

From Inspection Side

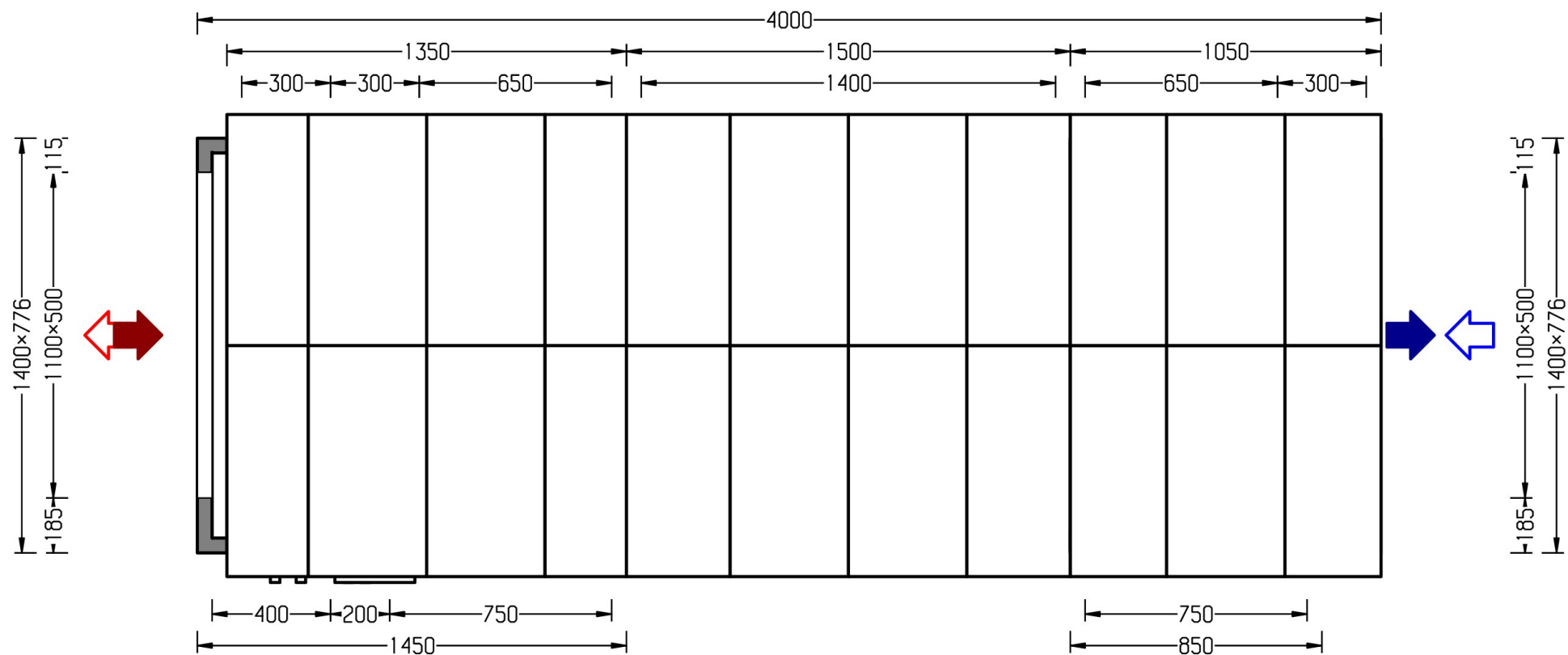
2013-05-27
2.7.130416.1

Customer id 60590
Project 67
Unit 14
AOC ACON-01203176

Project name
Unit name
Supply air eQ-018
Exhaust air eQ-018

VENTSPILS EC_2013-01-16
() / P5N5_kafeinīca
4947 m³/h
4772 m³/h

FläktWoods



From Above

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AIR HANDLING UNIT eQ

Project	67 () / VENTSPILS EC_2013-01-16	2.7.130416.1
AOC	ACON-01203176	
Unit	14 () / P5N5_kafeinīca	2013-05-27
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Customer		
Customers ref.		
Our ref.	Andrejs Garders	
Supply air flow	4947 m³/h	Exhaust air flow 4772 m³/h
Ext. static pressure	350 Pa	Ext. static pressure 350 Pa
Voltage	3 x 400V + N, 50 Hz	Weight 1372 kg
SFP _v	1,85 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:					
Connection section	2,6				3
Filter	2,0				112
Heat exchanger	1,7	57,4	-18 / 2,8		85
Plenum fan		74,0	2,8 / 3,7	30 / 30,9	668
Air heater	2,0		3,7 / 22		38
Air cooler	2,1			30,9 / 17,4	49
Connection section	2,5				1
Exhaust air:					
Connection section	2,4				2
Electrical control section					0
Filter	1,9				75
Heat exchanger	1,8		23 / 5,9		71
Plenum fan		73,1			519

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	56	57	69	60	59	56	52	52	65
Supply air connection	60	65	74	73	71	66	59	56	75
Extract connection	55	56	70	61	57	54	50	50	65
Exhaust connection	61	66	76	75	74	71	66	64	78
To surroundings	55	53	61	47	46	45	40	31	55

