



Project Name and No:	Manchester Metropolitan University Science & Engineering - 25716
Submission No:	1338B-NGB-ZZ-ZZ-TS-M-013
Material/Product Reference:	<u>Flaktwoods Air Handling Units</u>
Manufacturer's Name, Address and Contact No:	Dolphin House, Moreton Business Park, Moreton-on-Lugg, Hereford. HR4 8DS. UK
Proposed Location of Material/Plant on Project:	Air Handling Units – AHU07, AHU08 & AHU09
Specification References	1388B-HOL-XX-XX-SP-V-000001 MEP Generals Spec (New Build) 1388B-HOL-XX-XX-SP-V-000002 MEP Performance Spec (New Build) 1388B-HOL-XX-XX-SP-V-000010 MEP Generals Spec (Refurb) 1388B-HOL-XX-XX-SP-V-000011 MEP Performance Spec (Refurb) 9.14.1 MMU EMAP 54 Mandatory Equipment Schedule 1338B-5PA-XX-XX-SP-A-000001 Architectural Specification
List of Attachments:	Flaktwoods Tech Sub 281021
Sample Included (Y/N)	No
Compliant with Specification (Y/N) If No state Non-Compliance	No – Change to AHU07 with the specification requesting a Plate Heat Exchanger used, whereas the proposed uses a thermal wheel and purge sector

Date:	Name (Printed) Martin Edwards
02/11/2021	On behalf of NG Bailey

Approved/Approved with Comments	Name (Printed)	Representative of:	Date:
Comments:			

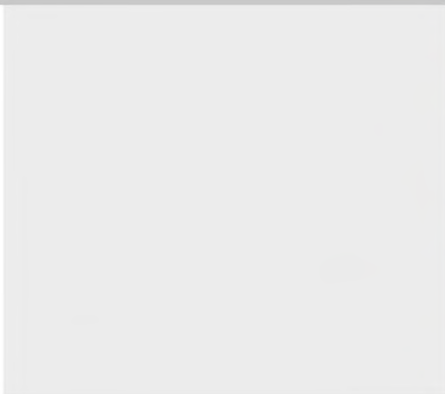
NG BAILEY

Manchester Metropolitan University – Science & Engineering

Technical Submission

1338B-NGB-ZZ-ZZ-TS-M-013

Air Handling Units – AHU07, AHU08 & AHU09



NG Bailey

TECHNICAL SUBMISSION FOR – Mechanical

SUMMARY

Technical Submission No.	1338B-NGB-ZZ-ZZ-TS-M-013
Revision:	0
Package Description:	AHU07, AHU08 & AHU09
Package Equipment:	Air Handling Units
Proposed Supplier:	Flaktwoods
Supplier Address:	Dolphin House, Moreton Business Park, Moreton-on-Lugg, Hereford. HR4 8DS
Building Locations:	MMU – Science & Engineering Refurbishment JDC Roof Level 2, JDT Level 1 Plantroom and JDT Level 0 Riser
Compliance with Specification:	No – Change to AHU07 with the specification requesting a Plate Heat Exchanger used, whereas the proposed uses a thermal wheel and purge sector
NGB Contact:	Martin Edwards
NGB Contact Tel:	07971157798
NGB Contact E-mail:	Martin.edwards2@ngbailey.co.uk
Raised By:	Martin Edwards
Date Raised:	02/11/2021
Response Required By:	16/11/2021

OVERVIEW

SUPPORTING DOCUMENTS:

This technical submittal is for the manufacture, supply & installation of the Air Handling Units within the Refurbishment.

The Hoare Lea Mechanical Specification "1338B-HOL-XX-XX-SP-V-000012" details the requirements for the AHU's and also contains the EMAP 54 – MANDATORY EQUIPMENT SCHEDULE of which Flaktwoods are the preferred manufacturer.

SUPPORTING DOCUMENTS

SUPPORTING DOCUMENTS:

Flaktwoods Tech Sub 281021

APPROVAL STATUS

COMMENTS:

STATUS:

A

B

C

(Please Circle)

MADE BY:

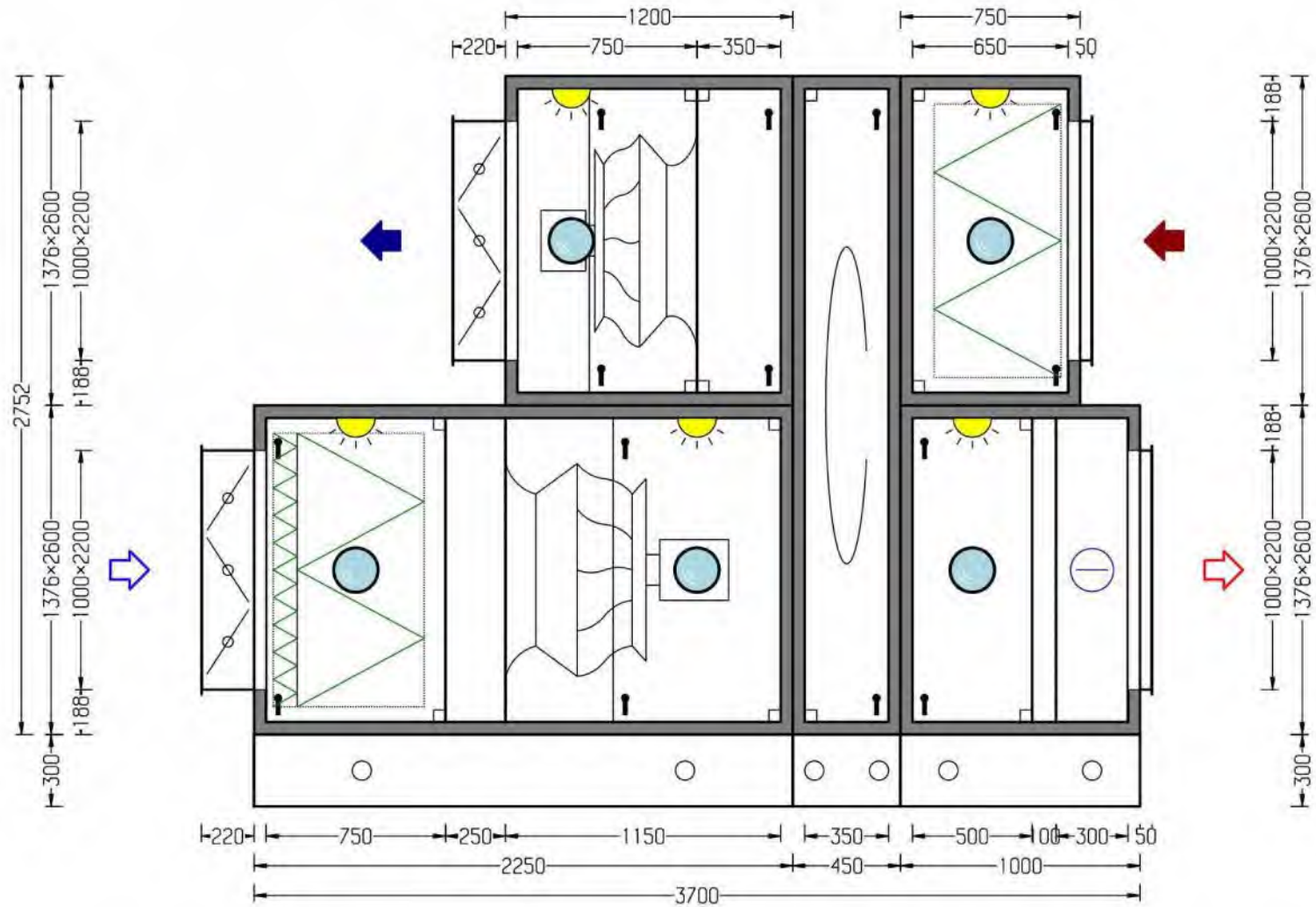
DATE:

STATUS KEY

A – Approved

B – Approved with comments

C – Rejected with comments



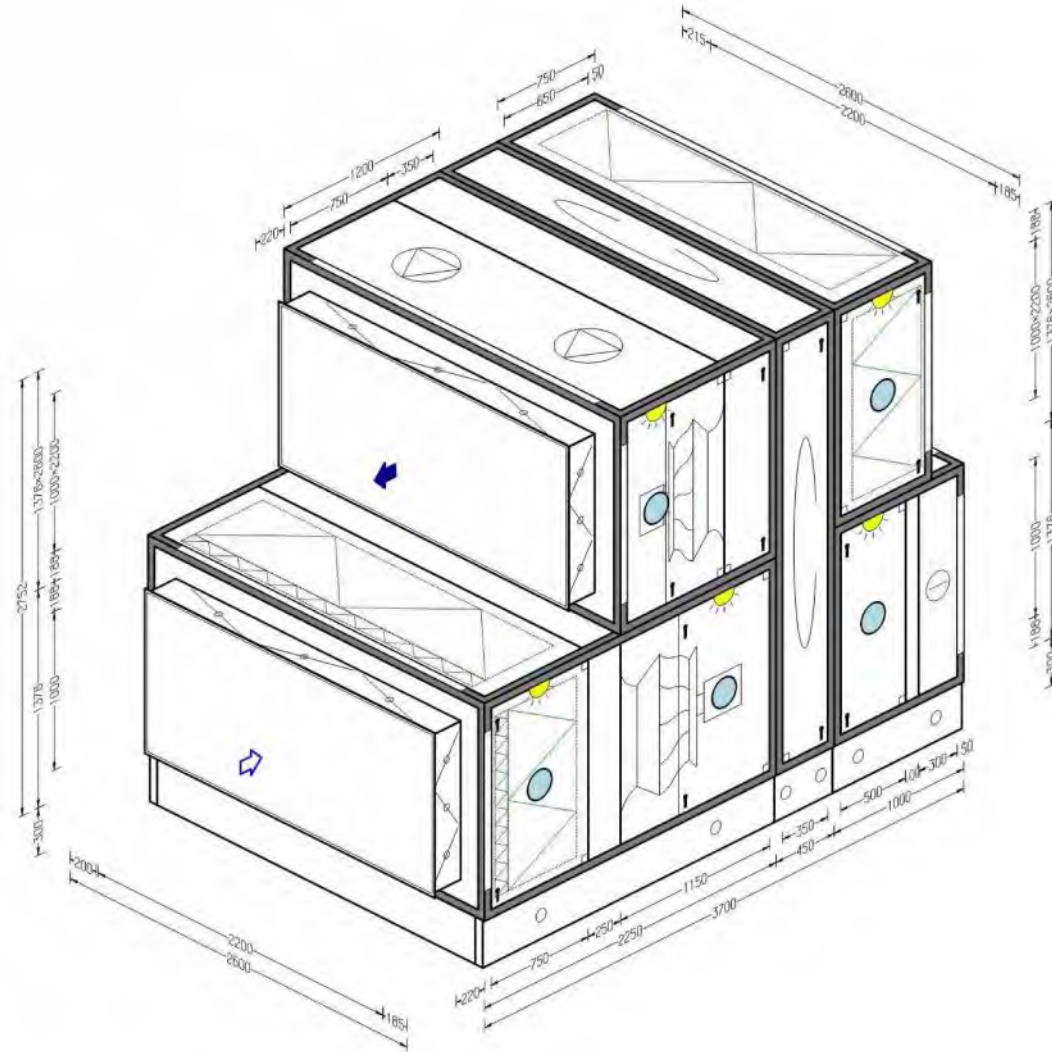
From Inspection Side

2021-10-28
Acon 3.03.56121
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Customer id 2459
Project 30504
Unit 6
AOC ACON-02873108

Project name (121138842A03) / ManMet S & E
Unit name (A2) / AHU07 (No Controls)
Supply air 6400 l/s
Exhaust air eQ-072
eQ-072 6510 l/s





Isometric South West

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Customer id	2459	Project name	(121138842A03) / ManMet S & E
Project	30504	Unit name	(A2) / AHU07 (No Controls)
Unit	6	Supply air	6400 l/s
AOC	ACON-02873108	Exhaust air	6510 l/s



AIR HANDLING UNIT eQ

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873108	
Unit	6 (A2) / AHU07 (No Controls)	2021-10-28
Size	072	Page 3/10
Customer	NG Bailey	
Customers ref.	Martin Edwards	
Our ref.	Andy Window	

Supply air volume flow rate	6400 l/s	Exhaust air volume flow rate	6510 l/s
External static pressure	305 Pa	External static pressure	360 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight	2472 kg
Specific el. power demand (SFPv)	1.95 kW/(m³/s)	Dimensioned for wet condition	
Ref. density	1.2 kg/m³	Ref. altitude above sea level	0 m

SUMMARY

Functional sections in direction of air flow	v0 (m/s)	Et (%)	tw (°C)	ts (°C)	dP* (Pa)
Supply air:					
Connection section	3.6				6
Filter	2.5				187
Inspection section					0
Plenum fan		74.9	-5 / -4.2	28 / 29	713
Heat exchanger	2.9	75.0	-4.2 / 14.7	29 / 23.8	150
Inspection section					0
Inspection section					0
Reverse Cycle DX Coil				28 / 16	63
Connection section	3.2				2
Fan system effect					0
Supply outlet					305
Exhaust air:					
Exhaust inlet					360
Connection section	3.3				2
Filter	2.3				78
Heat exchanger	3.1		21 / 4	22 / 27.1	151
Inspection section					0
Plenum fan		66.8			591

*Refers to the fan design case

Fan system effect is taken into account in fan performance

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	77	83	78	74	73	75	70	69	80
Supply air connection	79	84	82	85	78	80	74	66	86
Extract connection	80	80	75	69	61	59	54	59	71
Exhaust connection	85	89	86	86	82	79	75	75	88
To surroundings	74	73	64	53	52	55	49	41	62

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873108	
Unit	6 (A2) / AHU07 (No Controls)	2021-10-28
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TECHNICAL SPECIFICATION

(components listed in direction of air flow)

SUPPLY AIR

End connection frame

Pressure drop, dimensioning

6 Pa

Casing end wall

EQVA-072-1-1-22-1-1

Damper

EQAZ-12-220-100-3-2-1-01-2-0-8

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

Damper actuator

STAZ-30-1-14-2-0-2-1-1

Type: 2-Point with spring return

Delivery options: Mounted on current sub

Voltage: 24V

Filter

EQPB-072-07-33-4-1-1-1-8-0-8-1

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

112 Pa

Pressure drop, dimensioning

187 Pa

Pressure drop, end

262 Pa

Face area

2.9 m²

Face velocity

2.5 m/s

Inspection window

EQAZ-01-1-1

Design: standard

Bulkhead light

EQAZ-09-072-2-3-2-2

Type: LED

Delivery form: Lamp fitted with cable to outside of casing if there is a fixed panel.

