

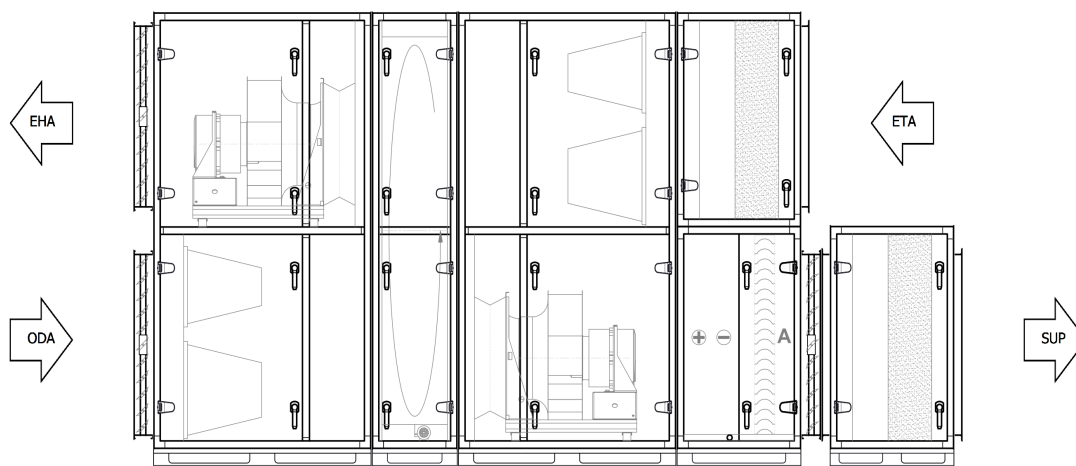
Projekt: TechHUB

Naslov: KI KLET

Kontaktna oseba: Miha

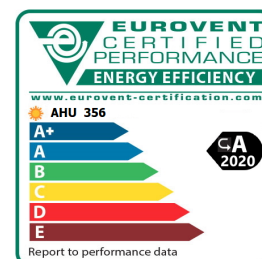
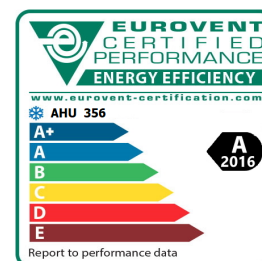
Model:

**VERSO-R-90-L/AZ-H-EC/IE4/10/6.8-F7-M5-HW/2R/2.2-CW/4R/2.6-  
-R1-C5-O/Sa**



## TEHNI NA SPECIFIKACIJA

velikost klimata	90		
Tipologija	NSPE		
	DPE		
Vrsta HRS	Rotacijski toplotni izmenjevalec		
Air handling unit data			
RLT class	B		
		Vtok	Odtok
Nominalna stopnja pretoka	[m³/h]	22185	14450
	[m³/s]	6,16	4,01
Nazivni zunanji tlak	[Pa]	500	500
Hitrost dotoka pri na rtovani stopnji pretoka	[m/s]	2,13	
SFPv	[kW/m³/s]	2,13	
The thermal efficiency of HRS	[%]	76	
Calculation data			
		Zima	Poletje
Design outdoor temperature	[°C]	-13	32
Outdoor relative humidity	[%]	90	40



VERSO-R-90-L/AZ-H-EC/IE4/10/6.8-F7-M5-HW/2R/2.2-CW/4R/2.6-R1-C5-O/Sa

Datum: 11.09.2024

Indoor temperature	[°C]	20	24
Indoor relative humidity	[%]	40	55
Atmosferski tlak	[Pa]	101325	
Gostota zraka	[kg/m³]	1,2	
Air handling unit location		Ljubljana, Slovenia	
Dry-bulb temperature (TdryS)	[°C]	31,9	
Wet-bulb temperature (TwetS)	[°C]	20,9	
Dew-point temperature (Tdw-pS)	[°C]	15,5	
Dry-bulb temperature (TdryW)	[°C]	-6,8	

#### Electrical data

Number of electrical input	1
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#### AHU

Electrical connection	~400V / 50Hz / 3-phase / 5x4mm² / 26,4A
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#### Avtomatsko krmiljenje

Tip	C5
Control panel	C5.1

#### functions

Two flow VAV
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#### accessories

