

From Inspection Side

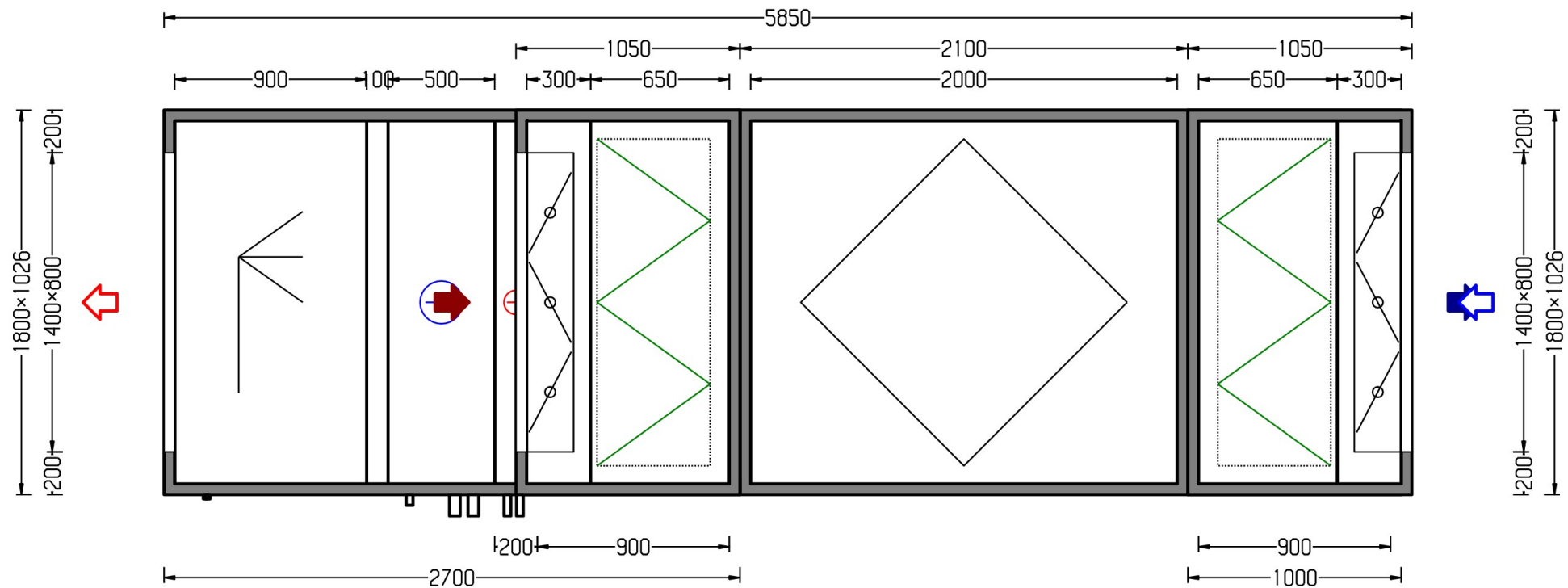
2013-12-14
2.7.131212.2

Customer id 60590
Project 71
Unit 11
AOC ACON-01377763

Project name VENTSPILS EC_2013-12-12
Unit name P2N2_ražošana
Supply air eQ-032
Exhaust air eQ-032

VENTSPILS EC_2013-12-12
P2N2_ražošana
10380 m³/h
9880 m³/h

FläktWoods



From Above

2013-12-14
2.7.131212.2

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Unit	11
AOC	ACON-01377763

Project name	VENTSPILS EC_2013-12-12
Unit name	P2N2_ražošana
Supply air	eQ-032 10380 m³/h
Exhaust air	eQ-032 9880 m³/h

FläktWoods

AIR HANDLING UNIT eQ

Project	71 () / VENTSPILS EC_2013-12-12	2.7.131212.2
AOC	ACON-01377763	
Unit	11 () / P2N2_ražošana	2013-12-14
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Customer		
Customers ref.		
Our ref.	Andrejs Garders	
Supply air flow	10380 m³/h	Exhaust air flow 9880 m³/h
Ext. static pressure	350 Pa	Ext. static pressure 350 Pa
Voltage	3 x 400V + N, 50 Hz	Weight 2345 kg
SFP _v	1,88 kW/(m³/s)	Dimensioned for wet condition
Ref. density	1,2 kg/m³	Ref. altitude above sea level 0 m