Differential pressure sensor type Dwyer

EQPZ-25-3-0-1-1

Magnehelic

Pressure range, first sensor: 0-500 Pa

Design: flush mounted in door

Filter monitoring

STAZ-24-3-1

Empty section

EQTC-072-025-0-0-0-0-0-0-1-2

Unit size : 072

Length: 025

Inspection side : right

Plenum fan

EQLA-072-2-0-1-1-6-1-1-2-8-1-2

Inspection side: right

Fan selection

Impeller type: Bluefin Floor mounted

Fan size: size 2

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873108	
Unit	6 (A2) / AHU07 (No Controls)	2021-10-28
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Anti-vibration mountings: rubber

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: mounted cable

Length: 350

Dimensioning data

Speed	1561 Rpm
Max speed	1670 Rpm
Total efficiency	67.9 %
Total static pressure, dimensioning (wet coil)	713 Pa
Dynamic pressure	98 Pa
Fan system input power (absorbed electrical power)	8.64 kW
Temperature rise	1 °C
K factor	6.79
Fan wheel size	071

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	6.88 kW
Pressure rise	604 Pa
Speed	1426 Rpm

Motor

Motor output	11 kW
Electric current	23.0 A

Frequency converter

Efficiency	97.0 %
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Inspection window

Design: standard

EQAZ-01-1-1

Bulkhead light

Type: LED

EQAZ-09-072-2-3-2-2

Delivery form: Lamp fitted with cable to outside of casing if there is a fixed panel.

Frequency converter

STR-1-4-0230-3-0-2-1-33-1

Motor accessories

APAC-5-1-0-0-1-0230-350-4-0-0

Fan + PM motor

GAPM-071-1150-4-1-1-0-00-1-1-1

Rotary heat exchanger

EQRO-072-01-170-0-10-1-8-1-02

Size: 072
Voltage: 3 x 400 V
Rotor type: Regoterm
Edge-reinforced: no
Foil spacing: Outputvariant 5 (1.7 mm, 200 mm wheel)
Delivery version: Whole rotor
Function length: standard
Material: galvanized sheet steel/AlZn
Inspection side: right

Efficiency

Temperature efficiency according to standard EN 308	75.0 %
Temperature efficiency at 0°C outdoors	75.0 %
Cooling recovery	74.4 %
Humidity efficiency, Summer	0.0 %
Humidity efficiency, Winter	40.6 %

Supply air

Summer

Winter



AIR HANDLING UNIT eQ

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873108	
Unit	6 (A2) / AHU07 (No Controls)	2021-10-28
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Pressure drop	150	133 Pa
Air temperature	29 / 23.8	-4.2 / 14.7 °C
Relative humidity	47.2 / 64.2	92.2 / 44.4 %
Capacity reduction	41	188 kW
Air flow transfer	619	617 l/s
Face velocity	3.0	2.9 m/s
Exhaust air	Summer	Winter
Pressure drop	151	142 Pa
Air temperature	22 / 27.1	21 / 4 °C
Relative humidity	45 / 33.1	50 / 100 %
Additional throttling	0	0 Pa
Face velocity	3.1	3.1 m/s

Empty section

EQTC-072-050-0-0-0-0-2-1-2

Unit size : 072
Length: 050
Inspection side : right
Inspection window
Design: standard

EQAZ-01-1-1

Bulkhead light

EQAZ-09-072-2-3-2-2

Type: LED
Delivery form: Lamp fitted with cable to outside of casing if there is a fixed panel.

Empty section

EQTC-072-010-0-0-0-0-0-1-2

Unit size : 072
Length: 010
Inspection side : right

Reverse Cycle DX Coil

EQNP-072-2-1-1-1-01-3-0-1-1-X

Air Volume (Std.)	5.82 m ³ /s	Coil Code	1/2-34-4-10-2215(17)R3.68
Air On Dry Bulb	28.0 °C	Dry Weight	180 kg
Air On Wet Bulb	20.0 °C	Fin Material	Aluminium
Air On R.H.	48.1 %	Tube Material	1/2" o.d. Copper x 0.51
Air Off Dry Bulb	16.0 °C	Casing Material	Pre-Galv. Steel
Air Off Wet Bulb	14.2 °C	No. Sections	2 Interlaced
Air Off R.H.	82.9 %	Liquid Conn.	2x7/8"
-	-	Suction Conn.	2x1,5/8"(1,5/8"x14swg+Domed Cap)
Cooling Load	120.9 kW	Connection Type	Plain O.D.
S.H.Ratio	70 %	Coil Type	AHU + d/tray
Refrigerant	32	Drain Size	3/4" inches
Evaporating(Dew) Temp	5.0 °C	Moisture Extraction	50 kg/hr
Liquid Temp. at TEV	45.0 °C	Rows	4
Superheat	5.0 °K	Circuits	17
Refrigerant P.D.(Pressure)	35 kPa	Fin Spacing	2.54mm(10/inch)
Refrigerant P.D.(Temperature)	1.2 °K	Air Flow	Horizontal
Finned Height	1080 mm	Eliminators	needed - fit P400
Finned Length	2215 mm	Face Velocity	2.4 m/s
Internal Volume	38.8 litres	Air p.d.	89 Pa
Max Working Pressure (DX)	33 Bar(g)		
Overall Height	1176 mm	Test Pressure	47 Bar(g)
Overall Length	2400 mm	Overall Depth	400 mm
		Connection Orientation	Standard

Heating Duty Air On: 5.0°C Air Off: 25.0°C Duty: 152.7kW Condensing Temp.: 40.0°C

Notes: USE 0.71mm RETURN BENDS

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AOC	ACON-02873108	
Unit	6 (A2) / AHU07 (No Controls)	2021-10-28
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Pressure drop evaporative refrigerant	23.9 kPa
Oversizing	1.9 %

End connection frame

Pressure drop, dimensioning	2 Pa
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Casing end wall
EQVA-072-2-1-22-1-1
Duct connection piece
EQAZ-26-220-100-2-1-1

Width cm : 220

Height in cm : 100

Connection type: flange connection

Material: galvanized sheet steel / AlZn

EXHAUST AIR
End connection frame

Pressure drop, dimensioning	2 Pa
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Casing end wall
EQVA-072-1-1-22-2-1
Duct connection piece
EQAZ-26-220-100-2-1-1

Width cm : 220

Height in cm : 100

Connection type: flange connection

Material: galvanized sheet steel / AlZn

Filter
EQPB-072-05-31-4-1-1-1-0-0-8-2

Inspection side: left

Filter selection

Filter class: M5 - ePM10 50%, synthetic

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

39 Pa

Pressure drop, dimensioning

78 Pa

Pressure drop, end

117 Pa

Face area

2.9 m²

Face velocity

2.3 m/s

Inspection window
EQAZ-01-1-1

Design: standard

Bulkhead light
EQAZ-09-072-2-3-2-2

Type: LED

Delivery form: Lamp fitted with cable to outside of casing if there is a fixed panel.

