

Project	27320 () / SOAS - Music Rooms	Acon 2.41.15892.18626
AOC	ACON-02484473	
Unit	12 () / AHU 1 rev 1	2019-07-12
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Customer

Customers ref.

Our ref. Yuksel Tyler

Supply air volume flow rate	1.29 m³/sec	Exhaust air volume flow rate	1.29 m³/sec
External static pressure	250 Pa	External static pressure	250 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight	1158 kg
Specific el. power demand (SFPv)	1.70 kW/(m³/s)	Dimensioned for wet condition	
Ref. density	1.2 kg/m³	Ref. altitude above sea level	0 m

SUMMARY TECHNICAL SPEC.

Unit

Supply air volume flow rate	1.29 m³/sec	Installation	Outdoor horizontal
External static pressure	250 Pa	Material	AlZn sheet steel
Internal static pressure	410 Pa	Thermal insulation	T3
Exhaust air volume flow rate	1.29 m³/sec	Condensation insulation	TB3
External static pressure	250 Pa	Leakage class	L2
Internal static pressure	247 Pa	Casing strength	CEN D2
Design outdoor temperature summer	30 °C	Sum filtration supply air	ePM1 - 60.0%
Dim. humidity summer	45 %	Sum filtration exhaust air	ePM10 - 50.0%
Design outdoor temperature winter	-4 °C		
Dim. humidity winter	99.9 %		
Temperature in, supply air, summer	9.7 °C	Temperature in, extract air, summer	23 °C
Air humidity in, supply air, summer	50 %	Air humidity in, extract air, summer	50 %
Temperature in, supply air, winter	21 °C	Temperature in, extract air, winter	21 °C
Air humidity in, supply air, winter	30 %	Air humidity in, extract air, winter	40 %
Mixing ratio at winter design temperature	0 %		
Temperature efficiency (EN308)	87.6 %	Heat recovery capacity	41.6 kW
SFPv supply air	0.91 kW/(m³/s)	Total dry weight	1158 kg
SFPv exhaust air inlet	0.79 kW/(m³/s)		
SFPv total sum	1.70 kW/(m³/s)	Heaviest block	854 kg

ErP (according to (EU) directive 1253/2014)



Approved according to requirements 2018

Unit type: NRVU BVU

SFPint (2016: 1625 W/(m³/s), 2018: 1345 W/(m³/s))

Dry temperature efficiency (balanced)

(EN308) (2016: 67 %, 2018: 73 %)

External leakage rate

Internal leakage rate

636 W/(m³/s)

87.6 %

0.4 %

0.0 %

	Supply air	Extract air	Unit
Heat exchanger pressure drop	148	148	Pa
Filter energy classification	B	C	
Filter pressure drop, start	50	24	Pa
Filter area	0.7	0.7	m²
Filter cross section air velocity	1.9	1.8	m/s
Speed class			
Air flow	1.40	1.29	m³/sec
Fan fan system effect	10	11	Pa
Fan total efficiency	63.0	59.6	%
Specific el. power demand (SFPv)	0	0	W/(m³/s)
SFP Class	0	0	

AIR HANDLING UNIT eQ Prime

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Coils

	Capacity [kW]	Air In [°C/%]	Air Out [°C/%]	Water in/out [°C]	Antifreeze	Water [l/s]	Water [kPa]	Conn [mm]
Air heater	6.27	17/34.3	21/26.7	80/70		0.15	0.1	32
Air cooler	42.9	24.8/60.9	9.3/99.6	7/12		2.04	30.7	50

Fan power supply data

Voltage, supply flow	3x400VAC+PE, 50Hz	Voltage, extract flow	3x400VAC+PE, 50Hz
Power, supply flow	3.0 kW	Power, extract flow	3.0 kW
Current, full load, supply flow	6.3 A	Current, full load, extract flow	6.3 A

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	58	60	73	65	56	61	57	52	68
Supply air connection	68	67	71	66	66	66	64	62	72
Extract connection	55	57	77	69	54	58	54	52	71
Exhaust connection	67	69	76	72	75	73	72	71	80
To surroundings	53	56	68	52	39	50	45	33	60

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TECHNICAL SPECIFICATION (components listed in direction of air flow)