SUMMARY

Functional sections in direction of air flow	v0 (m/s)	Et (%)	tw (°C)	ts (°C)	dP* (Pa)
Supply air:					
Supply inlet					50
Connection section	2,7				3
Filter	2,3				126
Heat exchanger	1,8	57,9	-18 / 3,1		100
Plenum fan		75,6	3,1 / 4	30 / 31	776
Air heater	2,1		4 / 30		30
Air cooler	2,3			31 / 20	65
Inspection section					0
Humidifier	2,8		30 / 18		75
Connection section	2,6				1
General loss					26
Supply outlet					300
Exhaust air:					
Exhaust inlet					300
Connection section	2,5				3
Filter	2,2				81
Heat exchanger	1,9		23 / 5,5		82
Plenum fan		74,1			539
General loss					23
Exhaust outlet					50

*Refers to the fan design case

SOUND POWER LEVELS

(standard: EN13053 ISO/CD 13347-2)

	Lw per octave band (dB)								LwA
Octave band (Hz)	63	125	250	500	1k	2k	4k	8k	dB(A)
Fresh air connection	62	62	77	65	64	59	54	53	71
Supply air connection	63	63	80	75	71	62	54	51	76
Extract connection	66	76	75	67	60	56	52	51	70
Exhaust connection	69	79	81	80	77	71	67	65	82
To surroundings	64	69	68	52	50	48	42	32	61

TOLERANCE

According to EN 13053 the LwA tolerance is 4dB. Octave band tolerances are presented in the tolerance table

	Lw per octave band (dB)								LwA
Octave band (Hz)	63	125	250	500	1k	2k	4k	8k	dB(A)
TOLERANCE	8	6	6	6	6	4	4	7	4

Frequency converters and motors mounted external are not included in the sound power levels

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Customer		
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SFP _v	1,88 kW/(m³/s)	Dimensioned for wet condition
Ref. density	1,2 kg/m³	Ref. altitude above sea level 0 m

SUMMARY

Unit

Supply air flow	10380 m³/h	Installation	Indoor horizontal
Ext. static pressure	350 Pa	Material	AlZn sheet steel
Exhaust air flow	9880 m³/h	Thermal insulation	T3
Ext. static pressure	350 Pa	Condensation insulation	TB3
Dim. temp. summer	30 °C	Leakage class	L2
Dim. humidity summer	35 %	Casing strength	CEN D2
Dim. temp. winter	-18 °C	Filter grade supply	
Dim. humidity winter	90 %	Filter grade extract	
Temperature in, supply air, summer	20 °C	Temperature in, extract air, summer	22 °C
Air humidity in, supply air, summer	60 %	Air humidity in, extract air, summer	50 %
Temperature in, supply air, winter	18 °C	Temperature in, extract air, winter	23 °C
Air humidity in, supply air, winter	45 %	Air humidity in, extract air, winter	35 %
Heat recovery efficiency	57,9 %	Heat recovery capacity	73,3 kW
SFP _v supply air	1,12 kW/(m³/s)	Total dry weight	2345 kg
SFP _v exhaust air inlet	0,80 kW/(m³/s)	Heaviest block	839 kg
SFP _v total sum	1,88 kW/(m³/s)		

Coils

	Capacity [kW]	Air In [°C/%]	Air Out [°C/%]	Water in/out [°C]	Antifreeze	Water [l/s]	Water [kPa]	Conn [mm]
Air heater	90,8	4/13,9	30/2,7	70/50		0,0	7,6	32
Air cooler	40,3	31/33	20/62,7	7/12		0,0	6,9	50

Motor data

Voltage	3 x 400V + N, 50 Hz		
Power, supply flow	4,0 kW	Power, extract flow	3,0 kW
Current, full load, supply flow	8,6 A	Current, full load, extract flow	6,3 A

SOUND POWER LEVELS

(standard: EN13053 ISO/CD 13347-2)

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Octave band (Hz)	63	125	250	500	1k	2k	4k	8k	dB(A)
Fresh air connection	62	62	77	65	64	59	54	53	71
Supply air connection	63	63	80	75	71	62	54	51	76
Extract connection	66	76	75	67	60	56	52	51	70
Exhaust connection	69	79	81	80	77	71	67	65	82
To surroundings	64	69	68	52	50	48	42	32	61

TOLERANCE

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Customer

Customers ref.

