

From Inspection Side

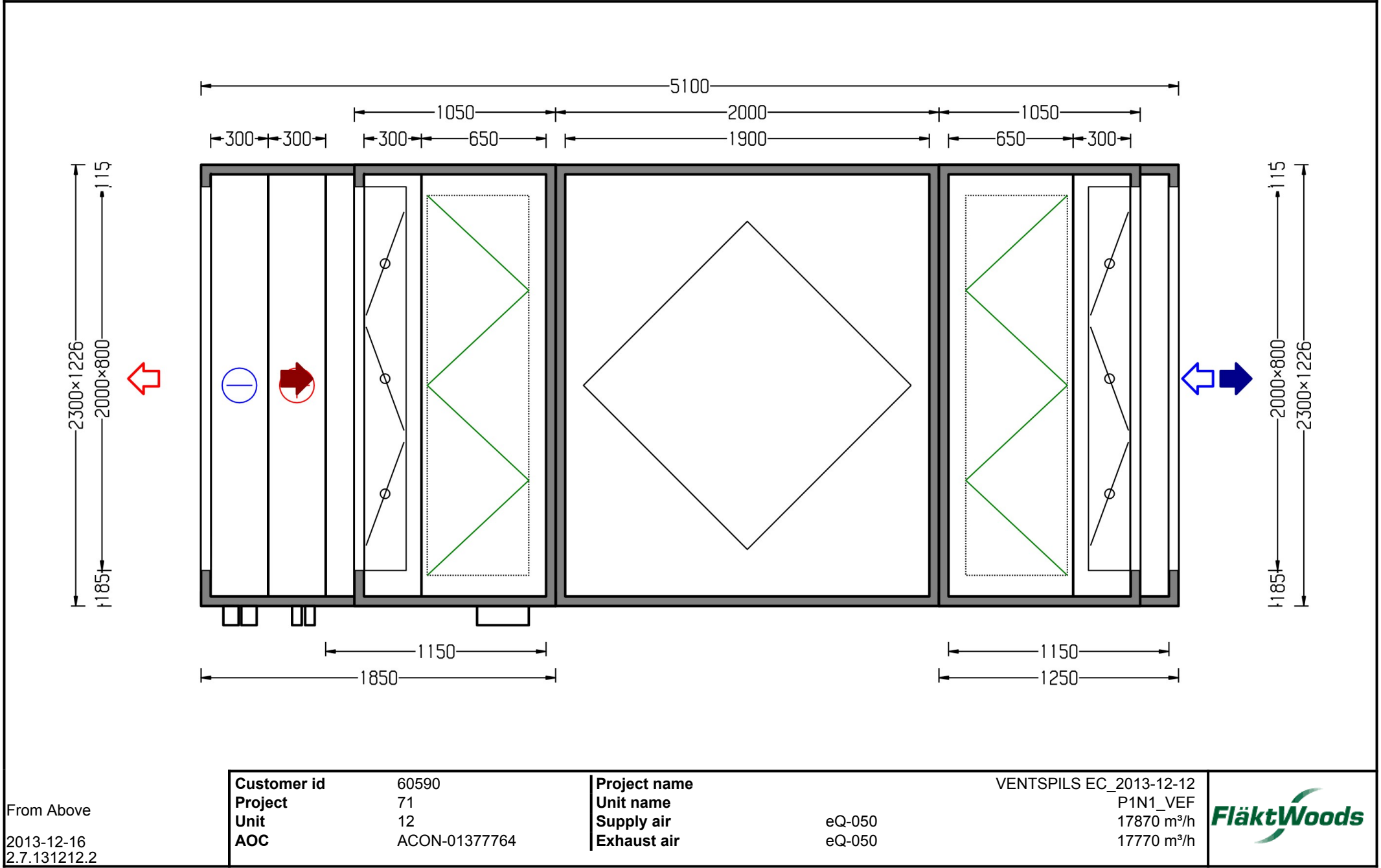
2013-12-16
2.7.131212.2

Customer id 60590
Project 71
Unit 12
AOC ACON-01377764

Project name
Unit name
Supply air eQ-050
Exhaust air eQ-050

VENTSPILS EC_2013-12-12
P1N1_VEF
17870 m³/h
17770 m³/h

FläktWoods



AIR HANDLING UNIT eQ

Project	71 () / VENTSPILS EC_2013-12-12	2.7.131212.2
AOC	ACON-01377764	
Unit	12 () / P1N1_VEF	2013-12-16
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Customer		
Customers ref.		
Our ref.	Andrejs Garders	
Supply air flow	17870 m³/h	Exhaust air flow 17770 m³/h
Ext. static pressure	550 Pa	Ext. static pressure 550 Pa
Voltage	3 x 400V + N, 50 Hz	Weight 3193 kg
SFP _v	2,45 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	3,2				5
Filter	2,6				137
Heat exchanger	2,3	58,3	-18 / 3,3		163
Plenum fan		76,1	3,3 / 4,4	30 / 31,2	935
Air heater	2,3		4,4 / 22		17
Air cooler	2,5			31,2 / 20	32
Connection section	3,1				1
General loss					30
Supply outlet					500
Exhaust air:					
Exhaust inlet					500
Connection section	3,1				5
Filter	2,5				89
Heat exchanger	2,5		23 / 5,9		145
Plenum fan		75,7			818
General loss					29
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	68	79	70	65	65	61	57	55	70
Supply air connection	68	85	81	80	77	71	65	59	82
Extract connection	68	79	72	67	65	61	57	55	71
Exhaust connection	70	87	85	84	81	77	73	69	86
To surroundings	67	75	63	52	53	51	46	35	62

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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Ref. density	1,2 kg/m³	Ref. altitude above sea level 0 m

SUMMARY

Unit

Supply air flow	17870 m³/h	Installation	Indoor horizontal
Ext. static pressure	550 Pa	Material	AlZn sheet steel
Exhaust air flow	17770 m³/h	Thermal insulation	T3
Ext. static pressure	550 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	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	58,3 %	Heat recovery capacity	128 kW
SFP _v supply air	1,29 kW/(m³/s)	Total dry weight	3193 kg
SFP _v exhaust air inlet	1,16 kW/(m³/s)		
SFP _v total sum	2,45 kW/(m³/s)	Heaviest block	1427 kg

Coils

	Capacity [kW]	Air In [°C/%]	Air Out [°C/%]	Water in/out [°C]	Antifreeze	Water [l/s]	Water [kPa]	Conn [mm]
Air heater	106	4,4/13,4	22/4,3	70/50		0,0	3,9	50
Air cooler	68,3	31,2/32,7	20/63,5	7/11,6		0,0	8,2	80

