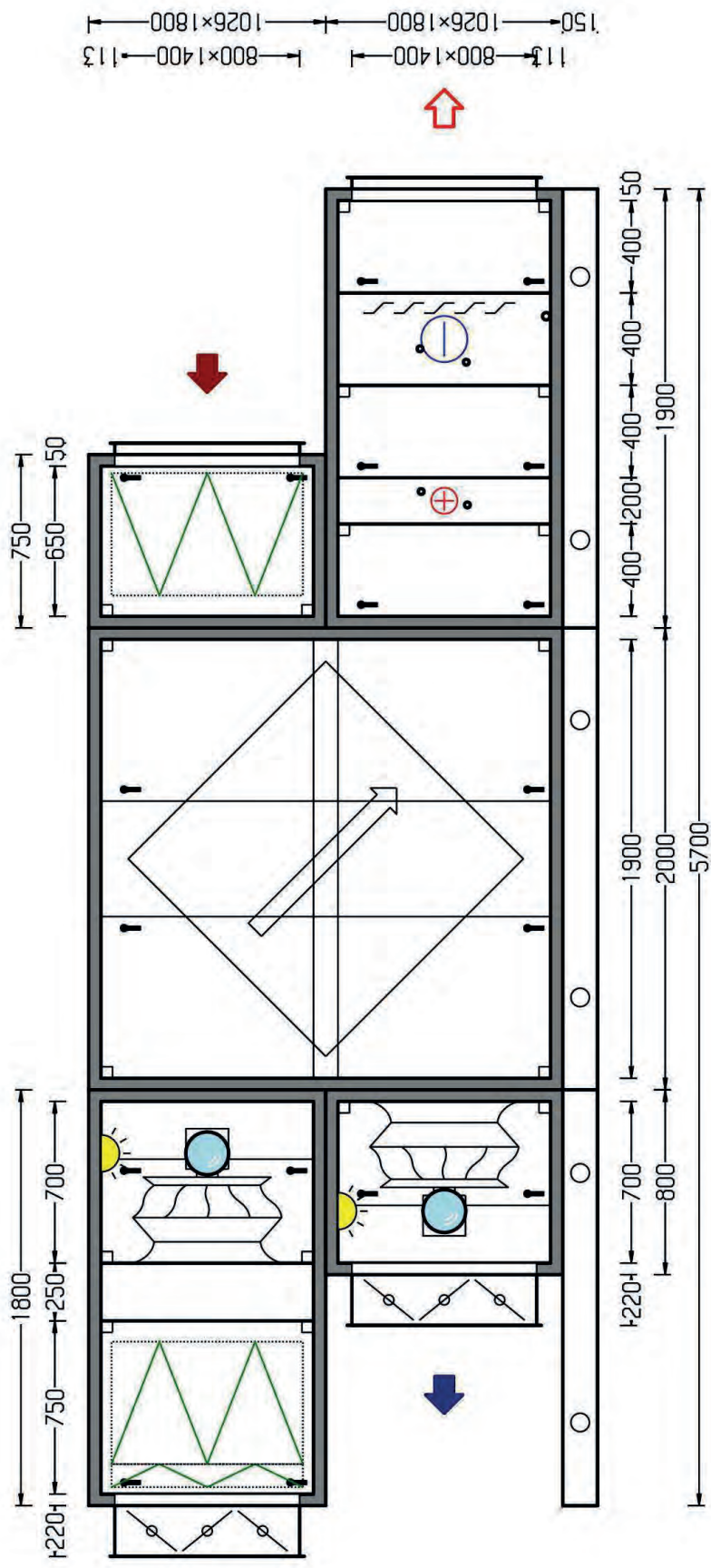
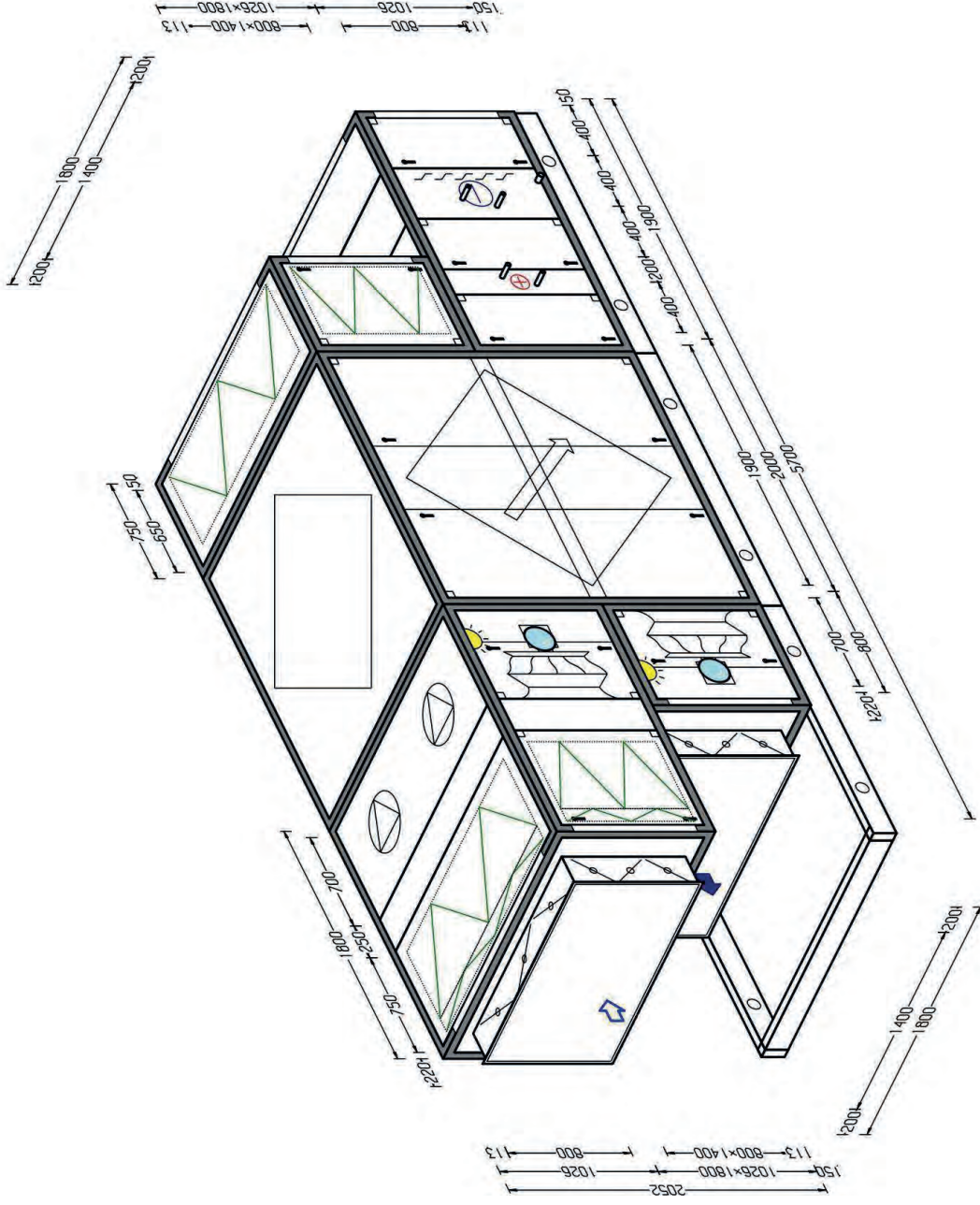




From Inspection Side 2021/04/20 Acon 2.55.47452 Page 1/13	Customer id Project 69028 Unit 781 AOC 373 ACON-02793552	Project name Unit name eQ-032 Supply air eQ-032 Exhaust air	Paterson Labs AHU (APRVL) / AHU12 Tail Spaces L0 - L3 2.30 m³/sec 2.45 m³/sec
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Customer id
 Project 69028
 Unit 781
 AOC 373
 ACON-02793552

Project name
 Unit name
 Supply air
 Exhaust air

eQ-032
 eQ-032

(APRVL) / AHU12 Tail Spaces L0 - L3
 Paterson Labs AHU
 2.30 m³/sec
 2.45 m³/sec

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793552	
Unit	373 (APRVL) / AHU12 Tail Spaces L0 - L3	2021/04/20
Size	032	Page 3/13
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	
Supply air volume flow rate	2.30 m³/sec	Exhaust air volume flow rate 2.45 m³/sec
External static pressure	320 Pa	External static pressure 260 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight 2162 kg
Specific el. power demand (SFPv)	1.55 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	2.30 m³/sec	Installation	Indoor horizontal
External static pressure	320 Pa	Material	AlZn sheet steel
Internal static pressure	334 Pa	Thermal insulation	T3
Exhaust air volume flow rate	2.45 m³/sec	Condensation insulation	TB3
External static pressure	260 Pa	Leakage class	L1(M) / L2(R)*
Internal static pressure	247 Pa	Casing strength	D1(M)
Design outdoor temperature summer	28.5 °C	Sum filtration supply air	ePM1 - 60.0%
Dim. humidity summer	19.7 °C wb	Sum filtration exhaust air	ePM1 - 60.0%
Design outdoor temperature winter	-4.5 °C		
Dim. humidity winter	-5.4 °C wb		
Temperature in, supply air, summer	22 °C	Temperature in, extract air, summer	22 °C
Air humidity in, supply air, summer	14.6 °C wb	Air humidity in, extract air, summer	15.4 °C wb
Temperature in, supply air, winter	20 °C	Temperature in, extract air, winter	22 °C
Air humidity in, supply air, winter	15 °C wb	Air humidity in, extract air, winter	13.1 °C wb
Mixing ratio at winter design temperature	0 %		
Temperature efficiency (EN308)	78.0 %	Heat recovery capacity	57.2 kW
SFPv supply air	0.91 kW/(m³/s)	Total dry weight	2162 kg
SFPv exhaust air inlet	0.69 kW/(m³/s)		
SFPv total sum	1.55 kW/(m³/s)	Heaviest block	900 kg

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



Approved according to requirements 2018

Unit type: NRVU BVU

SFPint (2016: 1166 W/(m³/s), 2018: 886 W/(m³/s))

530 W/(m³/s)

Dry temperature efficiency (balanced) (EN308) (2016: 67 %, 2018: 73 %)

76 %

External leakage rate

0.4 %

Internal leakage rate

0.5 %

	Supply air	Extract air	Unit
Heat exchanger pressure drop	139	155	Pa
Filter energy classification	B	B	
Filter pressure drop, start	35	19	Pa
Filter area	1.6	1.6	m²
Filter cross section air velocity	1.5	1.6	m/s
Air flow	2.30	2.45	m³/sec
Total pressure rise	576	461	Pa
Fan fan system effect	0	0	Pa
Fan total efficiency	64.0	67.5	%
Fan system input power (absorbed electrical power) according to SFP	2.1	1.71	kW

Fan system effect is taken into account in fan performance

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793552	
Unit	373 (APRVL) / AHU12 Tail Spaces L0 - L3	2021/04/20
Size	032	Page 4/13
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	
Supply air volume flow rate	2.30 m³/sec	Exhaust air volume flow rate 2.45 m³/sec
External static pressure	320 Pa	External static pressure 260 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight 2162 kg
Specific el. power demand (SFPv)	1.55 kW/(m³/s)	Dimensioned for wet condition
Ref. density	1.2 kg/m³	Ref. altitude above sea level 0 m

Coils

	Capacity [kW]	Air In [°C/°C wb]	Air Out [°C/°C wb]	Water in/out [°C]	Antifreeze	Water [l/s]	Water [kPa]	Conn [mm]
Air heater	68	-4.5/-8.4	20/6.4	70/50		0.83	10.5	25
Air cooler	13	25.5/18.4	22/16.8	6/12		0.51	11.6	25

Fan power supply data

Voltage, supply flow	3x400VAC+PE, 50Hz	Voltage, extract flow	3x400VAC+PE, 50Hz
Power, supply flow	2 x 1.7 kW	Power, extract flow	2 x 1.7 kW
Current, full load, supply flow	2 x 2.2 A	Current, full load, extract flow	2 x 2.2 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	69	84	72	66	61	60	54	50	71
Supply air connection	67	80	68	68	66	60	51	44	71
Extract connection	58	70	60	55	51	48	44	39	59
Exhaust connection	70	82	75	75	73	68	62	58	77
To surroundings	61	72	56	45	41	41	35	30	57

*Flakt Group eQ AHUs are leakage class L2 real unit as certified by Eurovent. CAL class @-400Pa and @+700Pa. For units where the casing has; (i) a customised or special design that differs from standard module box, (ii) nonstandard components penetrating the casing that is non-standard for a real unit, and (iii) where holes or penetrations are made in casing after delivery to site, the leakage class cannot be guaranteed. This also includes damage to the unit from handling and transportation.

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793552	
Unit	373 (APRVL) / AHU12 Tail Spaces L0 - L3	2021/04/20
Size	032	Page 5/13

TECHNICAL SPECIFICATION

(components listed in direction of air flow)

SUPPLY AIR

End connection frame

Pressure drop, dimensioning

2 Pa

Casing end wall

Damper

Width cm : 140

Height in cm : 080

Tightness class : CEN 3

Connection: Flange

Function : Outdoor air

Location: externally end wall

Damper type: 200 mm blade

Material : AlZn

Filter

Inspection side: right

Filter selection

Filter class: F7 - ePM1 60%, glassfibre

Filter frame : galvanized sheet steel

Prefilter: G4 – coarse, synthetic

Design

Connection side : inlet in end wall

Location: negative pressure

Drain tray: without

Number of filters

4x392x792

Pressure drop, start

68 Pa

Pressure drop, dimensioning

136 Pa

Pressure drop, end

204 Pa

Face area

1.3 m²

Face velocity

1.9 m/s

Differential pressure sensor type Dwyer Magnehelic

Pressure range, first sensor: 0-250 Pa

Pressure range, second sensor: 0-250 Pa

Design: flush mounted in door

Empty section

Unit size : 032

Length: 025

Inspection side : right

Plenum fan

Inspection side: right

Fan selection

Impeller type: Bluefin (composite)

Fan size: size 3

Anti-vibration mountings: wall mounted

Motor selection

Motor type: EC-motor

Motor control

Manufacture, type: EC-motor ZA

Housing protection: IP55

Design: on motor

Delivery options: mounted on current sub

Motor / VSD-accessories

Connection accessories: safety switch with quick connection

Length: 356

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793552	
Unit	373 (APRVL) / AHU12 Tail Spaces L0 - L3	2021/04/20
Size	032	Page 6/13

Dimensioning data

Two fan wheels in parallel	
Speed	1667 Rpm
Max speed	1800 Rpm
Total efficiency	63.0 %
Total static pressure, dimensioning (wet coil)	654 Pa
Dynamic pressure	9 Pa
Fan system input power (absorbed electrical power)	2.5 kW
Temperature rise	0.9 °C
K factor	16.36
Fan wheel size	045

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	2.1 kW
Pressure rise	576 Pa
Speed	1553 Rpm

Motor

Motor output	2 x 1.7 kW
Electric current	2 x 2.2 A
Output margin, minimum	10 %

Inspection window

Design: standard

Bulkhead light

Type: LED
Delivery form: Lamp supplied loose

Frequency converter

Motor accessories

Frequency converter

Fan + EC motor

Help code fan + EC-motor

Plate heat exchanger, RECUTERM

Size: 32
Output variant: Standard
Recuterm - defrost: Level 1 By pass damper > -16°C
Fin material : Aluminium
Droplet eliminator: without
Control connections: no
Material: AZ sheet steel
Inspection side: right

Efficiency

Temperature efficiency according to standard EN 308	78.0 %
Temperature efficiency at 0°C outdoors	79.4 %
Cooling recovery	78.0 %

Frost protection

Temperature limit when frost protection starts:	0 °C
Winter dim. , regulated	80.1 %

Supply air

	Summer	Winter
Pressure drop	143	131 Pa
Air temperature	29.4 / 23.6	-3.7 / 16.9 °C
Wet temperature	20 / 18.2	-4.9 / 6.8 °C wb
Capacity reduction	16	57 kW
Face velocity	1.5	1.5 m/s

Exhaust air

	Summer	Winter
Pressure drop	158	150 Pa
Air temperature	22 / 27.4	22 / 4.3 °C
Wet temperature	15.4 / 17.3	13.1 / 4.3 °C wb
Face velocity	1.6	1.6 m/s

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793552	
Unit	373 (APRVL) / AHU12 Tail Spaces L0 - L3	2021/04/20
Size	032	Page 7/13

Empty section

Unit size : 032
Length: 040
Inspection side : right

Air heater for hot water

Size: 032
Inspection side: right
Material: galvanized sheet steel

Coil selection

Calculation principle: input data
Output variant: 2
Fluid passes: 06
Fin spacing: 2 mm
Design: normal face area
Material, coil: Cu/Al, MS header

Nom. pipe size	25
Liquid volume	10.2 l
Pressure drop, dimensioning	25 Pa
Output	68 kW
Air temperature	-4.5 / 20 °C
Face velocity	1.7 m/s
Control principle for water heater	flow control
Water temperature	70 / 50 °C
Water flow	0.83 l/s
Water velocity	1.0 m/s
Pressure drop water	10.5 kPa
Oversizing	60.8 %

Empty section

Unit size : 032
Length: 040
Inspection side : right

Air cooler for chilled water

Size: 032
Inspection side: right
Material: galvanized sheet steel
Droplet eliminator: with, plastic
Design variant: version 3

Coil selection

Use as: Cooling Coil
Calculation principle: input data
Output variant: 2
Fluid passes: 08
Fin spacing: 3 mm
Design: normal face area
Material, coil: Cu/Al, MS header

Shunt selection

Shunt control: without

Nom. pipe size	25
Liquid volume	10.5 l
Pressure drop, dimensioning	27 Pa
Pressure drop, wet coil	27 Pa
Pressure drop, dry coil	15 Pa
Output	13 kW
Air temperature	25.5 / 22 °C
Wet temperature	18.4 / 16.8 °C wb
Face velocity	1.8 m/s

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793552	
Unit	373 (APRVL) / AHU12 Tail Spaces L0 - L3	2021/04/20
Size	032	Page 8/13

Water temperature	6 / 12 °C
Water flow	0.51 l/s
Water velocity	0.8 m/s
Pressure drop water	11.6 kPa
Oversizing	93.2 %

Empty section

Unit size : 032
Length: 040
Inspection side : right

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

Duct connection piece

Width cm : 140
Height in cm : 80
Connection type: flange connection
Material: galvanized sheet steel / AlZn

EXHAUST AIR

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

Duct connection piece

Width cm : 140
Height in cm : 80
Connection type: flange connection
Material: galvanized sheet steel / AlZn

Filter

Inspection side: left

Filter selection

Filter class: F7 - ePM1 60%, glassfibre
Filter frame : plastic
Prefilter: without

Design

Connection side : inlet in end wall
Location: negative pressure
Drain tray: without

Number of filters	4x392x792
Pressure drop, start	43 Pa
Pressure drop, dimensioning	86 Pa
Pressure drop, end	130 Pa
Face area	1.3 m ²
Face velocity	1.9 m/s

Differential pressure sensor type Dwyer Magnehelic

Pressure range, first sensor: 0-250 Pa
Design: flush mounted in door

Plenum fan

Inspection side: left

Fan selection

Impeller type: Bluefin (composite)
Fan size: size 3
Anti-vibration mountings: wall mounted

Motor selection

Motor type: EC-motor

Motor control

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793552	
Unit	373 (APRVL) / AHU12 Tail Spaces L0 - L3	2021/04/20
Size	032	Page 9/13

Manufacture, type: EC-motor ZA
 Housing protection: IP55
 Design: on motor
 Delivery options: mounted on current sub

Motor / VSD-accessories

Connection accessories: safety switch with quick connection
 Length: 356

Dimensioning data

Two fan wheels in parallel	
Speed	1524 Rpm
Max speed	1800 Rpm
Total efficiency	66.9 %
Total static pressure, dimensioning (wet coil)	507 Pa
Dynamic pressure	10 Pa
Fan system input power (absorbed electrical power)	1.96 kW
Temperature rise	0.7 °C
K factor	16.36
Fan wheel size	045

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	1.71 kW
Pressure rise	461 Pa
Speed	1441 Rpm

Motor

Motor output	2 x 1.7 kW
Electric current	2 x 2.2 A
Output margin, minimum	10 %

Inspection window

Design: standard

Bulkhead light

Type: LED
 Delivery form: Lamp supplied loose

Frequency converter

Motor accessories

Frequency converter

Fan + EC motor

Help code fan + EC-motor

End connection frame

Pressure drop, dimensioning	2 Pa
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Casing end wall

Damper

Width cm : 140
 Height in cm : 080
 Tightness class : CEN 3
 Connection: Flange
 Function : extract air
 Location: externally end wall
 Damper type: 200 mm blade
 Material : AlZn

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793552	
Unit	373 (APRVL) / AHU12 Tail Spaces L0 - L3	2021/04/20
Size	032	Page 10/13

BLOCK LIST

	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	VOLUME (m³)	WEIGHT (kg)
EQGB-032-180-22-1-1-2-1-2-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Casing end wall Filter Empty section Plug fan wall mounted	1850	1950	1196	4.31	389
EQHB-032-200-22-1-1-2-1-3-1-1 Unit casing (frame, unit) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Plate heat exchanger, RECUTERM	2050	1950	2372	9.48	900
EQGB-032-190-22-1-1-2-1-4-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Empty section Air heater for hot water Empty section Air cooler for chilled water Empty section Casing end wall	1950	1950	1346	5.12	415
EQGB-032-075-22-1-1-2-1-2-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)*	800	1950	1196	1.87	155

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793552	
Unit	373 (APRVL) / AHU12 Tail Spaces L0 - L3	2021/04/20
Size	032	Page 11/13

Casing strength: D1(M)

Casing end wall

Filter

EQGB-032-080-22-1-1-2-1-4-1-1	850	1950	1346	2.23	304
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Unit casing (frame, module)

Model box code: EQ 2111

Material: AlZn sheet steel

Thermal insulation: T3

Condensation insulation: TB3

Leakage class: L2(R)*

Casing strength: D1(M)

Plug fan wall mounted

Casing end wall

23.01	2162
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The dimensions are transport dimensions including packaging

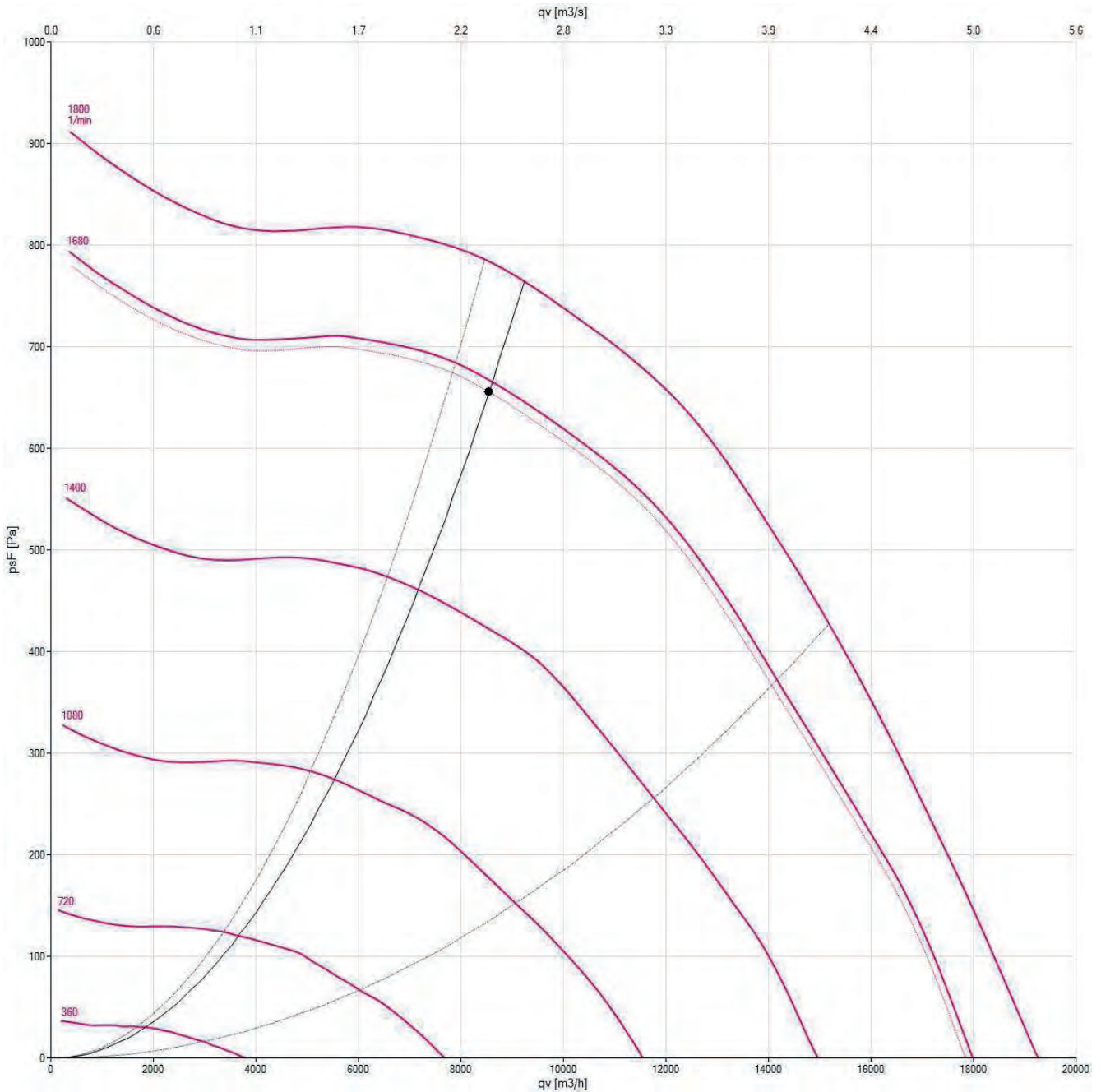
*Flakt Group eQ AHUs are leakage class L2 real unit as certified by Eurovent. CAL class @-400Pa and @+700Pa. For units where the casing has; (i) a customised or special design that differs from standard module box, (ii) nonstandard components penetrating the casing that is non-standard for a real unit, and (iii) where holes or penetrations are made in casing after delivery to site, the leakage class cannot be guaranteed. This also includes damage to the unit from handling and transportation.