Differential pressure sensor type Dwyer
EQPZ-25-3-0-1-1
Magnehelic

Pressure range, first sensor: 0-500 Pa

Design: flush mounted in door

Filter monitoring
STAZ-24-2-1
Empty section
EQTC-072-035-0-0-0-0-0-1-2-2

Unit size : 072

Length: 035

Inspection side : left

Plenum fan
EQLC-072-3-2-1-2-4-2-2-1-8-2-1

Inspection side: left

Fan selection

Impeller type: Bluefin (composite)

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AOC	ACON-02873108	
Unit	6 (A2) / AHU07 (No Controls)	2021-10-28
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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 1643 Rpm

Max speed 1780 Rpm

Total efficiency 66.8 %

Total static pressure, dimensioning (wet coil) 591 Pa

Dynamic pressure 35 Pa

Fan system input power (absorbed electrical power) 6.88 kW

Temperature rise 0.8 °C

K factor 5.07

Fan wheel size 056

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP 5.84 kW

Pressure rise 548 Pa

Speed 1535 Rpm

Motor

Motor output 2 x 4.6 kW

Electric current 2 x 5.8 A

Output margin, minimum 10 %

Inspection window

EQAZ-01-1-1

Design: standard

Bulkhead light

EQAZ-09-072-2-3-2-2

Type: LED

Delivery form: Lamp fitted with cable to outside of casing if there is a fixed panel.

Damper actuator

STAZ-30-8-14-2-0-2-1-1

Type: 2-Point with spring return

Delivery options: Mounted on current sub

Voltage: 24V

Frequency converter

STRR-2-4-0058-3-0-3-9-51-1

Motor accessories

APAC-6-4-6-0-1-0058-451-4-0-0

Frequency converter

STRR-4-4-0058-3-0-3-9-51-1

Fan + EC motor

GAEC-056-0460-4-0-1-0-00-0-1-1

Help code fan + EC-motor

AQEA-056-0460-0-1-0-02-1-000-1

Damper

EQAZ-12-220-100-3-2-4-01-2-0-8

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

AIR HANDLING UNIT eQ

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873108	
Unit	6 (A2) / AHU07 (No Controls)	2021-10-28
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BLOCK LIST

	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	VOLUME (m³)	WEIGHT (kg)
EQGB-072-225-22-1-1-2-1-1 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	2300	2750	1846	11.68	890
EQHB-072-045-22-1-1-2-1-3-1-1 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) Rotary heat exchanger	500	2750	3222	4.43	512
EQGB-072-100-22-1-1-2-1-4-1-1 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 Empty section Air cooler for evaporative refrigerant Casing end wall	1050	2750	1846	5.33	376
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)* Casing strength: D1(M) Casing end wall Filter	800	2750	1546	3.4	236
EQGB-072-120-22-1-1-2-1-4-1-1 Unit casing (frame, module) Model box code: EQ 2111 Material: AlZn sheet steel	1470	2750	1546	6.25	457



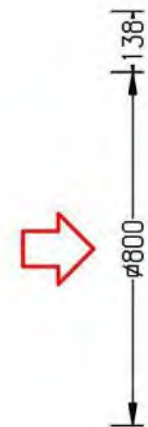
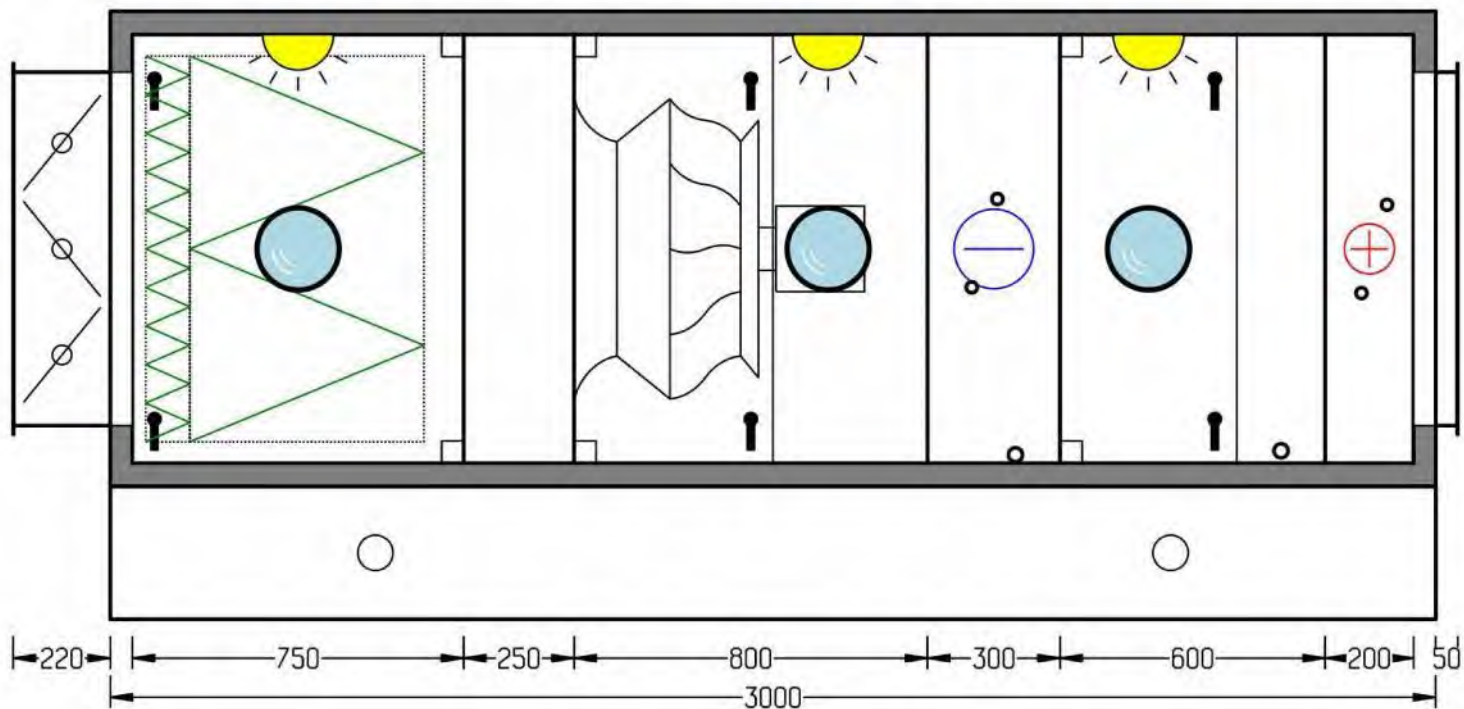
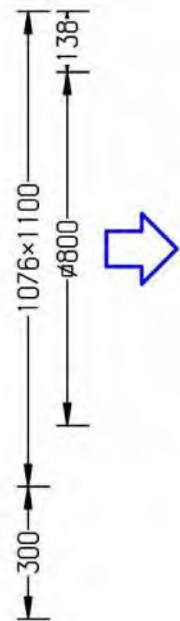
AIR HANDLING UNIT eQ

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873108	
Unit	6 (A2) / AHU07 (No Controls)	2021-10-28
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Thermal insulation: T3
Condensation insulation: TB3
Leakage class: L2(R)*
Casing strength: D1(M)
Empty section
Plug fan wall mounted

	31.09	2472
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.