Our ref. Andrejs Garders

Supply air flow	10380 m³/h	Exhaust air flow	9880 m³/h
Ext. static pressure	350 Pa	Ext. static pressure	350 Pa
Voltage	3 x 400V + N, 50 Hz	Weight	2345 kg
SFP _v	1,88 kW/(m³/s)	Dimensioned for wet condition	
Ref. density	1,2 kg/m³	Ref. altitude above sea level	0 m

TOLERANCE	8	6	6	6	6	4	4	7	4
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Frequency converters and motors mounted external are not included in the sound power levels

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TECHNICAL SPECIFICATION (components listed in direction of air flow)

SUPPLY AIR

Intake air section

Pressure drop, dimensioning

3 Pa

Casing end wall

Damper

Width cm : 140

Height in cm : 080

Tightness class : CEN 3

Connection: flange

Function : Outdoor air

Location: internally end wall

Damper type: 200 mm blade

Material : galvanized sheet steel

Damper actuator

Empty section

Unit size : 032

Length: 030

Inspection side : left

Filter

Unit size : 032

Filter class : F7

Filter type : synthetic

Filter length : Long bag (vertical pockets only)

Filter frame : galvanized sheet steel

Connection side : inlet in end wall

Location: negative pressure

Material: galvanized sheet steel

Inspection side : left

Number of filters

4x392x792

Pressure drop, start

76 Pa

Pressure drop, dimensioning

126 Pa

Pressure drop, end

176 Pa

Face area

1,3 m²

Face velocity

2,3 m/s

Analogue differential pressure sensor

Design: U-tube manometer for air flow measuring

Plate heat exchanger, RECUTERM

Unit size : 032

Installation alternative, right-hand/left-hand : 1

Exhaust air direction: downwards

Fin material : aluminium

Design : sectionalized defrosting

Material : galvanized sheet steel

Inspection side: left

Version number: version 1

Performance, unregulated

Air temperature in

-18

0 °C

Air temperature out

7,4

13,3 °C

Efficiency

61,9

57,9 %

Antifrost control

Temperature efficiency

51,4 %

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Capacity reduction 73,3 kW
25% of the inlet area is blocked off during sectional defrosting

Temperature limit when frost protection starts: -7 °C

Supply air

Pressure drop, dimensioning 100 Pa

Air temperature -18 / 3,1 °C

Relative humidity 90 / 14,8 %

Exhaust air

Pressure drop, dimensioning 82 Pa

Air temperature 23 / 5,5 °C

Relative humidity 35 / 76,8 %

EN308

Efficiency calculated in regard to conditions specified by the EN308 standard 57,3 %

Water trap

Type: Negative pressure -800 Pa

Water trap

Type: Negative pressure -800 Pa

Plenum fan Centriflow Plus

Unit size : 032

Fan size : 2

Equipment: normal + pressure tapping for air flow measurement

Anti-vibration mountings : rubber

Position inside the casing : supply air

Outlet direction : forward, towards following function

Material : galvanized sheet steel

Inspection side: left

Dimensioning data

Speed 1653 Rpm

Fan efficiency 75,6 %

Total efficiency 63,3 %

Pressure rise, dimensioning 776 Pa

Fan shaft power at dim. data 3,08 kW

Grid Power 3,68 kW

Temperature rise 1 °C

SFP Calculation

Grid power according to SFP 3,24 kW

Pressure rise 713 Pa

Speed 1571 Rpm

Centriflow Plus Fan Unit + Motor

Single-speed motor

Voltage: 380-420 V delta, 660-690 V star

Temperature sensors in stator winding: with thermistor

Design variant: FläktWoods IE2

Efficiency 86,6 %

Speed 1450 Rpm

Motor output 4,0 kW

Electric current 8,6 A

Number of Poles 4

Output margin, minimum 10 %

Frequency converter

Efficiency 96,6 %

Operating frequency 57 Hz

Max frequency at frequency control 61,5 Hz

Max speed at frequency control 1784 Rpm

Motor accessories

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Motor: 1-Speed
Motor control: Mounted frequency converter
Type: Standard
Length: 356
Power supply: 3x400 VAC

Air heater for hot water

Output variant : 2	
Material, coil : Cu/Al	
Fin pitch: 2 mm	
Fluid circuits: 04	
Design: one complete coil	
Material, frame : galvanized sheet steel	
Connection side : left	
Nom. pipe size	32
Liquid volume	10,8 l
Pressure drop, dimensioning	28 Pa
Output	90,8 kW
Air temperature	4 / 30 °C
Face velocity	2,1 m/s
Control principle for water heater	flow control
Water temperature	70 / 50 °C
Water flow	1,13 l/s
Water velocity	0,8 m/s
Pressure drop water	7,6 kPa

