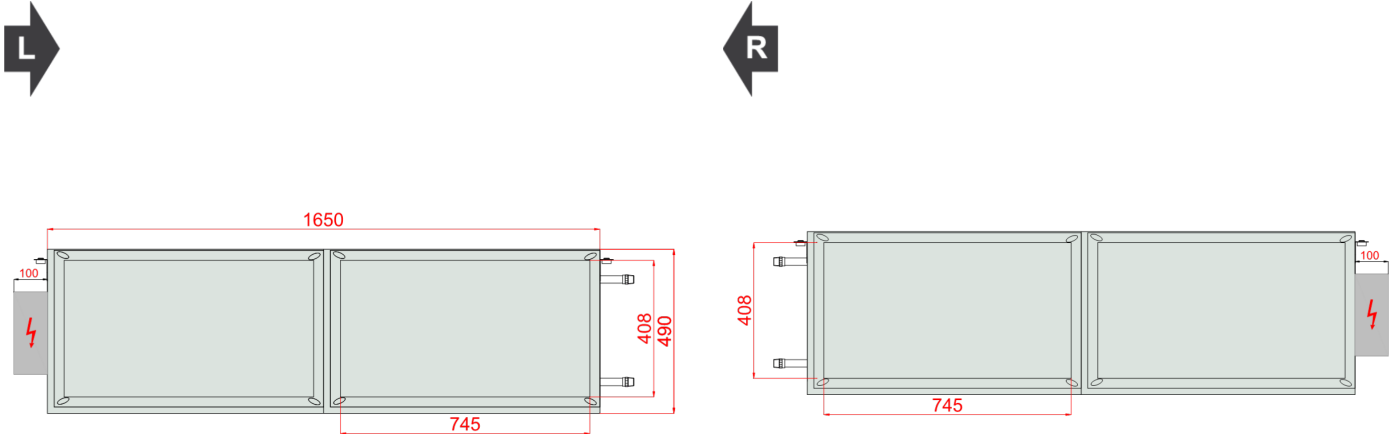


Comment 1:

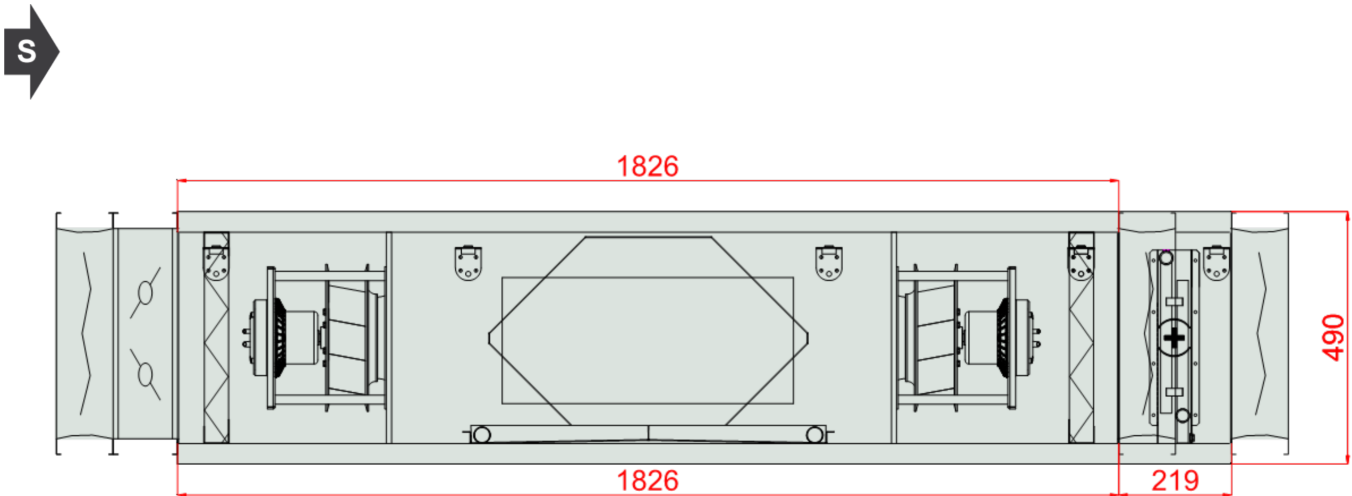


Front View (left)