VAVsensor x 2
Surface temperature sensor(PavTMP/J) x 1



#### COMMISSION REGULATION (EU) No 1253 (ecodesign requirements)

	Value	2018
The thermal efficiency of HRS, $t_{nrvu}$ (EN308)	[%]	76
Internal specific fan power, SFPint	[W/m³/s]	672
Type of drive - variable speed	Installed	Necessary
Thermal by-pass facility	Exist	Necessary
Warning - filter is clogged	Exist	Necessary
Unit conformity assessment		Complies

Notranji padec tlaka prezraevalnih elementov ( $P_{s, int}$ )	[Pa]	444
Notranji padec tlaka neprezraevalnih elementov ( $P_{s, add}$ )	[Pa]	275
Effective electric power input of the fans (clean filter)	[kW]	13,10

#### Osnovna sestava STANDART2

Paneli iz dveh pocinkanih ploevin, polnilo iz termo in zvočne izolacije

požarno odporna miner. volna (  $\lambda=0,036$  W/mK).

AHU painted C3 class, RAL 7035.

Indoor unit.

When filters gets dirty, unit control panel gives notice to change the filters.

Dirty filters cause increased energy consumption, which decreases performance and energy efficiency of the unit, so it is very important to change the filters regularly.

AHU shall operate with variable speed drive.

Instructions: [www.komfovent.com/en/downloads](http://www.komfovent.com/en/downloads)

Thermal insulation class	T3
Thermal bridging class	TB4
Casing strength	D2 (M)
Filter bypass leakage	F9 (M)
Casing air leakage	L1(R)

Casing air leakage (Model Box, EN 1886)

-400 Pa (L1)	[dm <sup>3</sup> /(s·m <sup>2</sup> )]	0,07
+700 Pa (L1)	[dm <sup>3</sup> /(s·m <sup>2</sup> )]	0,11

Najve ja stopnja zunanega puš anja - 400 Pa (R)	[%]	< 1
Najve ja stopnja zunanega puš anja + 400 Pa (R)	[%]	< 1
Najve ja stopnja notranjega puš anja ali prenos	[%]	0,06

#### AHU configuration

Separate sections with base frame connected to each section

Debelina panela	[mm]	45
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#### Teža klimata

Teža (neto)	[kg]	3677
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#### Pallets

AVK(S)	[mm]	1200x2800(399kg)
SL1	[mm]	1000x2800(355kg)
SL1	[mm]	1000x2800(355kg)
FVS(S)+RO	[mm]	2100x2800(1714kg)
FVS	[mm]	1500x2800(854kg)

#### Dodatna oprema

Adjustable feet (RegKoj)
Žaluzija Supply air outlet (SklenTiekOrlspu)
Screwed dampers (PrisSkl)

## GLASNOST

Nivo zvo nega tlaka Lw	na kanale				v okolico
	Pretok vto nega zraka [dB]		Pretok odto nega zraka [dB]		[dB]
F[Hz]	Zajem	Izpuh	Zajem	Izpuh	
63	65,6	67,0	57,2	72,1	67,7
125	68,7	61,4	58,8	78,1	69,0

VERSO-R-90-L/AZ-H-EC/IE4/10/6.8-F7-M5-HW/2R/2.2-CW/4R/2.6-R1-C5-O/Sa

Datum: 11.09.2024

250	70,1	58,8	46,6	71,1	62,8
500	64,2	52,8	37,0	70,4	52,8
1000	57,3	47,6	31,7	69,6	52,3
2000	53,1	44,8	28,5	69,2	45,8
4000	49,1	45,0	27,2	66,0	38,9
8000	42,9	44,3	26,0	61,6	36,2
dB(A)	66	56	45	75	59

**Rotacijski toplotni izmenjevalec**
**RR-AZ-2400-L-O-SN(2500x2500x350)-P2-A1-T**

Frekven cikl	[kW]	0,37
Enthalpy		
Purge sector		
Designed for dry conditions		
Preme	[mm]	2400
Višina vala	[mm]	1,7
Gostota	[kg/m³]	1,2
Heat recovery class (EN13053)		H3
Efficiency bonus (E), (EU 1253)		96

		Zima		Poletje	
		Vtok	Odtok	Vtok	Odtok
Izkoristek temperature	[%]	54,2		54,2	
Izkoristek vlage	[%]	80,5		77,3	
Tla ni padec	[Pa]	172	107	172	107
Hitrost	[m/s]	2,77	1,81	2,77	1,81
Standardni zra ni pretok	[m³/h]	22185	14450	22185	14450