Project 781 () / Paterson Labs AHU
 AOC ACON-02793552
 Unit 373 (APRVL) / AHU12 Tail Spaces L0 - L3
 Size 032

Acon 2.55.47452

2021/04/20
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Fan chart - Supply air - EQLC-032-3-3-1-2-3-2-1-2-8-1-1

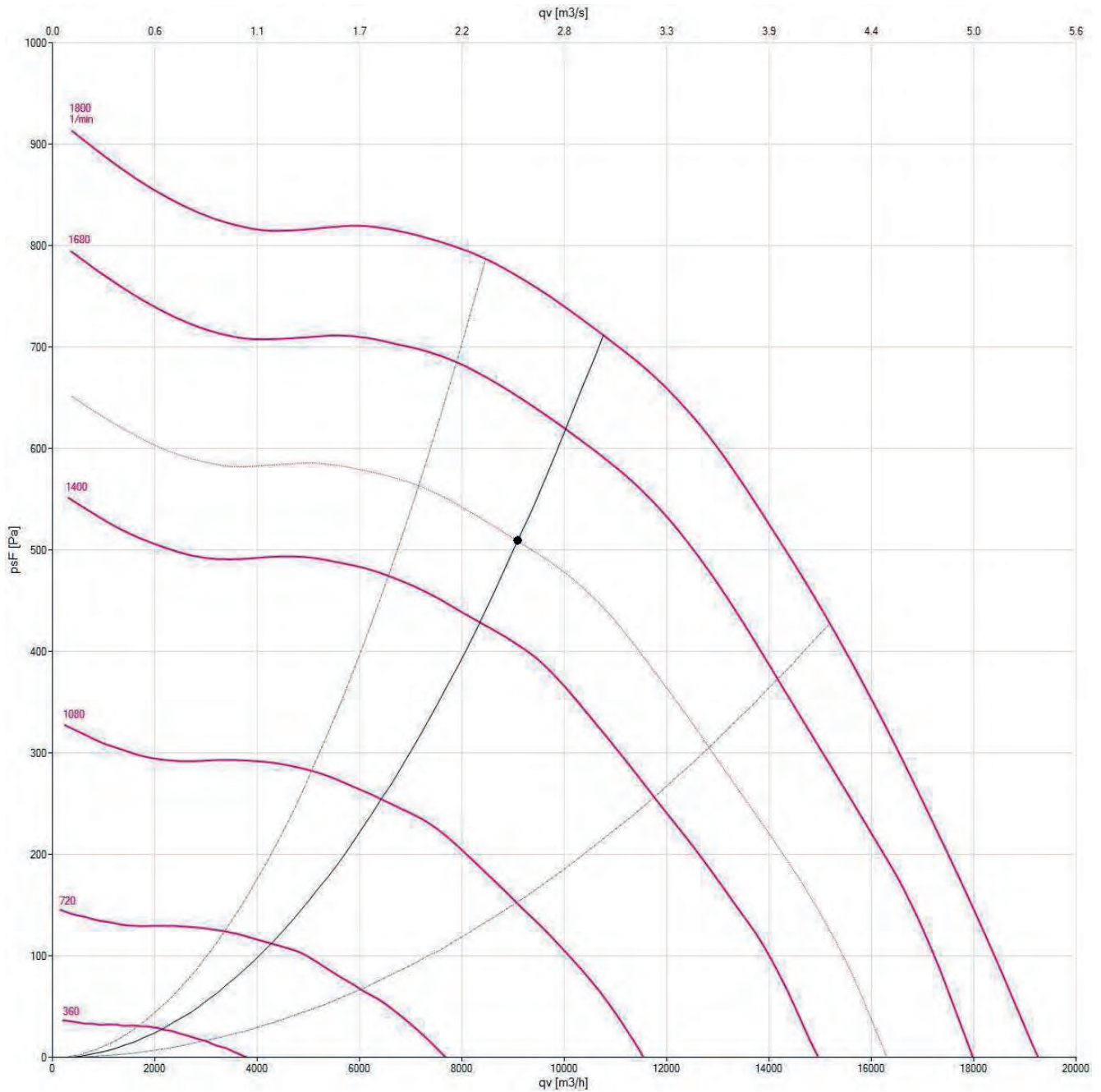


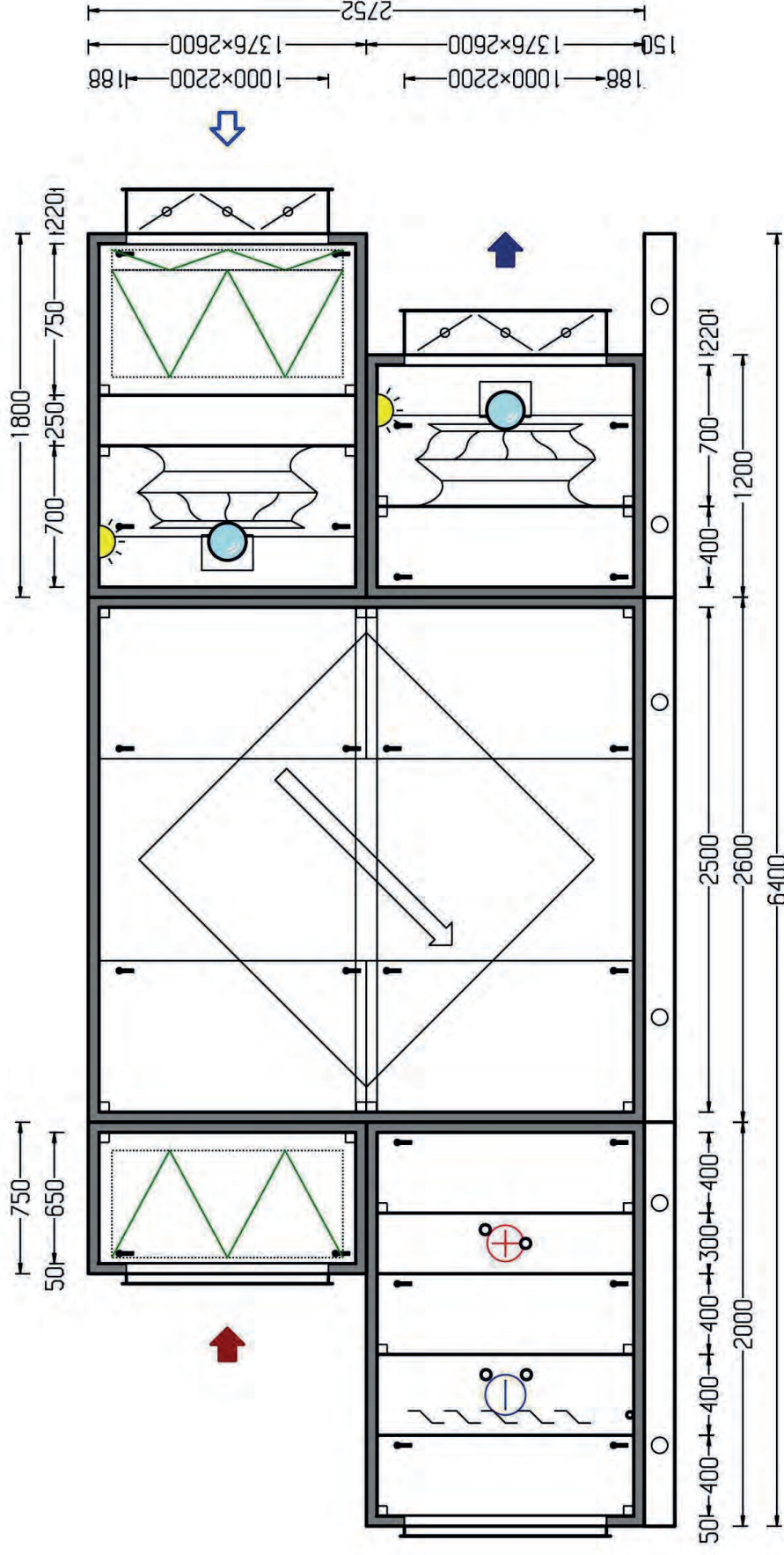
Project 781 () / Paterson Labs AHU
 AOC ACON-02793552
 Unit 373 (APRVL) / AHU12 Tail Spaces L0 - L3
 Size 032

Acon 2.55.47452

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Fan chart - Exhaust air inlet - EQLC-032-3-3-1-2-3-2-2-8-2-1



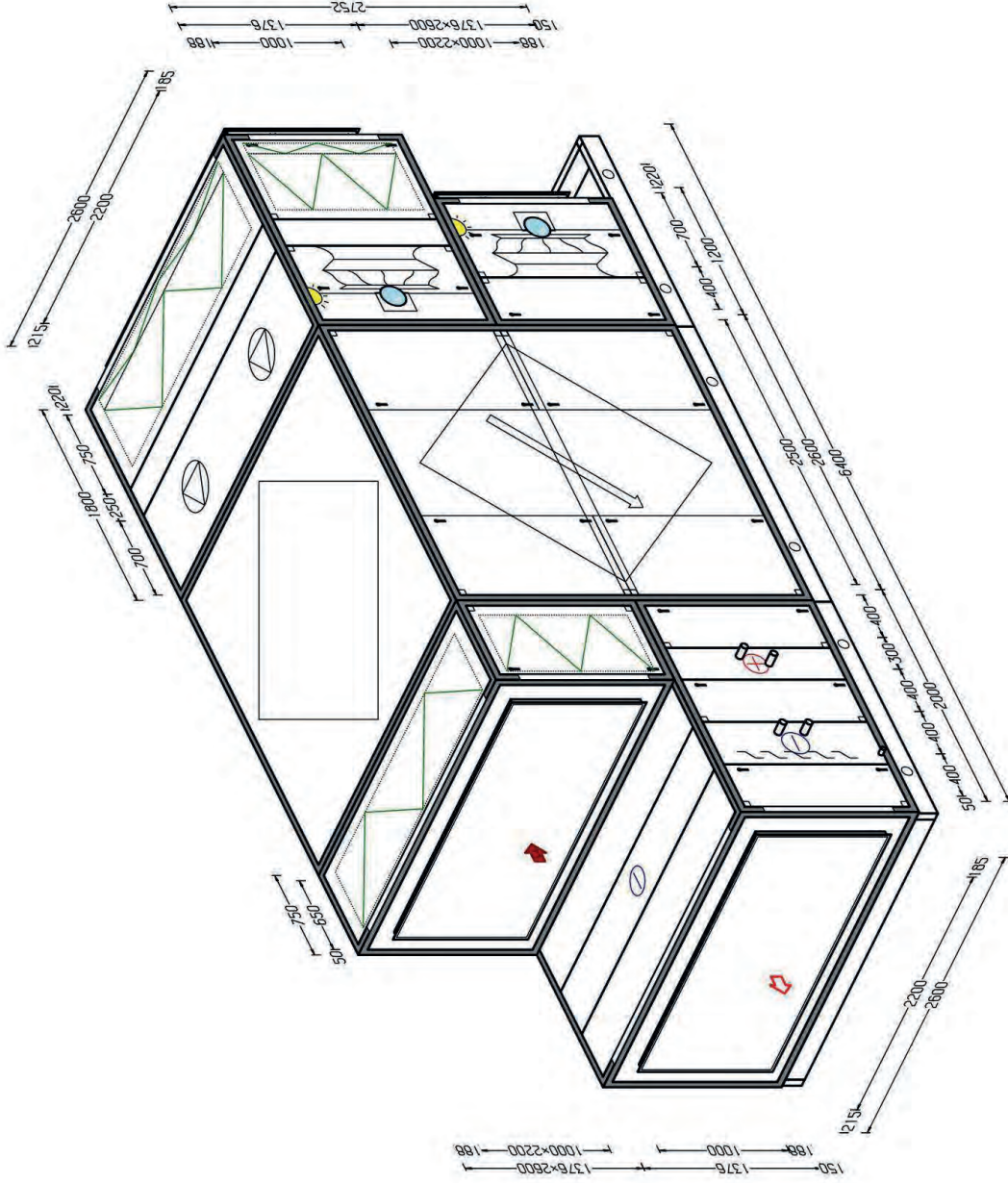


Paterson Labs AHU
(APRVL) / AHU14 Office & WriteUp L3-L6 South
eQ-072 4.84 m³/sec
eQ-072 4.73 m³/sec

Project name
Unit name
Supply air
Exhaust air

Customer id
Project
Unit
AOC

69028
781
374
ACON-02793553



Customer id
Project
Unit
AOC

69028
 781
 374
 ACON-02793553

Project name
Unit name
Supply air
Exhaust air

(APRVL) / AHU14 Office & WriteUp L3-L6 South
 eQ-072
 eQ-072

Paterson Labs AHU
 4.84 m³/sec
 4.73 m³/sec

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793553	
Unit	374 (APRVL) / AHU14 Office & WriteUp L3-L6 South	2021/04/20
Size	072	Page 3/13
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	
Supply air volume flow rate	4.84 m³/sec	Exhaust air volume flow rate 4.73 m³/sec
External static pressure	420 Pa	External static pressure 420 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight 3828 kg
Specific el. power demand (SFPv)	1.78 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	4.84 m³/sec	Installation	Indoor horizontal
External static pressure	420 Pa	Material	AlZn sheet steel
Internal static pressure	306 Pa	Thermal insulation	T3
Exhaust air volume flow rate	4.73 m³/sec	Condensation insulation	TB3
External static pressure	420 Pa	Leakage class	L1(M) / L2(R)*
Internal static pressure	201 Pa	Casing strength	D1(M)
Design outdoor temperature summer	28.5 °C	Sum filtration supply air	ePM1 - 60.0%
Dim. humidity summer	19.7 °C wb	Sum filtration exhaust air	ePM1 - 60.0%
Design outdoor temperature winter	-4.5 °C		
Dim. humidity winter	-5.4 °C wb		
Temperature in, supply air, summer	22 °C	Temperature in, extract air, summer	22 °C
Air humidity in, supply air, summer	14.6 °C wb	Air humidity in, extract air, summer	15.4 °C wb
Temperature in, supply air, winter	20 °C	Temperature in, extract air, winter	22 °C
Air humidity in, supply air, winter	15 °C wb	Air humidity in, extract air, winter	13.1 °C wb
Mixing ratio at winter design temperature	0 %		
Temperature efficiency (EN308)	72.6 %	Heat recovery capacity	99.9 kW
SFPv supply air	0.95 kW/(m³/s)	Total dry weight	3828 kg
SFPv exhaust air inlet	0.84 kW/(m³/s)		
SFPv total sum	1.78 kW/(m³/s)	Heaviest block	1790 kg

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



Approved according to requirements 2018

Unit type: NRVU BVU	
SFPint (2016: 1087 W/(m³/s), 2018: 807 W/(m³/s))	446 W/(m³/s)
Dry temperature efficiency (balanced) (EN308) (2016: 67 %, 2018: 73 %)	73 %
External leakage rate	0.4 %
Internal leakage rate	0.5 %

	Supply air	Extract air	Unit
Heat exchanger pressure drop	133	128	Pa
Filter energy classification	B	B	
Filter pressure drop, start	36	18	Pa
Filter area	3.2	3.2	m²
Filter cross section air velocity	1.5	1.5	m/s
Air flow	4.84	4.73	m³/sec
Total pressure rise	656	585	Pa
Fan fan system effect	0	0	Pa
Fan total efficiency	70.5	71.0	%
Fan system input power (absorbed electrical power) according to SFP	4.62	4.0	kW

Fan system effect is taken into account in fan performance

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793553	
Unit	374 (APRVL) / AHU14 Office & WriteUp L3-L6 South	2021/04/20
Size	072	Page 4/13
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	
Supply air volume flow rate	4.84 m³/sec	Exhaust air volume flow rate 4.73 m³/sec
External static pressure	420 Pa	External static pressure 420 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight 3828 kg
Specific el. power demand (SFPv)	1.78 kW/(m³/s)	Dimensioned for wet condition
Ref. density	1.2 kg/m³	Ref. altitude above sea level 0 m

Coils

	Capacity [kW]	Air In [°C/°C wb]	Air Out [°C/°C wb]	Water in/out [°C]	Antifreeze	Water [l/s]	Water [kPa]	Conn [mm]
Air heater	143	-4.5/-8.4	20/6.4	70/50		1.74	8.9	50
Air cooler	26.1	25.5/18.4	22/16.9	6/12		1.04	4.1	50

Fan power supply data

Voltage, supply flow	3x400VAC+PE, 50Hz	Voltage, extract flow	3x400VAC+PE, 50Hz
Power, supply flow	2 x 4.6 kW	Power, extract flow	2 x 3.4 kW
Current, full load, supply flow	2 x 5.8 A	Current, full load, extract flow	2 x 4.4 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	66	83	72	64	62	59	54	54	71
Supply air connection	67	80	68	69	66	61	55	49	71
Extract connection	60	71	61	56	53	50	46	46	60
Exhaust connection	74	86	77	79	75	72	69	64	81
To surroundings	60	71	56	45	42	41	36	30	56

*Flakt Group eQ AHUs are leakage class L2 real unit as certified by Eurovent. CAL class @-400Pa and @+700Pa. For units where the casing has; (i) a customised or special design that differs from standard module box, (ii) nonstandard components penetrating the casing that is non-standard for a real unit, and (iii) where holes or penetrations are made in casing after delivery to site, the leakage class cannot be guaranteed. This also includes damage to the unit from handling and transportation.

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793553	
Unit	374 (APRVL) / AHU14 Office & WriteUp L3-L6 South	2021/04/20
Size	072	Page 5/13

TECHNICAL SPECIFICATION

(components listed in direction of air flow)

SUPPLY AIR

End connection frame

Pressure drop, dimensioning

3 Pa

Casing end wall

Damper

Width cm : 220

Height in cm : 100

Tightness class : CEN 3

Connection: Flange

Function : Outdoor air

Location: externally end wall

Damper type: 200 mm blade

Material : AlZn

Filter

Inspection side: left

Filter selection

Filter class: F7 - ePM1 60%, glassfibre

Filter frame : galvanized sheet steel

Prefilter: G4 – coarse, synthetic

Design

Connection side : inlet in end wall

Location: negative pressure

Drain tray: without

Number of filters

8x592x592

Pressure drop, start

61 Pa

Pressure drop, dimensioning

122 Pa

Pressure drop, end

183 Pa

Face area

2.9 m²

Face velocity

1.7 m/s

Differential pressure sensor type Dwyer Magnehelic

Pressure range, first sensor: 0-250 Pa

Pressure range, second sensor: 0-250 Pa

Design: flush mounted in door

Empty section

Unit size : 072

Length: 025

Inspection side : left

Plenum fan

Inspection side: left

Fan selection

Impeller type: Bluefin (composite)

Fan size: size 3

Anti-vibration mountings: wall mounted

Motor selection

Motor type: EC-motor

Motor control

Manufacture, type: EC-motor ZA

Housing protection: IP55

Design: on motor

Delivery options: mounted on current sub

Motor / VSD-accessories

Connection accessories: safety switch with quick connection

Length: 451

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793553	
Unit	374 (APRVL) / AHU14 Office & WriteUp L3-L6 South	2021/04/20
Size	072	Page 6/13

Dimensioning data

Two fan wheels in parallel	
Speed	1480 Rpm
Max speed	1780 Rpm
Total efficiency	70.5 %
Total static pressure, dimensioning (wet coil)	726 Pa
Dynamic pressure	16 Pa
Fan system input power (absorbed electrical power)	5.27 kW
Temperature rise	0.9 °C
K factor	10.14
Fan wheel size	056

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	4.62 kW
Pressure rise	656 Pa
Speed	1396 Rpm

Motor

Motor output	2 x 4.6 kW
Electric current	2 x 5.8 A
Output margin, minimum	40 %

Inspection window

Design: standard

Bulkhead light

Type: LED
Delivery form: Lamp supplied loose

Frequency converter

Motor accessories

Frequency converter

Fan + EC motor

Help code fan + EC-motor

Plate heat exchanger, RECUTERM

Size: 72
Output variant: Standard
Recuterm - defrost: Level 1 By pass damper > -16°C
Fin material : Aluminium
Droplet eliminator: without
Control connections: no
Material: AZ sheet steel
Inspection side: left

Efficiency

Temperature efficiency according to standard EN 308	72.6 %
Temperature efficiency at 0°C outdoors	77.7 %
Cooling recovery	72.4 %

Frost protection

Temperature limit when frost protection starts:	0 °C
Winter dim. , regulated	77.3 %

Supply air

	Summer	Winter
Pressure drop	137	126 Pa
Air temperature	29.4 / 24	-3.7 / 16.2 °C
Wet temperature	20 / 18.3	-4.9 / 6.5 °C wb
Capacity reduction	31	100 kW
Face velocity	1.6	1.6 m/s

Exhaust air

	Summer	Winter
Pressure drop	131	124 Pa
Air temperature	22 / 27.5	22 / 3.7 °C
Wet temperature	15.4 / 17.3	13.1 / 3.7 °C wb
Face velocity	1.6	1.6 m/s

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793553	
Unit	374 (APRVL) / AHU14 Office & WriteUp L3-L6 South	2021/04/20
Size	072	Page 7/13

Empty section

Unit size : 072
Length: 040
Inspection side : left

Air heater for hot water

Size: 072
Inspection side: left
Material: galvanized sheet steel
Coil selection
Calculation principle: input data
Output variant: 2
Fluid passes: 04
Fin spacing: 3 mm
Design: normal face area
Material, coil: Cu/Al, MS header

Nom. pipe size	50
Liquid volume	24.6 l
Pressure drop, dimensioning	15 Pa
Output	143 kW
Air temperature	-4.5 / 20 °C
Face velocity	1.6 m/s
Control principle for water heater	flow control
Water temperature	70 / 50 °C
Water flow	1.74 l/s
Water velocity	0.9 m/s
Pressure drop water	8.9 kPa
Oversizing	24.1 %

Empty section

Unit size : 072
Length: 040
Inspection side : left

Air cooler for chilled water

Size: 072
Inspection side: left
Material: galvanized sheet steel
Droplet eliminator: with, plastic
Design variant: version 3
Coil selection
Use as: Cooling Coil
Calculation principle: input data
Output variant: 2
Fluid passes: 04
Fin spacing: 3 mm
Design: normal face area
Material, coil: Cu/Al, MS header

Shunt selection

Shunt control: without

Nom. pipe size	50
Liquid volume	24.5 l
Pressure drop, dimensioning	28 Pa
Pressure drop, wet coil	28 Pa
Pressure drop, dry coil	15 Pa
Output	26.1 kW
Air temperature	25.5 / 22 °C
Wet temperature	18.4 / 16.9 °C wb
Face velocity	1.8 m/s

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793553	
Unit	374 (APRVL) / AHU14 Office & WriteUp L3-L6 South	2021/04/20
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Water temperature	6 / 12 °C
Water flow	1.04 l/s
Water velocity	0.5 m/s
Pressure drop water	4.1 kPa
Oversizing	87.3 %

Empty section

Unit size : 072
Length: 040
Inspection side : left

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

Duct connection piece

Width cm : 220
Height in cm : 100
Connection type: flange connection
Material: galvanized sheet steel / AlZn

EXHAUST AIR

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

Duct connection piece

Width cm : 220
Height in cm : 100
Connection type: flange connection
Material: galvanized sheet steel / AlZn

Filter

Inspection side: right

Filter selection

Filter class: F7 - ePM1 60%, glassfibre
Filter frame : galvanized sheet steel
Prefilter: without

Design

Connection side : inlet in end wall
Location: negative pressure
Drain tray: without

Number of filters	8x592x592
Pressure drop, start	33 Pa
Pressure drop, dimensioning	66 Pa
Pressure drop, end	100 Pa
Face area	2.9 m ²
Face velocity	1.7 m/s

Differential pressure sensor type Dwyer Magnehelic

Pressure range, first sensor: 0-250 Pa
Design: flush mounted in door

Empty section

Unit size : 072
Length: 040
Inspection side : right

Plenum fan

Inspection side: right

Fan selection

Impeller type: Bluefin (composite)

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793553	
Unit	374 (APRVL) / AHU14 Office & WriteUp L3-L6 South	2021/04/20
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Fan size: size 3
Anti-vibration mountings: wall mounted

Motor selection

Motor type: EC-motor

Motor control

Manufacture, type: EC-motor ZA
Housing protection: IP55
Design: on motor
Delivery options: mounted on current sub

Motor / VSD-accessories

Connection accessories: safety switch with quick connection
Length: 451

Dimensioning data

Two fan wheels in parallel	
Speed	1391 Rpm
Max speed	1610 Rpm
Total efficiency	70.8 %
Total static pressure, dimensioning (wet coil)	621 Pa
Dynamic pressure	16 Pa
Fan system input power (absorbed electrical power)	4.39 kW
Temperature rise	0.8 °C
K factor	10.14
Fan wheel size	056

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	4.0 kW
Pressure rise	585 Pa
Speed	1334 Rpm

Motor

Motor output	2 x 3.4 kW
Electric current	2 x 4.4 A
Output margin, minimum	40 %

Inspection window

Design: standard

Bulkhead light

Type: LED
Delivery form: Lamp supplied loose

Frequency converter

Motor accessories

Frequency converter

Fan + EC motor

Help code fan + EC-motor

End connection frame

Pressure drop, dimensioning	3 Pa
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Casing end wall

Damper

Width cm : 220
Height in cm : 100
Tightness class : CEN 3
Connection: Flange
Function : extract air
Location: externally end wall
Damper type: 200 mm blade
Material : AlZn

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793553	
Unit	374 (APRVL) / AHU14 Office & WriteUp L3-L6 South	2021/04/20
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BLOCK LIST

	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	VOLUME (m³)	WEIGHT (kg)
EQGB-072-180-22-1-1-2-1-2-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Casing end wall Filter Empty section Plug fan wall mounted	1850	2750	1546	7.87	624
EQHB-072-260-22-1-1-2-1-3-1-1 Unit casing (frame, unit) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Plate heat exchanger, RECUTERM	2650	2750	3072	22.39	1790
EQGB-072-200-22-1-1-2-1-4-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Empty section Air heater for hot water Empty section Air cooler for chilled water Empty section Casing end wall	2050	2750	1696	9.56	634
EQGB-072-075-22-1-1-2-1-2-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)*	800	2750	1546	3.4	235

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793553	
Unit	374 (APRVL) / AHU14 Office & WriteUp L3-L6 South	2021/04/20
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Casing strength: D1(M)

Casing end wall

Filter

EQGB-072-120-22-1-1-2-1-4-1-1	1250	2750	1696	5.83	545
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Unit casing (frame, module)

Model box code: EQ 2111

Material: AlZn sheet steel

Thermal insulation: T3

Condensation insulation: TB3

Leakage class: L2(R)*

Casing strength: D1(M)

Empty section

Plug fan wall mounted

Casing end wall

49.04	3828
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The dimensions are transport dimensions including packaging

*Flakt Group eQ AHUs are leakage class L2 real unit as certified by Eurovent. CAL class @-400Pa and @+700Pa. For units where the casing has; (i) a customised or special design that differs from standard module box, (ii) nonstandard components penetrating the casing that is non-standard for a real unit, and (iii) where holes or penetrations are made in casing after delivery to site, the leakage class cannot be guaranteed. This also includes damage to the unit from handling and transportation.

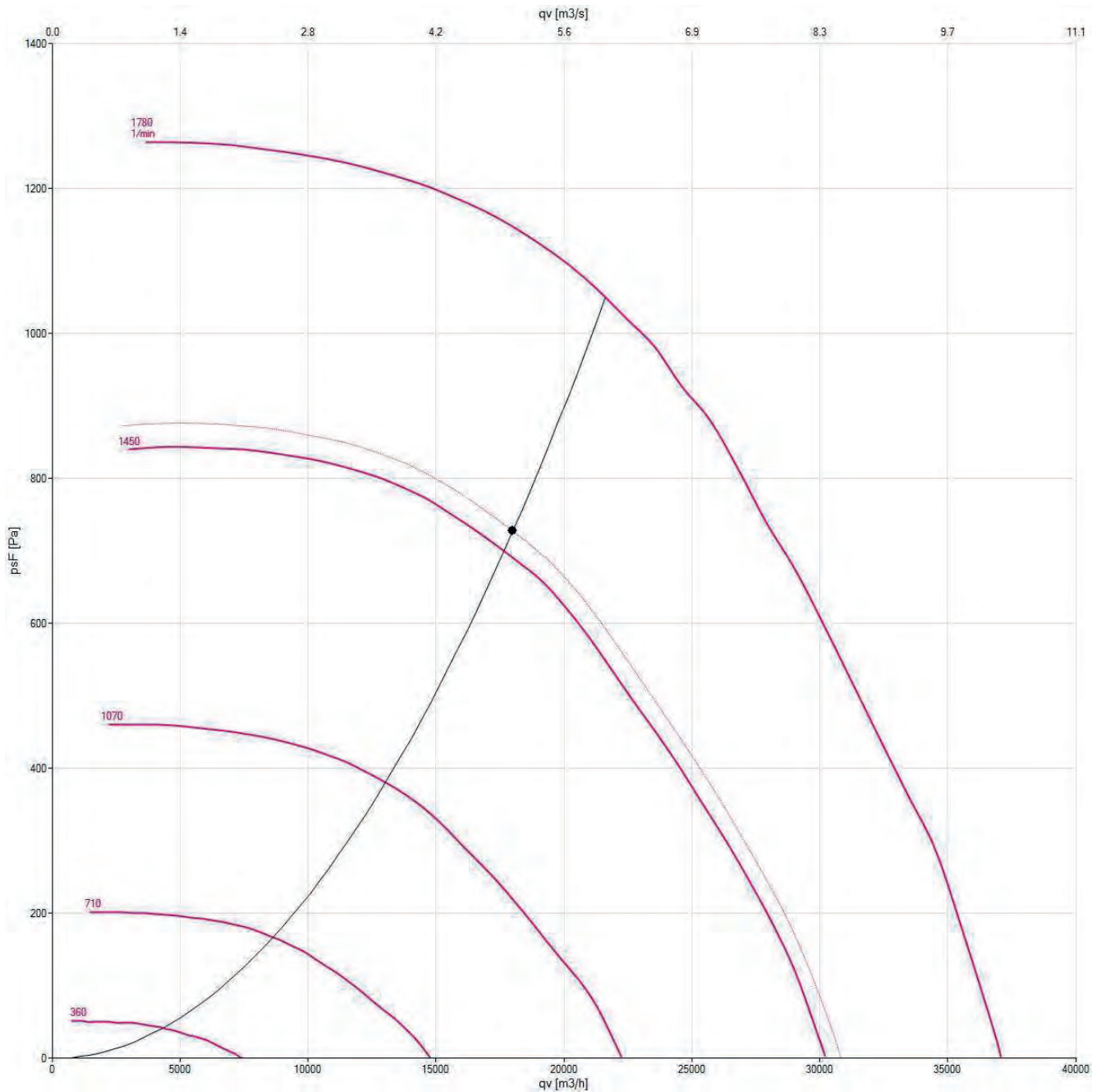
Project
AOC
Unit
Size

781 () / Paterson Labs AHU
ACON-02793553
374 (APRVL) / AHU14 Office & WriteUp L3-L6 South
072

Acon 2.55.47452

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Fan chart - Supply air - EQLC-072-3-1-1-2-4-2-1-2-8-2-1



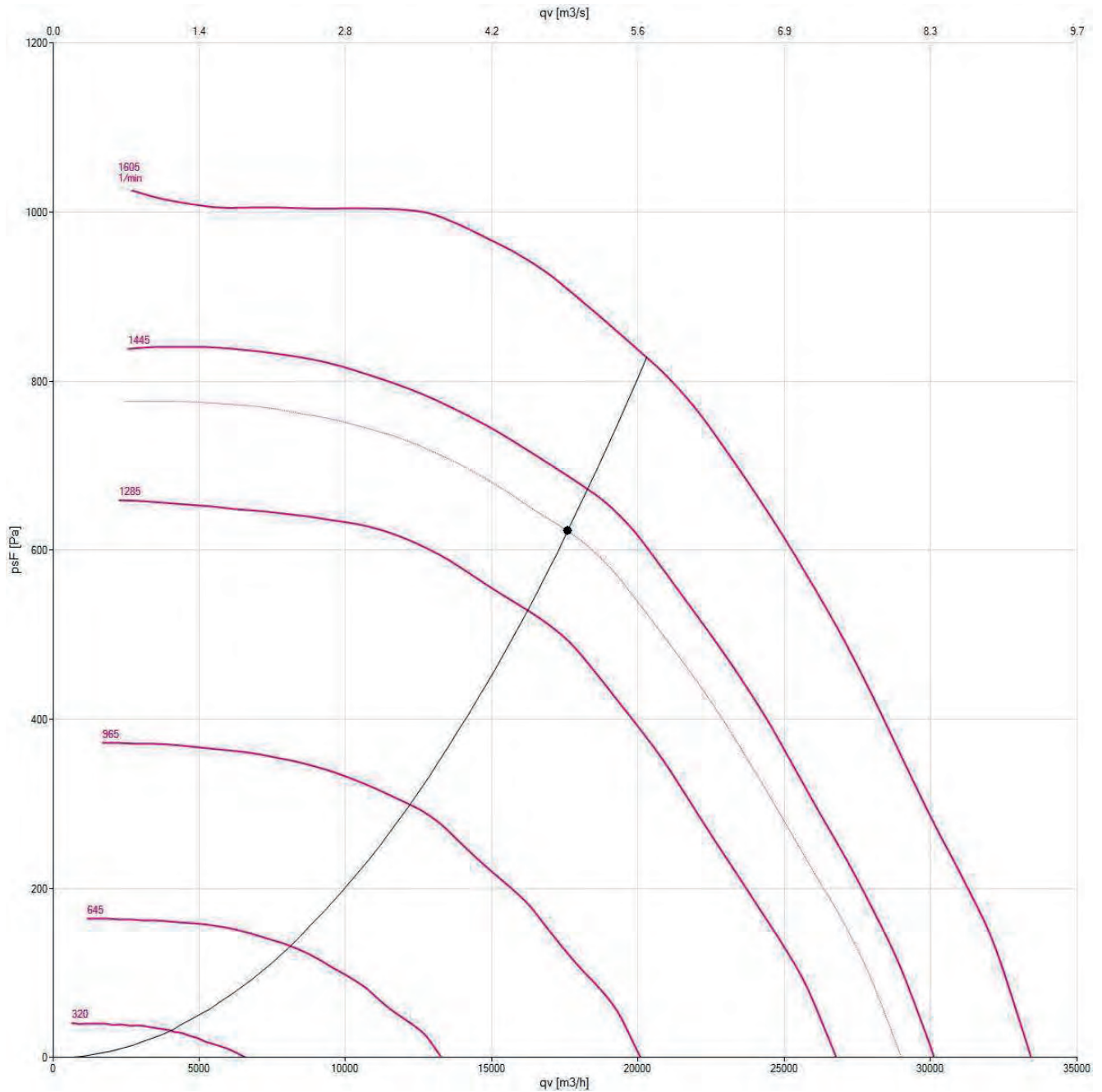
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AOC
Unit
Size