Front View (right)



Inspection Panels



Sizes [mm]

Air intake Supply FF	745x408	Lt 2045	Hi 410	Wi 745
Air outlet Supply FF	745x408	LtA 2390	H 490	W 825
Air inlet Exhaust FF	745x408	L1 2045		W2 1650
Air outlet Exhaust FF	745x408	L2 1826		
		L22 219		

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/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 121 Pa
 Initial Air Pressure Drop 91 Pa
 100% Dirty Air Pressure Drop 150 Pa
 Air velocity 2.04 m/s

Summer operation

50% Dirty Air Pressure Drop 121 Pa
 Initial Air Pressure Drop 91 Pa
 100% Dirty Air Pressure Drop 150 Pa
 Air velocity 2.04 m/s

Air Filter Sizes

P,FLT F7 742x410x48 (1-2-0301-0283) 1,000 x Pcs

Counter-Flow Recuperator (Hexagonal)

Type PCR VVS020s 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	2.15 m/s
Pressure drop Wet / Dry Wet	61 Pa
Air Pressure	101325 Pa
Air Density	1.2000 kg/m ³
Air Volume Flow	2200.00 m ³ /h
Recovery capacity Sensible / Total Total	23.5 kW
Actual efficiency / at balanced flow Real / BalancedFlow	80 % / 80 %
Dry efficiency in winter	74 %

Winter operation

Exhaust

Intake air DBT / RH	20.0 °C / 40 %
Discharge air DBT / RH	-2.8 °C / 99 %
Air velocity	2.15 m/s
Pressure drop Wet / Dry Wet	81 Pa
Air Pressure	101325 Pa
Air Density	1.2000 kg/m ³
Air Volume Flow	2200.00 m ³ /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	2.15 m/s
Pressure drop Wet / Dry Wet	87 Pa
Air Pressure	101325 Pa
Air Density	1.2000 kg/m ³
Air Volume Flow	2200.00 m ³ /h
Recovery capacity Sensible / Total Total	-6.5 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	2.15 m/s
Pressure drop Wet / Dry Wet	81 Pa
Air Pressure	101325 Pa
Air Density	1.2000 kg/m ³
Air Volume Flow	2200.00 m ³ /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 1

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 1



Total Static Pressure	521 Pa	Impeller efficiency: Static / Total	66 %/75 %
Dynamic pressure	71 Pa	Shaft power	0.48 kW x 1
External pressure	300 Pa	Working revolutions	3447 1/min
Total Pressure	592 Pa		
Winter operation		Summer operation	
Air Volume Flow	2200.00 m³/h	Air Volume Flow	2200.00 m³/h

Motor EC_IE4_F_71_IMB14_1.58p_0.7_50x 1

771.3.570	EC	50Hz	
FLA	3.4 A	MCA	4.3 A
MCB	6.0 A		
		Rated revolutions	4000 1/min
Operational Voltage	230 V/1 ph	Rated Power	0.70 kW x 1
Name plate RPM	230 V/1 ph/50 Hz		

EC Motor Controller

	_EC	_EC	
Motor Drive FLA (Full-Load Amperes)	3.4 A	Motor Drive MCA (Min. Circuit Ampacity)	4.3 A
Motor Drive MCB (Max. Circuit Breaker)	6.0 A		
EC Controller Settings	43 Hz		

Winter operation		Summer operation	
EPC for mean contaminated filters	0.56 kW	EPC for mean contaminated filters	0.58 kW
EPC for clean filters	0.53 kW	EPC for clean filters	0.56 kW
SFP for clean filters	0.87 kW/m³/s	SFP for clean filters	0.91 kW/m³/s

Fan Section Power Supply Additional Info

C20/1

Hot Water Coil

Type WCL VVS020s 2R DT SH.St.St.Std	Number of rows 2	Connection Supply/Return: 3/4"/22	
Standard Circuits	1,69 [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	2.42 m/s	Pressure drop Wet / Dry Wet	39 Pa
Air Pressure	101325 Pa	Air Density	1.2000 kg/m³
Air Volume Flow	2200.00 m³/h		
Total heating capacity	6.0 kW	Medium temperature	70.0 °C/50.0 °C
Medium flow rate	0.26 m³/h	Medium pressure drop	0.86 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)]	53.8	59.9	57.8	52.7	49.2	52.8	49.9	63.7
Outlet	[dB(A)]	52.9	59.9	45.2	50.0	43.8	42.0	37.3	61.3
Environment	[dB(A)]	39.0	50.3	56.3	52.6	52.9	33.4	25.8	59.6