**Zajem**

Temperatura	[°C]	-13	20	32	24
Relativna vlaga	[%]	90	40	40	55
Absolutna vlaga	[g/kg]	1,10	5,82	11,96	10,29
Enthalpy	[kJ/kg]	-10,34	34,89	62,81	50,32

**Izpuh**

Temperatura	[°C]	4,9	-9,8	27,7	31,2
Relativna vlaga	[%]	91	95	46	39
Absolutna vlaga	[g/kg]	4,90	1,56	10,67	11,25
Enthalpy	[kJ/kg]	17,20	-5,97	55,05	60,18

**Povratek energije**

Sensible heat	[kW]	133,6		-32,9	
Latent heat	[kW]	70		-24,4	
Total heat	[kW]	203,5		-57,3	

Recovery of moisture	[g/kg]	3,8	-4,3	-1,3	1
OACF		1,1		1,1	
OACF at working point		0,96		0,96	
EATR at working point	[%]	0,23		0,23	

## PRETOK VTO NEGA ZRAKA

### Žaluzija s pogonom

Zra na žaluzija iz alu profila		
Tip pogona	ON/OFF with spring return (AC/DC 24V)	
Torque	[Nm]	20
Tla ni padec	[Pa]	5

### Žaluzija s pogonom

Zra na žaluzija iz alu profila		
Tip pogona	ON/OFF (AC/DC 24V)	
Torque	[Nm]	20
Tla ni padec	[Pa]	5

### Filter zraka

Filter correction (F), (EU 1253)		0
Tip	Vre ast filter	
Energy efficiency class		
Air velocity class (EN13053)		V4
Razred filtra:		F7
Razred filtra (EN ISO 16890)		ePM1 60%
Dimenzije bxxhxl	[mm]	490x592x635
Energijska u inkovitost	[kWh/a]	1009
Število vre		6
Število filtrov		10
Tla ni padec (nov filter)	[Pa]	72
Tla ni padec	[Pa]	122
Priporo eni max tla ni padec (EN 13779 2007)	[Pa]	172
Velocity in the AHU filter section	[m/s]	2,13
Effective filtration area	[m²]	45,5

### Vodni grelec zraka

HW-G20-02R-2341-1080-160-1x25C-22F-M1-C40-IS1-XX-1xR2/1xR2-180		
Kapaciteta	[kW]	149,8
Standardni zra ni pretok	[m³/h]	22185
Hitrost	[m/s]	2,28
Tla ni padec	[Pa]	52

Temperatura zajema	[°C]	2,0
Rel. vlaga zajema	[%]	91
Outlet air temperature	[°C]	22,0
Rel. vlaga izpuha	[%]	24
Absolutna vlaga	[g/kg]	3,98
Medij		Voda
Temperatura zajema	[°C]	50
Temperatura izpuha	[°C]	40
Notranji volumen	[dm³/h]	13976
Tla ni padec	[kPa]	19,43
Etilenglikol volumen	[%]	30

#### Tehni na specifikacija

Cevi		Baker
Plates		Aluminij
Volumen	[m³]	0,0288
Koristni prostor	[m²]	112,15
Razdalja med lamelami	[mm]	2,2
Rows		2
Circuits		25
Povezava vtoka	["]	1xR2
Povezava iztoka	["]	1xR2
L	[mm]	160
B	[mm]	2500
H	[mm]	1160
Omejitve		
Max hidravli ni tlak	[bar]	21
Max temperatura medija	[°C]	130

#### Hladilec zraka

CW-G10-04R-2306-1080-220-1x49C-26F-M1-C40-IS1-XX-1xR3/1xR3-180

Kapaciteta	[kW]	131,5
Sensible	[kW]	106,3
Latent	[kW]	25,2
Standardni zra ni pretok	[m³/h]	22185
Hitrost	[m/s]	2,58
Pressure drop (standard)	[Pa]	71
Pressure drop dry	[Pa]	65
Temperatura zajema	[°C]	32,0
Rel. vlaga zajema	[%]	40

Outlet air temperature	[°C]	18,0
Rel. vlaga izpuha	[%]	82
Absolutna vlaga	[g/kg]	10,62