From Inspection Side

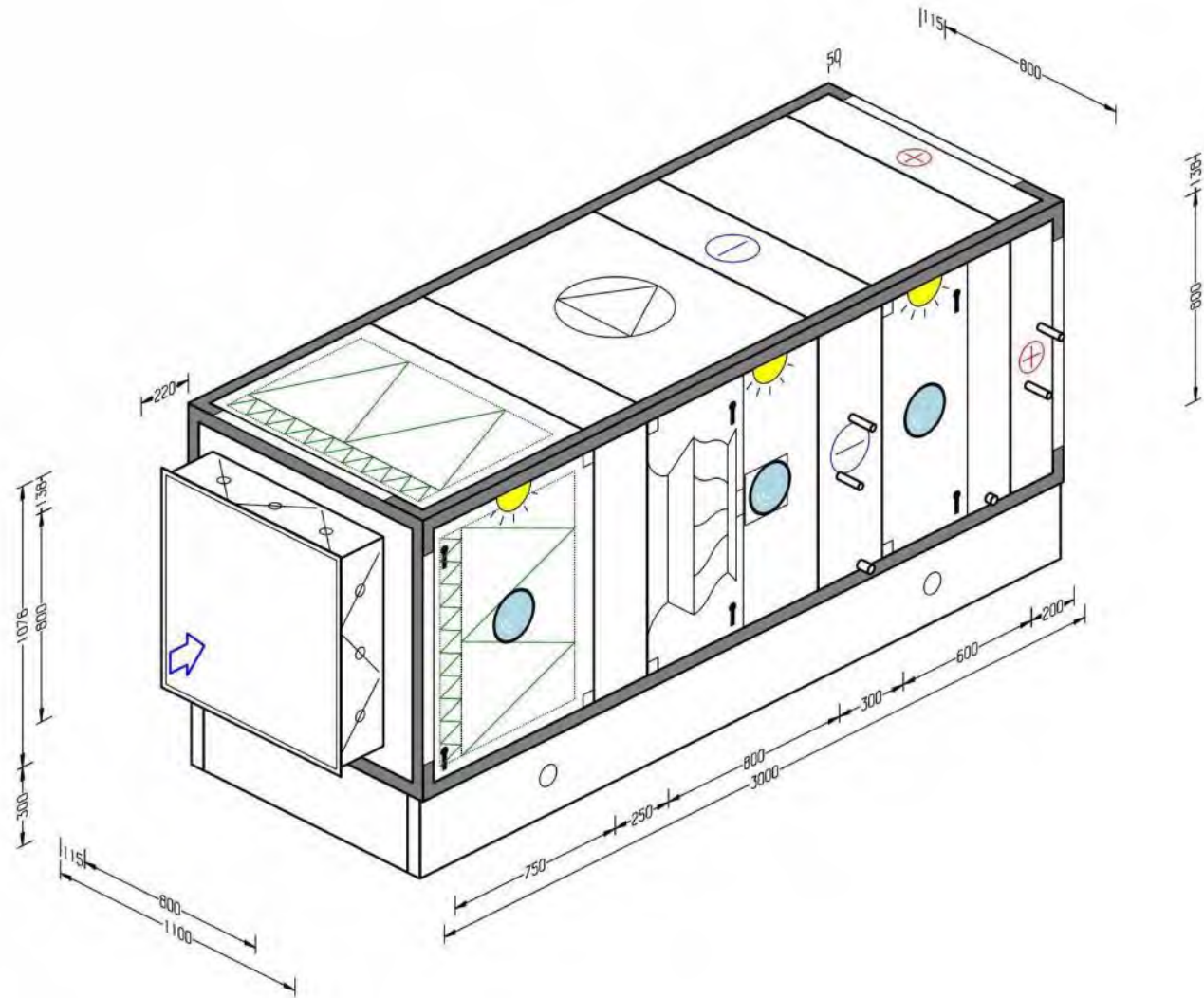
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Customer id 2459
Project 30504
Unit 7
AOC ACON-02873117

Project name
Unit name
Supply air eQ-020
Exhaust air

(121138842A03) / ManMet S & E
(B1) / AHU/08 (No Controls)
1720 l/s





Isometric South West

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Customer id	2459	Project name	(121138842A03) / ManMet S & E	
Project	30504	Unit name	(B1) / AHU/08 (No Controls)	
Unit	7	Supply air	1720 l/s	
AOC	ACON-02873117	Exhaust air	eQ-020	

AIR HANDLING UNIT eQ

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873117	
Unit	7 (B1) / AHU/08 (No Controls)	2021-10-28
Size	020	Page 3/7
Customer	NG Bailey	
Customers ref.	Martin Edwards	
Our ref.	Andy Window	

Supply air volume flow rate	1720 l/s	Exhaust air volume flow rate	0 l/s
External static pressure	255 Pa	External static pressure	0 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight	573 kg
Specific el. power demand (SFPv)	0.69 kW/(m³/s)	Dimensioned for wet condition	
Ref. density	1.2 kg/m³	Ref. altitude above sea level	0 m

SUMMARY

Functional sections in direction of air flow	v0 (m/s)	Et (%)	tw (°C)	ts (°C)	dP* (Pa)
Connection section	2.8				4
Filter	2.2				164
Inspection section					0
Plenum fan		65.6	-5 / -4.4	28 / 28.7	499
Air cooler	2.3			28 / 24	39
Inspection section					0
Air heater	2.1		-5 / 20		36
Connection section	2.7				1
Supply outlet					255

*Refers to the fan design case

Fan system effect is taken into account in fan performance

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	72	73	71	66	60	58	58	60	69
Supply air connection	73	81	80	76	74	67	62	62	78
To surroundings	65	66	66	62	46	37	32	30	62

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873117	
Unit	7 (B1) / AHU/08 (No Controls)	2021-10-28
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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

EQVA-020-1-1-22-1-1

Damper

EQAZ-12-080-080-3-2-1-01-2-0-8

Width cm : 080

Height in cm : 080

Tightness class : CEN 3

Connection: Flange

Function : Outdoor air

Location: externally end wall

Damper type: 200 mm blade

Material : AlZn

Damper actuator

STAZ-30-1-09-2-0-2-1-1

Type: 2-Point with spring return

Delivery options: Mounted on current sub

Voltage: 24V

Filter

EQPB-020-07-33-4-1-1-1-8-0-8-1

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

1x592x592, 1x287x592, 1x592x287, 1x287x287

Pressure drop, start

89 Pa

Pressure drop, dimensioning

164 Pa

Pressure drop, end

239 Pa

Face area

0.8 m²

Face velocity

2.2 m/s

Inspection window

EQAZ-01-1-1

Design: standard

Bulkhead light

EQAZ-09-020-2-3-2-2

Type: LED

Delivery form: Lamp fitted with cable to outside of casing if there is a fixed panel.