Motor data

Voltage	3 x 400V + N, 50 Hz		
Power, supply flow	11 kW	Power, extract flow	7,5 kW
Current, full load, supply flow	21 A	Current, full load, extract flow	15,3 A

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Fresh air connection	68	79	70	65	65	61	57	55	70
Supply air connection	68	85	81	80	77	71	65	59	82
Extract connection	68	79	72	67	65	61	57	55	71
Exhaust connection	70	87	85	84	81	77	73	69	86
To surroundings	67	75	63	52	53	51	46	35	62

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Customer

Customers ref.

Our ref. Andrejs Garders

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Ext. static pressure	550 Pa	Ext. static pressure	550 Pa
Voltage	3 x 400V + N, 50 Hz	Weight	3193 kg
SFP _v	2,45 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

5 Pa

Casing end wall

Multi cable

Damper

Width cm : 200

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 : 050

Length: 030

Inspection side : left

Filter

Unit size : 050

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

8x492x492

Pressure drop, start

87 Pa

Pressure drop, dimensioning

137 Pa

Pressure drop, end

187 Pa

Face area

2 m²

Face velocity

2,6 m/s

Analogue differential pressure sensor

Design: U-tube manometer for air flow measuring

Plate heat exchanger, RECUTERM

Unit size : 050

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

Air temperature out

7,6

13,4 °C

Efficiency

62,3

58,3 %

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Antifrost control

Temperature efficiency	52,1 %
Capacity reduction	128 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	163 Pa
Air temperature	-18 / 3,3 °C
Relative humidity	90 / 14,5 %

Exhaust air

Pressure drop, dimensioning	145 Pa
Air temperature	23 / 5,9 °C
Relative humidity	35 / 76,8 %

EN308

Efficiency calculated in regard to conditions specified by the EN308 standard	57,7 %
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Multi cable

Water trap

Type: Negative pressure -800 Pa

Water trap

Type: Negative pressure -800 Pa

Plenum fan Centriflow Plus

Unit size : 050

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	1416 Rpm
Fan efficiency	76,1 %
Total efficiency	67,5 %
Pressure rise, dimensioning	935 Pa
Fan shaft power at dim. data	6,34 kW
Grid Power	7,15 kW
Temperature rise	1,2 °C

