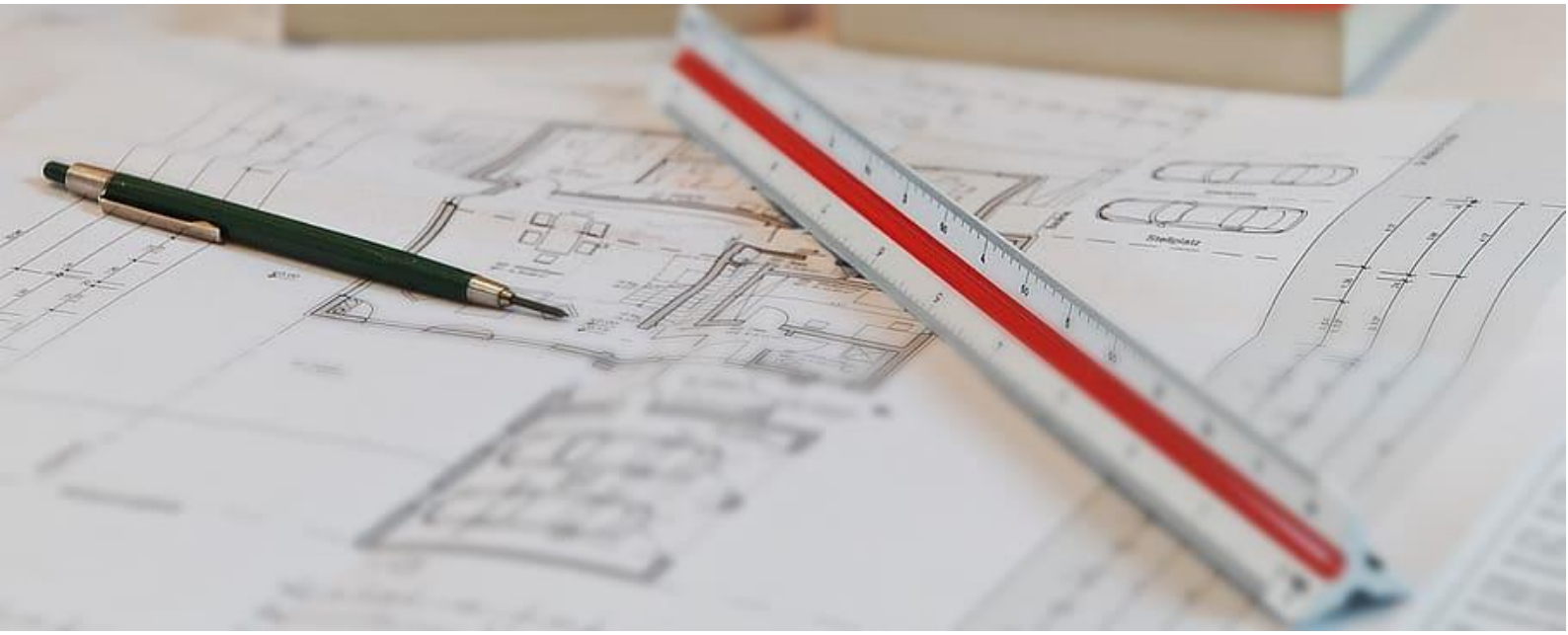
00136-RP-001 - Fresh Thai Cooling Statement



CONSULTING ENGINEERS LTD.

Revision	Changes / Notes Additions – Blue Highlight ~~Deletions – Strikethrough~~	By	Checked	Date
0	First Issue	AR	RM	30/10/2023
1	Updated Appendices	AR	AR	21/08/2024

Contents

Introduction

This document has been produced to inform Camden Council why the Fresh Thai restaurant refurbishment project requires cooling with respect to the cooling hierarchy referenced in the London Plan.

Site Description

The project is the refurbishment of the basement and ground levels of an existing six storey mixed use building at 80—82 Southampton Row, London to provide a new restaurant.

The restaurant will comprise a main kitchen and seating area at ground floor level with an adjacent coffee bar area. At basement level will be provide dining and WC provision as well as an access corridor to the building courtyard.

Supply ventilation is being provided to all areas via supply only ventilation units, with mechanical extract covering the kitchen and main seating, plus a small inline extract for the coffee bar and private dining. Mechanical cooling provided via cassette type units with condenser units located in the courtyard.

Refer appendix A for further MEP details.

Figure 1 Front of Building

Figure 2 Rear Courtyard looking at kitchen area windows

The landlord has stipulated that no large ventilation plant may be located outside – only small air conditioning due to the proximity to residential parts.