Medij		Voda
Temperatura zajema	[°C]	9
Temperatura izpuha	[°C]	14
Notranji volumen	[dm³/h]	22597
Tla ni padec	[kPa]	44,97
No glycol	[%]	0
Kondenzacija	[kg/h]	35,63

#### Tehni na specifikacija

Cevi		Baker
Plates		Aluminij
Volumen	[m³]	0,0382
Koristni prostor	[m²]	200,50
Razdalja med lamelami	[mm]	2,6
Rows		4
Circuits		49
Povezava vtoka	["]	1xR3
Povezava iztoka	["]	1xR3
L	[mm]	220
B	[mm]	2490
H	[mm]	1160
Omejitev		
Max hidravli ni tlak	[bar]	15
Max temperatura medija	[°C]	52

#### Separator kapljic z odvodom kondenza

Condensate drip pan material		Stainless steel
Tla ni padec	[Pa]	22

#### Ventilator EC

Designed for wet conditions		
Tip	116161	2 x RH56C-ZID.GL.CR
Premier kolesa	[mm]	560
Zra ni pretok	[m³/h]	2 x 11092
Built-in loss	[Pa]	49
Stati ni tlak	[Pa]	1028
Skupni tlak	[Pa]	1090
Hitrost	[1/min]	1723
Max. speed	[1/min]	1750
K-value		2 x 308

Motor efficiency class		IE4 (Super Premium)
Motor power	[kW]	2 x 5
Input current at 400V 50 Hz	[A]	2 x 6.4
SFPv	[kW/m³/s]	1,45
SFP class (EN16798-3)		SFP 4
Electric power to motor (Pm)	[kW]	2 x 4,73
Electric power to motor (clean filters)	[kW]	2 x 4,47
Electric power to motor class (EN13053)		P1
Pm ref (EN13053)	[kW]	11,69
Total fan efficiency	[%]	70,99
Static fan efficiency	[%]	66,95
Overall efficiency ErP	[%]	71,6

#### Sound absorbers

Izpuh		
Tip		800
Tla ni padec	[Pa]	30

## PRETOK ODTOK NEGA ZRAKA

#### Žaluzija s pogonom

Zra na žaluzija iz alu profila		
Tip pogona		ON/OFF with spring return (AC/DC 24V)
Torque	[Nm]	10
Tla ni padec	[Pa]	2

#### Filter zraka

Filter correction (F), (EU 1253)		0
Tip		Vre ast filter
Energy efficiency class		
Air velocity class (EN13053)		V1
Razred filtra:		M5
Razred filtra (EN ISO 16890)		ePM10 60%
Dimenzije bxhxl	[mm]	490x592x635
Energijska u inkovitost	[kWh/a]	1000
Število vre		6
Število filtrov		10
Tla ni padec (nov filter)	[Pa]	24
Tla ni padec	[Pa]	48
Priporo eni max tla ni padec (EN 13779 2007)	[Pa]	72
Velocity in the AHU filter section	[m/s]	1,38
Effective filtration area	[m²]	45,5