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)]	32.0	43.3	49.3	45.6	45.9	26.4	18.8	52.6

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 109 Pa
 Initial Air Pressure Drop 68 Pa
 100% Dirty Air Pressure Drop 150 Pa
 Air velocity 2.04 m/s

Summer operation

50% Dirty Air Pressure Drop 109 Pa
 Initial Air Pressure Drop 68 Pa
 100% Dirty Air Pressure Drop 150 Pa
 Air velocity 2.04 m/s

Air Filter Sizes

P,FLT M5 742x410x48 (1-2-0301-0279) 1,000 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|1.58x1

Qty in section x 1

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 1

Total Static Pressure	491 Pa	Impeller efficiency: Static / Total	65 %/74 %
Dynamic pressure	71 Pa	Shaft power	0.46 kW x 1
External pressure	300 Pa	Working revolutions	3412 1/min
Total Pressure	561 Pa		
Winter operation		Summer operation	
Air Volume Flow	2200.00 m³/h	Air Volume Flow	2200.00 m³/h

Motor EC_IE4_F_71_IMB14_1.58p_0.7_50x 1

771.3.570 EC 50Hz





FLA	3.4 A	MCA	4.3 A
MCB	6.0 A		
		Rated revolutions	4000 1/min
Operational Voltage	230 V/1 ph	Rated Power	0.70 kW x 1
Name plate RPM	230 V/1 ph/50 Hz		

EC Motor Controller

	_EC		_EC
Motor Drive FLA (Full-Load Amperes)	3.4 A	Motor Drive MCA (Min. Circuit Ampacity)	4.3 A
Motor Drive MCB (Max. Circuit Breaker)	6.0 A		
EC Controller Settings	43 Hz		

Winter operation

EPC for mean contaminated filters	0.53 kW
EPC for clean filters	0.50 kW
SFP for clean filters	0.82 kW/m³/s

Summer operation

EPC for mean contaminated filters	0.53 kW
EPC for clean filters	0.50 kW
SFP for clean filters	0.82 kW/m³/s

Fan Section Power Supply Additional Info

C20/1

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)]	49.1	62.4	68.4	68.7	67.0	61.6	56.0	73.6
Outlet	[dB(A)]	51.8	65.1	71.1	71.4	69.7	65.2	59.6	76.4
Environment	[dB(A)]	38.8	50.1	56.1	52.4	52.7	33.2	25.6	59.4

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)]	31.8	43.1	49.1	45.4	45.7	26.2	18.6	52.4

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 745x408	Front 745x408
Air Outlet	Front 745x408	Front 745x408
AirDamper	Supply	Exhaust
Air Inlet	Provided 715x380	Not Provided
Air Outlet	Not Provided	Provided 715x380
Flexible Connection	Supply	Exhaust
Air Inlet	Provided 715x380	Provided 715x380
Air Outlet	Provided 715x380	Provided 715x380

Control application



Functional Code AP110000063000001
APP Code uPC3 (AP-161)
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
1	Manufacturer's name		VTS sp. z o.o.
2	Manufacturer's product code		VVS020s-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	%	74.00
7	Nominal NRVU flow rate		0.61 / 0.61
8	Effective electric power input	kW	0.56 / 0.53
9	Internal Specific Fan Power (SFPint)	w/m³/s	266.67 / 265.74
10	Face velocity	m/s	2.11
11	Nominal external pressure	Pa	300.00 / 300.00
12	Internal Pressure Drop of ventilation components Δps,int	Pa	151.93 / 149.43
13	Internal pressure drop of non-ventilation components Δps,add	Pa	69.40 / 41.37
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	http://www.vtsgroup.com
19	Ecodesign Compliance	Yes (2018 +)

Section splits

Transport Sections	Mass [Kg]	LENGTH [mm]	WIDTH [mm]	HEIGHT [mm]
1	299	1826	1650	490
2	29	219	825	490

Transport Sections Dims