Cooling Hierarchy

The cooling hierarchy is described in the Camden Planning Guidance document 'Energy efficiency and adaptation'.

Against each point we have provided statements in the context of the project to demonstrate why cooling is necessary for the project:

All developments should follow the cooling hierarchy outlined below, to reduce the risk of overheating and subsequent reliance on active cooling:

1. Minimise internal heat generation through energy efficient design, considering the following:

- *Layout and uses: locate any spaces that need to be kept cool or that generate heat on cooler sides of developments.*

Layout is inflexible as can be see from the plans – it is not possible to change the layout and retain a functional restaurant space due to the constraints of the existing building.

- *Reducing heat gains e.g. including low energy lighting.*

All lighting is low energy LED, and that is the primary avenue for gain reduction as there is no other avenue to reduce equipment heat gains.

- *Seal/ insulate heat generating processes.*

The air conditioning plant provides both heating and cooling. There is no other heat generation other than a gas fire water heater for domestic hot water.

• Reduce the distance heat needs to travel and insulate pipework.

Noted and pipework distances are optimised to the constraints of the existing building.

• Design layouts to promote natural ventilation e.g. shallow floor plans and high floor to ceiling heights.

Not practical due to existing building and there are constraints on available louvre space to facilitate sufficient ventilation for the occupancy figures (figures on drawings as per Appendix A).

• Consider evaporation cooling which cools air through the evaporation of water.

Not practical for this site because of limited space for the plant due to the restriction from the landlord on locating plant other than small air conditioning internally. Additional evaporative cooling plant does not fit.

• Consider 'free cooling' or 'night cooling', which uses the cooling capacity of ambient air to directly cool the space.

Free cooling is provided to the kitchen space by means of the supply ventilation plant.

2. Reduce the amount of heat entering a building in summer:

• Consider the angle of the sun and optimum daylight and solar gain balance.

Not applicable as this is an existing site.

• Orientate and recess windows and openings to avoid excessive solar gain.

Not applicable as this is an existing site.

• Consider low g-values and the proportion, size and location of windows.

Not applicable as this is an existing site.

• Make use of shadowing from other buildings.

Not applicable as this is an existing site.

• Include adequate insulation.

Limited as this is an existing site.

• Design in shading: e.g. include internal courtyards, large shade-providing trees and vegetation, balconies, louvers, internal or external blinds, and shutters.

Not applicable as this is an existing site.

• Make use of the albedo effect (use light coloured or reflective materials to reflect the sun's rays).

Not applicable as this is an existing site and façade works are restricted.

• Include green infrastructure e.g. green wall, green/blue roofs and landscaping, to regulate temperatures.

Not applicable as this is an existing site.

3. Manage the heat within the building through exposed internal thermal mass and high ceilings

Not applicable as this is an existing site.

4. Passive ventilation:

- *Natural ventilation, openable windows, the 'stack effect' system.*

Not applicable as this is an existing site comprising basement and ground levels.

5. Mechanical ventilation:

- *Ensuring the most efficient system possible.*

Refer datasheets of equipment as Appendix B.

- *Consider mechanical ventilation with heat recovery.*

Insufficient space internally for units and also limited louvre space as well as adequate separation between intake and exhaust louvres.

6. Active cooling:

- *Ensuring they are the lowest carbon options.*

More efficient R32 refrigerant being utilised as per datasheet in Appendix B.

- *Ground Source Heat Pumps and Air Source Heat Pumps can be used in reverse to provide cooling to buildings.*

Existing site constraints preclude Ground Source Heat Pumps. In this case air source heat pumps are used.

- *Water based cooling systems also reduce the need for air conditioning by running cold water through pipes in the floor and/or ceiling to cool the air.*

A system of floor or ceiling pipework is not possible in the floor buildup or in the ceiling as not practical for the site.