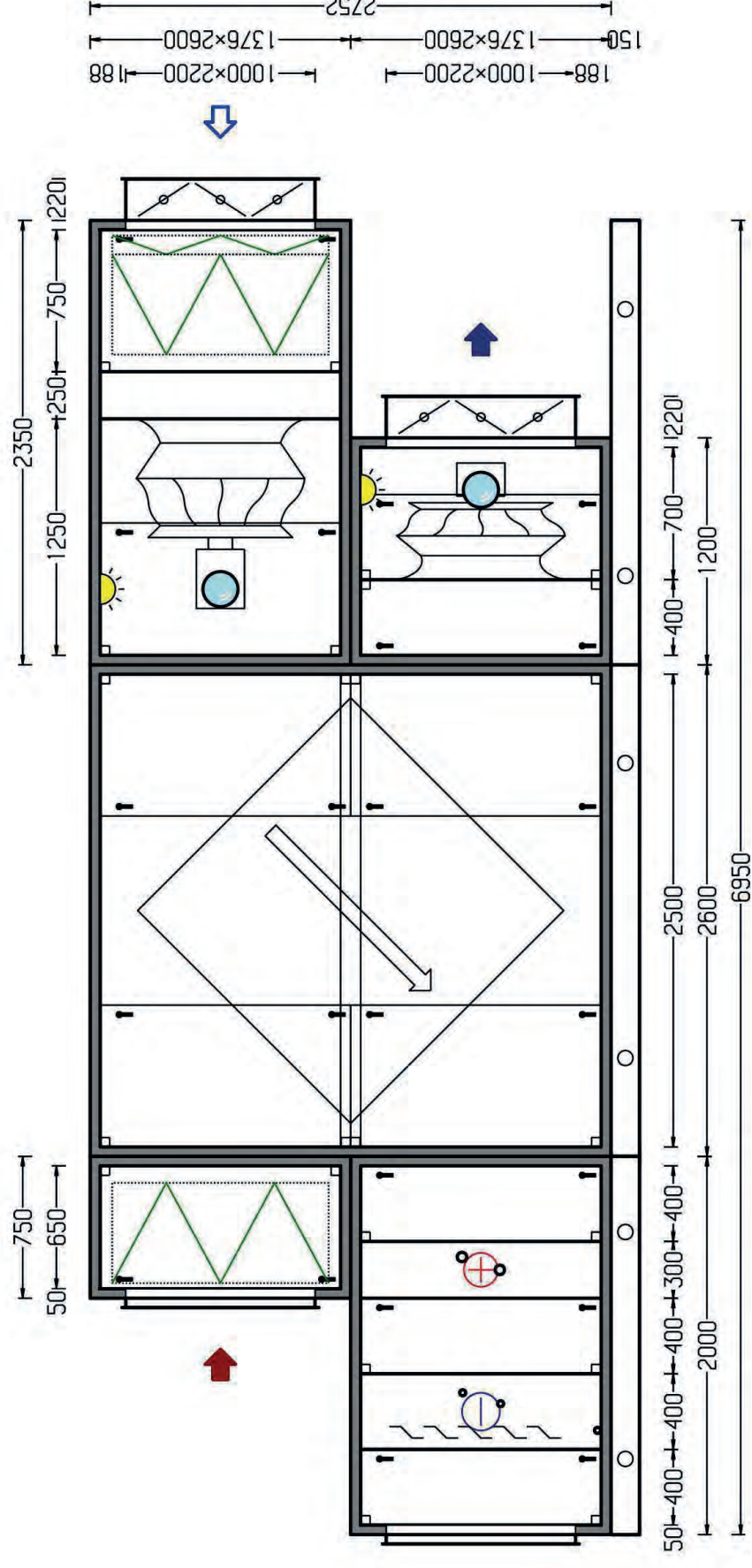
781 () / Paterson Labs AHU
ACON-02793553
374 (APRVL) / AHU14 Office & WriteUp L3-L6 South
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Fan chart - Exhaust air inlet - EQLC-072-3-1-1-2-3-2-2-8-1-1





From Inspection Side
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Customer id	69028	Project name	Paterson Labs AHU (APRVL) / AHU15 Office & Write Up	FläktGroup
	781			
	375			
	ACON-02793554			
Unit	AOC	Supply air	eQ-072	5.77 m³/sec
			eQ-072	5.25 m³/sec

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793554	
Unit	375 (APRVL) / AHU15 Office & Write Up	2021/04/20
Size	072	Page 3/13
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	
Supply air volume flow rate	5.77 m³/sec	Exhaust air volume flow rate 5.25 m³/sec
External static pressure	440 Pa	External static pressure 420 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight 4039 kg
Specific el. power demand (SFPv)	1.93 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	5.77 m³/sec	Installation	Indoor horizontal
External static pressure	440 Pa	Material	AlZn sheet steel
Internal static pressure	407 Pa	Thermal insulation	T3
Exhaust air volume flow rate	5.25 m³/sec	Condensation insulation	TB3
External static pressure	420 Pa	Leakage class	L1(M) / L2(R)*
Internal static pressure	241 Pa	Casing strength	D1(M)
Design outdoor temperature summer	28.5 °C	Sum filtration supply air	ePM1 - 60.0%
Dim. humidity summer	19.7 °C wb	Sum filtration exhaust air	ePM1 - 60.0%
Design outdoor temperature winter	-4.5 °C		
Dim. humidity winter	-5.4 °C wb		
Temperature in, supply air, summer	22 °C	Temperature in, extract air, summer	22 °C
Air humidity in, supply air, summer	20.4 °C wb	Air humidity in, extract air, summer	15.4 °C wb
Temperature in, supply air, winter	16 °C	Temperature in, extract air, winter	22 °C
Air humidity in, supply air, winter	4.6 °C wb	Air humidity in, extract air, winter	13.1 °C wb
Mixing ratio at winter design temperature	0 %		
Temperature efficiency (EN308)	69.7 %	Heat recovery capacity	115 kW
SFPv supply air	1.11 kW/(m³/s)	Total dry weight	4039 kg
SFPv exhaust air inlet	0.89 kW/(m³/s)		
SFPv total sum	1.93 kW/(m³/s)	Heaviest block	1790 kg

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



Approved according to requirements 2018

Unit type: NRVU BVU	
SFPint (2016: 1063 W/(m³/s), 2018: 800 W/(m³/s))	561 W/(m³/s)
Dry temperature efficiency (balanced) (EN308) (2016: 67 %, 2018: 73 %)	73 %
External leakage rate	0.3 %
Internal leakage rate	0.5 %

	Supply air	Extract air	Unit
Heat exchanger pressure drop	180	153	Pa
Filter energy classification	B	B	
Filter pressure drop, start	46	21	Pa
Filter area	3.2	3.2	m²
Filter cross section air velocity	1.8	1.7	m/s
Air flow	5.77	5.25	m³/sec
Total pressure rise	759	616	Pa
Fan fan system effect	0	0	Pa
Fan total efficiency	71.6	70.9	%
Fan system input power (absorbed electrical power) according to SFP	6.44	4.7	kW

Fan system effect is taken into account in fan performance

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793554	
Unit	375 (APRVL) / AHU15 Office & Write Up	2021/04/20
Size	072	Page 4/13
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	
Supply air volume flow rate	5.77 m³/sec	Exhaust air volume flow rate 5.25 m³/sec
External static pressure	440 Pa	External static pressure 420 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight 4039 kg
Specific el. power demand (SFPv)	1.93 kW/(m³/s)	Dimensioned for wet condition
Ref. density	1.2 kg/m³	Ref. altitude above sea level 0 m

Coils

	Capacity [kW]	Air In [°C/°C wb]	Air Out [°C/°C wb]	Water in/out [°C]	Antifreeze	Water [l/s]	Water [kPa]	Conn [mm]
Air heater	171	-4.5/-8.3	20/6.5	70/50		2.08	12.4	50
Air cooler	32.5	25.5/18.4	22/16.8	6/12		1.29	18.6	32

Fan power supply data

Voltage, supply flow	3x400VAC+PE, 50Hz	Voltage, extract flow	3x400VAC+PE, 50Hz
Power, supply flow	15 kW	Power, extract flow	2 x 4.6 kW
Current, full load, supply flow	31 A	Current, full load, extract flow	2 x 5.8 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	67	79	74	71	68	65	64	60	74
Supply air connection	65	73	70	74	70	65	61	54	75
Extract connection	62	71	64	58	54	52	47	49	62
Exhaust connection	75	87	79	80	77	73	70	67	82
To surroundings	62	69	59	50	47	46	43	31	57

*Flakt Group eQ AHUs are leakage class L2 real unit as certified by Eurovent. CAL class @-400Pa and @+700Pa. For units where the casing has; (i) a customised or special design that differs from standard module box, (ii) nonstandard components penetrating the casing that is non-standard for a real unit, and (iii) where holes or penetrations are made in casing after delivery to site, the leakage class cannot be guaranteed. This also includes damage to the unit from handling and transportation.

Project 781 () / Paterson Labs AHU
AOC ACON-02793554
Unit 375 (APRVL) / AHU15 Office & Write Up
Size 072

Acon 2.55.47452

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TECHNICAL SPECIFICATION (components listed in direction of air flow)

SUPPLY AIR

End connection frame

Pressure drop, dimensioning

4 Pa

Casing end wall

Damper

Width cm : 220

Height in cm : 100

Tightness class : CEN 3

Connection: Flange

Function : Outdoor air

Location: externally end wall

Damper type: 200 mm blade

Material : AlZn

Filter

Inspection side: left

Filter selection

Filter class: F7 - ePM1 60%, glassfibre

Filter frame : galvanized sheet steel

Prefilter: G4 – coarse, synthetic

Design

Connection side : inlet in end wall

Location: negative pressure

Drain tray: without

Number of filters

8x592x592

Pressure drop, start

81 Pa

Pressure drop, dimensioning

156 Pa

Pressure drop, end

231 Pa

Face area

2.9 m²

Face velocity

2.1 m/s

Differential pressure sensor type Dwyer Magnehelic

Pressure range, first sensor: 0-250 Pa

Pressure range, second sensor: 0-250 Pa

Design: flush mounted in door

Empty section

Unit size : 072

Length: 025

Inspection side : left

Plenum fan

Inspection side: left

Fan selection

Impeller type: Bluefin Floor mounted

Fan size: size 3

Anti-vibration mountings: steel spring

Motor selection

Motor type: PM-motor IE4

IEC Size: 132

Motor control

Manufacture, type: FläktGroup separate

Housing protection: IP54

Design: on panel

Delivery options: mounted on current sub

Motor / VSD-accessories

Connection accessories: safety isolating switch

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793554	
Unit	375 (APRVL) / AHU15 Office & Write Up	2021/04/20
Size	072	Page 6/13

Length: 451

Dimensioning data

Speed	1154 Rpm
Max speed	1500 Rpm
Total efficiency	72.9 %
Total static pressure, dimensioning (wet coil)	847 Pa
Dynamic pressure	41 Pa
Fan system input power (absorbed electrical power)	7.27 kW
Temperature rise	1 °C
K factor	5.37
Fan wheel size	080

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	6.44 kW
Pressure rise	759 Pa
Speed	1088 Rpm

Motor

Motor output	15 kW
Electric current	31.0 A
Output margin, minimum	40 %

Frequency converter

Efficiency	97.0 %
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Inspection window

Design: standard

Bulkhead light

Type: LED

Delivery form: Lamp supplied loose

Frequency converter

Motor accessories

Fan + PM motor

Plate heat exchanger, RECUTERM

Size: 72

Output variant: Standard

Recuterm - defrost: Level 1 By pass damper > -16°C

Fin material : Aluminium

Droplet eliminator: without

Control connections: no

Material: AZ sheet steel

Inspection side: left

Efficiency

Temperature efficiency according to standard EN 308	69.7 %
Temperature efficiency at 0°C outdoors	74.8 %
Cooling recovery	69.0 %

Frost protection

Temperature limit when frost protection starts:	0 °C
Winter dim. , regulated	73.8 %

Supply air

	Summer	Winter
Pressure drop	185	169 Pa
Air temperature	29.5 / 24.3	-3.6 / 15.3 °C
Wet temperature	20 / 18.4	-4.8 / 6.1 °C wb
Capacity reduction	36	115 kW
Face velocity	2.0	2.0 m/s

Exhaust air

	Summer	Winter
Pressure drop	156	148 Pa
Air temperature	22 / 27.7	22 / 3.5 °C
Wet temperature	15.4 / 17.4	13.1 / 3.5 °C wb
Face velocity	1.8	1.8 m/s

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793554	
Unit	375 (APRVL) / AHU15 Office & Write Up	2021/04/20
Size	072	Page 7/13

Empty section

Unit size : 072
Length: 040
Inspection side : left

Air heater for hot water

Size: 072
Inspection side: left
Material: galvanized sheet steel
Coil selection
Calculation principle: input data
Output variant: 2
Fluid passes: 04
Fin spacing: 3 mm
Design: normal face area
Material, coil: Cu/Al, MS header

Nom. pipe size	50
Liquid volume	24.6 l
Pressure drop, dimensioning	20 Pa
Output	171 kW
Air temperature	-4.5 / 20 °C
Face velocity	1.9 m/s
Control principle for water heater	flow control
Water temperature	70 / 50 °C
Water flow	2.08 l/s
Water velocity	1.1 m/s
Pressure drop water	12.4 kPa
Oversizing	15.5 %

Empty section

Unit size : 072
Length: 040
Inspection side : left

Air cooler for chilled water

Size: 072
Inspection side: left
Material: galvanized sheet steel
Droplet eliminator: with, plastic
Design variant: version 3
Coil selection
Use as: Cooling Coil
Calculation principle: input data
Output variant: 2
Fluid passes: 06
Fin spacing: 3 mm
Design: normal face area
Material, coil: Cu/Al, MS header

Shunt selection

Shunt control: without

Nom. pipe size	32
Liquid volume	21.7 l
Pressure drop, dimensioning	40 Pa
Pressure drop, wet coil	40 Pa
Pressure drop, dry coil	21 Pa
Output	32.5 kW
Air temperature	25.5 / 22 °C
Wet temperature	18.4 / 16.8 °C wb
Face velocity	2.2 m/s

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793554	
Unit	375 (APRVL) / AHU15 Office & Write Up	2021/04/20
Size	072	Page 8/13

Water temperature	6 / 12 °C
Water flow	1.29 l/s
Water velocity	1.0 m/s
Pressure drop water	18.6 kPa
Oversizing	78.1 %

Empty section

Unit size : 072
Length: 040
Inspection side : left

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

Duct connection piece

Width cm : 220
Height in cm : 100
Connection type: flange connection
Material: galvanized sheet steel / AlZn

EXHAUST AIR

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

Duct connection piece

Width cm : 220
Height in cm : 100
Connection type: flange connection
Material: galvanized sheet steel / AlZn

Filter

Inspection side: right

Filter selection

Filter class: F7 - ePM1 60%, glassfibre
Filter frame : galvanized sheet steel
Prefilter: without

Design

Connection side : inlet in end wall
Location: negative pressure
Drain tray: without

Number of filters	8x592x592
Pressure drop, start	40 Pa
Pressure drop, dimensioning	80 Pa
Pressure drop, end	119 Pa
Face area	2.9 m ²
Face velocity	1.9 m/s

Differential pressure sensor type Dwyer Magnehelic

Pressure range, first sensor: 0-250 Pa
Design: flush mounted in door

Empty section

Unit size : 072
Length: 040
Inspection side : right

Plenum fan

Inspection side: right

Fan selection

Impeller type: Bluefin (composite)

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793554	
Unit	375 (APRVL) / AHU15 Office & Write Up	2021/04/20
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Fan size: size 3
Anti-vibration mountings: wall mounted

Motor selection

Motor type: EC-motor

Motor control

Manufacture, type: EC-motor ZA
Housing protection: IP55
Design: on motor
Delivery options: mounted on current sub

Motor / VSD-accessories

Connection accessories: safety switch with quick connection
Length: 451

Dimensioning data

Two fan wheels in parallel	
Speed	1466 Rpm
Max speed	1780 Rpm
Total efficiency	71.4 %
Total static pressure, dimensioning (wet coil)	661 Pa
Dynamic pressure	19 Pa
Fan system input power (absorbed electrical power)	5.18 kW
Temperature rise	0.8 °C
K factor	10.14
Fan wheel size	056

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	4.7 kW
Pressure rise	616 Pa
Speed	1401 Rpm

Motor

Motor output	2 x 4.6 kW
Electric current	2 x 5.8 A
Output margin, minimum	40 %

Inspection window

Design: standard

Bulkhead light

Type: LED
Delivery form: Lamp supplied loose

Frequency converter

Motor accessories

Frequency converter

Fan + EC motor

Help code fan + EC-motor

End connection frame

Pressure drop, dimensioning	4 Pa
-----------------------------	------

Casing end wall

Damper

Width cm : 220
Height in cm : 100
Tightness class : CEN 3
Connection: Flange
Function : extract air
Location: externally end wall
Damper type: 200 mm blade
Material : AlZn

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793554	
Unit	375 (APRVL) / AHU15 Office & Write Up	2021/04/20
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BLOCK LIST

	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	VOLUME (m³)	WEIGHT (kg)
EQGB-072-235-22-1-1-2-1-2-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Casing end wall Filter Empty section Plug fan floor mounted	2400	2750	1546	10.2	814
EQHB-072-260-22-1-1-2-1-3-1-1 Unit casing (frame, unit) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Plate heat exchanger, RECUTERM	2650	2750	3072	22.39	1790
EQGB-072-200-22-1-1-2-1-4-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Empty section Air heater for hot water Empty section Air cooler for chilled water Empty section Casing end wall	2050	2750	1696	9.56	634
EQGB-072-075-22-1-1-2-1-2-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)*	800	2750	1546	3.4	235

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793554	
Unit	375 (APRVL) / AHU15 Office & Write Up	2021/04/20
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Casing strength: D1(M)

Casing end wall

Filter

EQGB-072-120-22-1-1-2-1-4-1-1	1250	2750	1696	5.83	566
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Unit casing (frame, module)

Model box code: EQ 2111

Material: AlZn sheet steel

Thermal insulation: T3

Condensation insulation: TB3

Leakage class: L2(R)*

Casing strength: D1(M)

Empty section

Plug fan wall mounted

Casing end wall

51.38	4039
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The dimensions are transport dimensions including packaging

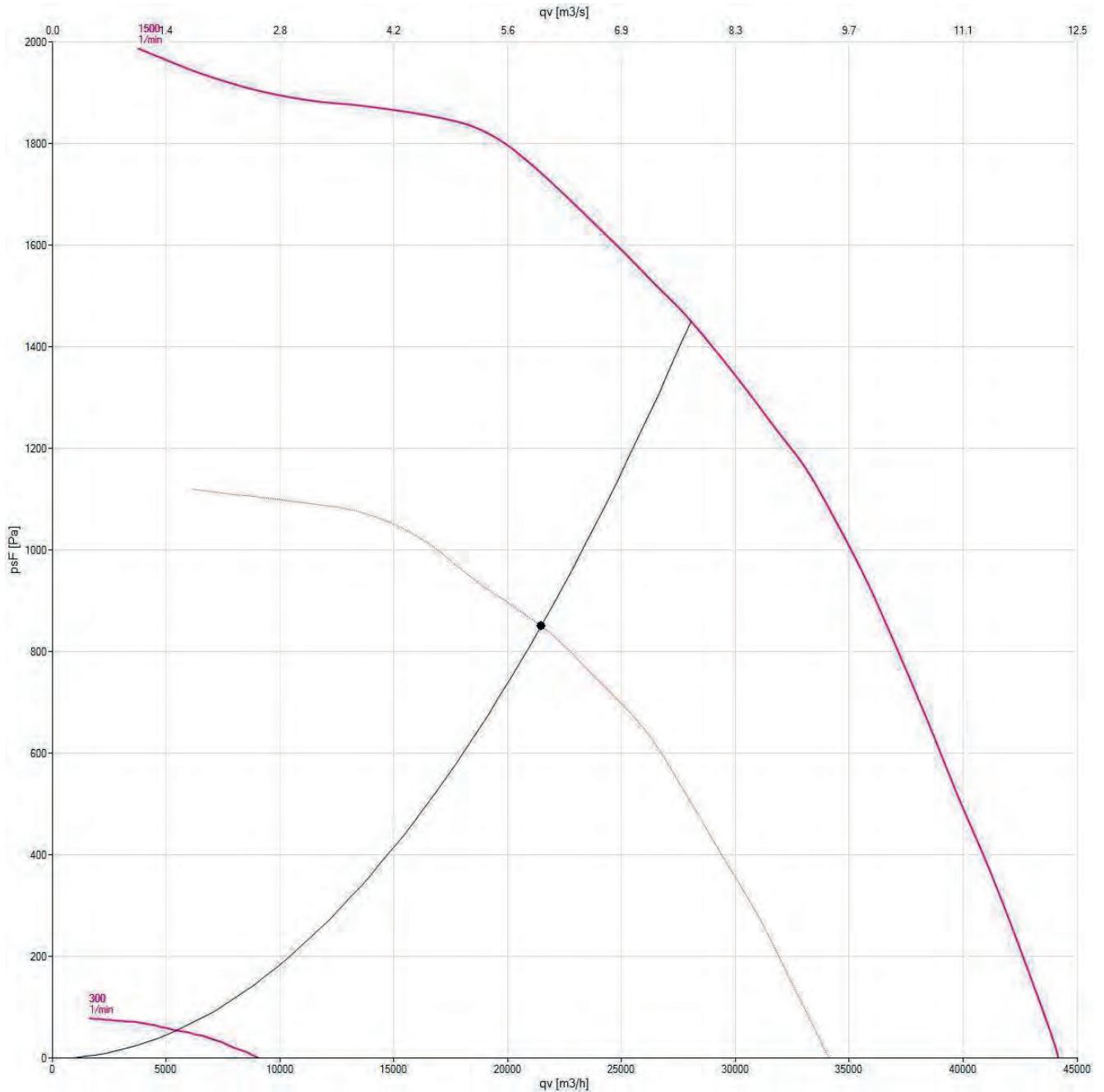
*Flakt Group eQ AHUs are leakage class L2 real unit as certified by Eurovent. CAL class @-400Pa and @+700Pa. For units where the casing has; (i) a customised or special design that differs from standard module box, (ii) nonstandard components penetrating the casing that is non-standard for a real unit, and (iii) where holes or penetrations are made in casing after delivery to site, the leakage class cannot be guaranteed. This also includes damage to the unit from handling and transportation.

Project 781 () / Paterson Labs AHU
 AOC ACON-02793554
 Unit 375 (APRVL) / AHU15 Office & Write Up
 Size 072

Acon 2.55.47452

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Fan chart - Supply air - EQLA-072-3-0-1-2-6-1-1-2-8-2-1

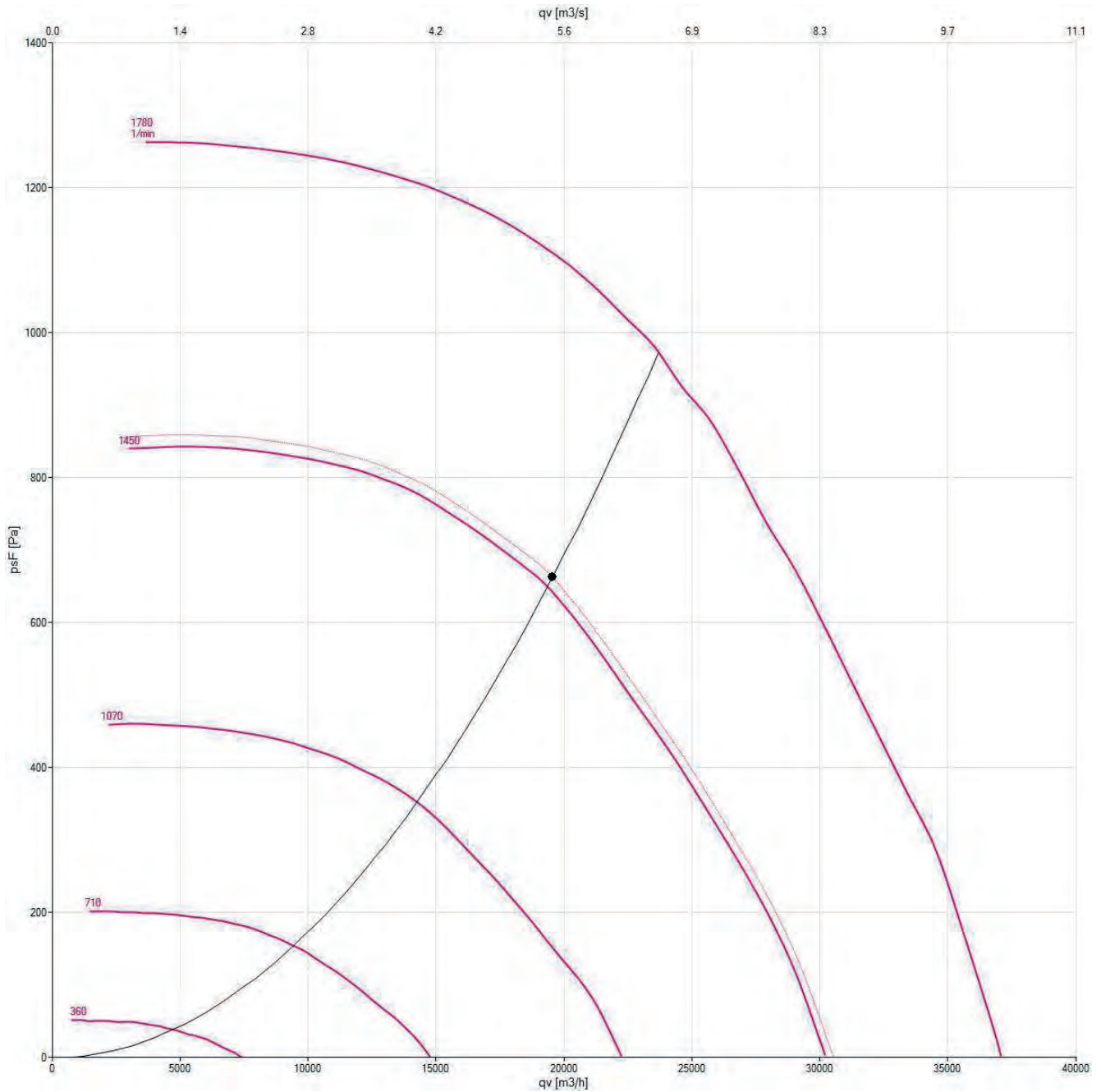


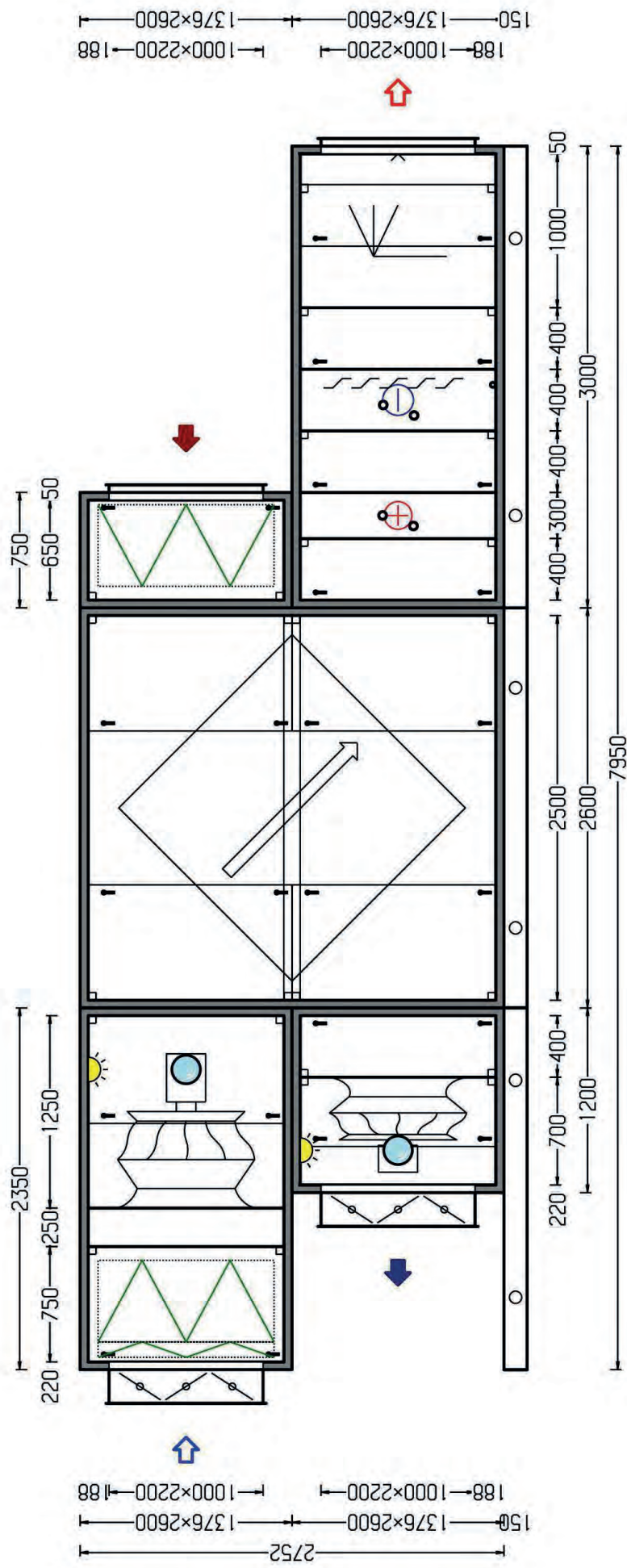
Project 781 () / Paterson Labs AHU
 AOC ACON-02793554
 Unit 375 (APRVL) / AHU15 Office & Write Up
 Size 072