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

AIR HANDLING UNIT eQ

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AOC ACON-01203176
Unit 14 () / P5N5_kafeinīca 2013-05-27
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Customer
Customers ref.
Our ref. Andrejs Garders
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SFP_v 1,85 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	4947 m³/h	Installation	Outdoor horizontal
Ext. static pressure	350 Pa	Material	AlZn sheet steel
Exhaust air flow	4772 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	16 °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	22 °C	Temperature in, extract air, winter	23 °C
Air humidity in, supply air, winter	20 %	Air humidity in, extract air, winter	35 %
Heat recovery efficiency	57,4 %	Heat recovery capacity	34,5 kW
SFP _v supply air	1,06 kW/(m³/s)	Total dry weight	1372 kg
SFP _v exhaust air inlet	0,82 kW/(m³/s)	Heaviest block	469 kg
SFP _v total sum	1,85 kW/(m³/s)	Largest block	1550 x 1957 x 1550 mm

Coils

	Capacity [kW]	Air In [°C/%]	Air Out [°C/%]	Water in/out [°C]	Antifreeze	Water [l/s]	Water [kPa]	Conn [mm]
Air heater	30,4	3,7/14,1	22/4,3	70/50	Ethylene glycol 35 %	0,39	1,8	32
Air cooler	22,7	30,9/33,1	17,4/74,3	7/12	Ethylene glycol 35 %	1,16	15,6	32

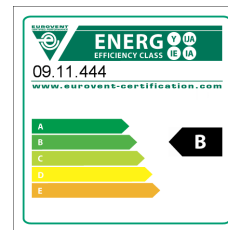
Motor data

Voltage 3 x 400V + N, 50 Hz
Power, supply flow 2,2 kW Power, extract flow 1,5 kW
Current, full load, supply flow 4,7 A Current, full load, extract flow 3,3 A

SOUND POWER LEVELS

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TECHNICAL SPECIFICATION (components listed in direction of air flow)

SUPPLY AIR

Intake/ exhaust section (outdoor version, with door)

Unit size: 018
Installation alternative: Fresh air in end, with intake grille and damper
Damper type: with galvanized CEN 3 damper
Inspection side: left
Pressure drop, dimensioning

3 Pa

Casing end wall

Multi cable

Damper

Width cm : 110
Height in cm : 050
Tightness class : CEN 3
Connection: flange
Function : Outdoor air
Location: internally end wall
Damper type: 100 mm blade
Material : galvanized sheet steel

Damper actuator

Empty section

Unit size : 018
Length: 030
Inspection door : with door (for negative pressure)
Inspection side : left

Filter

Unit size : 018
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
Pressure drop, start
Pressure drop, dimensioning
Pressure drop, end
Face area
Face velocity

2x592x592

62 Pa

112 Pa

162 Pa

0,7 m²

2,0 m/s

Analogue differential pressure sensor

Design: U-tube manometer for air flow measuring



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Plate heat exchanger, RECUTERM

Unit size : 018

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

Exhaust air direction: downwards

Fin material : aluminium

Design : sectionalized defrosting

Control connection: with

Material : galvanized sheet steel

Inspection side: left

Version number: version 1

Performance, unregulated

Air temperature in	-18	0 °C
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Air temperature out	7,2	13,2 °C
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Efficiency	61,4	57,4 %
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Antifrost control

Temperature efficiency		50,7 %
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Capacity reduction		34,5 kW
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25% of the inlet area is blocked off during sectional defrosting

Temperature limit when frost protection starts:		-7 °C
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Supply air

Pressure drop, dimensioning		85 Pa
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Air temperature		-18 / 2,8 °C
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Relative humidity		90 / 15 %
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Exhaust air

Pressure drop, dimensioning		71 Pa
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Air temperature		23 / 5,9 °C
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Relative humidity		35 / 76,7 %
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Multi cable

Water trap

Type: Negative pressure –800 Pa

Water trap

Type: Negative pressure –800 Pa

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Plenum fan Centriflow Plus

Unit size : 018
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	2216 Rpm
Fan efficiency	74,0 %
Total efficiency	60,0 %
Pressure rise, dimensioning	668 Pa
Fan shaft power at dim. data	1,29 kW
Grid Power	1,59 kW
Temperature rise	0,9 °C

SFP Calculation

Grid power according to SFP	1,46 kW
Pressure rise	636 Pa
Speed	2129 Rpm

Centriflow Plus Fan Unit + Motor

Wheel diameter: 040
Number of poles: 4
Rated output: 00220
Motor type: Fläkt Woods Asynchronous
Voltage: 220 – 240 VD / 380 – 420 VY
Brand: Fläkt Woods
Version: 2011

Multi cable

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
Speed
Motor output
Electric current
Number of Poles
Output margin, minimum

84,3 %
1450 Rpm
2,2 kW
4,7 A
4
10,0 %

Frequency converter

Efficiency	96,2 %
Operating frequency	76 Hz
Max frequency at frequency control	90,1 Hz
Max speed at frequency control	2611 Rpm