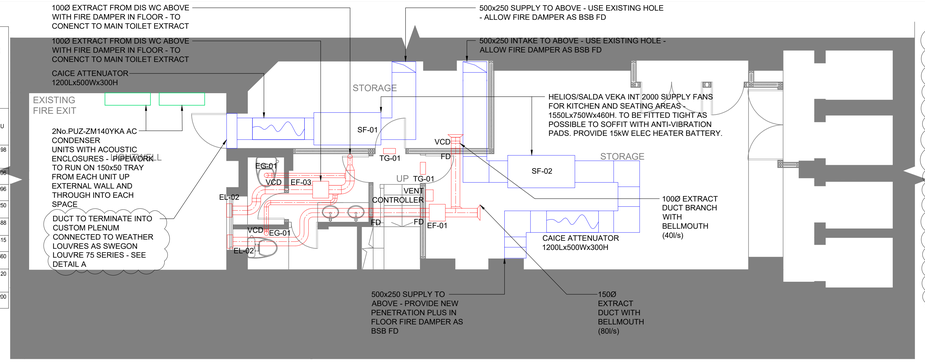
Conclusion

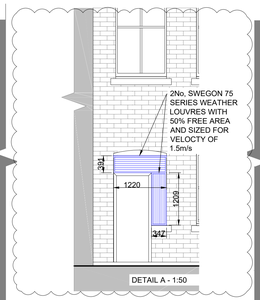
We advise that due to the nature of the project – primarily the constraints of operating within an existing building – and the limits these places upon the restaurant design, that the proposed air conditioning system is the only practicable solution to providing adequate comfort to the occupants.

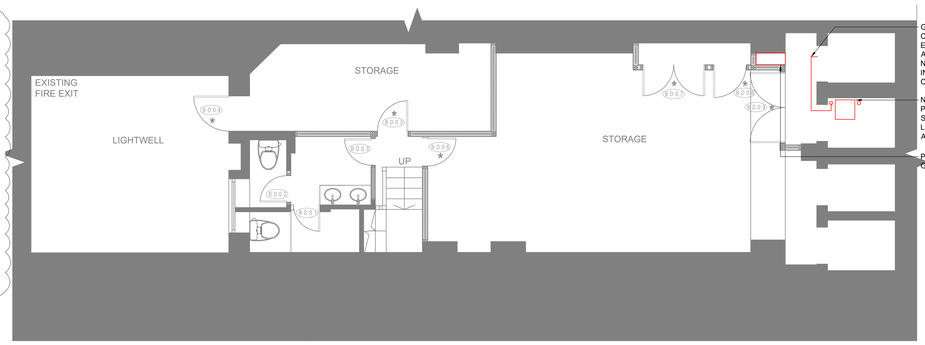
Appendix A – MEP Drawings

KITCHEN VENTILATION TO DW 172 PLUS GENERAL VENTILATION

ITEM	PLAN AREA (SQ m)	FUEL	DW 172 COEFFICIENT	FLOW RATE (CU m/s)
8 RING INDUCTION HOB	0.99	ELEC	0.200	0.198
ELECTRIC WARMER	0.399	ELEC	0.240	0.096
ELECTRIC WARMER	0.399	ELEC	0.240	0.096
CANOPY FACTOR (WALL MOUNT OVERHEAD)				1.250
TOTAL KITCHEN EXTRACT RATE (CU m/s)				0.488
KITCHEN SUPPLY RATE @ 85% EXTRACT				0.415
MAIN SEATING AREA VENTILATION 36 PEOPLE @ 10l/s/PERSON				0.360
GRAB AND GO/COFFEE AREA VENTILATION 12 PEOPLE @ 10l/s/PERSON				0.120
BASEMENT AND COFFEE/GRAB AND GO EXTRACT VENTILATION				0.200







GENERAL NOTES:

1. DO NOT SCALE THIS DRAWING. ALL DIMENSIONS IN MILIMETRES UNLESS OTHERWISE STATED.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DOCUMENTATION FROM THE ARCHITECT, STRUCTURAL ENGINEER, AND ANY OTHER 3RD PARTIES AS WELL AS THE MEP DESIGN PACKAGE AS A WHOLE.
3. ALL ITEMS OF EQUIPMENT SHALL BE INSTALLED AS TO THE MANUFACTURER'S RECOMMENDATIONS.
4. ALL INFORMATION AND LAYOUTS DETAILED ON THIS DRAWING ARE SUBJECT TO SITE DIMENSION CHECKS.
5. SETTING OUT OF VISIBLE SERVICES ELEMENTS TO BE AS INTERIOR DESIGNER/ARCHITECTS DRAWINGS PROVIDING THERE IS NO NEGATIVE IMPACT ON PERFORMANCE OR COMPLIANCE AS A RESULT. LIAISE WITH THE DESIGN TEAM IF IN DOUBT.
6. ALL PENETRATIONS THROUGH STRUCTURE MUST BE APPROPRIATELY SEALED TO MAINTAIN ACOUSTIC, AIR TIGHTNESS, FIRE AND, WEATHER TIGHTNESS AS RELEVANT. ALL SEALING METHODS MUST BE APPROVED BY THE ARCHITECT AND BE APPROPRIATELY CERTIFICATED FOR PERFORMANCE. NO METHOD OF SEALING SHALL COMPROMISE THE WARRANTY OF ANY FABRIC ITEM E.G. ROOF COVERINGS.
7. ALL SERVICES SHALL BE BE FIXED IN POSITION VIA FIRE RATED FIXINGS, IN PARTICULAR CABLE TIES OR CONTAINMENT SUPPORTS.
8. THESE DRAWINGS SHALL BE VIEWED/PRINTED IN COLOUR.