SUPPLY AIR

Intake air section

Size: 018

Material: AZ sheet steel

Inspection side: left

Pressure drop, dimensioning

4 Pa

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

Type: 2-Point with spring return

Delivery options: Mounted and connected

Duct connection piece

Connection: Flange

Material, frame: galvanized sheet steel / AlZn

Filter

Inspection side: left

Filter selection

Filter class: F7 - ePM1 60%, glassfibre

Filter frame : Galv cassette

Prefilter: without

Design

Connection side : inlet in end wall

Location: negative pressure

Drain tray: without

Number of filters

2x592x592

Pressure drop, start

49 Pa

Pressure drop, dimensioning

99 Pa

Pressure drop, end

149 Pa

Face area

0.7 m²

Face velocity

2.1 m/s

Filter monitoring

Location: Supply air

Type: Combi sensor (modbus)

Delivery options: Mounted and connected

Rotary heat exchanger

Size: 18

Rotor type: Regoterm

Output variant: output variant 10 (1.6, 270mm wheel)

Function lenght: rotary with fan section before and after

Delivery version: Assembled rotor unit, max. face area

Material: galvanized sheet steel

Inspection side: left

Voltage: 1 x 230 V

Control connections: yes

Efficiency

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Temperature efficiency according to standard EN 308	87.6 %
Temperature efficiency at 0°C outdoors	87.6 %
Cooling recovery	86.6 %
Humidity efficiency, Summer	0.0 %
Humidity efficiency, Winter	54.1 %

Supply air

	Summer	Winter
Pressure drop	154	138 Pa
Air temperature	30 / 23.9	-4 / 17.9 °C
Relative humidity	45 / 64.2	99.9 / 36.1 %
Capacity reduction	10	42 kW
Air flow transfer	0.17	0.17 m³/sec
Face velocity	2.0	2.0 m/s

Exhaust air

	Summer	Winter
Pressure drop	154	141 Pa
Air temperature	23 / 29.1	21 / 0.3 °C
Relative humidity	50 / 34.9	40 / 100 %
Additional throttling	0	0 Pa
Face velocity	2.0	2.0 m/s

Plenum fan

Inspection side: left

Fan selection

Fan size: size 2

Anti-vibration mountings: rubber

Motor selection

Motor type: PM-motor IE4

IEC Size: 90

Motor control

Manufacture, type: FläktGroup built-on

Housing protection: IP65

Design: on motor support

Delivery options: mounted on current sub, quick connection

Dimensioning data

Speed	2323 Rpm
Max speed	3190 Rpm
Nominal power (fan + motor + VSD)	3.0 kW
Nominal current (fan + motor + VSD)	6.3 A
Total efficiency	64.0 %
Total static pressure, dimensioning (wet coil)	660 Pa
Dynamic pressure	66 Pa
Fan system input power (absorbed electrical power)	1.36 kW
Output margin, minimum	30 %
Temperature rise	0.9 °C
K factor	29.62
Fan wheel size	040

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	1.18 kW
Pressure rise	575 Pa
Speed	2195 Rpm

Motor

Motor output	4.0 kW
Electric current	9.1 A

Doorstop (for doors on pressurized units)

Pressure-/flow sensor

Location: Supply air

Type: Combi sensor (modbus)

Pressure range: 0-3750 Pa

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Delivery options: Mounted and connected

Frequency converter

Motor cable

Centriflow 3D fan unit + PM motor

Intake air section

Size: 018

Material: AZ sheet steel

Inspection side: left

Pressure drop, dimensioning

0 Pa

Air cooler for chilled water

Use as: Cooling Coil

Size: 18

Coil Calculation Variant: Configure Friterm

Calculation principle: flow control, input data

Output variant: 8

Design: normal face area

Fin spacing: 2 mm

Fluid passes: 10

Droplet eliminator: with, plastic

Material, coil: Cu/Al, MS header

Material: galvanized sheet steel

Inspection side: left

Design variant: version 3

Shunt control: without

Nom. pipe size

50

Liquid volume

23.2 l

Pressure drop, dimensioning

134 Pa

Pressure drop, wet coil

134 Pa

Pressure drop, dry coil

100 Pa

Output

42.9 kW

Air temperature

24.8 / 9.3 °C

Relative humidity

60.9 / 99.6 %

Face velocity

1.9 m/s

Water temperature

7 / 12 °C

Water flow

2.04 l/s

Water velocity

1.2 m/s

Pressure drop water

30.7 kPa

Valve / valve actuator

Manufacturer: Siemens

Control alternative: Valve with actuator

Valve type: 3-port

Calculated kvs value: 16

Delivery options: Enclosed

Empty section

Size: 018

Length: 300 mm

Drain tray: without

Inspection door: with door

Inspection side: left

Doorstop (for doors on pressurized units)