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Fan chart - Exhaust air inlet - EQLC-072-3-1-1-2-4-2-2-8-1-1





From Inspection Side 2021/04/20 Acon 2.55.47452 Page 1/14	Customer id Project Unit AOC	69028 781 376 ACON-02793555	Project name		Paterson Labs AHU (APRVL) / AHU16 Labs South L5 5.61 m³/sec 5.11 m³/sec	FläktGroup
			Unit name			
			Supply air			
			Exhaust air			
			eQ-072 eQ-072			

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793555	
Unit	376 (APRVL) / AHU16 Labs South L5	2021/04/20
Size	072	Page 3/14
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	
Supply air volume flow rate	5.61 m³/sec	Exhaust air volume flow rate 5.11 m³/sec
External static pressure	360 Pa	External static pressure 350 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight 4272 kg
Specific el. power demand (SFPv)	1.74 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	5.61 m³/sec	Installation	Indoor horizontal
External static pressure	360 Pa	Material	AlZn sheet steel
Internal static pressure	419 Pa	Thermal insulation	T3
Exhaust air volume flow rate	5.11 m³/sec	Condensation insulation	TB3
External static pressure	350 Pa	Leakage class	L1(M) / L2(R)*
Internal static pressure	229 Pa	Casing strength	D1(M)
Design outdoor temperature summer	28.5 °C	Sum filtration supply air	ePM1 - 60.0%
Dim. humidity summer	19.7 °C wb	Sum filtration exhaust air	ePM1 - 60.0%
Design outdoor temperature winter	-4.5 °C		
Dim. humidity winter	-5.4 °C wb		
Temperature in, supply air, summer	16 °C	Temperature in, extract air, summer	22 °C
Air humidity in, supply air, summer	14 °C wb	Air humidity in, extract air, summer	15.4 °C wb
Temperature in, supply air, winter	16 °C	Temperature in, extract air, winter	22 °C
Air humidity in, supply air, winter	4.6 °C wb	Air humidity in, extract air, winter	13.1 °C wb
Mixing ratio at winter design temperature	0 %		
Temperature efficiency (EN308)	69.9 %	Heat recovery capacity	112 kW
SFPv supply air	1.03 kW/(m³/s)	Total dry weight	4272 kg
SFPv exhaust air inlet	0.77 kW/(m³/s)		
SFPv total sum	1.74 kW/(m³/s)	Heaviest block	1790 kg

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



Approved according to requirements 2018

Unit type: NRVU BVU	
SFPint (2016: 1067 W/(m³/s), 2018: 800 W/(m³/s))	540 W/(m³/s)
Dry temperature efficiency (balanced) (EN308) (2016: 67 %, 2018: 73 %)	73 %
External leakage rate	0.4 %
Internal leakage rate	0.5 %

	Supply air	Extract air	Unit
Heat exchanger pressure drop	172	146	Pa
Filter energy classification	B	B	
Filter pressure drop, start	44	20	Pa
Filter area	3.2	3.2	m²
Filter cross section air velocity	1.8	1.6	m/s
Air flow	5.61	5.11	m³/sec
Total pressure rise	690	537	Pa
Fan fan system effect	0	0	Pa
Fan total efficiency	70.3	71.3	%
Fan system input power (absorbed electrical power) according to SFP	5.8	3.98	kW

Fan system effect is taken into account in fan performance

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793555	
Unit	376 (APRVL) / AHU16 Labs South L5	2021/04/20
Size	072	Page 4/14
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	
Supply air volume flow rate	5.61 m³/sec	Exhaust air volume flow rate 5.11 m³/sec
External static pressure	360 Pa	External static pressure 350 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight 4272 kg
Specific el. power demand (SFPv)	1.74 kW/(m³/s)	Dimensioned for wet condition
Ref. density	1.2 kg/m³	Ref. altitude above sea level 0 m

Coils

	Capacity [kW]	Air In [°C/°C wb]	Air Out [°C/°C wb]	Water in/out [°C]	Antifreeze	Water [l/s]	Water [kPa]	Conn [mm]
Air heater	139	-4.5/-8.3	16/4.4	70/50		1.69	8.3	50
Air cooler	83.4	25.5/18.4	16/14.1	6/12		3.31	17.4	50

Fan power supply data

Voltage, supply flow	3x400VAC+PE, 50Hz	Voltage, extract flow	3x400VAC+PE, 50Hz
Power, supply flow	15 kW	Power, extract flow	2 x 3.4 kW
Current, full load, supply flow	31 A	Current, full load, extract flow	2 x 4.4 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	67	76	72	70	66	64	63	59	73
Supply air connection	65	71	69	73	69	64	59	53	74
Extract connection	62	69	61	56	53	50	46	47	60
Exhaust connection	74	84	76	79	75	72	69	65	81
To surroundings	62	66	56	49	45	45	42	30	55

*Flakt Group eQ AHUs are leakage class L2 real unit as certified by Eurovent. CAL class @-400Pa and @+700Pa. For units where the casing has; (i) a customised or special design that differs from standard module box, (ii) nonstandard components penetrating the casing that is non-standard for a real unit, and (iii) where holes or penetrations are made in casing after delivery to site, the leakage class cannot be guaranteed. This also includes damage to the unit from handling and transportation.

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793555	
Unit	376 (APRVL) / AHU16 Labs South L5	2021/04/20
Size	072	Page 5/14

TECHNICAL SPECIFICATION (components listed in direction of air flow)

SUPPLY AIR

End connection frame

Pressure drop, dimensioning

4 Pa

Casing end wall

Damper

Width cm : 220

Height in cm : 100

Tightness class : CEN 3

Connection: Flange

Function : Outdoor air

Location: externally end wall

Damper type: 200 mm blade

Material : AlZn

Filter

Inspection side: right

Filter selection

Filter class: F7 - ePM1 60%, glassfibre

Filter frame : galvanized sheet steel

Prefilter: G4 – coarse, synthetic

Design

Connection side : inlet in end wall

Location: negative pressure

Drain tray: without

Number of filters

8x592x592

Pressure drop, start

78 Pa

Pressure drop, dimensioning

153 Pa

Pressure drop, end

228 Pa

Face area

2.9 m²

Face velocity

2.0 m/s

Differential pressure sensor type Dwyer Magnehelic

Pressure range, first sensor: 0-250 Pa

Pressure range, second sensor: 0-250 Pa

Design: flush mounted in door

Empty section

Unit size : 072

Length: 025

Inspection side : right

Plenum fan

Inspection side: right

Fan selection

Impeller type: Bluefin Floor mounted

Fan size: size 3

Anti-vibration mountings: steel spring

Motor selection

Motor type: PM-motor IE4

IEC Size: 132

Motor control

Manufacture, type: FläktGroup separate

Housing protection: IP54

Design: on panel

Delivery options: mounted on current sub

Motor / VSD-accessories

Connection accessories: safety isolating switch

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793555	
Unit	376 (APRVL) / AHU16 Labs South L5	2021/04/20
Size	072	Page 6/14

Length: 451

Dimensioning data

Speed	1111 Rpm
Max speed	1500 Rpm
Total efficiency	72.0 %
Total static pressure, dimensioning (wet coil)	779 Pa
Dynamic pressure	39 Pa
Fan system input power (absorbed electrical power)	6.59 kW
Temperature rise	1 °C
K factor	5.37
Fan wheel size	080

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	5.8 kW
Pressure rise	690 Pa
Speed	1044 Rpm

Motor

Motor output	15 kW
Electric current	31.0 A
Output margin, minimum	30 %

Frequency converter

Efficiency	97.0 %
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Inspection window

Design: standard

Bulkhead light

Type: LED

Delivery form: Lamp supplied loose

Frequency converter

Motor accessories

Fan + PM motor

Plate heat exchanger, RECUTERM

Size: 72

Output variant: Standard

Recuterm - defrost: Level 1 By pass damper > -16°C

Fin material : Aluminium

Droplet eliminator: without

Control connections: no

Material: AZ sheet steel

Inspection side: right

Efficiency

Temperature efficiency according to standard EN 308	69.9 %
Temperature efficiency at 0°C outdoors	75.0 %
Cooling recovery	69.2 %

Frost protection

Temperature limit when frost protection starts:	0 °C
Winter dim. , regulated	73.7 %

Supply air

	Summer	Winter
Pressure drop	176	161 Pa
Air temperature	29.5 / 24.3	-3.6 / 15.3 °C
Wet temperature	20 / 18.4	-4.9 / 6 °C wb
Capacity reduction	35	112 kW
Face velocity	1.9	1.9 m/s

Exhaust air

	Summer	Winter
Pressure drop	149	142 Pa
Air temperature	22 / 27.7	22 / 3.5 °C
Wet temperature	15.4 / 17.4	13.1 / 3.5 °C wb
Face velocity	1.7	1.7 m/s

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793555	
Unit	376 (APRVL) / AHU16 Labs South L5	2021/04/20
Size	072	Page 7/14

Empty section

Unit size : 072
Length: 040
Inspection side : right

Air heater for hot water

Size: 072
Inspection side: right
Material: galvanized sheet steel
Coil selection
Calculation principle: input data
Output variant: 2
Fluid passes: 04
Fin spacing: 3 mm
Design: normal face area
Material, coil: Cu/Al, MS header

Nom. pipe size	50
Liquid volume	24.6 l
Pressure drop, dimensioning	19 Pa
Output	139 kW
Air temperature	-4.5 / 16 °C
Face velocity	1.9 m/s
Control principle for water heater	flow control
Water temperature	70 / 50 °C
Water flow	1.69 l/s
Water velocity	0.9 m/s
Pressure drop water	8.3 kPa
Oversizing	39.6 %

Empty section

Unit size : 072
Length: 040
Inspection side : right

Air cooler for chilled water

Size: 072
Inspection side: right
Material: galvanized sheet steel
Droplet eliminator: with, plastic
Design variant: version 3
Coil selection
Use as: Cooling Coil
Calculation principle: input data
Output variant: 3
Fluid passes: 04
Fin spacing: 2 mm
Design: normal face area
Material, coil: Cu/Al, MS header

Shunt selection

Shunt control: without

Nom. pipe size	50
Liquid volume	34.2 l
Pressure drop, dimensioning	65 Pa
Pressure drop, wet coil	65 Pa
Pressure drop, dry coil	45 Pa
Output	83.4 kW
Air temperature	25.5 / 16 °C
Wet temperature	18.4 / 14.1 °C wb
Face velocity	2.1 m/s

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793555	
Unit	376 (APRVL) / AHU16 Labs South L5	2021/04/20
Size	072	Page 8/14

Water temperature	6 / 12 °C
Water flow	3.31 l/s
Water velocity	1.1 m/s
Pressure drop water	17.4 kPa
Oversizing	12.5 %

Empty section

Unit size : 072
Length: 040
Inspection side : right

Humidifier

Unit size: 072
Length in cm: 100
Material: stainless sheet steel (AISI 304)
Inspection side: right

Special Unit Section

Size: 072
Pressure drop, dimensioning 0 Pa
Insertion loss, regenerated noise included 0,0,0,0,0,0,0 dB

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

Duct connection piece

Width cm : 220
Height in cm : 100
Connection type: flange connection
Material: galvanized sheet steel / AlZn

EXHAUST AIR

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

Duct connection piece

Width cm : 220
Height in cm : 100
Connection type: flange connection
Material: galvanized sheet steel / AlZn

Filter

Inspection side: left

Filter selection

Filter class: F7 - ePM1 60%, glassfibre
Filter frame : galvanized sheet steel
Prefilter: without

Design

Connection side : inlet in end wall
Location: negative pressure
Drain tray: without

Number of filters	8x592x592
Pressure drop, start	38 Pa
Pressure drop, dimensioning	76 Pa
Pressure drop, end	114 Pa
Face area	2.9 m²
Face velocity	1.8 m/s

Differential pressure sensor type Dwyer Magnehelic

Pressure range, first sensor: 0-250 Pa

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793555	
Unit	376 (APRVL) / AHU16 Labs South L5	2021/04/20
Size	072	Page 9/14

Design: flush mounted in door

Empty section

Unit size : 072

Length: 040

Inspection side : left

Plenum fan

Inspection side: left

Fan selection

Impeller type: Bluefin (composite)

Fan size: size 3

Anti-vibration mountings: wall mounted

Motor selection

Motor type: EC-motor

Motor control

Manufacture, type: EC-motor ZA

Housing protection: IP55

Design: on motor

Delivery options: mounted on current sub

Motor / VSD-accessories

Connection accessories: safety switch with quick connection

Length: 451

Dimensioning data

Two fan wheels in parallel

Speed

1391 Rpm

Max speed

1610 Rpm

Total efficiency

71.3 %

Total static pressure, dimensioning (wet coil)

579 Pa

Dynamic pressure

18 Pa

Fan system input power (absorbed electrical power)

4.42 kW

Temperature rise

0.7 °C

K factor

10.14

Fan wheel size

056

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP

3.98 kW

Pressure rise

537 Pa

Speed

1329 Rpm

Motor

Motor output

2 x 3.4 kW

Electric current

2 x 4.4 A

Output margin, minimum

10 %

Inspection window

Design: standard

Bulkhead light

Type: LED

Delivery form: Lamp supplied loose

Frequency converter

Motor accessories

Frequency converter

Fan + EC motor

Help code fan + EC-motor

End connection frame

Pressure drop, dimensioning

3 Pa

Casing end wall

Damper

Width cm : 220

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793555	
Unit	376 (APRVL) / AHU16 Labs South L5	2021/04/20
Size	072	Page 10/14

Height in cm : 100
Tightness class : CEN 3
Connection: Flange
Function : extract air
Location: externally end wall
Damper type: 200 mm blade
Material : AlZn

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793555	
Unit	376 (APRVL) / AHU16 Labs South L5	2021/04/20
Size	072	Page 11/14

BLOCK LIST

	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	VOLUME (m³)	WEIGHT (kg)
EQGB-072-235-22-1-1-2-1-2-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Casing end wall Filter Empty section Plug fan floor mounted	2400	2750	1546	10.2	814
EQHB-072-260-22-1-1-2-1-3-1-1 Unit casing (frame, unit) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Plate heat exchanger, RECUTERM	2650	2750	3072	22.39	1790
EQGB-072-300-22-1-1-2-1-4-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Empty section Air heater for hot water Empty section Air cooler for chilled water Empty section Humidifier Special Unit Section Casing end wall	3050	2750	1696	14.23	877
EQGB-072-075-22-1-1-2-1-2-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3	800	2750	1546	3.4	235

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793555	
Unit	376 (APRVL) / AHU16 Labs South L5	2021/04/20
Size	072	Page 12/14

Condensation insulation: TB3

Leakage class: L2(R)*

Casing strength: D1(M)

Casing end wall

Filter

EQGB-072-120-22-1-1-2-1-4-1-1	1250	2750	1696	5.83	556
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Unit casing (frame, module)

Model box code: EQ 2111

Material: AlZn sheet steel

Thermal insulation: T3

Condensation insulation: TB3

Leakage class: L2(R)*

Casing strength: D1(M)

Empty section

Plug fan wall mounted

Casing end wall

56.05	4272
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The dimensions are transport dimensions including packaging

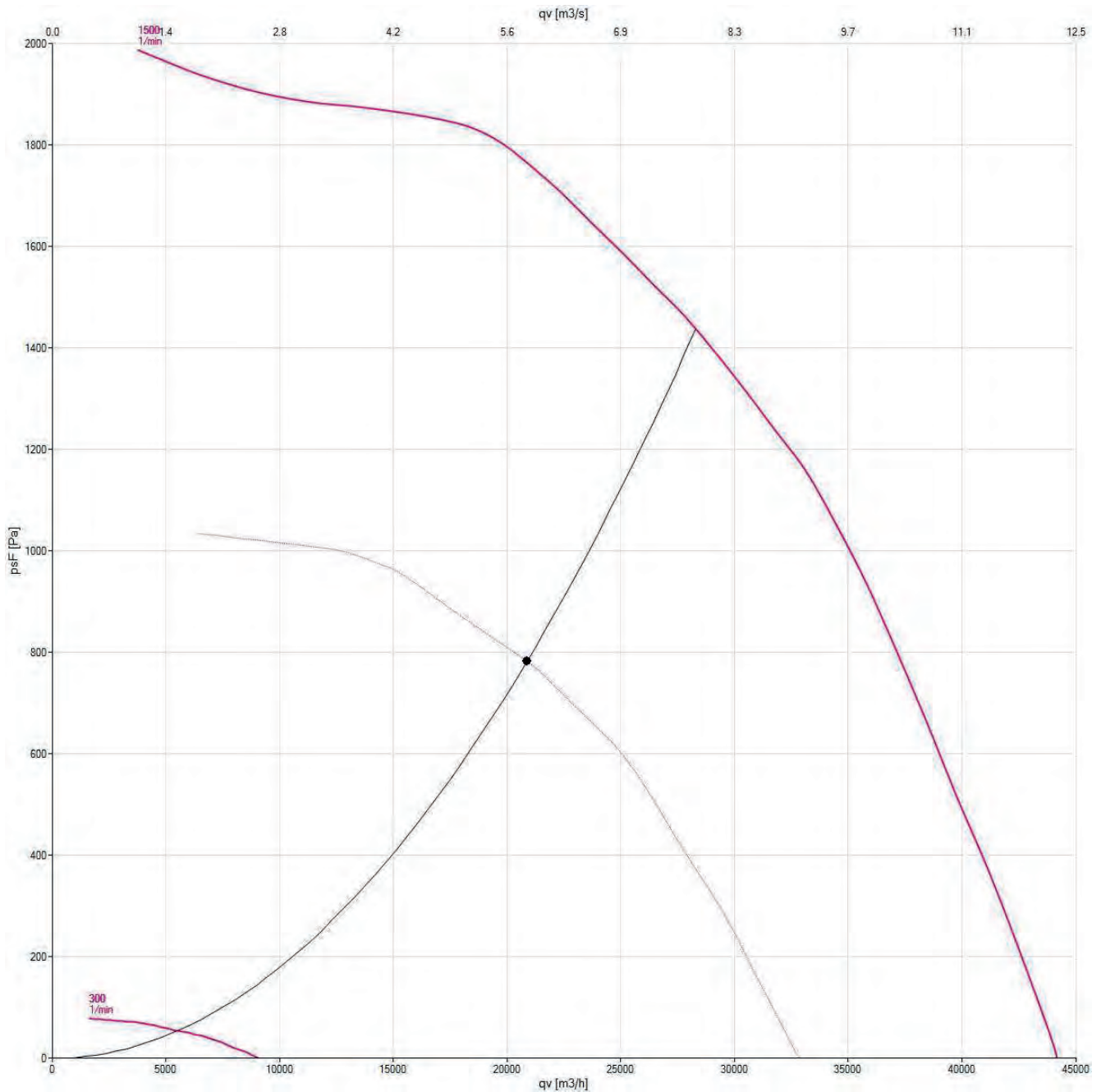
*Flakt Group eQ AHUs are leakage class L2 real unit as certified by Eurovent. CAL class @-400Pa and @+700Pa. For units where the casing has; (i) a customised or special design that differs from standard module box, (ii) nonstandard components penetrating the casing that is non-standard for a real unit, and (iii) where holes or penetrations are made in casing after delivery to site, the leakage class cannot be guaranteed. This also includes damage to the unit from handling and transportation.

Project 781 () / Paterson Labs AHU
 AOC ACON-02793555
 Unit 376 (APRVL) / AHU16 Labs South L5
 Size 072

Acon 2.55.47452

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Fan chart - Supply air - EQLA-072-3-0-1-2-6-1-1-2-8-1-1

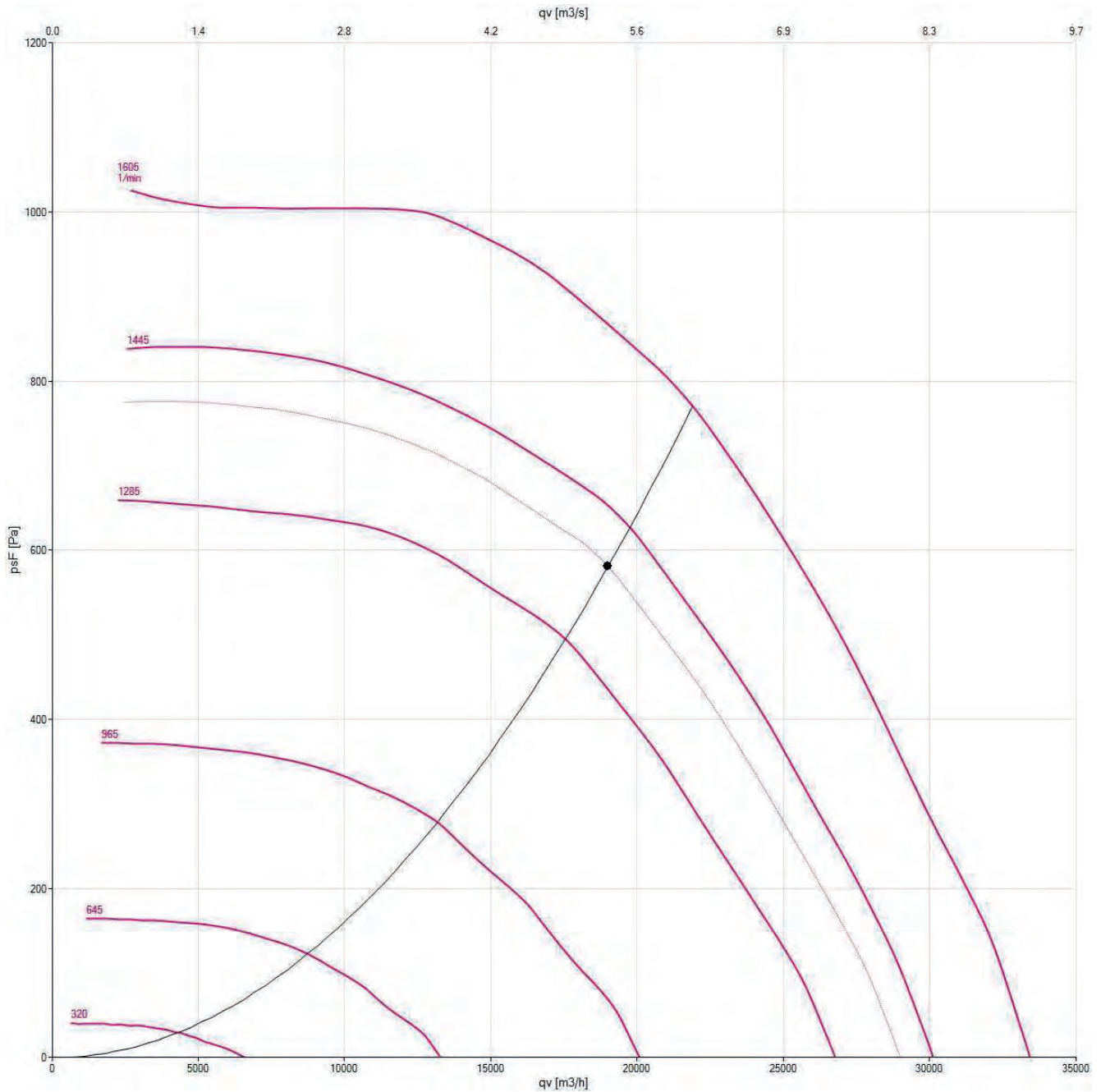


Project 781 () / Paterson Labs AHU
 AOC ACON-02793555
 Unit 376 (APRVL) / AHU16 Labs South L5
 Size 072

Acon 2.55.47452

2021/04/20
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Fan chart - Exhaust air inlet - EQLC-072-3-1-1-2-3-2-2-8-2-1



Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793556	
Unit	377 (APRVL) / AHU17 Labs Middle L5 & L6 SF	2021/04/20
Size	072	Page 3/14
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	
Supply air volume flow rate	5.65 m³/sec	Exhaust air volume flow rate 4.79 m³/sec
External static pressure	310 Pa	External static pressure 340 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight 4272 kg
Specific el. power demand (SFPv)	1.60 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	5.65 m³/sec	Installation	Indoor horizontal
External static pressure	310 Pa	Material	AlZn sheet steel
Internal static pressure	424 Pa	Thermal insulation	T3
Exhaust air volume flow rate	4.79 m³/sec	Condensation insulation	TB3
External static pressure	340 Pa	Leakage class	L1(M) / L2(R)*
Internal static pressure	206 Pa	Casing strength	D1(M)
Design outdoor temperature summer	28.5 °C	Sum filtration supply air	ePM1 - 60.0%
Dim. humidity summer	19.7 °C wb	Sum filtration exhaust air	ePM1 - 60.0%
Design outdoor temperature winter	-4.5 °C		
Dim. humidity winter	-5.4 °C wb		
Temperature in, supply air, summer	16 °C	Temperature in, extract air, summer	22 °C
Air humidity in, supply air, summer	14.6 °C wb	Air humidity in, extract air, summer	15.4 °C wb
Temperature in, supply air, winter	16 °C	Temperature in, extract air, winter	22 °C
Air humidity in, supply air, winter	4.6 °C wb	Air humidity in, extract air, winter	13.1 °C wb
Mixing ratio at winter design temperature	0 %		
Temperature efficiency (EN308)	67.6 %	Heat recovery capacity	108 kW
SFPv supply air	0.98 kW/(m³/s)	Total dry weight	4272 kg
SFPv exhaust air inlet	0.73 kW/(m³/s)		
SFPv total sum	1.60 kW/(m³/s)	Heaviest block	1790 kg

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



Approved according to requirements 2018

Unit type: NRVU BVU	
SFPint (2016: 1066 W/(m³/s), 2018: 800 W/(m³/s))	524 W/(m³/s)
Dry temperature efficiency (balanced) (EN308) (2016: 67 %, 2018: 73 %)	73 %
External leakage rate	0.4 %
Internal leakage rate	0.5 %

	Supply air	Extract air	Unit
Heat exchanger pressure drop	174	131	Pa
Filter energy classification	B	B	
Filter pressure drop, start	44	18	Pa
Filter area	3.2	3.2	m²
Filter cross section air velocity	1.8	1.5	m/s
Air flow	5.65	4.79	m³/sec
Total pressure rise	644	508	Pa
Fan fan system effect	0	0	Pa
Fan total efficiency	69.5	71.3	%
Fan system input power (absorbed electrical power) according to SFP	5.55	3.52	kW

Fan system effect is taken into account in fan performance

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793556	
Unit	377 (APRVL) / AHU17 Labs Middle L5 & L6 SF	2021/04/20
Size	072	Page 4/14
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	
Supply air volume flow rate	5.65 m³/sec	Exhaust air volume flow rate 4.79 m³/sec
External static pressure	310 Pa	External static pressure 340 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight 4272 kg
Specific el. power demand (SFPv)	1.60 kW/(m³/s)	Dimensioned for wet condition
Ref. density	1.2 kg/m³	Ref. altitude above sea level 0 m

Coils

	Capacity [kW]	Air In [°C/°C wb]	Air Out [°C/°C wb]	Water in/out [°C]	Antifreeze	Water [l/s]	Water [kPa]	Conn [mm]
Air heater	140	-4.5/-8.2	16/4.5	70/50		1.7	8.4	50
Air cooler	83.9	25.5/18.4	16/14.1	6/12		3.33	17.6	50

Fan power supply data

Voltage, supply flow	3x400VAC+PE, 50Hz	Voltage, extract flow	3x400VAC+PE, 50Hz
Power, supply flow	15 kW	Power, extract flow	2 x 3.4 kW
Current, full load, supply flow	31 A	Current, full load, extract flow	2 x 4.4 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	67	74	71	69	66	64	63	59	72
Supply air connection	64	69	69	73	68	64	60	53	73
Extract connection	61	69	61	55	52	49	45	45	59
Exhaust connection	73	84	75	78	74	71	68	63	80
To surroundings	61	65	56	48	45	45	42	30	54

*Flakt Group eQ AHUs are leakage class L2 real unit as certified by Eurovent. CAL class @-400Pa and @+700Pa. For units where the casing has; (i) a customised or special design that differs from standard module box, (ii) nonstandard components penetrating the casing that is non-standard for a real unit, and (iii) where holes or penetrations are made in casing after delivery to site, the leakage class cannot be guaranteed. This also includes damage to the unit from handling and transportation.