6kW HEATING AND 5kW COOLING DUTY MITSUBISHI MR SLIM R32 POWER INVERTER PLA-ZM50EA2 4 WAY CASSETTE UNIT. ALL SUSPENDED TO SAME LEVELS AS CONTAINMENT @ 2600mm AFFL

AC AIR CONDITIONING CONTROLLER

VENT VENTILATION CONTROL PANEL FOR CONTROL OF KITCHEN SUPPLY AND EXTRACT FANS, PLUS SEATING AREA SUPPLY AND EXTRACT

EF-01 HELIOS SVS EC 200 SLIMLINE INLINE EXTRACT FAN 390L x 372W x 288H LINKED TO WALL CONTROLLER.

EF-02 HELIOS SVS EC 200 SLIMLINE INLINE EXTRACT FAN 390L x 372W x 288H LINKED TO WALL CONTROLLER.

EF-03 HELIOS SVS EC 200 SLIMLINE INLINE EXTRACT FAN 390L x 372W x 288H CONTROLLED VIA LIGHTING PIRs.

TG-01 FIRE RATED 150x150 TRANSFER GRILLE

EL-01 VENTILATION LOUVRE WITH PLENUM - AS GILBERTS WGF-38 OR EQUIVALENT POWDER COATED WEATHER LOUVRE. LOUVRE TO BE 750x350 FACE DIMENSIONS. GLAZING PANE NEEDS TO BE REPLACED WITH METAL FOR LOUVRE TO BE CUT INTO. ARCHITECT TO DETAIL FIXING.

EL-02 VENTILATION LOUVRE WITH PLENUM - AS GILBERTS WGF-38 OR EQUIVALENT POWDER COATED WEATHER LOUVRE. LOUVRE TO BE 200x200 FACE DIMENSIONS. GLAZING PANE NEEDS TO BE REPLACED WITH METAL FOR LOUVRE TO BE CUT INTO. ARCHITECT TO DETAIL FIXING. ON SHEE ELOW LOUVRE INSTALL WINDOW FAN FOR WC.