Air heater for hot water

Size: 18

Calculation principle: flow control, input data

Output variant: 1

Design: normal face area

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Fin spacing: 3 mm	
Fluid passes: 02	
Material, coil: Cu/Al, MS header	
Material: galvanized sheet steel	
Inspection side: left	
Nom. pipe size	32
Liquid volume	3.6 l
Pressure drop, dimensioning , Winter	9 Pa
Output	6.27 kW
Air temperature	17 / 21 °C
Face velocity	2.0 m/s
Control principle for water heater	flow control
Water temperature	80 / 70 °C
Water flow	0.15 l/s
Water velocity	0.2 m/s
Pressure drop water	0.1 kPa

Frost protection sensor

Design: Immersion sensor
Delivery options: Enclosed

Valve / valve actuator

Manufacturer: Siemens
Control alternative: Valve with actuator
Valve type: 3-port
Calculated kvs value: 0.63
Delivery options: Enclosed

Casing end wall

Pressure drop, dimensioning	0 Pa
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Duct connection piece

Width cm : 110
Height in cm : 50
Connection type: flange connection
Material: galvanized sheet steel / AlZn

EXHAUST AIR

Intake air section

Size: 018	
Material: AZ sheet steel	
Inspection side: right	
Pressure drop, dimensioning	0 Pa

Duct connection piece

Connection: Flange
Material, frame: galvanized sheet steel / AlZn

Filter

Inspection side: right

Filter selection

Filter class: M5 - ePM10 50%, synthetic
Filter frame : Galv cassette
Prefilter: without

Design

Connection side : inlet in end wall	
Location: negative pressure	
Drain tray: without	
Number of filters	2x592x592
Pressure drop, start	26 Pa
Pressure drop, dimensioning	76 Pa
Pressure drop, end	126 Pa

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Face area	0.7 m ²
Face velocity	1.8 m/s

Filter monitoring

Location: Exhaust air
 Type: Combi sensor (modbus)
 Delivery options: Mounted and connected

Plenum fan

Inspection side: right

Fan selection

Fan size: size 2
 Anti-vibration mountings: rubber

Motor selection

Motor type: PM-motor IE4
 IEC Size: 90

Motor control

Manufacture, type: FläktGroup built-on
 Housing protection: IP65
 Design: on motor support
 Delivery options: mounted on current sub, quick connection

Dimensioning data

Speed	2285 Rpm
Max speed	3190 Rpm
Nominal power (fan + motor + VSD)	3.0 kW
Nominal current (fan + motor + VSD)	6.3 A
Total efficiency	60.7 %
Total static pressure, dimensioning (wet coil)	497 Pa
Dynamic pressure	85 Pa
Fan system input power (absorbed electrical power)	1.23 kW
Output margin, minimum	30 %
Temperature rise	0.7 °C
K factor	29.62
Fan wheel size	040

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	1.03 kW
Pressure rise	437 Pa
Speed	2116 Rpm

Motor

Motor output	4.0 kW
Electric current	9.1 A

Doorstop (for doors on pressurized units)

Pressure-/flow sensor

Location: Exhaust air
 Type: Combi sensor (modbus)
 Pressure range: 0-3750 Pa
 Delivery options: Mounted and connected

Frequency converter

Motor cable

Centriflow 3D fan unit + PM motor

Intake air section

Size: 018	
Material: AZ sheet steel	
Inspection side: right	
Pressure drop, dimensioning	4 Pa