SFP Calculation

Grid power according to SFP	6,42 kW
Pressure rise	870 Pa
Speed	1350 Rpm

Multi cable

Single-speed motor

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

Temperature sensors in stator winding: with thermistor

Design variant: FläktWoods IE2

Efficiency	89,8 %
Speed	1470 Rpm
Motor output	11 kW
Electric current	21,0 A
Number of Poles	4
Output margin, minimum	10 %

Frequency converter

Efficiency	98,7 %
Operating frequency	48 Hz

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Max frequency at frequency control	53,7 Hz
Max speed at frequency control	1578 Rpm

Motor accessories

Motor: 1-Speed
 Motor control: Mounted frequency converter
 Connection accessories: Quick connection
 Type: Standard
 Length: 428
 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
 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: 210
 Delivery options: Mounted on current sub, quick connection

Air heater for hot water

Output variant : 1	
Material, coil : Cu/Al	
Fin pitch: 2 mm	
Fluid circuits: 02	
Design: one complete coil	
Material, frame : galvanized sheet steel	
Connection side : left	
Nom. pipe size	50
Liquid volume	11,9 l
Pressure drop, dimensioning	15 Pa
Output	106 kW
Air temperature	4,4 / 22 °C
Face velocity	2,3 m/s
Control principle for water heater	flow control
Water temperature	70 / 50 °C
Water flow	1,31 l/s
Water velocity	0,7 m/s
Pressure drop water	3,9 kPa

Frost protection sensor

Type of heater: Air heater
 Sensor type: Standard
 Design: Immersion sensor
 Delivery option: Supplied with STEQ

Air cooler for chilled water

Use as: Cooling Coil
 Unit size : 050
 Output variant : 2
 Design: normal face area
 Fin pitch: 2 mm
 Material, coil : Cu/Al
 Material, frame : galvanized sheet steel

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Connection side : left	
Nom. pipe size	80
Liquid volume	26,0 l
Pressure drop, dimensioning	32 Pa
Pressure drop	32 Pa
Output	68,3 kW
Air temperature	31,2 / 20 °C
Relative humidity	32,7 / 63,5 %
Face velocity	2,5 m/s
Water temperature	7 / 11,6 °C
Water flow	3,57 l/s
Water velocity	1,0 m/s
Pressure drop water	8,2 kPa

Water trap

Type: Positive pressure +3000 Pa

Coil control

Manufacturer: Siemens

Control alternative: Only actuator

Valve type: Without

Type of coil: Cooling coil

Calculated kvs value: 40

Delivery options: Supplied with STEQ

End connection frame

Pressure drop, dimensioning	1 Pa
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Casing end wall

EXHAUST AIR

Intake air section

Pressure drop, dimensioning	5 Pa
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Casing end wall

Multi cable

Damper

Width cm : 200

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 : 050

Length: 030

Inspection side : right

Filter

Unit size : 050

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

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Inspection side : right	
Number of filters	8x492x492
Pressure drop, start	39 Pa
Pressure drop, dimensioning	89 Pa
Pressure drop, end	139 Pa
Face area	2 m ²
Face velocity	2,5 m/s

Analogue differential pressure sensor

Design: U-tube manometer for air flow measuring

Plenum fan Centriflow Plus

Unit size : 050
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	1339 Rpm
Fan efficiency	75,7 %
Total efficiency	65,7 %
Pressure rise, dimensioning	818 Pa
Fan shaft power at dim. data	5,42 kW
Grid Power	6,24 kW
Temperature rise	1 °C

SFP Calculation

Grid power according to SFP	5,75 kW
Pressure rise	765 Pa
Speed	1300 Rpm

Centriflow Plus Fan Unit + Motor

Multi cable

Single-speed motor

Voltage: 380-420 V delta, 660-690 V star
Temperature sensors in stator winding: with thermistor
Design variant: FläktWoods IE2

Efficiency	88,7 %
Speed	1460 Rpm
Motor output	7,5 kW
Electric current	15,3 A
Number of Poles	4
Output margin, minimum	10 %

Frequency converter

Efficiency	97,9 %
Operating frequency	46 Hz
Max frequency at frequency control	50,1 Hz
Max speed at frequency control	1462 Rpm

Motor accessories

Motor: 1-Speed
Motor control: Mounted frequency converter
Connection accessories: Quick connection
Type: Standard
Length: 428
Power supply: 3x400 VAC

Fan control

Fan location: Exhaust fan
Control function: Flow control



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Control reference: Setpoint in DUC

Pressure range: 0-5000 Pa

Fire function: Without

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: 153

Delivery options: Mounted on current sub, quick connection