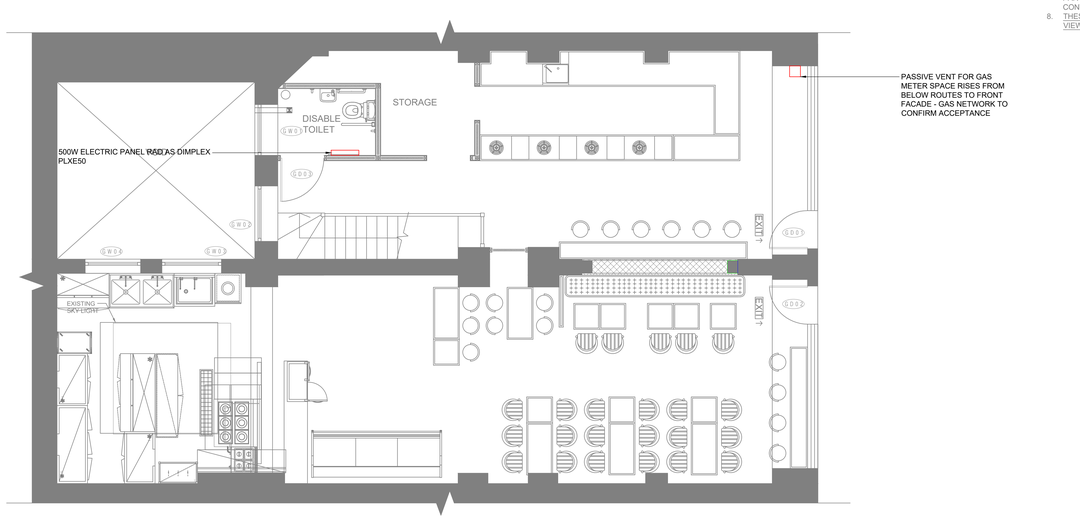
FD FIRE DAMPER AS BSB FD

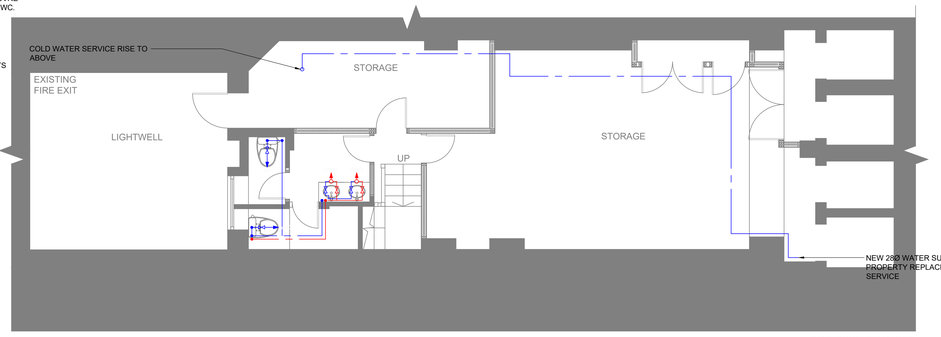
EG-01 STANDARD ROUND TOILET EXTRAT VALVE AS GILBERTS GX100 EXTRACT VALVE

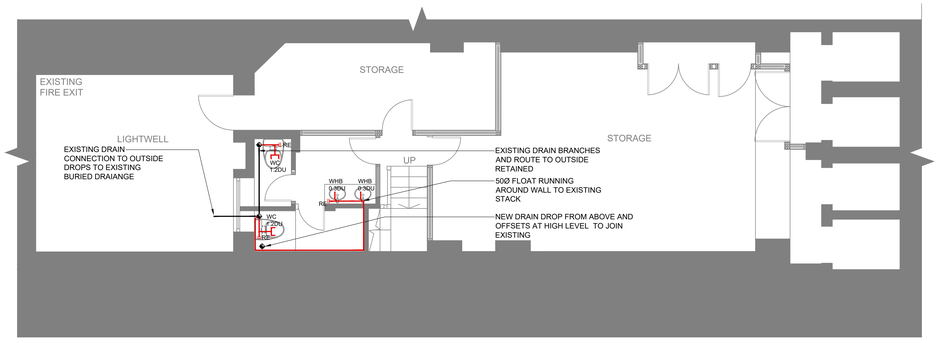
COMBINED KITCHEN FAN, ESP AND CARBON FILTERS, ACCESS SIDE OF BULKHEAD AS OZCON ECOLIGHT EC01C 693W x 2100L x 715H

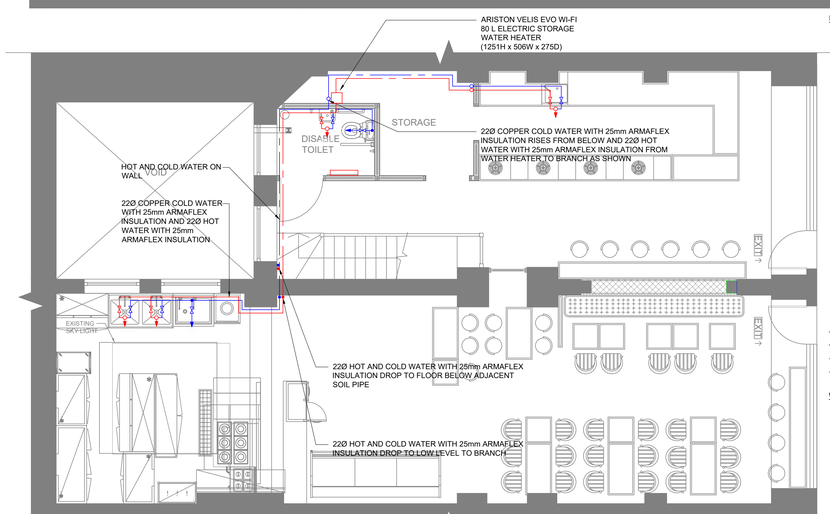
KITCHEN CANOPY - 1450L x 900W x 800H FOR 8 HOB UNIT SHOWN, BUT 8 HOB UNIT SUPPLIED. ALLOWANCE FOR FIRE SUPPRESSION WITHIN CANOPY E.G. ANSUL SYSTEM. DETAILS TBC.