Damper

Width cm : 110

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

Damper actuator

Type: 2-Point with spring return
Delivery options: Mounted and connected

Duct connection piece

Connection: Flange
Material, frame: galvanized sheet steel / AlZn

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CONTROLS

Product list

Electrical cabinet

STEQ-003-10-10-0-1-4-62-6-2-5

Placement: In cabinet

Voltage: 3x400 VAC

Control equipment: Siemens Climatix 600, TCP/IP

HMI (display): Semigrafical, handheld IP65

Design: Outdoor

Temperature control

STBZ-01-2-0-0-1-0-0-0-1-62-1

Type of control: Exhaust air control

Cooling recovery: With

Temperature control

STBZ-02-10-1-0-2-1-3

Placement: Supply air

Design: Duct mounted

Delivery options: Enclosed

Controls documentation

STBZ-36-62-5-018-1-03-03-1-1

Documentaion language, electrical drawings: English

HMI language: English

Fan control

STBZ-20-3-0-0-0-0-1-1-0

Control function: Flow supply- and extract fan

Fire function: Both fans stopped

Start equipment fan

STBZ-21-3-3-4-063-063-3-1-2

Fan configuration: Supply- and extract fan

Motor type: PM motor

Voltage: 3 x 400 V

Delivery options: Mounted and connected

Main switch

STBZ-80-023-1-1-2

Auxiliary switch: With auxiliary contact

Delivery options: Mounted and connected

Temperature control

STBZ-02-30-1-0-1-1-5

Placement: Out door temp sensor

Design: Mounted in air handling unit

Delivery options: Mounted and connected to combi sensor

Temperature control

STBZ-02-20-1-0-1-1-5

Placement: Exhaust air

Design: Mounted in air handling unit

Delivery options: Mounted and connected to combi sensor

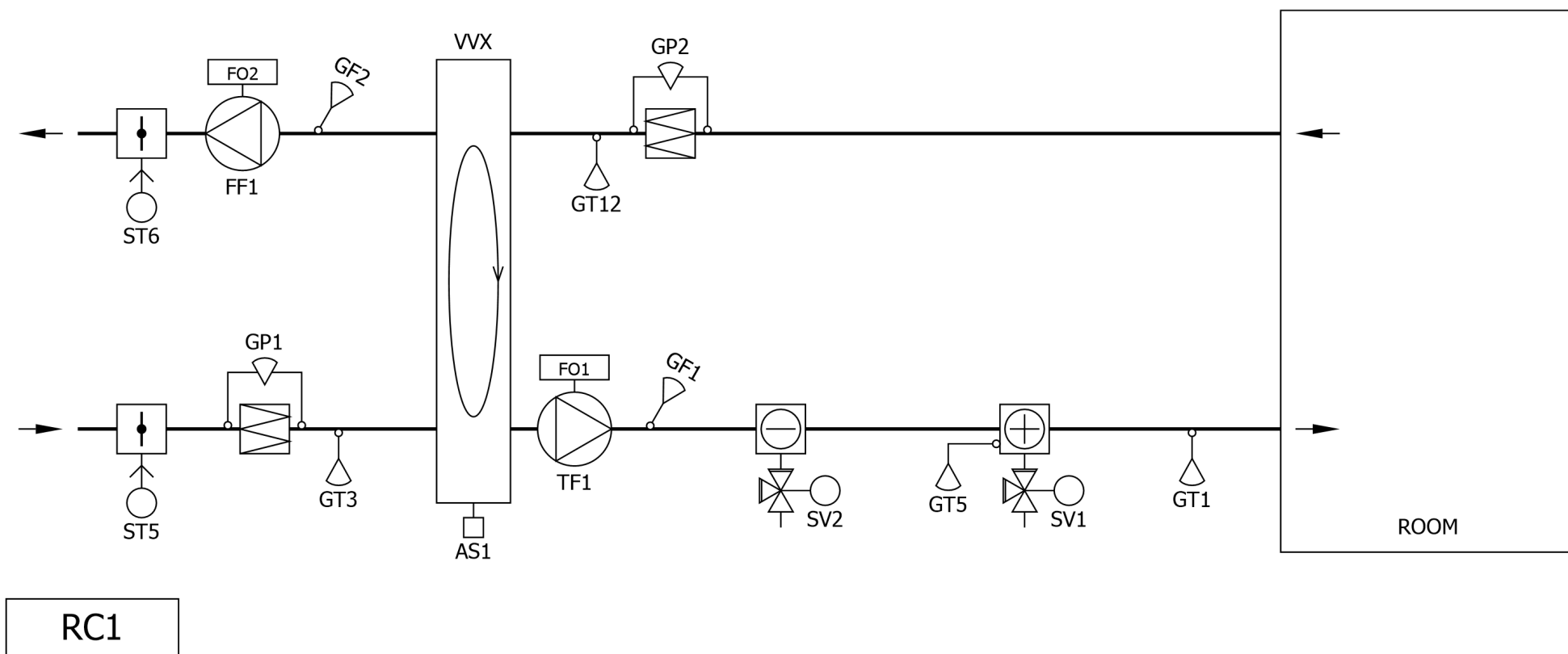
Communication

STBZ-51-62-1-0-3-0-1-2

Web: Simple web

Communication protocol: BACnet IP

Delivery options: Mounted and connected



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FläktGroup

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Description of Operation

Start and stop of air handling unit

When the fire alarm is triggered, both the supply air fan TF1 and exhaust fan FF1 are stopped.