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793556	
Unit	377 (APRVL) / AHU17 Labs Middle L5 & L6 SF	2021/04/20
Size	072	Page 5/14

TECHNICAL SPECIFICATION

(components listed in direction of air flow)

SUPPLY AIR

End connection frame

Pressure drop, dimensioning

4 Pa

Casing end wall

Damper

Width cm : 220

Height in cm : 100

Tightness class : CEN 3

Connection: Flange

Function : Outdoor air

Location: externally end wall

Damper type: 200 mm blade

Material : AlZn

Filter

Inspection side: right

Filter selection

Filter class: F7 - ePM1 60%, glassfibre

Filter frame : galvanized sheet steel

Prefilter: G4 – coarse, synthetic

Design

Connection side : inlet in end wall

Location: negative pressure

Drain tray: without

Number of filters

8x592x592

Pressure drop, start

78 Pa

Pressure drop, dimensioning

153 Pa

Pressure drop, end

228 Pa

Face area

2.9 m²

Face velocity

2.0 m/s

Differential pressure sensor type Dwyer Magnehelic

Pressure range, first sensor: 0-250 Pa

Pressure range, second sensor: 0-250 Pa

Design: flush mounted in door

Empty section

Unit size : 072

Length: 025

Inspection side : right

Plenum fan

Inspection side: right

Fan selection

Impeller type: Bluefin Floor mounted

Fan size: size 3

Anti-vibration mountings: steel spring

Motor selection

Motor type: PM-motor IE4

IEC Size: 132

Motor control

Manufacture, type: FläktGroup separate

Housing protection: IP54

Design: on panel

Delivery options: mounted on current sub

Motor / VSD-accessories

Connection accessories: safety isolating switch

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793556	
Unit	377 (APRVL) / AHU17 Labs Middle L5 & L6 SF	2021/04/20
Size	072	Page 6/14

Length: 451

Dimensioning data

Speed	1092 Rpm
Max speed	1500 Rpm
Total efficiency	71.7 %
Total static pressure, dimensioning (wet coil)	734 Pa
Dynamic pressure	39 Pa
Fan system input power (absorbed electrical power)	6.3 kW
Temperature rise	0.9 °C
K factor	5.37
Fan wheel size	080

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	5.55 kW
Pressure rise	644 Pa
Speed	1025 Rpm

Motor

Motor output	15 kW
Electric current	31.0 A
Output margin, minimum	35 %

Frequency converter

Efficiency	97.0 %
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Inspection window

Design: standard

Bulkhead light

Type: LED

Delivery form: Lamp supplied loose

Frequency converter

Motor accessories

Fan + PM motor

Plate heat exchanger, RECUTERM

Size: 72

Output variant: Standard

Recuterm - defrost: Level 1 By pass damper > -16°C

Fin material : Aluminium

Droplet eliminator: without

Control connections: no

Material: AZ sheet steel

Inspection side: right

Efficiency

Temperature efficiency according to standard EN 308	67.6 %
Temperature efficiency at 0°C outdoors	72.1 %
Cooling recovery	66.5 %

Frost protection

Temperature limit when frost protection starts:	0 °C
Winter dim. , regulated	69.1 %

Supply air

	Summer	Winter
Pressure drop	179	163 Pa
Air temperature	29.4 / 24.5	-3.7 / 14.1 °C
Wet temperature	20 / 18.5	-4.9 / 5.4 °C wb
Capacity reduction	33	108 kW
Face velocity	1.9	1.9 m/s

Exhaust air

	Summer	Winter
Pressure drop	134	127 Pa
Air temperature	22 / 27.8	22 / 3.4 °C
Wet temperature	15.4 / 17.4	13.1 / 3.4 °C wb
Face velocity	1.6	1.6 m/s

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793556	
Unit	377 (APRVL) / AHU17 Labs Middle L5 & L6 SF	2021/04/20
Size	072	Page 7/14

Empty section

Unit size : 072
Length: 040
Inspection side : right

Air heater for hot water

Size: 072
Inspection side: right
Material: galvanized sheet steel

Coil selection

Calculation principle: input data
Output variant: 2
Fluid passes: 04
Fin spacing: 3 mm
Design: normal face area
Material, coil: Cu/Al, MS header

Nom. pipe size	50
Liquid volume	24.6 l
Pressure drop, dimensioning	20 Pa
Output	140 kW
Air temperature	-4.5 / 16 °C
Face velocity	1.9 m/s
Control principle for water heater	flow control
Water temperature	70 / 50 °C
Water flow	1.7 l/s
Water velocity	0.9 m/s
Pressure drop water	8.4 kPa
Oversizing	39.1 %

Empty section

Unit size : 072
Length: 040
Inspection side : right

Air cooler for chilled water

Size: 072
Inspection side: right
Material: galvanized sheet steel
Droplet eliminator: with, plastic
Design variant: version 3

Coil selection

Use as: Cooling Coil
Calculation principle: input data
Output variant: 3
Fluid passes: 04
Fin spacing: 2 mm
Design: normal face area
Material, coil: Cu/Al, MS header

Shunt selection

Shunt control: without

Nom. pipe size	50
Liquid volume	34.2 l
Pressure drop, dimensioning	66 Pa
Pressure drop, wet coil	66 Pa
Pressure drop, dry coil	46 Pa
Output	83.9 kW
Air temperature	25.5 / 16 °C
Wet temperature	18.4 / 14.1 °C wb
Face velocity	2.1 m/s

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793556	
Unit	377 (APRVL) / AHU17 Labs Middle L5 & L6 SF	2021/04/20
Size	072	Page 8/14

Water temperature	6 / 12 °C
Water flow	3.33 l/s
Water velocity	1.1 m/s
Pressure drop water	17.6 kPa
Oversizing	12.3 %

Empty section

Unit size : 072
Length: 040
Inspection side : right

Humidifier

Unit size: 072
Length in cm: 100
Material: stainless sheet steel (AISI 304)
Inspection side: right

Special Unit Section

Size: 072
Pressure drop, dimensioning 0 Pa
Insertion loss, regenerated noise included 0,0,0,0,0,0,0 dB

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

Duct connection piece

Width cm : 220
Height in cm : 100
Connection type: flange connection
Material: galvanized sheet steel / AlZn

EXHAUST AIR

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

Duct connection piece

Width cm : 220
Height in cm : 100
Connection type: flange connection
Material: galvanized sheet steel / AlZn

Filter

Inspection side: left

Filter selection

Filter class: F7 - ePM1 60%, glassfibre
Filter frame : galvanized sheet steel
Prefilter: without

Design

Connection side : inlet in end wall
Location: negative pressure
Drain tray: without

Number of filters	8x592x592
Pressure drop, start	34 Pa
Pressure drop, dimensioning	68 Pa
Pressure drop, end	102 Pa
Face area	2.9 m²
Face velocity	1.7 m/s

Differential pressure sensor type Dwyer Magnehelic

Pressure range, first sensor: 0-250 Pa

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793556	
Unit	377 (APRVL) / AHU17 Labs Middle L5 & L6 SF	2021/04/20
Size	072	Page 9/14

Design: flush mounted in door

Empty section

Unit size : 072

Length: 040

Inspection side : left

Plenum fan

Inspection side: left

Fan selection

Impeller type: Bluefin (composite)

Fan size: size 3

Anti-vibration mountings: wall mounted

Motor selection

Motor type: EC-motor

Motor control

Manufacture, type: EC-motor ZA

Housing protection: IP55

Design: on motor

Delivery options: mounted on current sub

Motor / VSD-accessories

Connection accessories: safety switch with quick connection

Length: 451

Dimensioning data

Two fan wheels in parallel

Speed

1334 Rpm

Max speed

1610 Rpm

Total efficiency

71.6 %

Total static pressure, dimensioning (wet coil)

546 Pa

Dynamic pressure

16 Pa

Fan system input power (absorbed electrical power)

3.89 kW

Temperature rise

0.7 °C

K factor

10.14

Fan wheel size

056

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP

3.52 kW

Pressure rise

508 Pa

Speed

1274 Rpm

Motor

Motor output

2 x 3.4 kW

Electric current

2 x 4.4 A

Output margin, minimum

30 %

Inspection window

Design: standard

Bulkhead light

Type: LED

Delivery form: Lamp supplied loose

Frequency converter

Motor accessories

Frequency converter

Fan + EC motor

Help code fan + EC-motor

End connection frame

Pressure drop, dimensioning

3 Pa

Casing end wall

Damper

Width cm : 220

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793556	
Unit	377 (APRVL) / AHU17 Labs Middle L5 & L6 SF	2021/04/20
Size	072	Page 10/14

Height in cm : 100
Tightness class : CEN 3
Connection: Flange
Function : extract air
Location: externally end wall
Damper type: 200 mm blade
Material : AlZn

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793556	
Unit	377 (APRVL) / AHU17 Labs Middle L5 & L6 SF	2021/04/20
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BLOCK LIST

	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	VOLUME (m³)	WEIGHT (kg)
EQGB-072-235-22-1-1-2-1-2-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Casing end wall Filter Empty section Plug fan floor mounted	2400	2750	1546	10.2	814
EQHB-072-260-22-1-1-2-1-3-1-1 Unit casing (frame, unit) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Plate heat exchanger, RECUTERM	2650	2750	3072	22.39	1790
EQGB-072-300-22-1-1-2-1-4-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Empty section Air heater for hot water Empty section Air cooler for chilled water Empty section Humidifier Special Unit Section Casing end wall	3050	2750	1696	14.23	877
EQGB-072-075-22-1-1-2-1-2-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3	800	2750	1546	3.4	235

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793556	
Unit	377 (APRVL) / AHU17 Labs Middle L5 & L6 SF	2021/04/20
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Condensation insulation: TB3

Leakage class: L2(R)*

Casing strength: D1(M)

Casing end wall

Filter

EQGB-072-120-22-1-1-2-1-4-1-1	1250	2750	1696	5.83	556
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Unit casing (frame, module)

Model box code: EQ 2111

Material: AlZn sheet steel

Thermal insulation: T3

Condensation insulation: TB3

Leakage class: L2(R)*

Casing strength: D1(M)

Empty section

Plug fan wall mounted

Casing end wall

56.05	4272
-------	------

The dimensions are transport dimensions including packaging

*Flakt Group eQ AHUs are leakage class L2 real unit as certified by Eurovent. CAL class @-400Pa and @+700Pa. For units where the casing has; (i) a customised or special design that differs from standard module box, (ii) nonstandard components penetrating the casing that is non-standard for a real unit, and (iii) where holes or penetrations are made in casing after delivery to site, the leakage class cannot be guaranteed. This also includes damage to the unit from handling and transportation.

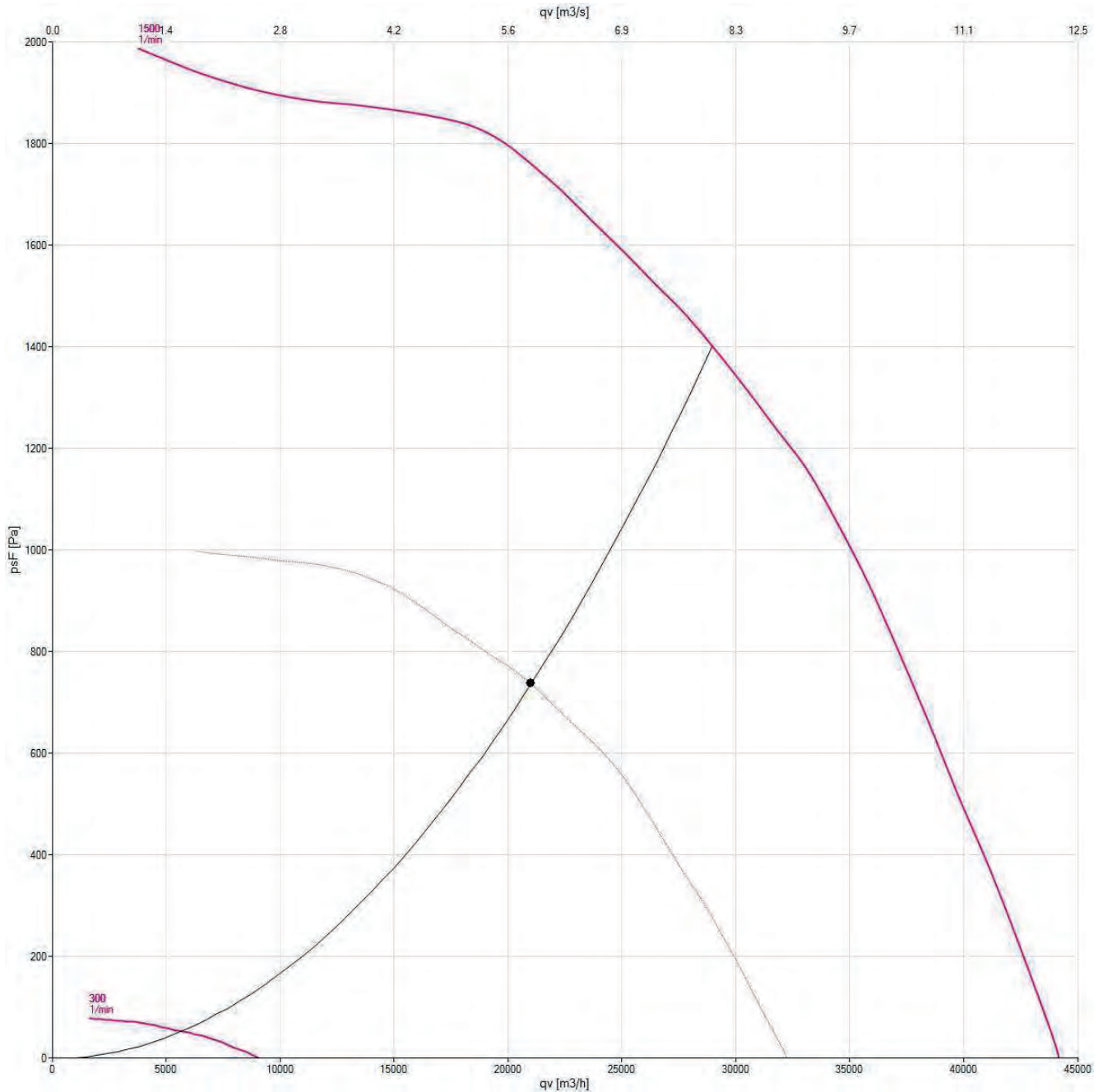
Project
AOC
Unit
Size

781 () / Paterson Labs AHU
ACON-02793556
377 (APRVL) / AHU17 Labs Middle L5 & L6 SF
072

Acon 2.55.47452

2021/04/20
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Fan chart - Supply air - EQLA-072-3-0-1-2-6-1-1-2-8-1-1



Project
AOC
Unit
Size

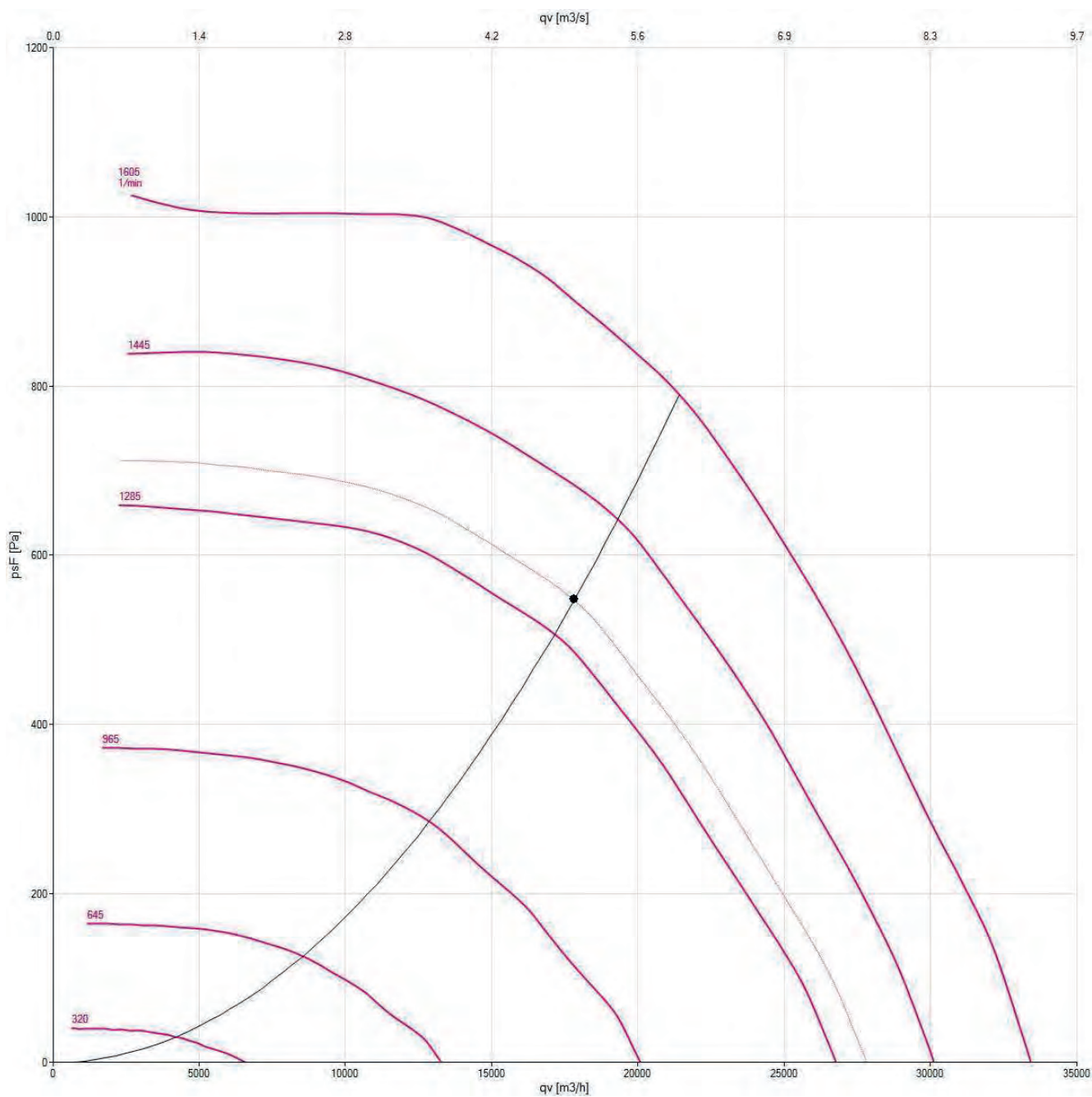
781 () / Paterson Labs AHU
ACON-02793556
377 (APRVL) / AHU17 Labs Middle L5 & L6 SF
072

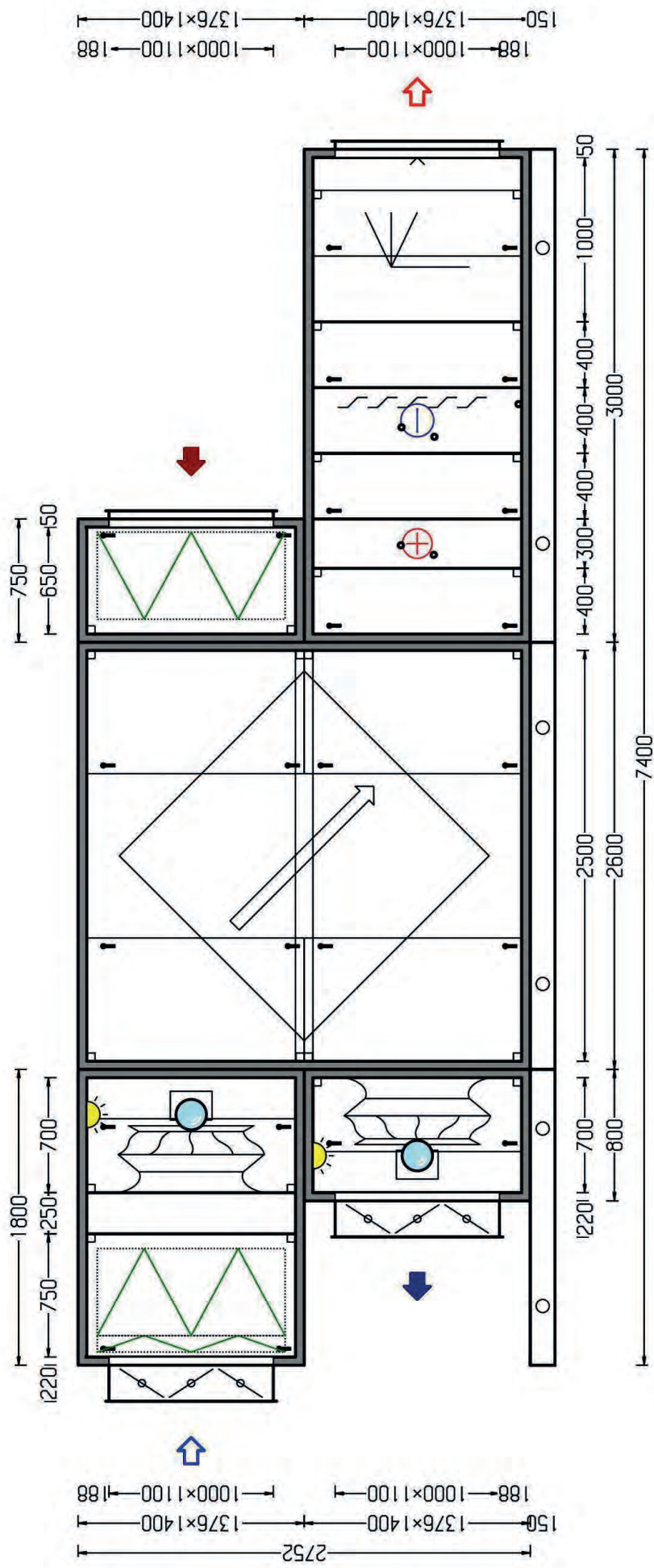
Acon 2.55.47452

2021/04/20

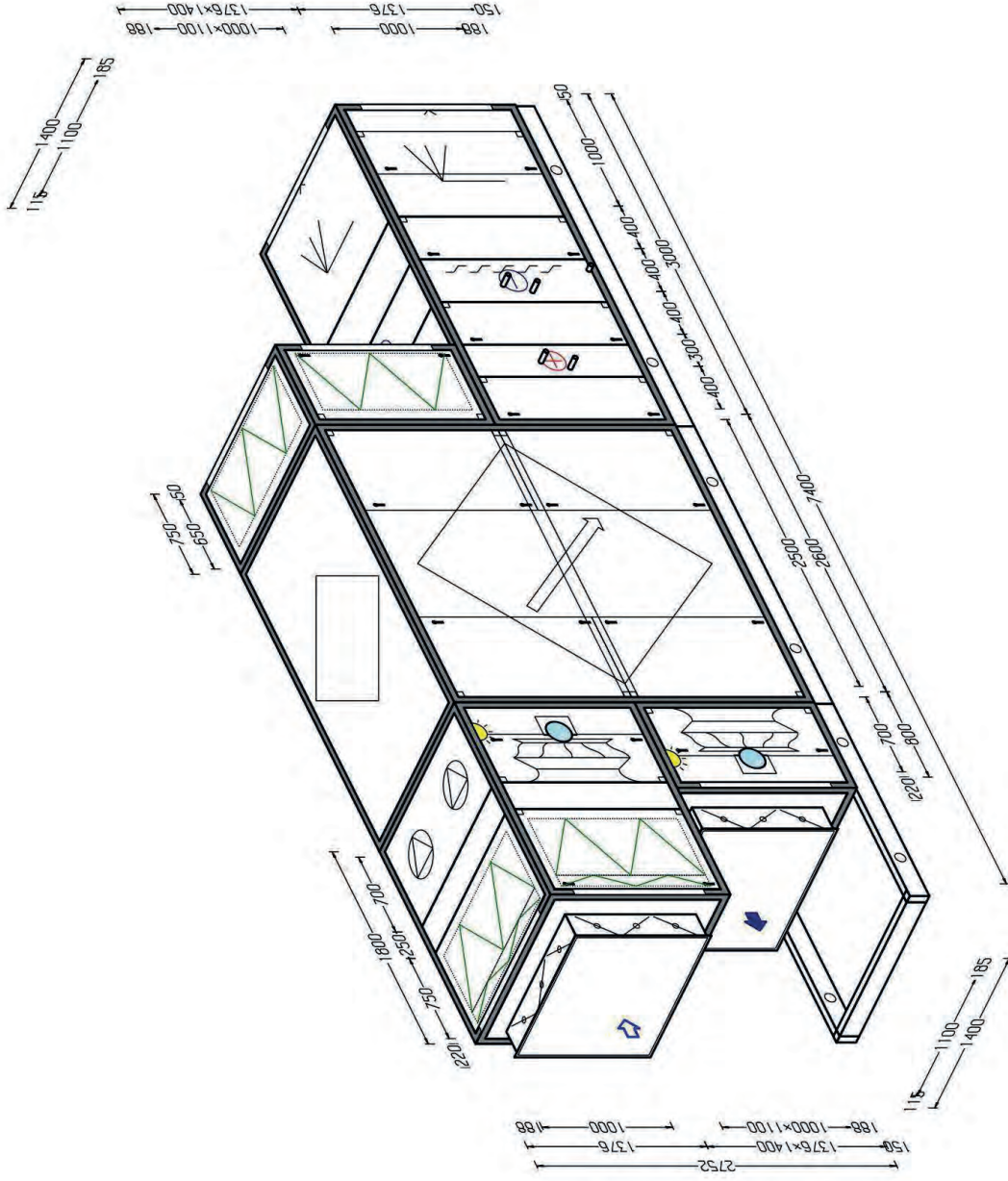
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Fan chart - Exhaust air inlet - EQLC-072-3-1-1-2-3-2-2-8-2-1





From Inspection Side	Paterson Labs AHU	FläktGroup
2021/04/20	(APRVL) / AHU18 Labs North L5 & L6	
Acon 2.55.47452	eQ-036	
Page 1/14	eQ-036	
	2.50 m³/sec	
	2.25 m³/sec	



Customer id
 Project 69028
 Unit 781
 AOC 378
 ACON-02793557

Project name
 Unit name
 Supply air
 Exhaust air

eQ-036
 eQ-036

(APRVL) / AHU18 Labs North L5 & L6
 Paterson Labs AHU
 2.50 m³/sec
 2.25 m³/sec

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793557	
Unit	378 (APRVL) / AHU18 Labs North L5 & L6	2021/04/20
Size	036	Page 3/14
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	
Supply air volume flow rate	2.50 m³/sec	Exhaust air volume flow rate 2.25 m³/sec
External static pressure	340 Pa	External static pressure 310 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight 2578 kg
Specific el. power demand (SFPv)	1.55 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	2.50 m³/sec	Installation	Indoor horizontal
External static pressure	340 Pa	Material	AlZn sheet steel
Internal static pressure	337 Pa	Thermal insulation	T3
Exhaust air volume flow rate	2.25 m³/sec	Condensation insulation	TB3
External static pressure	310 Pa	Leakage class	L1(M) / L2(R)*
Internal static pressure	182 Pa	Casing strength	D1(M)
Design outdoor temperature summer	28.5 °C	Sum filtration supply air	ePM1 - 60.0%
Dim. humidity summer	19.7 °C wb	Sum filtration exhaust air	ePM1 - 60.0%
Design outdoor temperature winter	-4.5 °C		
Dim. humidity winter	-5.4 °C wb		
Temperature in, supply air, summer	16 °C	Temperature in, extract air, summer	22 °C
Air humidity in, supply air, summer	14.6 °C wb	Air humidity in, extract air, summer	15.4 °C wb
Temperature in, supply air, winter	16 °C	Temperature in, extract air, winter	22 °C
Air humidity in, supply air, winter	4.6 °C wb	Air humidity in, extract air, winter	13.1 °C wb
Mixing ratio at winter design temperature	0 %		
Temperature efficiency (EN308)	70.1 %	Heat recovery capacity	49.9 kW
SFPv supply air	0.92 kW/(m³/s)	Total dry weight	2578 kg
SFPv exhaust air inlet	0.70 kW/(m³/s)		
SFPv total sum	1.55 kW/(m³/s)	Heaviest block	1136 kg

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



Approved according to requirements 2018

Unit type: NRVU BVU

SFPint (2016: 1084 W/(m³/s), 2018: 805 W/(m³/s))

459 W/(m³/s)

Dry temperature efficiency (balanced) (EN308) (2016: 67 %, 2018: 73 %)

73 %

External leakage rate

0.6 %

Internal leakage rate

0.5 %

	Supply air	Extract air	Unit
Heat exchanger pressure drop	137	115	Pa
Filter energy classification	B	B	
Filter pressure drop, start	36	16	Pa
Filter area	1.7	1.7	m²
Filter cross section air velocity	1.5	1.4	m/s
Air flow	2.50	2.25	m³/sec
Total pressure rise	598	459	Pa
Fan fan system effect	0	0	Pa
Fan total efficiency	66.2	66.2	%
Fan system input power (absorbed electrical power) according to SFP	2.3	1.59	kW

Fan system effect is taken into account in fan performance

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793557	
Unit	378 (APRVL) / AHU18 Labs North L5 & L6	2021/04/20
Size	036	Page 4/14
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	
Supply air volume flow rate	2.50 m³/sec	Exhaust air volume flow rate 2.25 m³/sec
External static pressure	340 Pa	External static pressure 310 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight 2578 kg
Specific el. power demand (SFPv)	1.55 kW/(m³/s)	Dimensioned for wet condition
Ref. density	1.2 kg/m³	Ref. altitude above sea level 0 m

Coils

	Capacity [kW]	Air In [°C/°C wb]	Air Out [°C/°C wb]	Water in/out [°C]	Antifreeze	Water [l/s]	Water [kPa]	Conn [mm]
Air heater	61.9	-4.5/-8.3	16/4.4	70/50		0.75	7.8	32
Air cooler	37	25.5/18.3	16/14	6/12		1.47	17.1	32

Fan power supply data

Voltage, supply flow	3x400VAC+PE, 50Hz	Voltage, extract flow	3x400VAC+PE, 50Hz
Power, supply flow	2 x 2.4 kW	Power, extract flow	2 x 1.7 kW
Current, full load, supply flow	2 x 3.1 A	Current, full load, extract flow	2 x 2.2 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	68	81	72	66	62	61	55	51	70
Supply air connection	66	80	68	69	66	60	51	46	71
Extract connection	60	71	61	55	51	48	43	39	59
Exhaust connection	71	83	75	75	73	68	62	57	77
To surroundings	61	70	56	45	41	42	35	30	56

*Flakt Group eQ AHUs are leakage class L2 real unit as certified by Eurovent. CAL class @-400Pa and @+700Pa. For units where the casing has; (i) a customised or special design that differs from standard module box, (ii) nonstandard components penetrating the casing that is non-standard for a real unit, and (iii) where holes or penetrations are made in casing after delivery to site, the leakage class cannot be guaranteed. This also includes damage to the unit from handling and transportation.