Differential pressure sensor type Dwyer

EQPZ-25-3-0-1-1

Magnehelic

Pressure range, first sensor: 0-500 Pa

Design: flush mounted in door

Filter monitoring

STAZ-24-3-1

Empty section

EQTC-020-025-0-0-0-0-0-0-1-2

Unit size : 020

Length: 025

Inspection side : right

Plenum fan

EQLC-020-2-4-1-2-3-1-1-2-8-1-1

Inspection side: right

Fan selection

Impeller type: Bluefin (composite)

Fan size: size 2

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873117	
Unit	7 (B1) / AHU/08 (No Controls)	2021-10-28
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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: 308

Dimensioning data

Speed	2147 Rpm
Max speed	2360 Rpm
Total efficiency	65.6 %
Total static pressure, dimensioning (wet coil)	499 Pa
Dynamic pressure	33 Pa
Fan system input power (absorbed electrical power)	1.44 kW
Temperature rise	0.7 °C
K factor	20
Fan wheel size	040

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	1.2 kW
Pressure rise	415 Pa
Speed	2021 Rpm

Motor

Motor output	2.1 kW
Electric current	2.7 A
Output margin, minimum	10 %

Inspection window

Design: standard

EQAZ-01-1-1

Bulkhead light

Type: LED

Delivery form: Lamp fitted with cable to outside of casing if there is a fixed panel.

EQAZ-09-020-2-3-2-2

Frequency converter

STRR-1-4-0027-3-0-3-9-51-1

Motor accessories

APAC-4-4-6-0-1-0027-308-4-0-0

Fan + EC motor

GAEC-040-0210-4-0-1-0-00-0-1-1

Help code fan + EC-motor

AQEA-040-0210-0-1-0-01-1-000-1

Air cooler for chilled water

EQNN-020-02-1-1-10-01-0-1-1-3

Size: 020

Inspection side: right

Material: galvanized sheet steel

Droplet eliminator: without

Design variant: version 3

Coil selection

Use as: Cooling Coil

Calculation principle: input data

Output variant: 2

Fluid passes: 10

Fin spacing: 2 mm

Design: normal face area

Material, coil: Cu/Al, MS header

Shunt selection

Shunt control: without

Nom. pipe size 25

Liquid volume 7.0 l

Ethylene glycol 20 %

AIR HANDLING UNIT eQ

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873117	
Unit	7 (B1) / AHU/08 (No Controls)	2021-10-28
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Pressure drop, dimensioning	39 Pa
Pressure drop, wet coil	39 Pa
Pressure drop, dry coil	34 Pa
Output	10.9 kW
Air temperature	28 / 24 °C
Relative humidity	50 / 60.7 %
Face velocity	2.3 m/s
Water temperature	6 / 12 °C
Water flow	0.46 l/s
Water velocity	0.8 m/s
Pressure drop water	11.4 kPa
Oversizing	116.6 %

Empty section adjacent to cooling coil

EQTB-020-6-1-1-1-1

Unit size: 020
 Section length, mm: 600
 Position: upstream of EQH(N,P)
 Material, droplet eliminator mountings: Galvanized steel
 Inspections side: Right

Inspection window

EQAZ-01-1-1

Design: standard

Bulkhead light

EQAZ-09-020-2-3-2-2

Type: LED

Delivery form: Lamp fitted with cable to outside of casing if there is a fixed panel.

Air heater for hot water

EQEE-020-2-01-1-08-1-1-1-3

Size: 020
 Inspection side: right
 Material: galvanized sheet steel
Coil selection
 Calculation principle: input data
 Output variant: 2
 Fluid passes: 08
 Fin spacing: 2 mm
 Design: normal face area
 Material, coil: Cu/Al, MS header

Nom. pipe size	25
Liquid volume	6.8 l
Pressure drop, dimensioning	35 Pa
Output	52.1 kW
Air temperature	-5 / 20 °C
Face velocity	2.1 m/s
Control principle for water heater	flow control
Water temperature	75 / 50 °C
Water flow	0.51 l/s
Water velocity	0.7 m/s
Pressure drop water	4.8 kPa
Oversizing	51.4 %

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

EQVA-020-2-1-22-1-1

Duct connection piece

EQAZ-26-080-080-2-1-1

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

AIR HANDLING UNIT eQ

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873117	
Unit	7 (B1) / AHU/08 (No Controls)	2021-10-28
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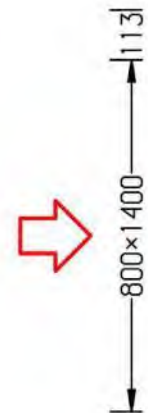
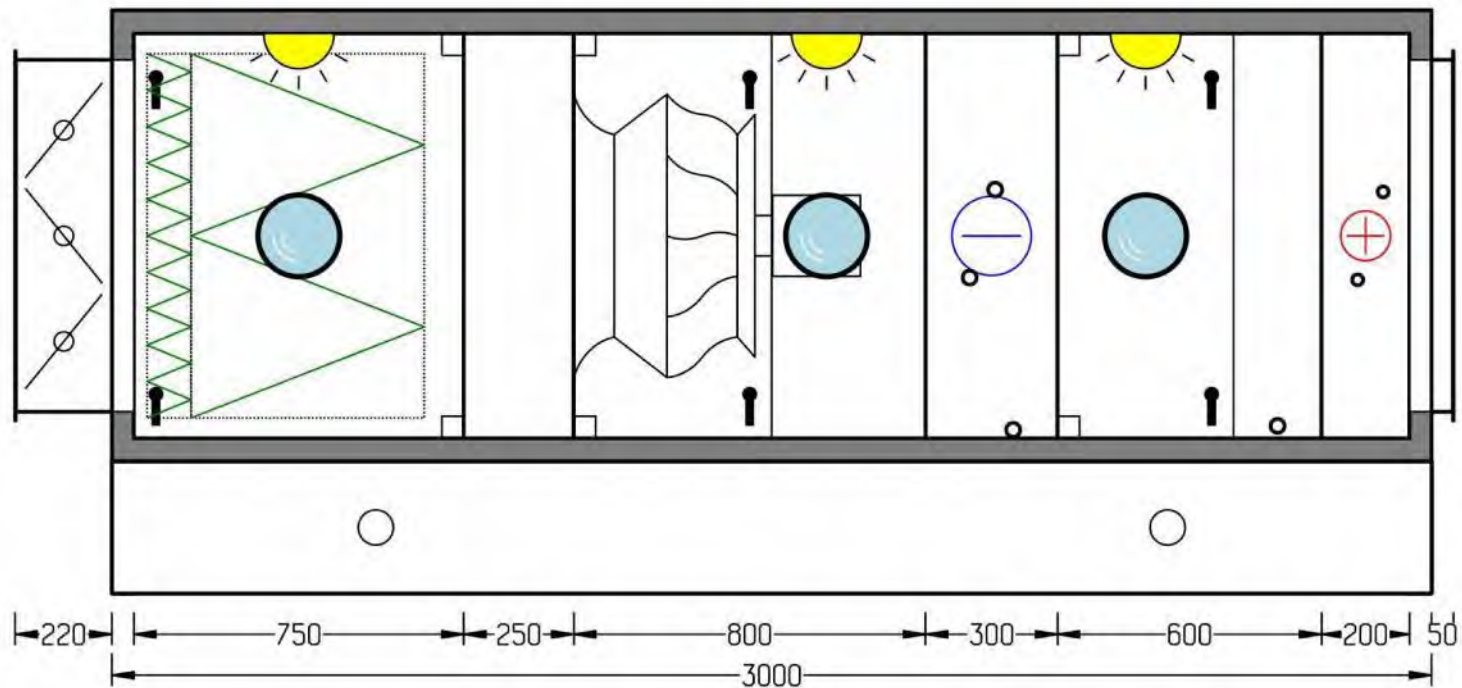
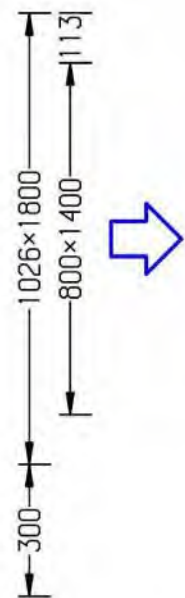
BLOCK LIST