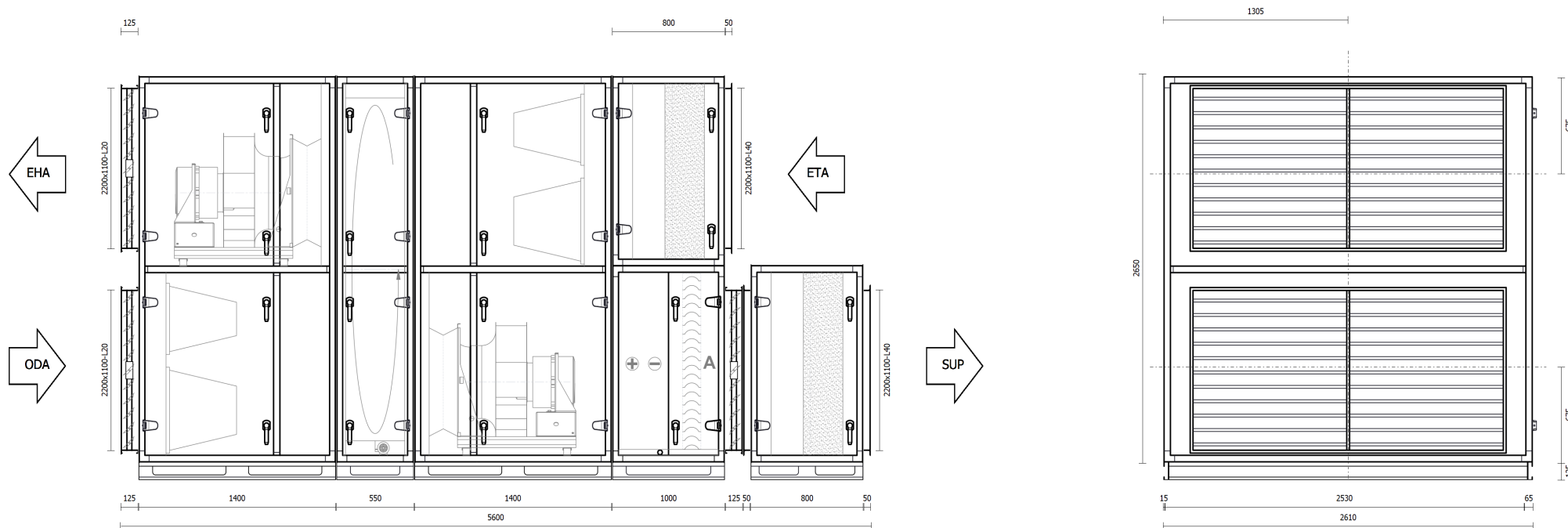
**Ventilator EC**

Tip	116160	2 x RH56C-ZID.GG.CR
Premier koleša	[mm]	560
Zra ni pretok	[m³/h]	2 x 7225
Built-in loss	[Pa]	21
Stati ni tlak	[Pa]	691
Skupni tlak	[Pa]	717
Hitrost	[1/min]	1348
Max. speed	[1/min]	1550
K-value		2 x 308
Motor efficiency class		IE4 (Super Premium)
Motor power	[kW]	2 x 3,4
Input current at 400V 50 Hz	[A]	2 x 4.2
SFPv	[kW/m³/s]	1,03
SFP class (EN16798-3)		SFP 3
Electric power to motor (Pm)	[kW]	2 x 2,15
Electric power to motor (clean filters)	[kW]	2 x 2,07
Electric power to motor class (EN13053)		P1
Pm ref (EN13053)	[kW]	5,51
Total fan efficiency	[%]	66,96
Static fan efficiency	[%]	64,55
Overall efficiency ErP	[%]	70,2

**Sound absorbers**

Zajem		
Tip		800
Tla ni padec	[Pa]	13

We reserve the rights to change technical data of the products in the process of their improvement without advance notice. Validity period of presented data - 1 month



ODA - Outdoor air;  
 SUP - Supply air;  
 ETA - Extract air;  
 EHA - Exhaust air;  
 Note: Due to the tolerances of the individual parts and the sealing gaskets used, the actual dimensions may vary slightly.

Ventilation equipment installation specification 11.09.2024

Ventilation device model VERSO-R-90-L/AZ-H-EC/IE4/10/6.8-F7-M5-HW/2R/2.2-CW/4R/2.6-R1-C5-O/Sa

Notes

Kontaktna oseba:

Nr.	Title	AX code	Quantity
1	Avtomatsko krmiljenje C5		1

**Pretok vto nega zraka**

2	Filter zraka: 490x592x635\6	771400091	10
3	Rotacijski toplotni izmenjevalec RR-AZ-2400-L-O-S(2500x2500x350)-P2-A1(C5)	1078649	1
4	Grelec zraka HW-G20-02R-2341-1080-160-1x25C-22F-M1-C40-IS1-XX-1xR2/1xR2-180	0	1
5	Hladilec zraka CW-G10-04R-2306-1080-220-1x49C-26F-M1-C40-IS1-XX-1xR3/1xR3-180	0	1
6	Ventilator RH56C-ZID.GL.CR(116161)	727000484	2
7	Sound absorbers PRO_90_70_SE20_100_15_S	1204846	1
8	Dodatna oprema		

**Pretok odto nega zraka**

9	Filter zraka: 490x592x635\6	771200192	10
10	Ventilator RH56C-ZID.GG.CR(116160)	727000524	2
11	Sound absorbers PRO_90_71_SE20_100_15_S	1204847	1
12	Dodatna oprema		