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793557	
Unit	378 (APRVL) / AHU18 Labs North L5 & L6	2021/04/20
Size	036	Page 5/14

TECHNICAL SPECIFICATION (components listed in direction of air flow)

SUPPLY AIR

End connection frame

Pressure drop, dimensioning

4 Pa

Casing end wall

Damper

Width cm : 110

Height in cm : 100

Tightness class : CEN 3

Connection: Flange

Function : Outdoor air

Location: externally end wall

Damper type: 200 mm blade

Material : AlZn

Filter

Inspection side: right

Filter selection

Filter class: F7 - ePM1 60%, glassfibre

Filter frame : galvanized sheet steel

Prefilter: G4 – coarse, synthetic

Design

Connection side : inlet in end wall

Location: negative pressure

Drain tray: without

Number of filters

4x592x592

Pressure drop, start

64 Pa

Pressure drop, dimensioning

129 Pa

Pressure drop, end

193 Pa

Face area

1.4 m²

Face velocity

1.8 m/s

Differential pressure sensor type Dwyer Magnehelic

Pressure range, first sensor: 0-250 Pa

Pressure range, second sensor: 0-250 Pa

Design: flush mounted in door

Empty section

Unit size : 036

Length: 025

Inspection side : right

Plenum fan

Inspection side: right

Fan selection

Impeller type: Bluefin (composite)

Fan size: size 3

Anti-vibration mountings: wall mounted

Motor selection

Motor type: EC-motor

Motor control

Manufacture, type: EC-motor ZA

Housing protection: IP55

Design: on motor

Delivery options: mounted on current sub

Motor / VSD-accessories

Connection accessories: safety switch with quick connection

Length: 356

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793557	
Unit	378 (APRVL) / AHU18 Labs North L5 & L6	2021/04/20
Size	036	Page 6/14

Dimensioning data

Two fan wheels in parallel	
Speed	1716 Rpm
Max speed	2050 Rpm
Total efficiency	64.8 %
Total static pressure, dimensioning (wet coil)	677 Pa
Dynamic pressure	11 Pa
Fan system input power (absorbed electrical power)	2.74 kW
Temperature rise	0.9 °C
K factor	16.36
Fan wheel size	045

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	2.3 kW
Pressure rise	598 Pa
Speed	1602 Rpm

Motor

Motor output	2 x 2.4 kW
Electric current	2 x 3.1 A
Output margin, minimum	40 %

Inspection window

Design: standard

Bulkhead light

Type: LED
Delivery form: Lamp supplied loose

Frequency converter

Motor accessories

Frequency converter

Fan + EC motor

Help code fan + EC-motor

Plate heat exchanger, RECUTERM

Size: 36
Output variant: Standard
Recuterm - defrost: Level 1 By pass damper > -16°C
Fin material : Aluminium
Droplet eliminator: without
Control connections: no
Material: AZ sheet steel
Inspection side: right

Efficiency

Temperature efficiency according to standard EN 308	70.1 %
Temperature efficiency at 0°C outdoors	75.2 %
Cooling recovery	69.3 %

Frost protection

Temperature limit when frost protection starts:	0 °C
Winter dim. , regulated	72.9 %

Supply air

	Summer	Winter
Pressure drop	141	129 Pa
Air temperature	29.4 / 24.3	-3.7 / 15 °C
Wet temperature	20 / 18.4	-4.9 / 5.9 °C wb
Capacity reduction	15	50 kW
Face velocity	1.7	1.7 m/s

Exhaust air

	Summer	Winter
Pressure drop	117	111 Pa
Air temperature	22 / 27.7	22 / 3.5 °C
Wet temperature	15.4 / 17.4	13.1 / 3.4 °C wb
Face velocity	1.5	1.5 m/s

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793557	
Unit	378 (APRVL) / AHU18 Labs North L5 & L6	2021/04/20
Size	036	Page 7/14

Empty section

Unit size : 036
Length: 040
Inspection side : right

Air heater for hot water

Size: 036
Inspection side: right
Material: galvanized sheet steel
Coil selection
Calculation principle: input data
Output variant: 2
Fluid passes: 08
Fin spacing: 3 mm
Design: normal face area
Material, coil: Cu/Al, MS header

Nom. pipe size	32
Liquid volume	12.4 l
Pressure drop, dimensioning	16 Pa
Output	61.9 kW
Air temperature	-4.5 / 16 °C
Face velocity	1.7 m/s
Control principle for water heater	flow control
Water temperature	70 / 50 °C
Water flow	0.75 l/s
Water velocity	0.8 m/s
Pressure drop water	7.8 kPa
Oversizing	45.9 %

Empty section

Unit size : 036
Length: 040
Inspection side : right

Air cooler for chilled water

Size: 036
Inspection side: right
Material: galvanized sheet steel
Droplet eliminator: with, plastic
Design variant: version 3
Coil selection
Use as: Cooling Coil
Calculation principle: input data
Output variant: 3
Fluid passes: 08
Fin spacing: 2.5 mm
Design: normal face area
Material, coil: Cu/Al, MS header

Shunt selection

Shunt control: without

Nom. pipe size	32
Liquid volume	17.1 l
Pressure drop, dimensioning	45 Pa
Pressure drop, wet coil	45 Pa
Pressure drop, dry coil	29 Pa
Output	37 kW
Air temperature	25.5 / 16 °C
Wet temperature	18.3 / 14 °C wb
Face velocity	1.9 m/s

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793557	
Unit	378 (APRVL) / AHU18 Labs North L5 & L6	2021/04/20
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Water temperature	6 / 12 °C
Water flow	1.47 l/s
Water velocity	1.0 m/s
Pressure drop water	17.1 kPa
Oversizing	3.3 %

Empty section

Unit size : 036
Length: 040
Inspection side : right

Humidifier

Unit size: 036
Length in cm: 100
Material: stainless sheet steel (AISI 304)
Inspection side: right

Special Unit Section

Size: 036
Pressure drop, dimensioning 0 Pa
Insertion loss, regenerated noise included 0,0,0,0,0,0,0 dB

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

Duct connection piece

Width cm : 110
Height in cm : 100
Connection type: flange connection
Material: galvanized sheet steel / AlZn

EXHAUST AIR

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

Duct connection piece

Width cm : 110
Height in cm : 100
Connection type: flange connection
Material: galvanized sheet steel / AlZn

Filter

Inspection side: left

Filter selection

Filter class: F7 - ePM1 60%, glassfibre
Filter frame : plastic
Prefilter: without

Design

Connection side : inlet in end wall
Location: negative pressure
Drain tray: without

Number of filters	4x592x592
Pressure drop, start	30 Pa
Pressure drop, dimensioning	61 Pa
Pressure drop, end	91 Pa
Face area	1.4 m²
Face velocity	1.6 m/s

Differential pressure sensor type Dwyer Magnehelic

Pressure range, first sensor: 0-250 Pa

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793557	
Unit	378 (APRVL) / AHU18 Labs North L5 & L6	2021/04/20
Size	036	Page 9/14

Design: flush mounted in door

Plenum fan

Inspection side: left

Fan selection

Impeller type: Bluefin (composite)

Fan size: size 3

Anti-vibration mountings: wall mounted

Motor selection

Motor type: EC-motor

Motor control

Manufacture, type: EC-motor ZA

Housing protection: IP55

Design: on motor

Delivery options: mounted on current sub

Motor / VSD-accessories

Connection accessories: safety switch with quick connection

Length: 356

Dimensioning data

Two fan wheels in parallel

Speed

1479 Rpm

Max speed

1800 Rpm

Total efficiency

65.8 %

Total static pressure, dimensioning (wet coil)

492 Pa

Dynamic pressure

9 Pa

Fan system input power (absorbed electrical power)

1.77 kW

Temperature rise

0.6 °C

K factor

16.36

Fan wheel size

045

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP

1.59 kW

Pressure rise

459 Pa

Speed

1411 Rpm

Motor

Motor output

2 x 1.7 kW

Electric current

2 x 2.2 A

Output margin, minimum

35 %

Inspection window

Design: standard

Bulkhead light

Type: LED

Delivery form: Lamp supplied loose

Frequency converter

Motor accessories

Frequency converter

Fan + EC motor

Help code fan + EC-motor

End connection frame

Pressure drop, dimensioning

3 Pa

Casing end wall

Damper

Width cm : 110

Height in cm : 100

Tightness class : CEN 3

Connection: Flange

Function : extract air

Location: externally end wall



AIR HANDLING UNIT eQ

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793557	
Unit	378 (APRVL) / AHU18 Labs North L5 & L6	2021/04/20
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Damper type: 200 mm blade
Material : AlZn

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793557	
Unit	378 (APRVL) / AHU18 Labs North L5 & L6	2021/04/20
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BLOCK LIST

	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	VOLUME (m³)	WEIGHT (kg)
EQGB-036-180-22-1-1-2-1-2-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Casing end wall Filter Empty section Plug fan wall mounted	1850	1550	1546	4.43	398
EQHB-036-260-22-1-1-2-1-3-1-1 Unit casing (frame, unit) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Plate heat exchanger, RECUTERM	2650	1550	3072	12.62	1136
EQGB-036-300-22-1-1-2-1-4-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3 Condensation insulation: TB3 Leakage class: L2(R)* Casing strength: D1(M) Empty section Air heater for hot water Empty section Air cooler for chilled water Empty section Humidifier Special Unit Section Casing end wall	3050	1550	1696	8.02	591
EQGB-036-075-22-1-1-2-1-2-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel Thermal insulation: T3	800	1550	1546	1.92	155

Project	781 () / Paterson Labs AHU	Acon 2.55.47452
AOC	ACON-02793557	
Unit	378 (APRVL) / AHU18 Labs North L5 & L6	2021/04/20
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Condensation insulation: TB3

Leakage class: L2(R)*

Casing strength: D1(M)

Casing end wall

Filter

EQGB-036-080-22-1-1-2-1-4-1-1	850	1550	1696	2.23	297
-------------------------------	-----	------	------	------	-----

Unit casing (frame, module)

Model box code: EQ 2111

Material: AlZn sheet steel

Thermal insulation: T3

Condensation insulation: TB3

Leakage class: L2(R)*

Casing strength: D1(M)

Plug fan wall mounted

Casing end wall

29.22	2578
-------	------

The dimensions are transport dimensions including packaging

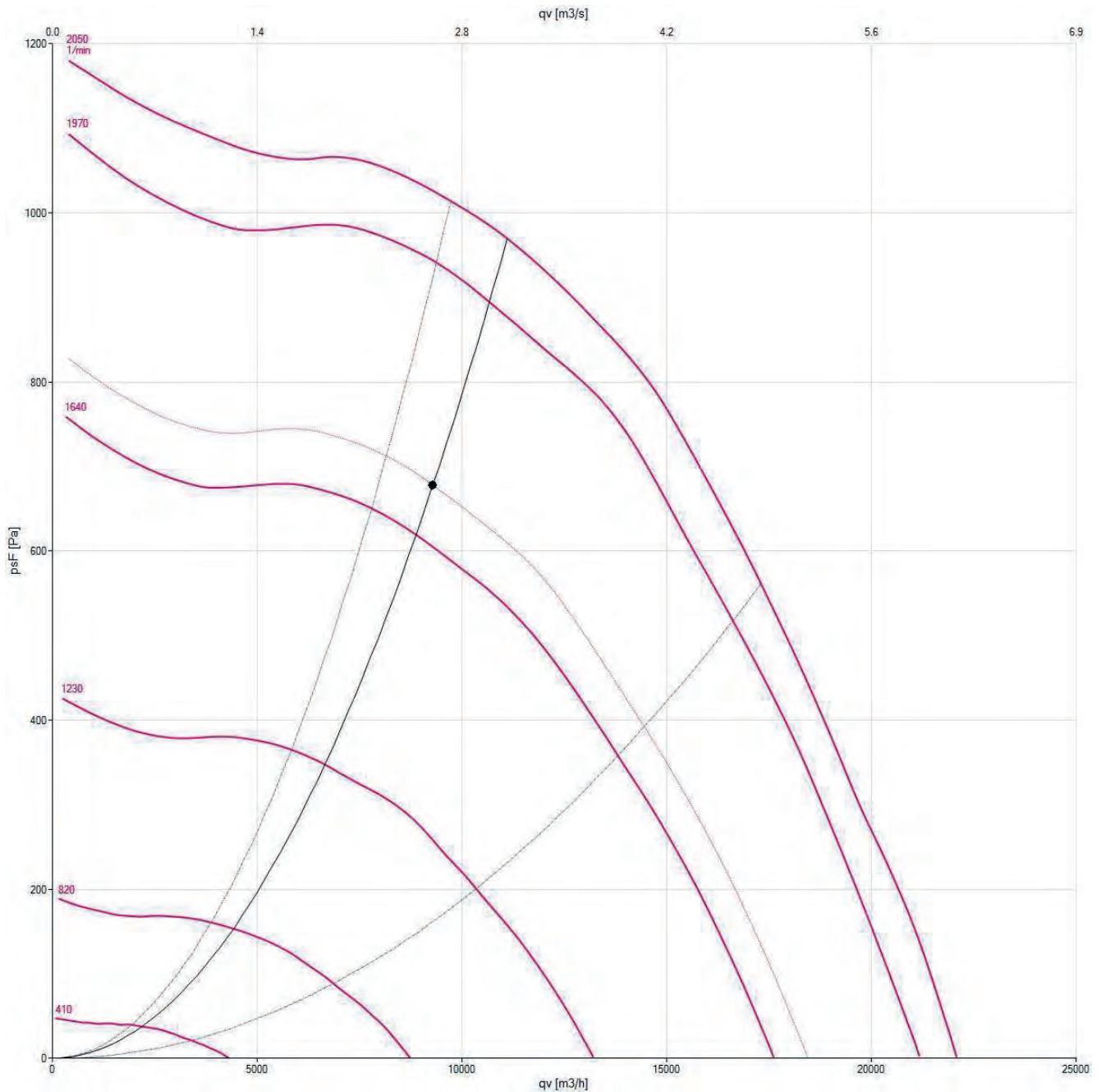
*Flakt Group eQ AHUs are leakage class L2 real unit as certified by Eurovent. CAL class @-400Pa and @+700Pa. For units where the casing has; (i) a customised or special design that differs from standard module box, (ii) nonstandard components penetrating the casing that is non-standard for a real unit, and (iii) where holes or penetrations are made in casing after delivery to site, the leakage class cannot be guaranteed. This also includes damage to the unit from handling and transportation.

Project 781 () / Paterson Labs AHU
 AOC ACON-02793557
 Unit 378 (APRVL) / AHU18 Labs North L5 & L6
 Size 036

Acon 2.55.47452

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Fan chart - Supply air - EQLC-036-3-3-1-2-4-2-1-2-8-1-1

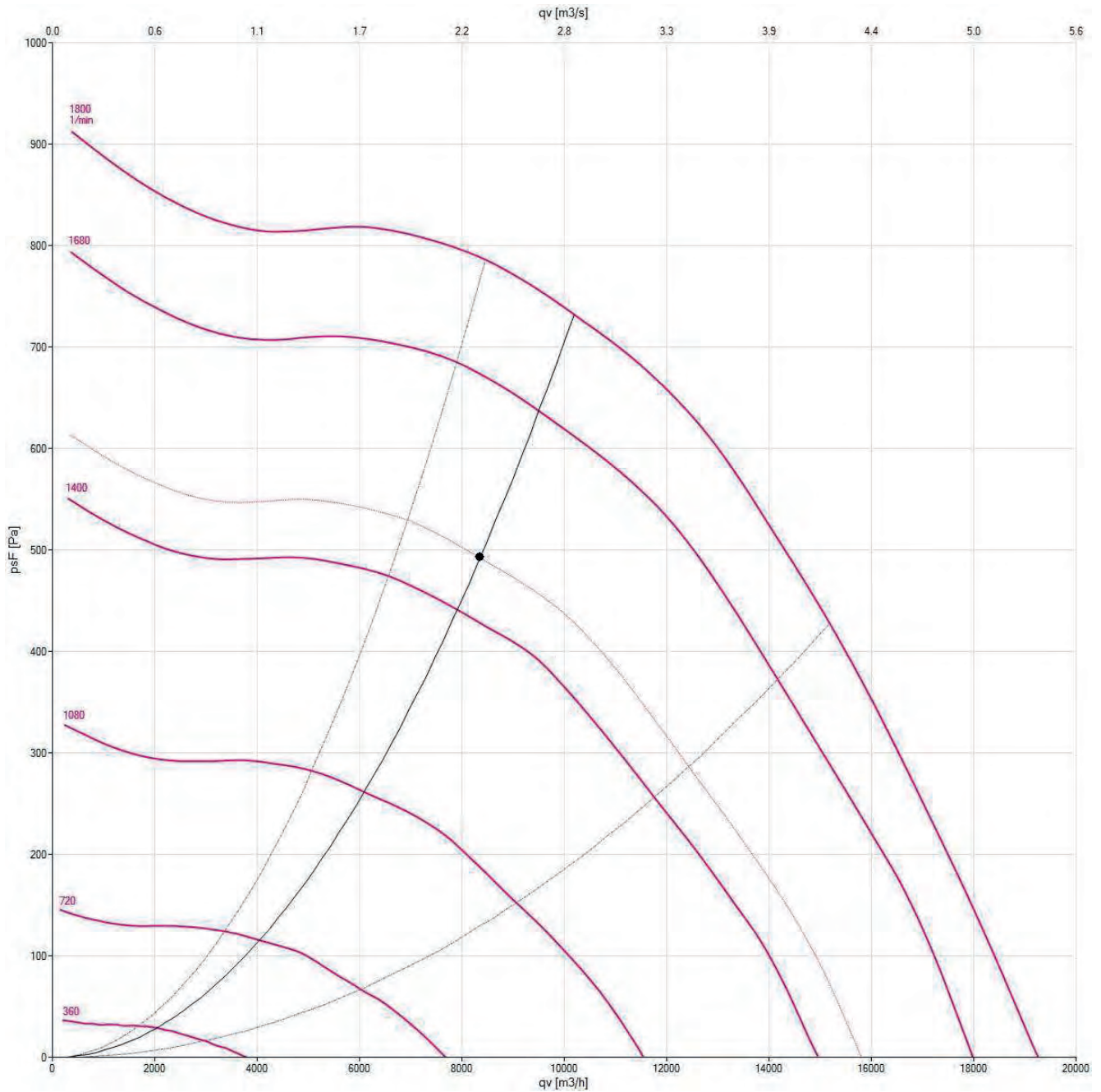


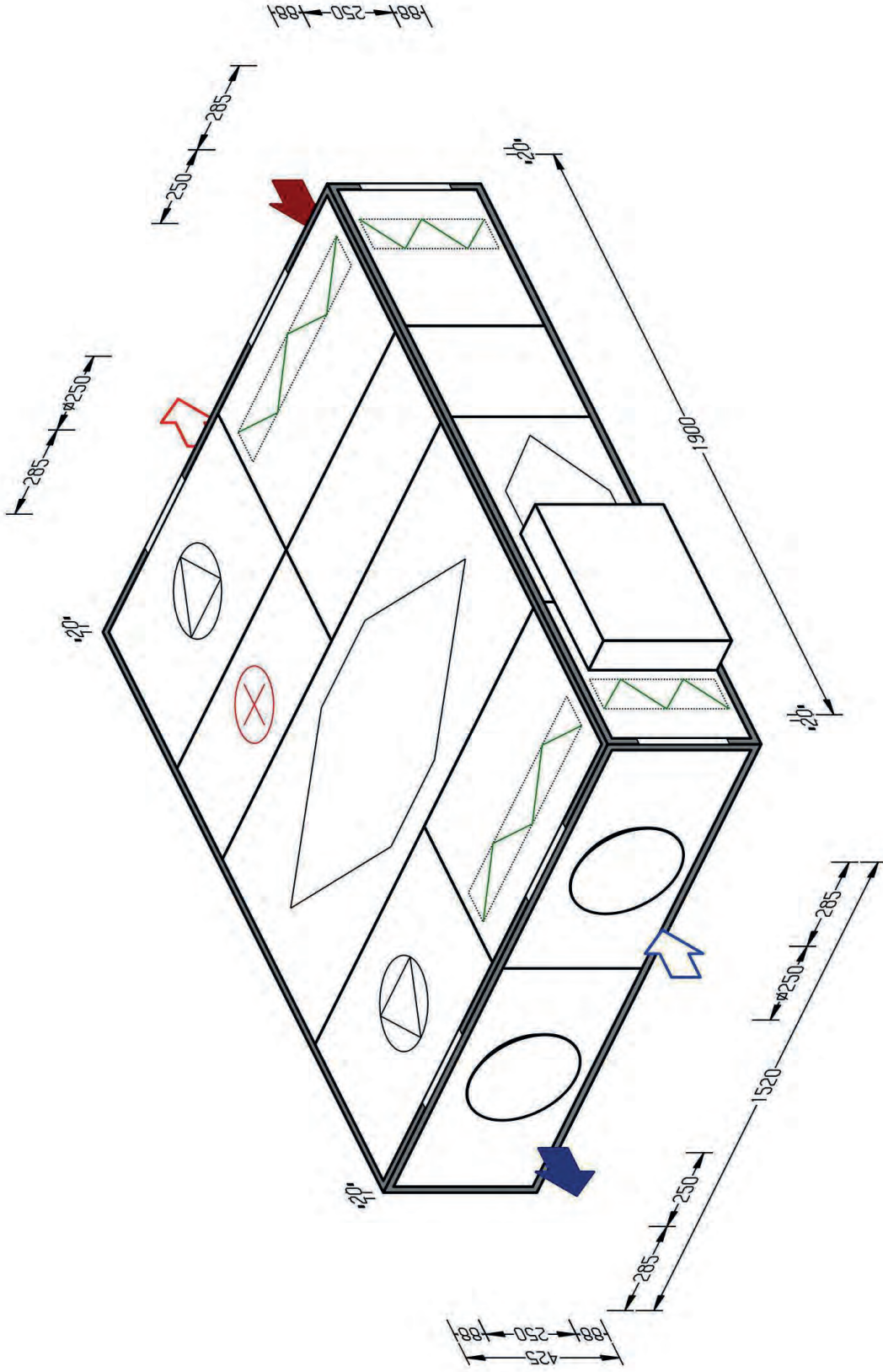
Project 781 () / Paterson Labs AHU
 AOC ACON-02793557
 Unit 378 (APRVL) / AHU18 Labs North L5 & L6
 Size 036

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Fan chart - Exhaust air inlet - EQLC-036-3-3-1-2-3-2-2-8-2-1





Customer id	69028
Project	781
Unit	253
AOC	ACON-02780017

Project name	Paterson Labs AHU
Unit name	(B08) / MVHR 01 Water Plantroom
Supply air	Eco Premium-4
Exhaust air	Eco Premium-4

Supply air	0.47 m³/sec
Exhaust air	0.47 m³/sec

Project	781 () / Paterson Labs AHU	Acon 2.54.45169
AOC	ACON-02780017	
Unit	253 (B08) / MVHR 01 Water Plantroom	2021/03/30
Size	4	Page 3/10
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	

Technical specification

Input data / Conditions

Ref. density	1.2 kg/m ³		
Supply air		Exhaust air	
Supply air volume flow rate	0.47 m ³ /sec	Exhaust air volume flow rate	0.47 m ³ /sec
External static pressure	220 Pa	External static pressure	240 Pa
Design outdoor temperature summer	28 °C		
Dim. humidity summer	14.7 °C wb		
Design outdoor temperature winter	-4.5 °C		
Dim. humidity winter	-5 °C wb		
Temperature in, supply air, summer	18 °C	Temperature in, extract air, summer	22 °C
Air humidity in, supply air, summer	12.1 °C wb	Air humidity in, extract air, summer	16.2 °C wb
Temperature in, supply air, winter	20 °C	Temperature in, extract air, winter	22 °C
Air humidity in, supply air, winter	10.8 °C wb	Air humidity in, extract air, winter	10.6 °C wb

Result

eco Premium, Size: 4

SFPv total sum 1.40 kW/(m³/s)

Unit Supply

Voltage	1 x 230 V, 50 Hz
Recommended fuse	10 A
Leakage class	L3(R)*
Casing variant	Normal

Transport dimensions

Length	1990 mm
Width	1670 mm
Height	595 mm
Weight	271 kg

Inspection side	Right hand
Placement	Indoor
Language	English

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



Approved according to requirements 2018

Unit type: NRVU BVU

SFPint (2016: 1498 W/(m³/s), 2018: 1219 W/(m³/s))

Dry temperature efficiency (balanced) (EN308) (2016: 67 %, 2018: 73 %)

External leakage rate

Internal leakage rate

622 W/(m³/s)

79 %

0.4 %

0.5 %

	Supply air	Extract air	Unit
Heat exchanger pressure drop	126	126	Pa
Filter energy classification			
Filter pressure drop, start	49	26	Pa
Filter area	0.2	0.2	m ²
Filter cross section air velocity	1.9	1.9	m/s
Air flow	0.47	0.47	m ³ /sec
Total pressure rise	424	426	Pa
Fan fan system effect	24	24	Pa
Fan total efficiency	60.3	60.4	%
Fan system input power (absorbed electrical power) according to SFP	0.33	0.332	kW

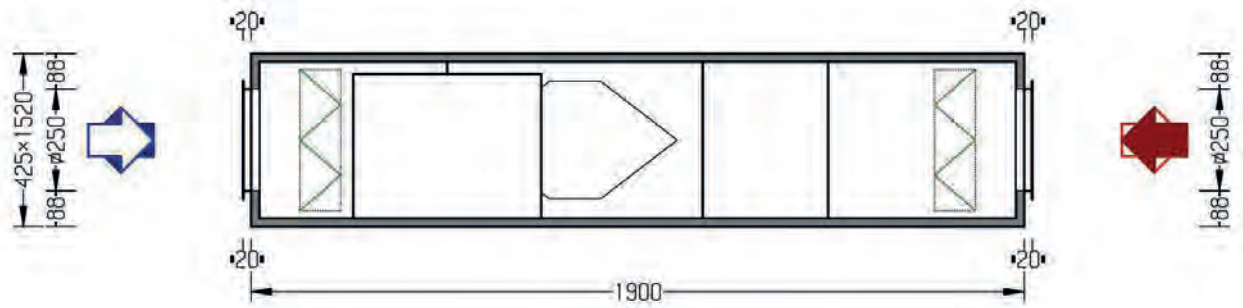
Project	781 () / Paterson Labs AHU	Acon 2.54.45169
AOC	ACON-02780017	
Unit	253 (B08) / MVHR 01 Water Plantroom	2021/03/30
Size	4	Page 4/10
Customer	Arup / Imtech	
Customers ref.		
Our ref.	Andy Window / Steve Dunleavy	

SOUND POWER LEVELS

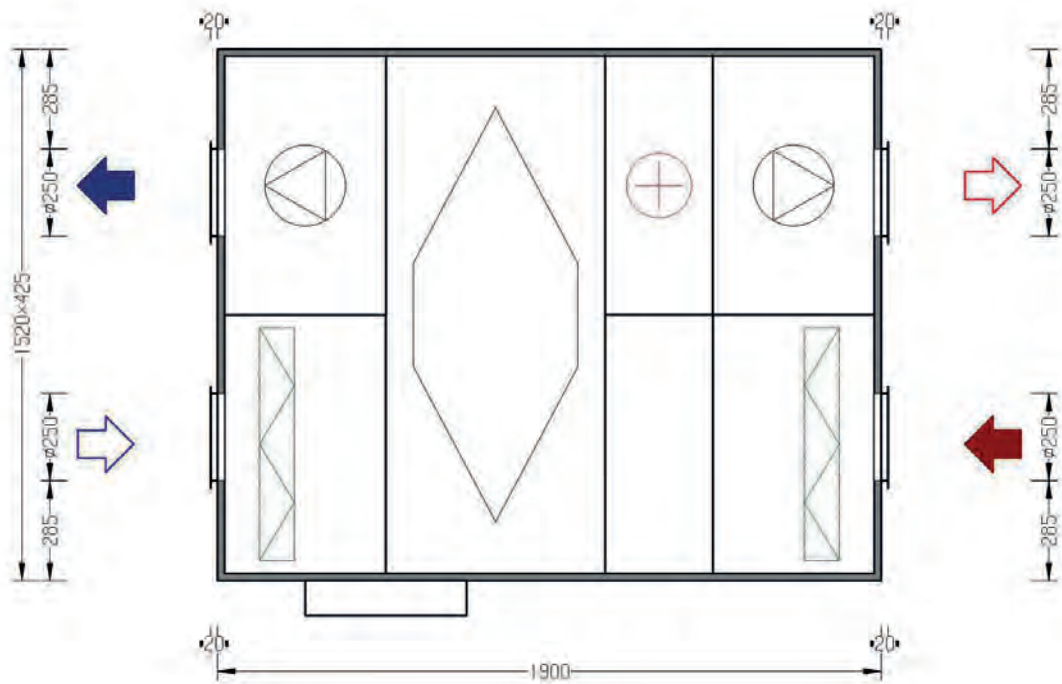
(standard: EN13053 ISO/CD 13347-2)