Motor accessories

Motor: 1-Speed
Motor control: Mounted frequency converter
Connection accessories: Quick connection
Type: Standard
Length: 261
Power supply: 3x400 VAC

Fan control

Fan location: Supply fan
Control function: Flow control
Control reference: Setpoint in DUC
Pressure range: 0-5000 Pa
Fire function: Without



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Design: Standard

Delivery option: Mounted on current sub, quick connection

Start equipment fan

Fan location: Supply 1

Motor: 1-Speed

Start method: Frequency converter

Voltage: 400 VAC, 3-phase

Rated current high speed: 047

Delivery options: Mounted on current sub, quick connection

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

Pressure drop, dimensioning

38 Pa

Output

30,4 kW

Air temperature

3,7 / 22 °C

Face velocity

2,0 m/s

Liquid volume

6,5 l

Control principle for water heater

flow control

Water temperature

70 / 50 °C

Water flow

0,39 l/s

Water velocity

0,4 m/s

Pressure drop water

1,8 kPa

Ethylene glycol

35 %

Frost protection sensor

Type of heater: Air heater

Sensor type: Standard

Design: Immersion sensor

Delivery option: Supplied with STEQ

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Air cooler for chilled water

Use as: Cooling Coil	
Unit size : 018	
Output variant : 4	
Design: normal face area	
Fin pitch: 2 mm	
Material, coil : Cu/Al	
Material, frame : galvanized sheet steel	
Connection side : left	
Nom. pipe size	32
Liquid volume	12,4 l
Ethylene glycol	35 %
Pressure drop, dimensioning	49 Pa
Pressure drop	49 Pa
Output	22,7 kW
Air temperature	30,9 / 17,4 °C
Relative humidity	33,1 / 74,3 %
Face velocity	2,1 m/s
Water temperature	7 / 12 °C
Water flow	1,16 l/s
Water velocity	0,8 m/s
Pressure drop water	15,6 kPa

Water trap

Type: Positive pressure +3000 Pa

End connection frame

Pressure drop, dimensioning	1 Pa
Casing end wall	

EXHAUST AIR

Intake/ exhaust section (outdoor version, with door)

Unit size: 018	
Installation alternative: Fresh air in end, with intake grille and damper	
Damper type: with galvanized CEN 3 damper	
Inspection side: right	
Pressure drop, dimensioning	2 Pa

Casing end wall

Multi cable

Damper

Width cm : 110
Height in cm : 050
Tightness class : CEN 3
Connection: flange
Function : exhaust air
Location: internally end wall
Damper type: 100 mm blade
Material : galvanized sheet steel

Damper actuator

Empty section

Unit size : 018
Length: 030
Inspection door : with door (for negative pressure)
Inspection side : right



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Electrical casing

AHU size: 018
Function: Single casing for STEQ (L=300)
Effect for frequency converter: 000
Power supply: 3x400VAC
Manufacturer controls: Siemens
Design: Outdoor
Flange location: Without
Material: Fz steelplate
Inspection side: Left
Version number: version 1

Filter

Unit size : 018
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
Design: U-tube manometer for air flow measuring

2x592x592
25 Pa
75 Pa
125 Pa
0,7 m²
1,9 m/s

AIR HANDLING UNIT eQ

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Plenum fan Centriflow Plus

Unit size : 018
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	2002 Rpm
Fan efficiency	73,1 %
Total efficiency	57,6 %
Pressure rise, dimensioning	519 Pa
Fan shaft power at dim. data	0,953 kW
Grid Power	1,21 kW
Temperature rise	0,8 °C

SFP Calculation

Grid power according to SFP	1,09 kW
Pressure rise	469 Pa
Speed	1934 Rpm

Centriflow Plus Fan Unit + Motor

Wheel diameter: 040
Number of poles: 4
Rated output: 00150
Motor type: Fläkt Woods Asynchronous
Voltage: 220 – 240 VD / 380 – 420 VY
Brand: Fläkt Woods
Version: 2011

Multi cable

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
Speed
Motor output
Electric current
Number of Poles
Output margin, minimum

82,8 %
1450 Rpm
1,5 kW
3,3 A
4
10,0 %

Frequency converter

Efficiency	95,1 %
Operating frequency	69 Hz
Max frequency at frequency control	78,6 Hz
Max speed at frequency control	2279 Rpm

Motor accessories

Motor: 1-Speed
Motor control: Mounted frequency converter
Connection accessories: Quick connection
Type: Standard
Length: 261
Power supply: 3x400 VAC

Fan control

Fan location: Exhaust fan
Control function: Flow control
Control reference: Setpoint in DUC
Pressure range: 0-5000 Pa
Fire function: Without



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Design: Standard

Delivery option: Mounted on current sub, quick connection

Start equipment fan

Fan location: Exhaust 1

Motor: 1-Speed

Start method: Frequency converter

Voltage: 400 VAC, 3-phase

Rated current high speed: 033

Delivery options: Mounted on current sub, quick connection