Air cooler for chilled water

Use as: Cooling Coil	
Unit size : 032	
Output variant : 4	
Design: normal face area	
Fin pitch: 2.5 mm	
Material, coil : Cu/Al	
Droplet eliminator : with, plastic	
Material, frame : galvanized sheet steel	
Connection side : left	
Nom. pipe size	50
Liquid volume	22,6 l
Pressure drop, dimensioning	65 Pa
Pressure drop	65 Pa
Output	40,3 kW
Air temperature	31 / 20 °C
Relative humidity	33 / 62,7 %
Face velocity	2,3 m/s
Water temperature	7 / 12 °C
Water flow	1,92 l/s
Water velocity	0,7 m/s
Pressure drop water	6,9 kPa

Water trap

Type: Positive pressure +3000 Pa

fin comb, kit of 10 pcs

Manual air purging valve

Empty section

Unit size : 032
Length: 010
Inspection side : left

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Humidifier, evaporative

Unit size: 032
Humidification rate: 60%
Version: circulating water
Inspection side: left

	Summer	Winter
Pressure drop, dimensioning	75	76 Pa
Air temperature	20 / 20	30 / 18 °C
Relative humidity	62,7 / 62,7	3 / 44,4 %
Water temperature	10	10 °C
Humidifier data		
Water Consumption		14 l/min
Water trap		
Type: Positive pressure +3000 Pa		

End connection frame

Pressure drop, dimensioning	1 Pa
Casing end wall	

EXHAUST AIR

Intake air section

Pressure drop, dimensioning	3 Pa
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Casing end wall

Damper

Width cm : 140
Height in cm : 080
Tightness class : CEN 3
Connection: flange
Function : exhaust air
Location: internally end wall
Damper type: 200 mm blade
Material : galvanized sheet steel

Damper actuator

Empty section

Unit size : 032
Length: 030
Inspection side : right

Filter

Unit size : 032
Filter class : M5
Filter type : synthetic
Filter length : Long bag (vertical pockets only)
Filter frame : galvanized sheet steel
Connection side : inlet in end wall
Location: negative pressure
Material: galvanized sheet steel
Inspection side : right
Number of filters
Pressure drop, start
Pressure drop, dimensioning
Pressure drop, end
Face area
Face velocity
Analogue differential pressure sensor

4x392x792
31 Pa
81 Pa
131 Pa
1,3 m²
2,2 m/s

AIR HANDLING UNIT eQ

Project	71 () / VENTSPILS EC_2013-12-12	2.7.131212.2
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Unit	11 () / P2N2_ražošana	2013-12-14
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Design: U-tube manometer for air flow measuring

Plenum fan Centriflow Plus

Unit size : 032

Fan size : 2

Equipment: normal + pressure tapping for air flow measurement

Anti-vibration mountings : rubber

Position inside the casing : exhaust air

Outlet direction : forward, to duct (rectangular)

Material : galvanized sheet steel

Inspection side: right

Dimensioning data

Speed	1441 Rpm
Fan efficiency	74,1 %
Total efficiency	61,3 %
Pressure rise, dimensioning	539 Pa
Fan shaft power at dim. data	2,02 kW
Grid Power	2,45 kW
Temperature rise	0,7 °C

SFP Calculation

Grid power according to SFP	2,21 kW
Pressure rise	488 Pa
Speed	1393 Rpm

Centriflow Plus Fan Unit + Motor

Single-speed motor

Voltage: 220-240 V delta, 380-420 V star, 220 V delta, 380 V star

Temperature sensors in stator winding: with thermistor

Design variant: FläktWoods IE2

Efficiency	85,5 %
Speed	1445 Rpm
Motor output	3,0 kW
Electric current	6,3 A
Number of Poles	4
Output margin, minimum	10 %

Frequency converter

Efficiency	96,7 %
Operating frequency	50 Hz
Max frequency at frequency control	52,6 Hz
Max speed at frequency control	1519 Rpm

Motor accessories

Motor: 1-Speed

Motor control: Mounted frequency converter

Type: Standard

Length: 356

Power supply: 3x400 VAC