	Lw per octave band (dB)								LwA	LpA (3 m)
Octave band (Hz)	63	125	250	500	1k	2k	4k	8k	dB(A)	dB(A)
Fresh air connection	71	64	58	57	53	42	30	30	58	
Supply air connection	74	73	74	72	70	67	65	61	75	
Extract connection	72	65	58	58	54	42	30	30	59	
Exhaust connection	75	74	74	73	70	67	66	61	76	
To surroundings	68	68	65	55	45	40	35	30	59	41

Unit Sketch
From Inspection Side



From Above



Project 781 () / Paterson Labs AHU
 AOC ACON-02780017
 Unit 253 (B08) / MVHR 01 Water Plantroom
 Size 4

Acon 2.54.45169

2021/03/30
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Plenum fan

	Supply	Exhaust	Unit
Dimensioning data			
Speed	2330	2359	Rpm
Max speed	2700	2700	Rpm
Total efficiency	60.5	60.6	%
Total static pressure, dimensioning (wet coil)	436	438	Pa
Fan shaft power at dim. data	0.294	0.30	kW
Fan system input power (absorbed electrical power)	0.343	0.35	kW
Temperature rise	0.6	0.6	°C
Motor			
Motor output	0.50	0.50	kW
Electric current	2.2	2.2	A
Voltage	1x230	1x230	V

Pleated filter

	Supply	Exhaust	Unit
Filter class	coarse 80%, (G4)	coarse 80%, (G4)	
Number of filters	2x348x352	2x348x352	
Pressure drop, start	37	36	Pa
Pressure drop, dimensioning	47	46	Pa
Pressure drop, end	57	56	Pa
Face velocity	2.0	1.9	m³/sec
Filter monitoring	Pressure switch	Pressure switch	

Plate heat exchanger

Efficiency

Temperature efficiency according to standard EN 308	79	%
Cooling recovery	79	%

	Supply		Exhaust		
	Summer	Winter	Summer	Winter	
Pressure drop	126	126	126	126	Pa
Air temperature	28 / 23.2	-4.5 / 16.5	22 / 26.8	22 / 1	°C
Wet temperature	14.7 / 12.8	-5 / 7	16.2 / 17.8	10.6 / -0.2	°C wb

Air heater water

Size: 4		
Inspection side: right		
Calculation principle: flow control, capacity of coil		
Liquid volume	0.1	/
Pressure drop, dimensioning	18	Pa
Output	2.54	kW

Project	781 () / Paterson Labs AHU	Acon 2.54.45169
AOC	ACON-02780017	
Unit	253 (B08) / MVHR 01 Water Plantroom	2021/03/30
Size	4	Page 7/10

Air temperature	16.5 / 21	°C
Face velocity	4.2	m/s
Control principle for water heater	flow control	
Water temperature	70 / 50	°C
Water flow	0.03	l/s
Water velocity	0.8	m/s
Pressure drop water	9.1	kPa
Oversizing	52.5	%

Controls

Filter monitoring (REDZ-28-1)

Ethernet Communication (Modbus/TCP & Web)
(REDZ-05-1)

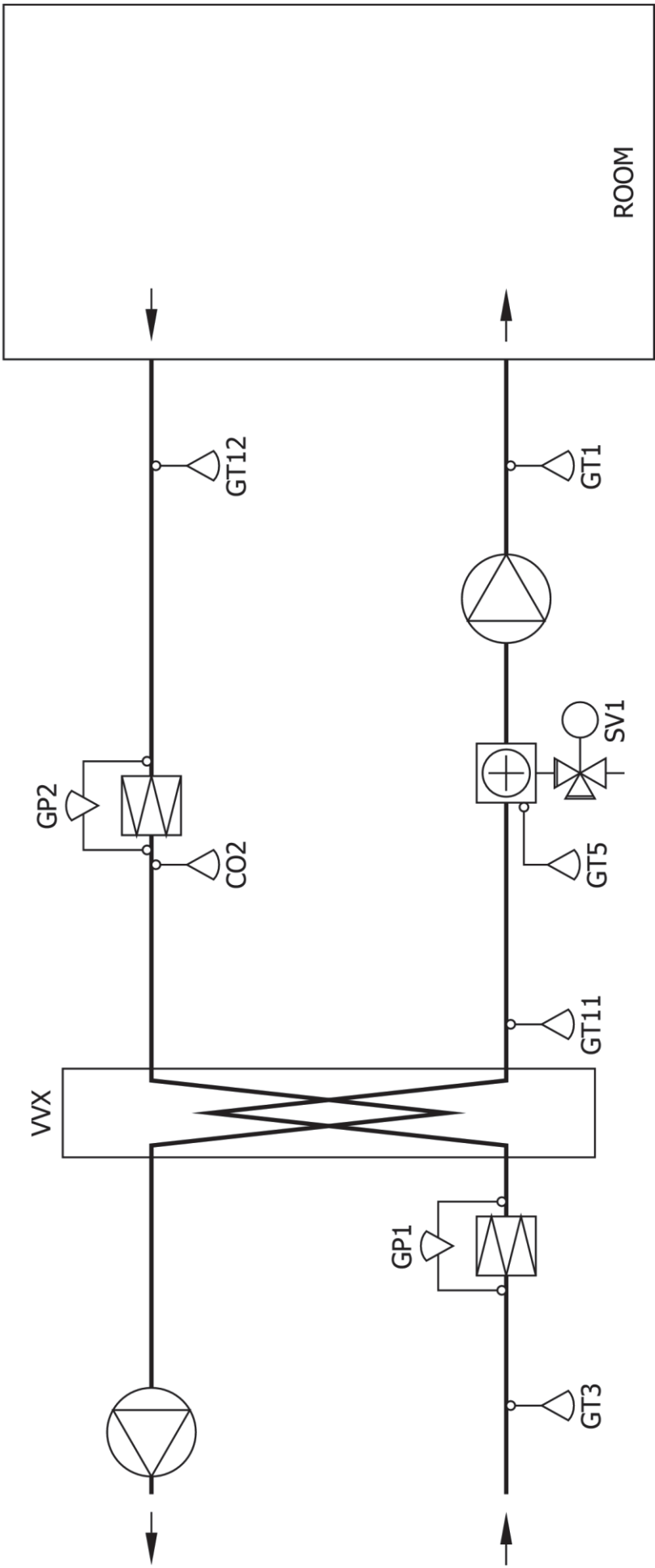
Accessories

Spare filter (REDZ-81-4-1)

Spare filter (REDZ-81-4-1)

Product list

Qty.	Product	Product code Acon
1	eco Premium	REDA-4-1-02-1-4-03
1	Spare filter	REDZ-81-4-1
1	Spare filter	REDZ-81-4-1
1	Filter monitoring	REDZ-28-1
1	Ethernet Communication (Modbus/TCP & Web)	REDZ-05-1



RC1

Customer id Project Uid AOC	69028	Project name Unit name	Paterson Labs AHU (B08) / MVHR 01 Water Plantroom	Page 8/10
	781			
	253			
	ACON-02780017			
2021/03/30		FläktGroup		

Project	781 () / Paterson Labs AHU	Acon 2.54.45169
AOC	ACON-02780017	
Unit	253 (B08) / MVHR 01 Water Plantroom	2021/03/30
Size	4	Page 9/10

Description of Operation

Start and stop of air handling unit

Start-up delay are activated for TF.

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

Temperature control

When the need for heat increases, RC1 controls heat exchanger VVX for heat recovery and heater for warm air in sequence.

Temperature sensor GT1 keeps the right supply air temperature via RC1.

RC1 controls the heating coil via the valve actuator SV1.

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

TF and FF start automatically at night for cooling with cold outdoor air. Recovery signal is blocked.

Alarms for:

heat exchanger VVX,

fire alarm,

frost protection guard,

or temperature sensor failure.

Project 781 () / Paterson Labs AHU
AOC ACON-02780017
Unit 253 (B08) / MVHR 01 Water Plantroom
Size 4

Acon 2.54.45169

2021/03/30

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Component List

Description	Reference	Type	Delivery options	Notes
CO2 sensor	CO2	T8031	Factory Fitted & Wired	
Freeze protection sensor	GT5	NTC10k	Factory Fitted & Wired	
Frost protection sensor	GT11	NTC10k	Factory Fitted & Wired	
Temperature sensor Outdoor air	GT3	NTC10k	Factory Fitted & Wired	
Temperature sensor Supply air	GT1	NTC10k	Factory Fitted & Wired	
Temp.sensor Extract/Room air	GT12/GT2	NTC10k/WRF 04	Factory Fitted & Wired	
Filter pressure sensor	GP1/2	LGW3A2	Factory Fitted & Wired	

OptiSorp

Steam distribution system



INSTALLATION AND OPERATING INSTRUCTIONS

Contents

1	Notes on steam distribution system OptiSorp	4
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1.2	Positioning of the steam distribution system	4
1.3	Determination of steam absorption distance	5
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2	Notes for the planning engineer	6
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1 Notes on steam distribution system OptiSorp

1.1 OptiSorp – Steam distribution system for very short humidification distance

The OptiSorp is made from stainless steel and high-grade plastic components. It is designed for connection to the Condair and Defensor steam humidifiers. The OptiSorp steam distribution system is installed directly in the air duct or in an air-handling unit. It comprises horizontal collector pipes and several vertical pipes provided with steam nozzles. The OptiSorp separates the condensate from the inlet steam and feeds this uniformly and drip-free to the air flow. In particular the steam absorption distance is considerably less compared with conventional steam distribution pipes.

Note: To ensure a safe support of the collector pipes we recommend the use of the specially designed support for the steam distribution system OptiSorp. The entire support is made from stainless steel and available in four different mounting sets for duct heights ranging from 450 to 3200 mm (see table in chapter 3.7). The mounting sets comprise all necessary parts for the correct support of a OptiSorp system.

1.2 Positioning of the steam distribution system

The positioning of the steam distribution system should be determined when laying out the air-conditioning system. The following points should be observed to ensure correct humidification of the air. The conditions must be maintained exactly to ensure that the OptiSorp system satisfies the high demands made of it. A layout based on incorrect data, an unfavourable installation position or wrong installation can result in excessive humidity with separation of condensate and therefore to damage from water. The air duct must therefore be sealed in the area of the absorption distance and provided with a water drainage tray with outlet. The system is preferably fitted immediately following the air heater (and before the cooling coils). Other installation situations require additional care. A viewing port immediately following the system is highly recommended for installation and inspection of operation of the installation. Installation of the system is always made laterally to the air flow. With vertical air flow the nozzle tubes are fitted at an angle of 20° to 30° to enable the condensate to flow away easily.

With exception of determination of the steam absorption distance, the same basic rules apply to the OptiSorp steam distribution system as to the standard steam distributor pipes (see installation and operating instructions of the humidifier).

1.3 Determination of steam absorption distance

Determination of the absorption distance " B_N " depends on various factors. For simple determination of the absorption distance " B_N " the table can be used. The nominal values obtained from the table refer to an air inlet temperature of 10 °C to 30 °C. The length of the steam absorption distance can be calculated more accurately with the SELECT software program. The result must be compared with the actual steam absorption distance or with the minimum spacings to be observed.

1.4 Notes on installation

Before installation check that the correct OptiSorp system is used and that the system is in accordance with the type and steam output on the specification label.

The OptiSorp is suitable for installation in air ducts or air-conditioning units. For this purpose the templates supplied are attached to the ventilation duct spaced according to the collectors. The duct plate is cut out round. The connection side of the pre-fitted system is inserted from inside through these holes. The connector pieces are then fitted on the pipes from outside and screwed to the duct wall. The collector pipes should be aligned horizontally and secured at the end on the duct wall.

For large systems or in special cases, where this type of installation is not possible, the collector pipes can be fitted individually from outside. The nozzle tubes are then inserted in the collectors in the air duct and secured with the pipe clamps and O-rings. Suitable pliers are required for the installation. All parts are supplied loose for this case if required.

Then install the steam and condensate hoses according to the instructions in the installation and operating instructions of the humidifier. It is advisable to drain the condensate separately and not return it to the humidifier owing to the increased volume.

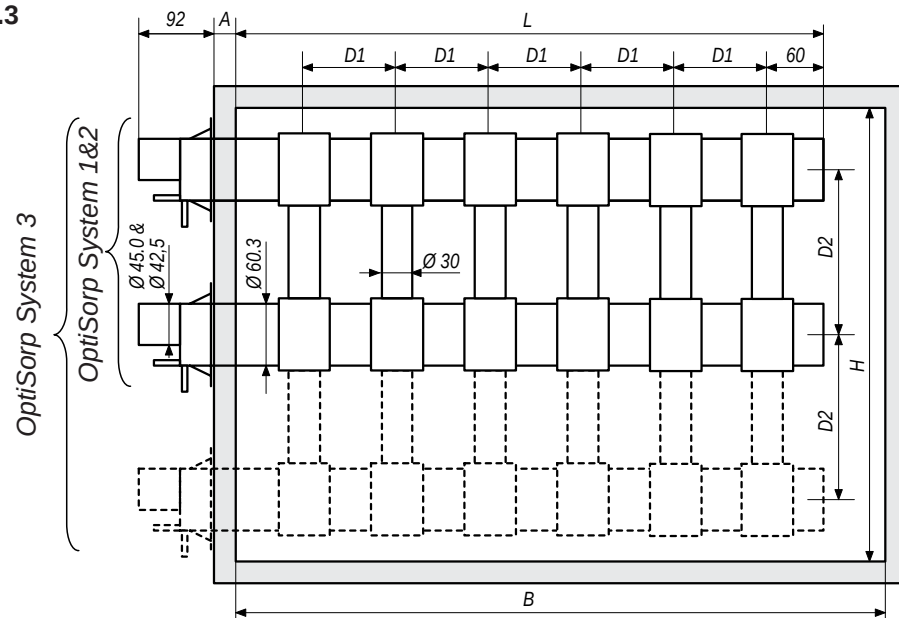
2 Notes for the planning engineer

2.1 Layout

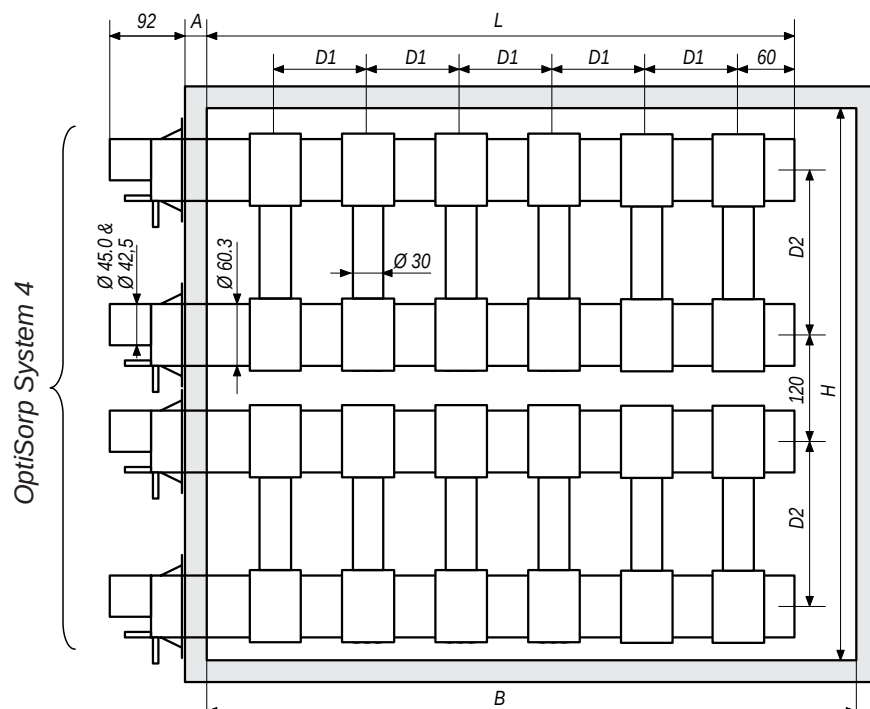
The choice of the OptiSorp steam distribution system can be made with the SELECT software programme or from the layout tables. The system is determined by the number of steam connections of the steam humidifier. This also determines the maximum steam output. The maximum possible collector lengths and collector spacing is selected depending on the duct width and height.

2.2 Dimension diagrams

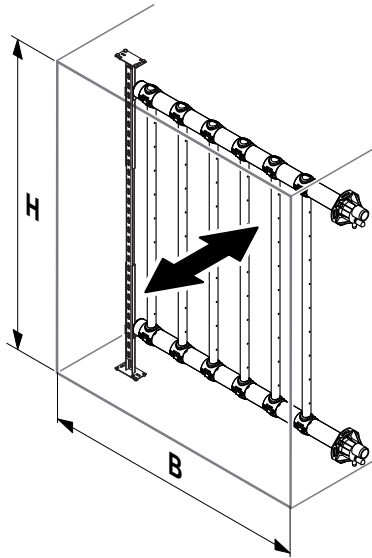
Systems 1...3



System 4



2.3 Power selection diagram OptiSorp Systems 1...4



	L	mm	350	500	650	800	1000	1200	1500	1800	2000	2300	2500
	B min.	mm	450	600	750	900	1100	1300	1600	1900	2200	2500	2700
System 1	m_D max.	kg/h	30	45									
	D2	mm	350	500	650	800	1000	1200	1500				
	H min.	mm	450	600	800	950	1150	1350	1650				
System 2	m_D max.	kg/h	60	90									
	D2	mm	350	500	650	800	1000	1200	1500	1800	2000		
	H min.	mm	450	600	800	950	1150	1350	1650	1950	2200		
System 3	m_D max.	kg/h	90	135									
	D2	mm	325	400	500	600	750	900	1050	1200	1350	1500	
	H min.	mm	800	950	1150	1350	1650	1950	2300	2600	2900	3200	
System 4	m_D max.	kg/h	120	180									
	D2	mm	300	375	475	575	725	875	1050	1200	1350	1500	
	H min.	mm	800	950	1150	1350	1650	1950	2300	2600	2900	3200	

2.4 Type key

X / XXX / XXX / XXX

No. OptiSorp system

Collector length "L" in [mm]

Collector distance "D2" in [mm]

Steam capacity "m_D" in [kg/h]

2.5 Determination of the humidification distance “B_N”

Entering humidity φ 1 in % r.H.	Leaving humidity φ 2 in % r.H.					
	40	50	60	70	80	90
5	0.22 m	0.28 m	0.36 m	0.48 m	0.66 m	1.08 m
10	0.20 m	0.26 m	0.34 m	0.45 m	0.64 m	1.04 m
20	0.16 m	0.22 m	0.30 m	0.41 m	0.58 m	0.96 m
30	0.10 m	0.17 m	0.25 m	0.36 m	0.52 m	0.88 m
40		0.11 m	0.20 m	0.30 m	0.45 m	0.79 m
50			0.13 m	0.24 m	0.38 m	0.69 m
60				0.16 m	0.30 m	0.58 m
70					0.20 m	0.45 m
The length of the absorption distance B _N in m is for ducts with <600 mm about 50% longer						

2.6 Planning data OptiSorp steam distribution system (for faxing!)

Layout data required		Installation 1	Installation 2	Installation 3	Installation 4
1. Clear height of air duct “B” (without insulation)	mm				
2. Clear width of air duct “H” (without insulation)	mm				
3. Wall thickness of air duct “A” (without insulation)	mm				
4. Air volume per hour or	m ³ /h				
5. Air speed	m/s				
6. Air duct static pressure	Pa				
7. Temperature after humidification	°C				
8. Abs. humidity before humidification	g/kg				
9. Humidity increase (Δx) or	g/kg				
10. Rel. humidity after humidification	%				
11. Humidifier capacity	kg/h				
12. Steam humidifier selected	type				
13. Number of steam connections	pcs.				
14. Following air-cond. components	type				
15. Existing humidification distance	m				
OptiSorp System selected	type				
– Collector length (L)	mm				
– Collector spacing (D2)	mm				
– Steam output at 500 Pa (m _D)	kg/h				
Order	No.				

3 Mounting

3.1 Safety

The OptiSorp steam distribution system must only be installed by **adequately qualified personnel**.
Observe and comply with all safety instructions in the installation and operating instructions of the steam humidifier.

3.2 Delivery

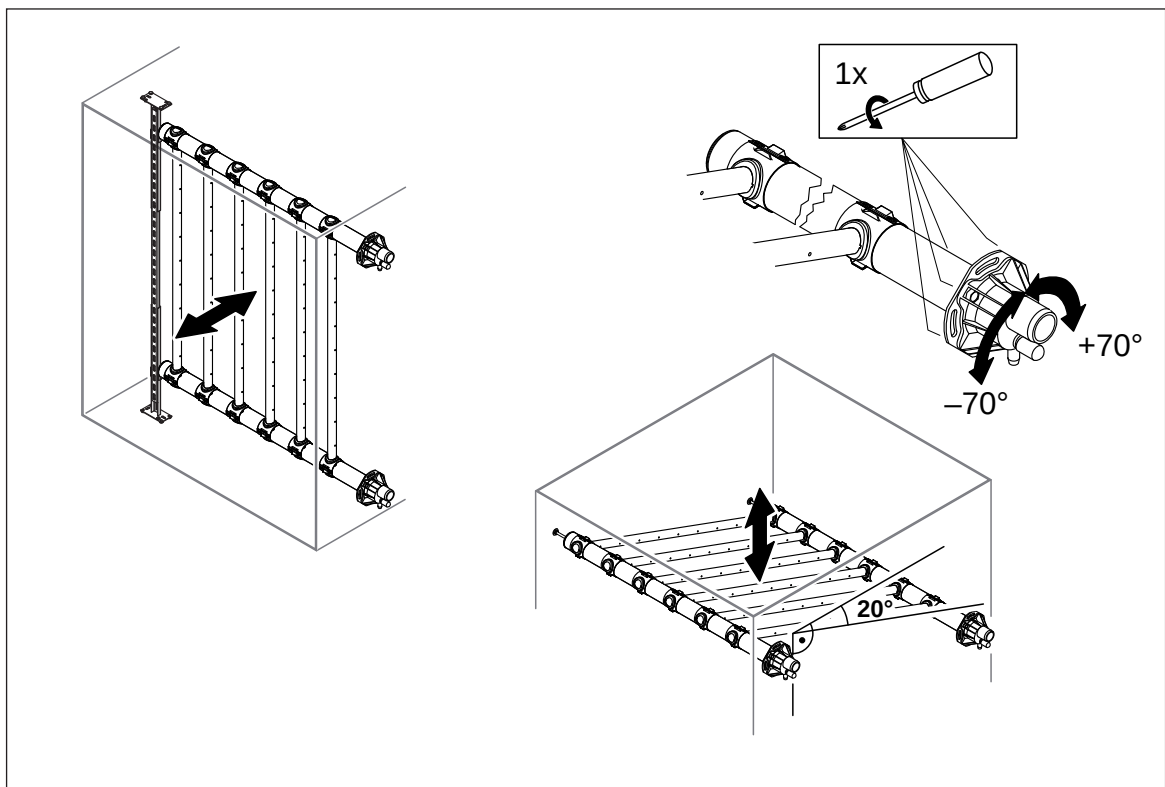
The OptiSorp steam distribution system will be delivered either premounted or as single components. Observe the corresponding mounting instructions.

3.3 Mounting positions

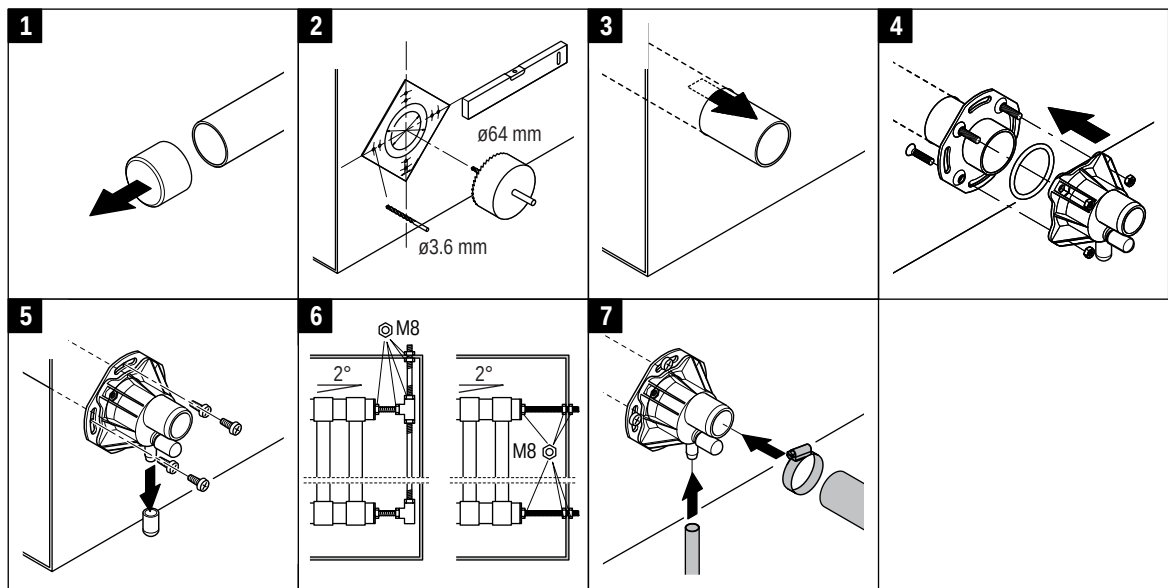
The OptiSorp steam distribution system can be installed in **horizontal** or **vertical ducts**. When mounting in a vertical duct the nozzle pipes must have a minimum declination of 20° and the end pieces of the collector pipes must be turned, so that the vertical condensate connection directs straight downwards (see figure below).

Note: Before mounting the OptiSorp system check the type designation and steam capacity on the data plate to ensure that the correct OptiSorp system is installed in the right place.

In addition to this installation and operating instructions please observe and comply with the instructions regarding the steam installation (positioning, max. length of steam pipe, etc.) in the installation and operating instructions of the steam humidifier.

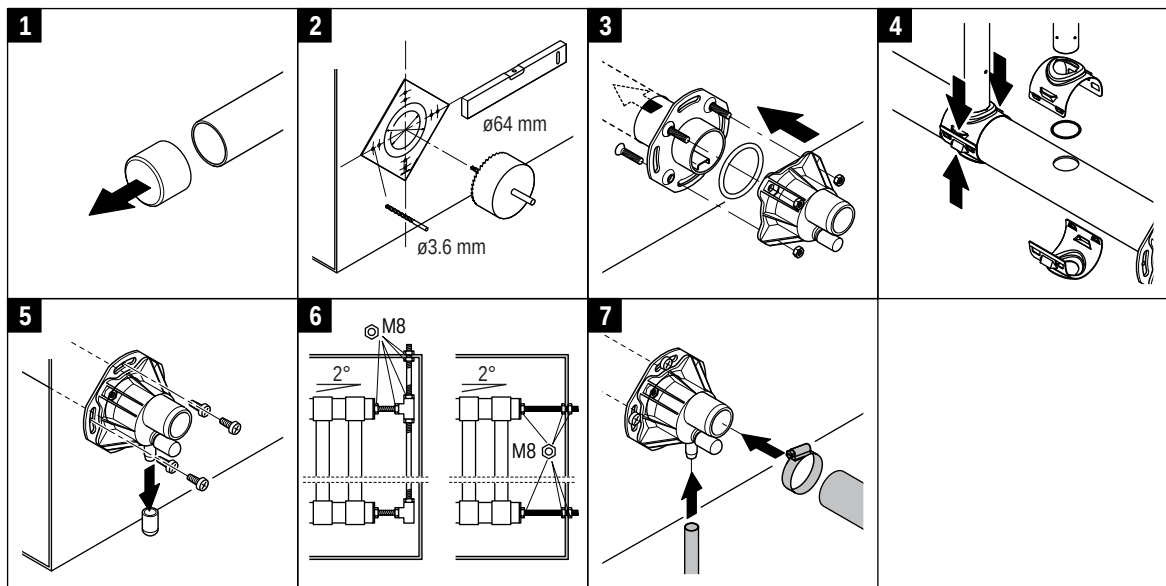


3.4 Mounting the premounted OptiSorp system



1. Remove the protection covers.
2. Measure the distance of the collector pipes and affix the installation template on the duct wall at the designed place with this distance (permissible variation ± 3 mm) and cut out the openings.
3. From inside of duct, insert the collector pipes through the prepared openings.
4. Slip from the outside flange, O-ring and steam hose connections onto the tube and fix them by the four screws. Pay attention that the condensate drains are below the steam hose connection.
5. Starting with the lowest collector pipe fix the steam hose connections with the 4 screws at the duct wall.
6. Align the collector pipes with a down-slope of 2° against the steam connector. Then, fasten the pipe ends on the duct using M8 threaded rod or the specially designed support available as accessory (see mounting drawing in chapter 3.7).
7. Connect the steam hose and the condensate hose to each collector pipe according to the instructions in the installation and operating instructions of the humidifier.
 Note: with the system 1 connect the steam hose DS80 or Z10 to the lower steam connector DV81 and close the upper steam connector with the sealing cap supplied.