Damper actuator ST5 opens before TF1 starts and closes when TF1 stops. ST5 closes at power failure.

Damper actuator ST6 opens before FF1 starts and closes when FF1 stops. ST6 closes at power failure.

The operation and alarm indication are in the OP-panel of RC1

RC1 controls the heatrecovery to 100% at start up, if the outdoor temperature is below 15°C

Temperature control

RC1 controls the air cooler, the heat exchanger and the air heater in sequence. When the need for heat increases, the heat exchanger VVX is controlled for heat recovery and the heater for warm air. When the need for cool air increases, the air cooler is controlled for cold air.

RC1 controls the heating coil via the valve actuator SV1.

RC1 controls rotary heat exchanger via drive AS1.

RC1 controls the cooling coil via the valve actuator SV2.

Temperature sensor GT12 keeps the right exhaust air temperature via RC1.

Temperature sensor GT1 keeps the supply air temperature within limits via RC1.

when the need for cold air increases RC1 controls actual recovery to 100% for cold air recovery.

when there is a risk for frost in the heating coil, frost protection sensor GT5 opens the valve actuator SV1, if the frost risk remains the air handling unit will be stopped.

when the air handling unit stops, frost protection sensor GT5 keeps the return water temperature constant to approximately 20°C

Fan control

Flow sensor GF1 keeps the flow constant for TF1 via FO1.

Flow sensor GF2 keeps the flow constant for FF1 via FO2.

Alarms for:

Running in manual mode,

heat exchanger VVX,

control failure supply air fan,

control failure exhaust air fan,

failure frequency converter supply air fan,

frost protection guard,

filter guard supply air,

filter guard exhaust air,

or temperature sensor failure.

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Component List

Description	Reference	Type	Delivery options	Notes
on/off damper actu. spring Outdoor air	ST5	GCA1.21	Factory Fitted & Wired	
Pressure guard Supply filter	GP1	QBM70	Factory Fitted & Wired	
Frequency converter exhaust air	FO1	OJ-DV	Factory Fitted & Wired	
Frequency converter supply air	FO1	OJ-DV	Factory Fitted & Wired	
Pressure guard Exhaust filter	GP2	QBM70	Factory Fitted & Wired	
Valve actuator Heating coil	SV1	SQS65	Supplied loose without cable for Fitting/Cabling/Containment by others	
Valve Heating	SV1	VXG44 kvs0.63	Supplied loose without cable for Fitting/Cabling/Containment by others	
Valve actuator Cooling coil	SV2	SQS65	Supplied loose without cable for Fitting/Cabling/Containment by others	
Valve Cooling	SV2	VXG44 kvs16.0	Supplied loose without cable for Fitting/Cabling/Containment by others	
Frost protection Immersion sensor	GT5	TF14	Supplied loose with Cable & Quick Connector for Fitting/Containment by others	
on/off damper actu. spring Exhaust air	ST6	GCA1.21	Factory Fitted & Wired	
Temperature sensor Supply air	GT1	PT1000 AKF1019207	Supplied loose with Cable & Quick Connector for Fitting/Containment by others	
Flow control Supply air	GF1	QBM70	Factory Fitted & Wired	
Flow control Exhaust air	GF2	QBM70	Factory Fitted & Wired	
Temperature sensor Outdoor air	GT3	QBM70	Factory Fitted & Wired	
Temperature sensor Exhaust air	GT12	QBM70	Factory Fitted & Wired	

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RATED CURRENT

Connection Point	Product Codes	Rated Voltage	Rated Current
Electrical cabinet	Acon STEQ	3x400 VAC	14.6 A*
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TOTAL			14.6 A

*External loads (e.g pumps, shunts) are not included.