	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	VOLUME (m³)	WEIGHT (kg)
EQGB-020-300-22-9-1-2-4-1-1-1	3050	1250	1546	5.89	573
Unit casing (frame, module)					
Model box code: EQ 2192					
Material: AlZn sheet steel					
Thermal insulation: T2					
Condensation insulation: TB2					
Leakage class: L2(R)*					
Casing strength: CEN D2					
Casing end wall					
Filter					
Empty section					
Plug fan wall mounted					
Air cooler for chilled water					
Empty section adjacent to cooling coil					
Air heater for hot water					
Casing end wall					
				5.89	573

The dimensions are transport dimensions including packaging

*Flakt Group eQ AHUs are leakage class L2 real unit as certified by Eurovent.

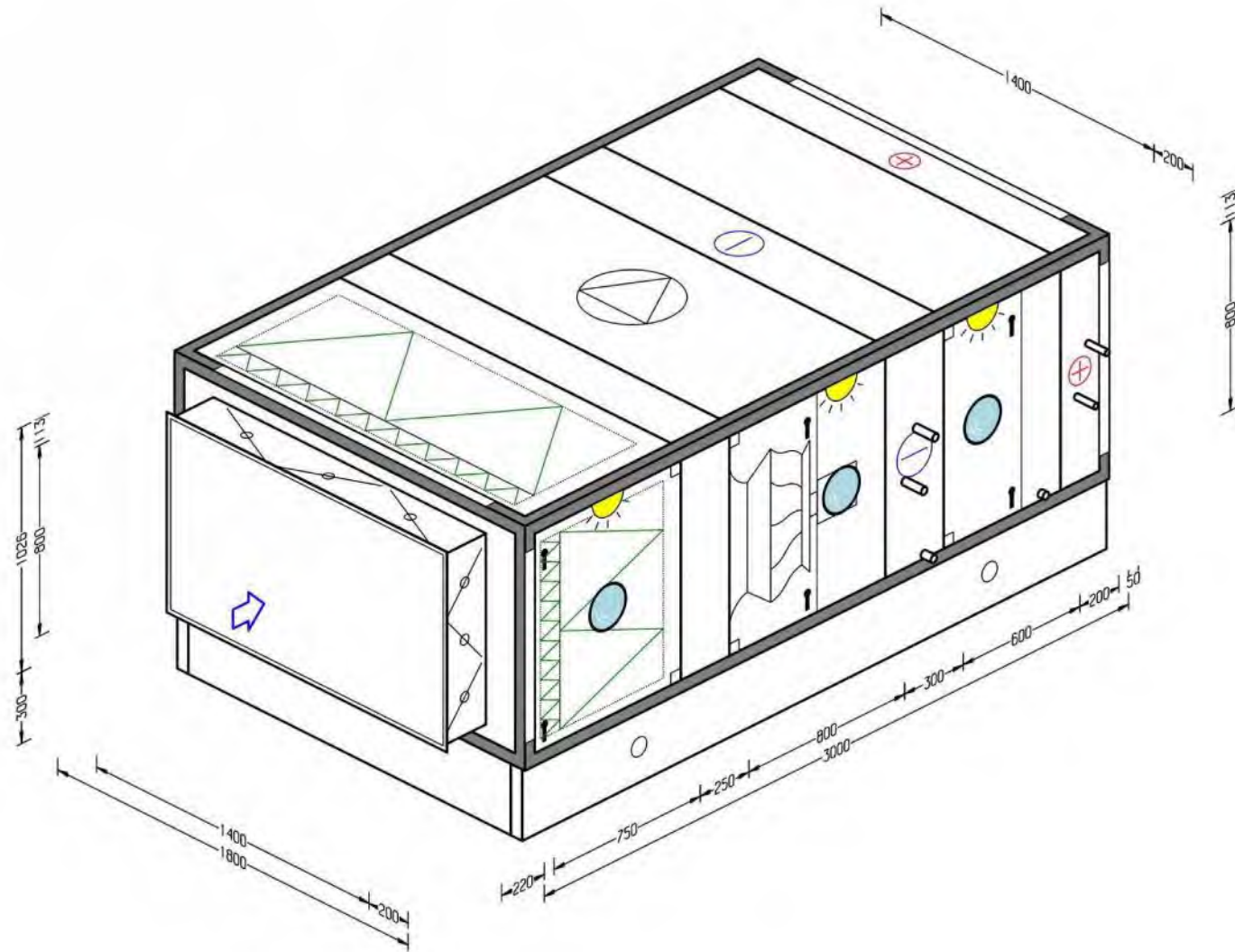
CAL class @-400Pa and @+700Pa. For units where the casing has; (i) a customised or special design that differs from standard module box, (ii) nonstandard components penetrating the casing that is non-standard for a real unit, and (iii) where holes or penetrations are made in casing after delivery to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



From Inspection Side

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Customer id	2459	Project name	(121138842A03) / ManMet S & E	
Project	30504	Unit name	(C1) / AHU/09 (No Controls)	
Unit	8	Supply air	2490 l/s	
AOC	ACON-02873122	Exhaust air	eQ-032	



Isometric South West

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Customer id	2459	Project name	(121138842A03) / ManMet S & E	
Project	30504	Unit name	(C1) / AHU/09 (No Controls)	
Unit	8	Supply air	2490 l/s	
AOC	ACON-02873122	Exhaust air	eQ-032	

AIR HANDLING UNIT eQ

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873122	
Unit	8 (C1) / AHU/09 (No Controls)	2021-10-28
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Customer	NG Bailey	
Customers ref.	Martin Edwards	
Our ref.	Andy Window	