3.5 Mounting the different parts of the OptiSorp system

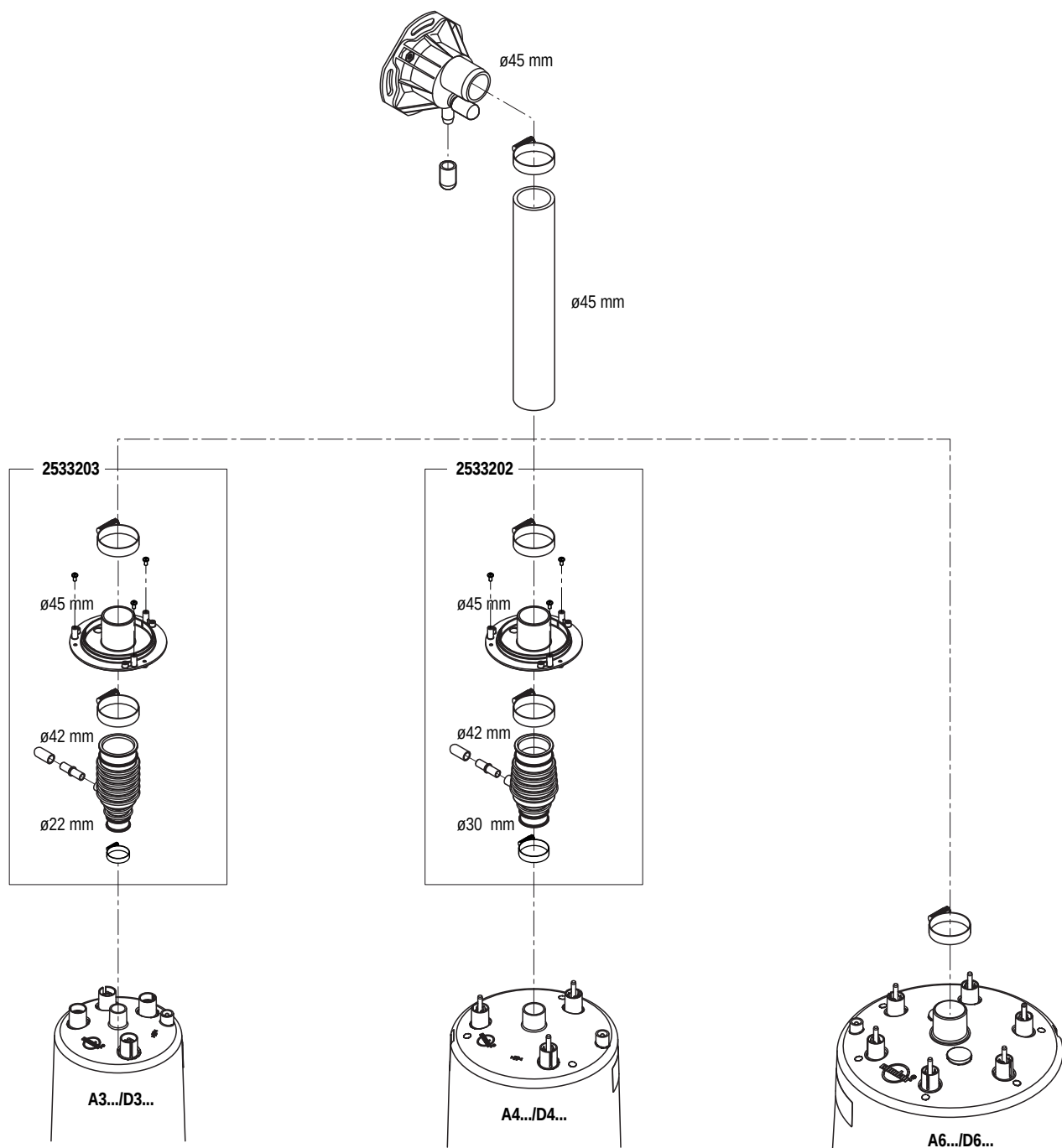


1. Remove the protection covers.
2. Measure the distance of the collector pipes and affix the installation template on the duct wall at the designed place with this distance (permissible variation ± 3 mm) and cut out the openings.
3. From inside of duct, insert the collector pipes through the prepared openings.
4. Slip from the outside flange, O-ring and steam hose connections onto the tube and fix them by the four screws. Pay attention that the condensate drains are below the steam hose connection.
5. Starting with the lowest collector pipe fix the steam hose connections with the 4 screws at the duct wall.
6. Align the collector pipes with a down-slope of 2° against the steam connector. Then, fasten the pipe ends on the duct using M8 threaded rod or the specially designed support available as accessory (see mounting drawing in chapter 3.7).
7. Connect the steam hose and the condensate hose to each collector pipe according to the instructions in the installation and operating instructions of the humidifier.
 Note: with the system 1 connect the steam hose DS80 or Z10 to the lower steam connector DV81 and close the upper steam connector with the sealing cap supplied.

3.6 Connecting the Condair CP3 to the OptiSorp system

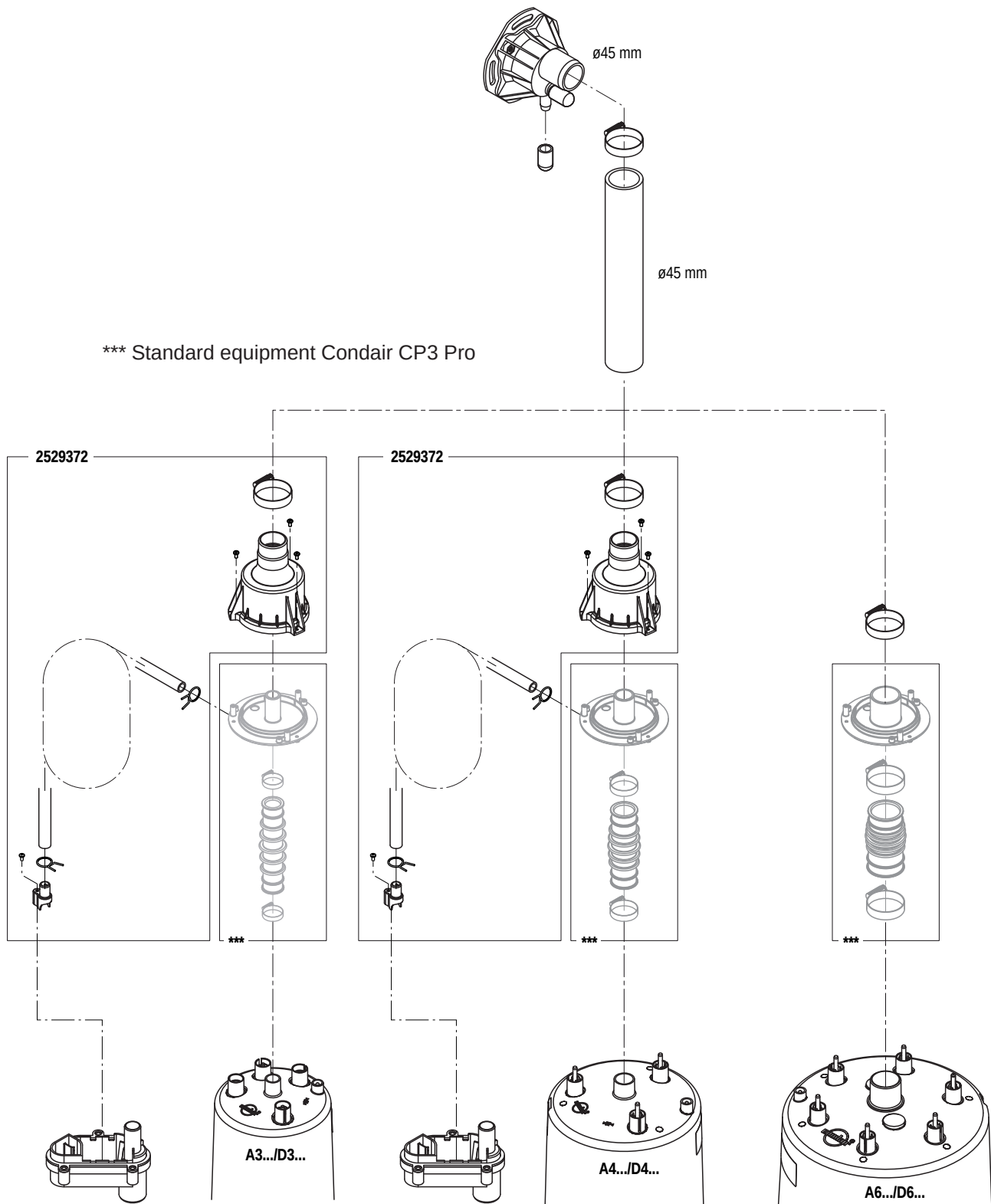
3.6.1 Connecting the Condair CP3 Basic to the OptiSorp system

Accessories	Art.-/SAP-No.
Adapater set OptiSorp for Condair CP3 Basic 5...8 kg/h	2533203
Adapater set OptiSorp for Condair CP3 Basic 9...15 kg/h	2533202



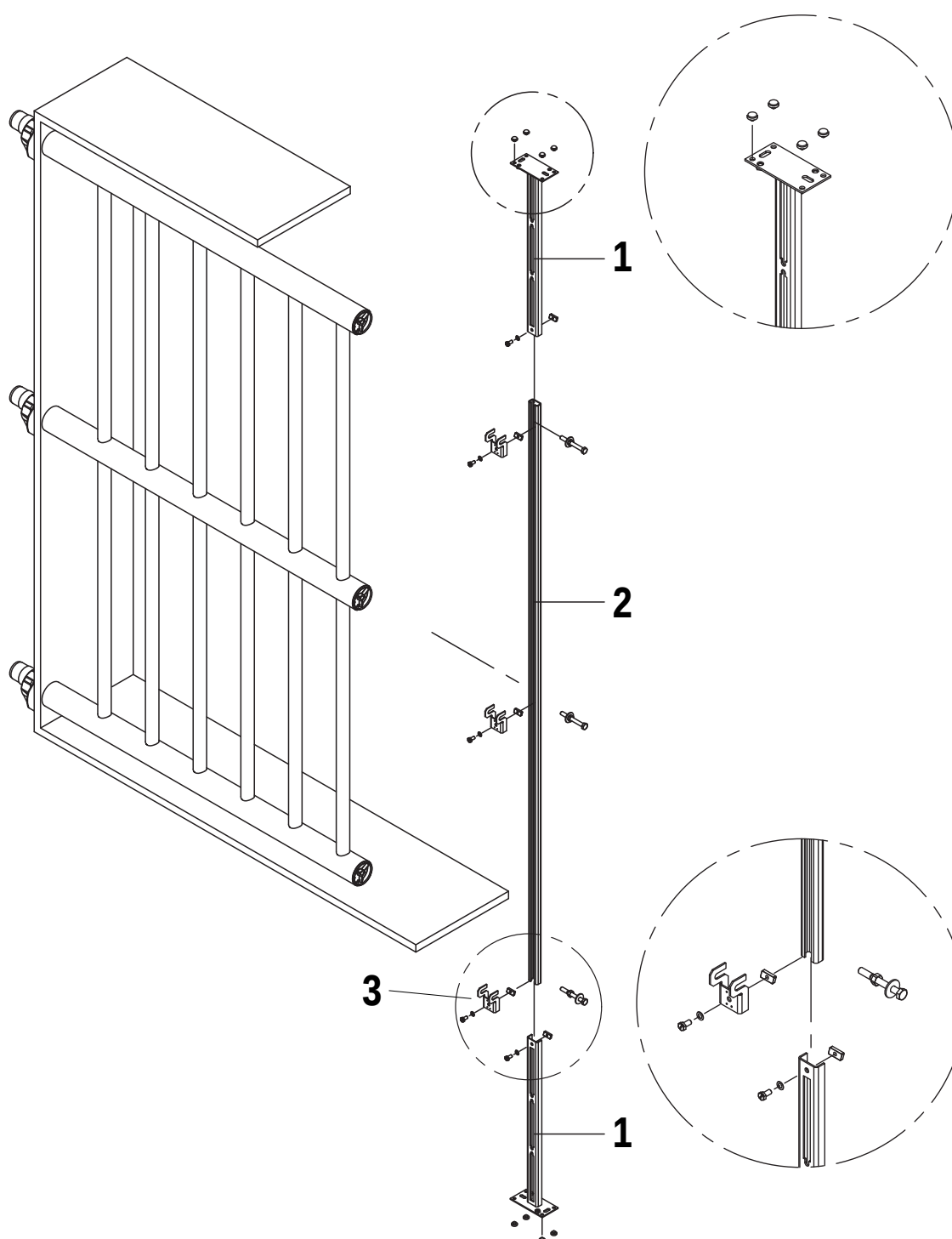
3.6.2 Connecting the Condair CP3 Pro to the OptiSorp system

Accessories	Art.-/SAP-No.
Adapater set OptiSorp for Condair CP3 Pro 5...15 kg/h	2529372



3.7 OptiSorp Support (accessory)

Range duct height [mm]	Art.-No.	Foothold (Pos. 1) No. x Length [mm]	Rail (Pos. 2) [mm]	Bracket (Pos. 3)
450...950	1117477	1 x 450 mm	500	4
950...1350	1117478	2 x 450 mm	500	4
1350...2300	1117479	2 x 450 mm	1400	4
2300...3200	1117480	2 x 450 mm	2300	4



4 Putting into operation and operation

4.1 Putting into operation

When connected to several basic units these should be operated in parallel. Otherwise condensate runs into the units switched off and fills these until overflow occurs. Problems can then arise when switching on again.

The following should be ensured when putting into operation:

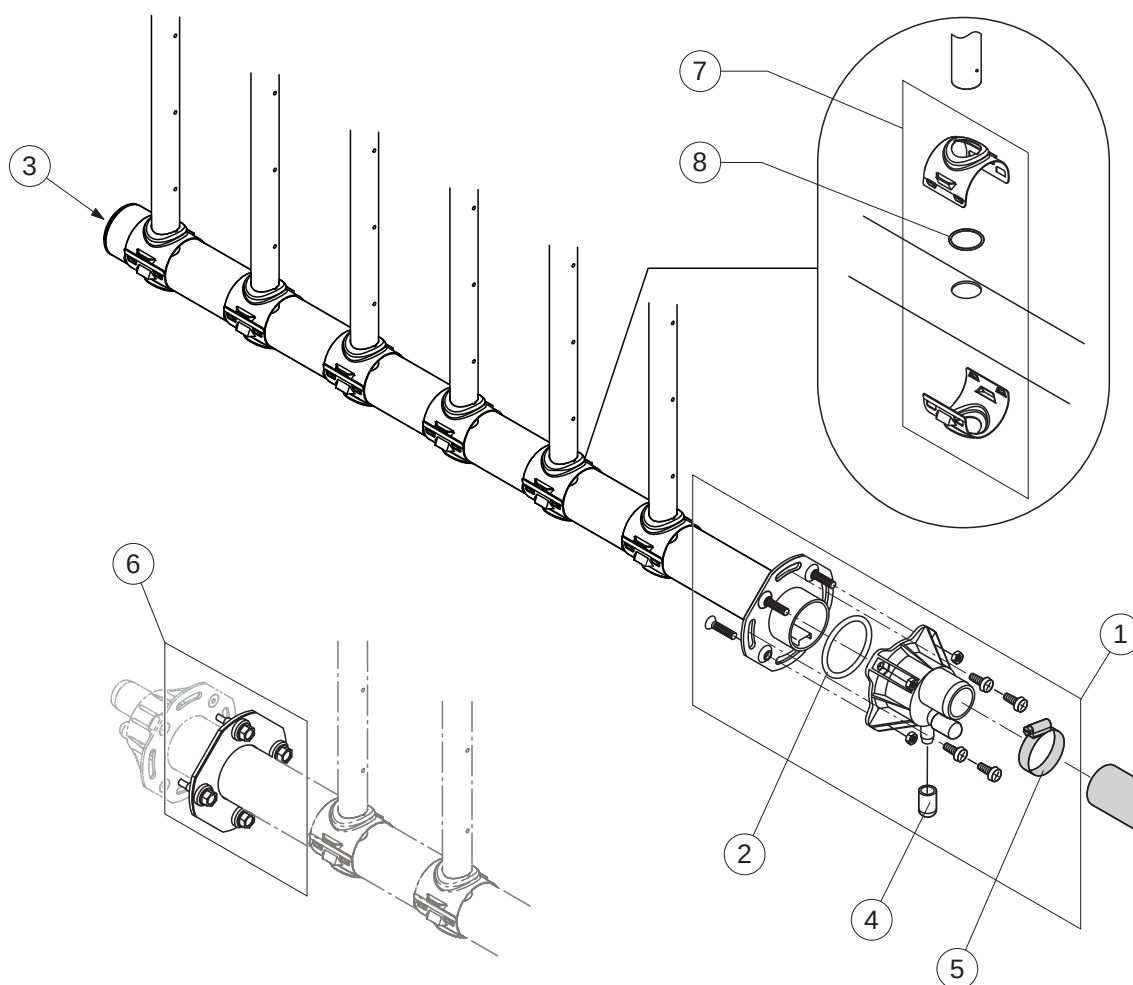
1. that the system pressure don't increase over 1500 Pa. The system pressure is componed of the airduct static pressure, the pressure drop over the OptiSorp system (typical 500 Pa) and the back pressure in the steam hose (typical 100 Pa/m)
2. that no water splashes from the steam distribution system and the condensate runs out of the system satisfactorily. Condensating formation may be caused by:
 - Steam supply pipe not properly drained
 - Metallic steam pipe inadequately insulated
 - Overstressed steam generator feeds water through steam pipe
 - System condensate drain is blocked
 - Extreme back-pressure in condensate hose
 - Incorrect installation of condensate hose

4.2 Operation

- Carry out visual checks periodically
- Further details according to the installation and operating instructions of the humidifier

5 Spare parts list

Pos.	Article	Type	Art.-/SAP-No.
1	Flange connection cpl. DV81	ø45	1113746
2	O-ring (3 pcs)	ø59.69 x ø5.34	1119190
3	Sealing cap with fixation		1117559
4	Sealing cap ø10		1104660
5	Hose clamp (2 pcs)	DV81 with DS80 DV81 with Z10	2538896 2538898
6	Internal sealing	DV81	2526236
7	Pipe clamp with O-ring		1117893
8	O-ring for pipe clamp (5 pcs)		1118549
---	Sealing cap ø41		1115334



Christie Paterson Redevelopment

Chillers Technical Submission

7th October 2021
PRP-IES-ZZZ-ZZ-TS-M-0029

Compiled	Checked	Revision	Date	Notes
AL	AM	P01	14/07/2021	First Issue
AL	AM	P02	07/10/2021	Revised sound data added, confirmation of dual pumps

Paterson Redevelopment Project

Equipment:	Ref:	Date:
Chillers	PRP-IES-ZZZ-ZZ-TS-M-0029 P02	07/10/2021
Drawing Ref:	Specification Ref:	
N/A	PRP-ARUP-Z01-ZZ-SP-M-0003 Cooling	

The Information Enclosed Within This Technical Submission Is Issued for:

Tender	Information	Comment	Procurement	Construction
☐	☒	☒	☐	☐

Issued to (where applicable):

Main Contractor	BMS Specialist	Drawing Coordinator	O&M Technical Author	ARUP	Other.....
☒	☐	☐	☐	☒	☐

Information provided encompasses the following elements (where applicable)

Building Work Requirements	Drainage Requirements	Electrical Requirements	Mechanical Requirements	BMS Requirements	Asset Register / Maintenance Required
☐	☐	☒	☒	☒	☒
Sample	Install Info	Co-ordination Info	O&M Info	Acoustic Info	Other.....
☐	☐	☒	☒	☒	☐

Technical Submission:

Daikin selection for CHL01 & CHL02 including integral dual pumps

Please provide your comments on the following proposals:

Documents 'Enclosed':

Daikin EWADC10TZ-XR B2 (CHL01) & EWAH430TZXR B2 (CHL02) technical selection.

Compliance/VE statement(s):

Add / delete as required.

The equipment 'detailed' above is specification/ER's compliant and there are no cost (£nil) implications associated with this proposal. Please note that the selection for CHL01 is based on R134a refrigerant this VE option was offered and accepted at GMP submission stage.

The equipment 'detailed' above is specification/ER's compliant and is proposed on a 'Imtech Engineering Services North preferred supplier basis's ONLY. There are no cost (£nil) implications associated with this proposal.

The equipment 'detailed' above is proposed, in lieu of that 'specified', on an ER compliant/Design Development/'preferred' alternative supplier basis and there are no cost (£nil) implications associated with this proposal.

The equipment 'detailed' above is proposed as a Change from the ER's/Original Design and is submitted as a VE item. Please refer to our separate VE correspondence ref: _____, dated the _____ for information.

Notes:

1. Please be advised that in the absence of a response by the 'due date' stated below, it is our intention to proceed with the ordering/installation of the materials/equipment/systems in accordance with the enclosed technical details/quotation(s)/drawings/catalogue pages/sample(s).

2. We believe that we have provided sufficient information for you to fully appraise our proposal(s), however, should you require anything further or would like to meet to discuss/review the enclosed details then please contact us.

Response required by: 21/10/2021 Andy Lawrence

Response: (Please Feel Free To Mark Up Drawings With Any Comments)

A) No Comments	B) Minor Comments, Proceed	C) Rejected
☐	☐	☐

Response Date:	Completed By:	Signed:

Bookmark Summary

[Arup COmments on P01](#)

[CHL01 Daikin Selection](#)

[CHL01 technical drawing](#)

[CHL02 Daikin selection](#)

[CHL02 Technical Drawing](#)

Project title	Paterson Redevelopment Project			Job number
				263083
Client	Integrated Health Projects (IHP)	Name of person commenting	Adam Ellis	File reference
				7-02-07
Copies to	IHP			Date
				09 Aug 2021

Document number	Comment
	This Submission has been examined for adherence with the engineering design intent. This does not relieve the Contractor from their responsibility to execute the works in full compliance with the Contract Documents.
PRP-IES-ZZZ-ZZ-TS-M-0029 – Chiller technical Submission	STATUS B: - The sound data is different to that in the schedule. We assume this is the information that has been provided to the acoustician. - Can you confirm the Chillers are provided with duty/standby pumps.



EWADC10TZ-XR B2



- > Air cooled chiller
- > Inverter Driven Single Screw compressor
- > Gold efficiency version
- > Reduced sound configuration
- > R134a refrigerant

- ➔ **Unit description:** Daikin air-cooled chiller with inverter driven screw compressor and R134a refrigerant. Color: Ivory White (Munsell code 5Y7.5/1) (±RAL7044).
- ➔ **Compressor:** Latest design Daikin single screw compressor enjoying Variable Volume Ratio (VVR) technology for optimized unit performances at any load and operating condition. Daikin design refrigerant cooled inverter integrated within compressor casing. Sophisticated unit control logic allows the inverter to modulate compressor speed minimizing power consumption and noise emission at any load condition.
- ➔ **Evaporator:** New generation shell and tube (dual compressor models) or plate heat type (single compressor models) assuring optimal heat transfer and minimized water pressure drops.
- ➔ **Condenser:** Full body Aluminum "Long Life Alloy" Microchannel coils providing superior resistance to corrosion compared to standard aluminum alloy. Coils' layout designed to guarantee optimized heat transfer allowing maximized performances and reduced turbulence for low noise emission.
- ➔ **Condenser coil fans:** The condenser fans are propeller type with high efficiency design blades to maximize performances. The material of the blades is glass-reinforced resin and each fan is protected by a guard. Fan motors are internally protected from over temperature and are IP54.
- ➔ **Refrigerant circuit:** Each unit has one or two independent refrigerant circuits and each one includes: Compressor Inverter driven with integrated oil separator, Electronic expansion valve, Discharge line shut off valve, Liquid line shut off valve, Sight glass with moisture indicator, Filter drier, Charging valves, High pressure switch, High pressure transducers, Low pressure transducers, Oil pressure transducer, Suction temperature sensor.
- ➔ **Electrical:** Control and power sections are located in the main panel that is manufactured to ensure protection against all weather conditions. The electrical panel is IP54 and internally protected against possible accidental contact with live parts. The main panel is fitted with a main switch interlocked door that shuts off power supply when opening.
- ➔ **Controller:** Latest generation MicroTech 4 controller provides an easy to use control environmental. The control logic is designed to provide maximum efficiency, to continue operation in unusual operating conditions and to provide a history of unit operation. Sophisticated software with adaptive logic selects the most energy efficient combination of compressor load, electronic expansion valve position and condenser fans to keep stable operating conditions and maximize chiller efficiency and reliability. One of the greatest benefits is the easy interface with LonWorks, Bacnet, Ethernet TCP/IP or Modbus communications.





Cooling mode performances

Cooling capacity	981.5 kW	Evaporator water IN/OUT	12.00 °C / 6.00 °C
Power input	300.0 kW	Evaporator water flow	39.05 l/s
EER Cooling Efficiency	3.272 kW / kW	Evaporator pressure drops	32.6 kPa
		Ambient temperature	35.0 °C
IPLV.IP	6.300 kW / kW	Lw / Lp @ 1m	95 dB(A) / 73 dB(A)
SEER / ηs	6.18 / 244.2%	Evaporator fluid	Water
SEPR	7.05	Evaporator fouling factor	0.000 m²C/W

SEER declared according to EN14825, fan coil application 12/7°C (inlet/outlet) water temperatures. SEPR declared according to EN14825:2018, high temperature process cooling application. Sound power level according to ISO 9614-1. IPLV.IP and seasonal efficiency data generally refer to standard unit without options

Unit information

Compressor type	Inverter Driven Single Screw	Refrigerant type	R134a
Capacity control	Stepless	Condenser type	Microchannel
Compressor N°	2	Condenser fans N°	20
Circuit N°	2	Condenser fans control	VFD
Refrigerant charge	130 kg	Altitude	0 MSL
Nominal air flow	74313 l/s	Evaporator type	Shell & Tubes

Actual refrigerant charge depends on the final unit construction, refer to unit nameplate.

Electrical information

Power supply	400 V / 50.0 Hz / 3 Ph	Max. inrush current	0 A
Running current	500.01 A	Compressor starting method	Inverter
Max. Running current	677 A		
Max. current wires sizing	744.4 A		

Voltage tolerance ± 10%. Phase Voltage unbalance ± 3%. Electrical data referred to standard unit without options, refer to unit name plate data.



EWADC10TZ-XR B2

Performances calculated according to EN14511-3:2013

Acoustic information

Sound pressure level at 1 m from the unit (rif. 2 x 10⁻⁵ Pa)

63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	db(A)
79.0	73.0	72.0	70.0	68.0	64.0	61.0	60.0	73.0

Acoustic information

Sound pressure level at 10 m from the unit (rif. 2 x 10⁻⁵ Pa)

63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	db(A)
68.2	62.2	61.2	59.2	57.2	53.2	50.2	49.2	62.1

Values referred to Evap. IN/OUT 12/7°C and 35°C Amb., full load operation, standard unit configuration without options. Sound pressure level calculated from sound power level. Sound pressure in octave band is for information only and not considered binding.

Physical information

Evap. connections size **219.1 mm**

Length **9587 mm**

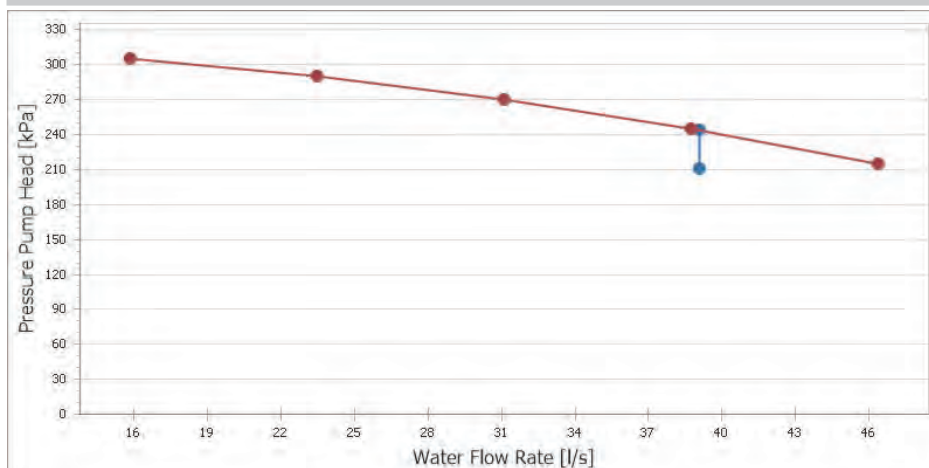
Width **2282 mm**

Weight shipping/operating **7190 kg / 7640 kg**

Height **2540 mm**

Information referred to standard unit configuration without options, refer to certified unit drawing.

Pump curve



* @working conditions

Water flow rate [l/s] *	39.05
Evaporator pressure drop [kPa] *	32.6
Pump water head [kPa] *	243.7
Pump motor power input [kW]	15
Pump motor current [A]	26.6
Power supply [V/Ph/Hz]	400/3/50
PN	16
Motor protection	IP55
Insulation class	F



**Certification notes**

Certified in accordance with Eurovent Certification Program: Liquid Chilling Packages and Heat Pumps (LCP-HP). Standard ratings are specified in the section "Rating requirements" of the Rating Standards. All standard ratings are verified by tests conducted in accordance with the following standards: EN 14511-3:2013 (performance testing) and ISO 9614 (acoustic testing).

Within the scope of AHRI Air-Cooled Water-Chilling Packages Certification Program. AHRI Certified performance may be obtained from the manufacturer's representative

General notes

For more information about the above selected product, please go to <http://www.daikineurope.com/industrial/>. Unit performances are reproducible in laboratory test environment only in accordance to recognized industry standards. This technical data sheet is generated by Daikin Applied Tool software designed and distributed by Daikin Applied Europe S.p.A. The present software does not constitute an offer binding upon Daikin Applied Europe S.p.A who compiled the content of this software to the best of its knowledge. No express or implied warranty is given for the completeness, accuracy, reliability or fitness for particular purpose of its content and the products and services presented therein. Specifications are subject to change without prior notice. Product images are indicative only and are intended for illustrative purposes only; pictures may be differed from the ordered product and are subject to change without prior notice. Daikin Applied Europe S.p.A. explicitly rejects any liability for any direct or indirect damage, in the broadest sense, arising from or related to the use and/or interpretation of this document. All content is copyrighted by Daikin Applied Europe S.p.A.