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BLOCK LIST

	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	VOLUME (m³)	WEIGHT (kg)
EQHC-018-230-22-1-1-2-1-1-2-1 Unit casing, eQ Prime Model box code: EQ 1111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2 Casing strength: CEN D2 EQVI Filter Plenum fan Centriflow 3D Rotary heat exchanger Filter Plenum fan Centriflow 3D EQVI	2450	1800	1957	8.63	854
EQGA-018-120-22-1-1-2-1-1-2-1 Unit casing (frameless, module) Model box code: EQ 1111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2 Casing strength: CEN D2 Air cooler for chilled water Empty section Air heater for hot water Casing end wall	1300	1550	1181	2.38	304
				11.01	1158

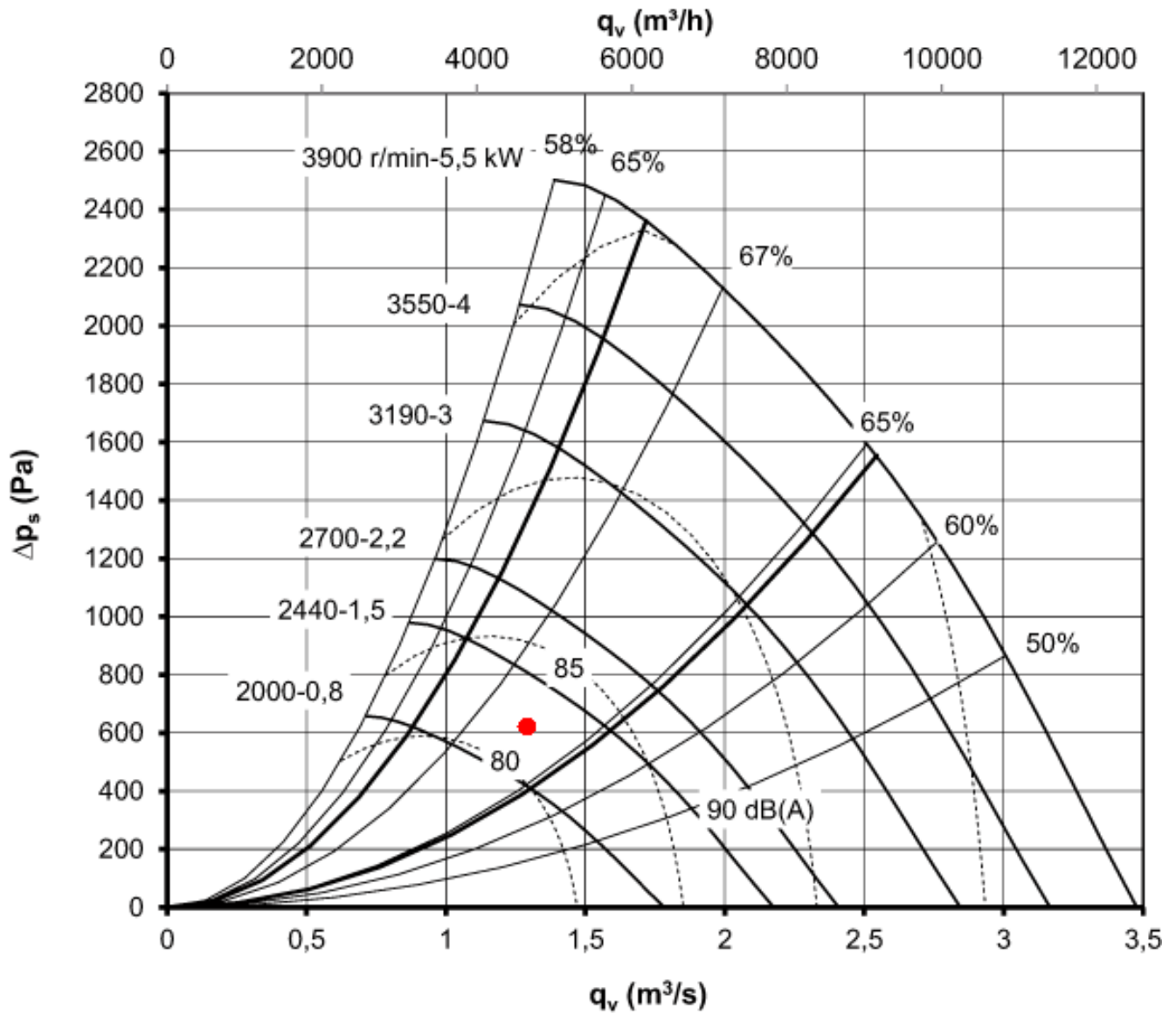
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Fan chart - Supply air - EQLP-018-2-0-1-1-4-0-1-2-1-2-1



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Fan chart - Exhaust air inlet - EQLP-018-2-0-1-1-4-0-2-2-1-1-1