Supply air volume flow rate	2490 l/s	Exhaust air volume flow rate	0 l/s
External static pressure	333 Pa	External static pressure	0 Pa
Mains electricity	3x400VAC±10%+N+PE, 50Hz	Weight	781 kg
Specific el. power demand (SFPv)	0.72 kW/(m³/s)	Dimensioned for wet condition	
Ref. density	1.2 kg/m³	Ref. altitude above sea level	0 m

SUMMARY

Functional sections in direction of air flow	v0 (m/s)	Et (%)	tw (°C)	ts (°C)	dP* (Pa)
Connection section	2.3				3
Filter	2.0				152
Inspection section					0
Plenum fan		69.4	-5 / -4.4	28 / 28.7	549
Air cooler	2.0			28 / 24	31
Inspection section					0
Air heater	1.8		-5 / 20		29
Connection section	2.3				1
Supply outlet					333

*Refers to the fan design case

Fan system effect is taken into account in fan performance

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	76	75	71	65	60	58	55	56	68
Supply air connection	77	81	75	76	73	69	64	59	78
To surroundings	69	68	66	61	46	37	30	30	61

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873122	
Unit	8 (C1) / AHU/09 (No Controls)	2021-10-28
Size	032	Page 4/7

TECHNICAL SPECIFICATION

(components listed in direction of air flow)

SUPPLY AIR

End connection frame

Pressure drop, dimensioning

3 Pa

Casing end wall

EQVA-032-1-1-22-1-1

Damper

EQAZ-12-140-080-3-2-1-01-2-0-8

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

Damper actuator

STAZ-30-1-10-2-0-2-1-1

Type: 2-Point with spring return

Delivery options: Mounted on current sub

Voltage: 24V

Filter

EQPB-032-07-33-4-1-1-1-8-0-8-1

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

77 Pa

Pressure drop, dimensioning

152 Pa

Pressure drop, end

227 Pa

Face area

1.3 m²

Face velocity

2.0 m/s

Inspection window

EQAZ-01-1-1

Design: standard

Bulkhead light

EQAZ-09-032-2-3-2-2

Type: LED

Delivery form: Lamp fitted with cable to outside of casing if there is a fixed panel.

Differential pressure sensor type Dwyer

EQPZ-25-3-0-1-1

Magnehelic

Pressure range, first sensor: 0-500 Pa

Design: flush mounted in door

Filter monitoring

STAZ-24-3-1

Empty section

EQTC-032-025-0-0-0-0-0-0-1-2

Unit size : 032

Length: 025

Inspection side : right

Plenum fan

EQLC-032-1-3-1-2-3-1-1-2-8-1-1

Inspection side: right

Fan selection

Impeller type: Bluefin (composite)

Fan size: size 1

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873122	
Unit	8 (C1) / AHU/09 (No Controls)	2021-10-28
Size	032	Page 5/7

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

Speed	1680 Rpm
Max speed	1950 Rpm
Total efficiency	69.4 %
Total static pressure, dimensioning (wet coil)	549 Pa
Dynamic pressure	28 Pa
Fan system input power (absorbed electrical power)	2.14 kW
Temperature rise	0.7 °C
K factor	12.86
Fan wheel size	050

SFP Calculation

Fan system input power (absorbed electrical power) according to SFP	1.81 kW
Pressure rise	467 Pa
Speed	1580 Rpm

Motor

Motor output	3.5 kW
Electric current	4.4 A
Output margin, minimum	10 %

Inspection window

Design: standard

EQAZ-01-1-1

Bulkhead light

Type: LED

Delivery form: Lamp fitted with cable to outside of casing if there is a fixed panel.

EQAZ-09-032-2-3-2-2

Frequency converter

STRR-1-4-0044-3-0-3-9-51-1

Motor accessories

APAC-4-4-6-0-1-0044-356-4-0-0

Fan + EC motor

GAEC-050-0350-4-0-1-0-00-0-1-1

Help code fan + EC-motor

AQEA-050-0350-0-1-0-01-1-000-1

Air cooler for chilled water

EQNN-032-02-1-1-06-01-0-1-1-3

Size: 032

Inspection side: right

Material: galvanized sheet steel

Droplet eliminator: without

Design variant: version 3

Coil selection

Use as: Cooling Coil

Calculation principle: input data

Output variant: 2

Fluid passes: 06

Fin spacing: 2 mm

Design: normal face area

Material, coil: Cu/Al, MS header

Shunt selection

Shunt control: without

Nom. pipe size

32

Liquid volume

11.3 l

Ethylene glycol

20 %

AIR HANDLING UNIT eQ

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873122	
Unit	8 (C1) / AHU/09 (No Controls)	2021-10-28
Size	032	Page 6/7

Pressure drop, dimensioning	31 Pa
Pressure drop, wet coil	31 Pa
Pressure drop, dry coil	27 Pa
Output	15.8 kW
Air temperature	28 / 24 °C
Relative humidity	50 / 60.7 %
Face velocity	2.0 m/s
Water temperature	6 / 12 °C
Water flow	0.66 l/s
Water velocity	0.7 m/s
Pressure drop water	7.2 kPa
Oversizing	128.5 %

Empty section adjacent to cooling coil

EQTB-032-6-1-1-1-1

Unit size: 032
 Section length, mm: 600
 Position: upstream of EQH(N,P)
 Material, droplet eliminator mountings: Galvanized steel
 Inspections side: Right

Inspection window

EQAZ-01-1-1

Design: standard

Bulkhead light

EQAZ-09-032-2-3-2-2

Type: LED

Delivery form: Lamp fitted with cable to outside of casing if there is a fixed panel.

Air heater for hot water

EQEE-032-2-01-1-06-1-1-1-3

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	29 Pa
Output	75.4 kW
Air temperature	-5 / 20 °C
Face velocity	1.8 m/s
Control principle for water heater	flow control
Water temperature	75 / 50 °C
Water flow	0.74 l/s
Water velocity	0.8 m/s
Pressure drop water	8.3 kPa
Oversizing	63.7 %

End connection frame

Pressure drop, dimensioning 1 Pa

Casing end wall

EQVA-032-2-1-22-1-1

Duct connection piece

EQAZ-26-140-080-2-1-1

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

AIR HANDLING UNIT eQ

Project	30504 (121138842A03) / ManMet S & E	Acon 3.03.56121
AOC	ACON-02873122	
Unit	8 (C1) / AHU/09 (No Controls)	2021-10-28
Size	032	Page 7/7

BLOCK LIST

	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	VOLUME (m³)	WEIGHT (kg)
EQGB-032-300-22-9-1-2-4-1-1-1	3050	1950	1496	8.9	781
Unit casing (frame, module)					
Model box code: EQ 2192					
Material: AlZn sheet steel					
Thermal insulation: T2					
Condensation insulation: TB2					
Leakage class: L2(R)*					
Casing strength: CEN D2					
Casing end wall					
Filter					
Empty section					
Plug fan wall mounted					
Air cooler for chilled water					
Empty section adjacent to cooling coil					
Air heater for hot water					
Casing end wall					
				8.9	781

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.