HVAC SERVICES LAYOUT









DOMESTIC WATER LEGEND

WC WATER CLOSET(TYPICAL)
15Ø VALVED BCWS

WHB WASH HAND BASIN (TYPICAL)
15Ø VALVED BCWS & HWSF C/W TMV3 THERMOSTATIC MIXING VALVE AT 43°C

WM WASHING MACHINE (TYPICAL)
15Ø VALVED BCWS

DW DISHWASHER (TYPICAL)
15Ø VALVED BCWS

SK SINK (TYPICAL)
15Ø VALVED BCWS & HWSF

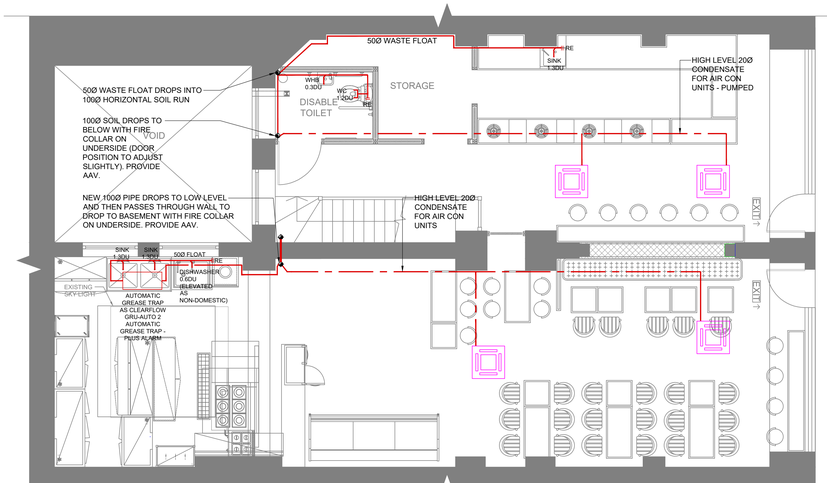
DRAIN OFF COCKS TO BE PROVIDED ON ALL LOW POINTS.

INSULATION UPTO 1m FROM OUTLETS @ 25mm

HIGH LEVEL COLD WATER SERVICE
LOW LEVEL COLD WATER SERVICE
HIGH LEVEL HOT WATER SERVICE
LOW LEVEL HOT WATER SERVICE

WATER SERVICES NOTES:

* THERMOSTATIC BLENDING VALVES: HOT WATER THERMOSTATIC BLENDING VALVES PROVIDED SHALL LIMIT THE TEMPERATURE OF HOT WATER AT BASINS, SHOWERS AND BATHS ARE TO BE FULLY WRAS APPROVED UNDER AT LEAST THE TMV2 SCHEME AND SHALL BE DESIGNED TO COMPLY WITH EUROPEAN STANDARDS EN1111 AND EN1287. THEY SHALL BE ADJUSTABLE, FAIL SAFE TO COLD PATTERN, BE OF CHROME FINISH, AND BE SUPPLIED BY HEATGUARD OR EQUAL COMPLETE WITH STRAINERS, CHECK VALVES AND INTEGRAL ISOLATING BALL VALVES. ANY FACTORY PRE-SET MAXIMUM OUTLET TEMPERATURE SHALL NOT EXCEED 48°C FOR BASINS, SHOWERS AND BATHS.



DRAINAGE LEGEND:

WC WATER CLOSET (TYPICAL)
100Ø PAN CONNECTOR TO 100Ø uPVC SOIL PIPE AT L/L

WHB WASH HAND BASIN (TYPICAL)
32Ø PLASTIC DEEP SEAL 'P' TRAP TO MuPVC WASTE PIPE AT L/L

DW DISHWASHER (TYPICAL)
40Ø PLASTIC DEEP SEAL 'P' TRAP C/W STAND PIPE TO 50Ø MuPVC WASTE PIPE

SINK SINK (TYPICAL)
32Ø PLASTIC DEEP SEAL 'P' TRAP TO MuPVC WASTE PIPE AT L/L

RE RODDING ACCESS

DU DISCHARGE UNITS

HIGH LEVEL DRAINAGE
LOW LEVEL DRAINAGE

DRAINAGE NOTES:

1. PROVIDE FIRE WRAP FOR ANY SOIL PIPE PENETRATING A FIRE COMPARTMENT - IF CONSTRUCTION DOES NOT ALLOW WRAP THEN UTILISE A FIRE COLLAR TO UNDERSIDE OF SOFFITT FOR VERTICAL RUNS AND ON BOTH SIDES OF INTERNAL WALLS FOR HORIZONTAL RUNS.
2. ALL STACKS TO BE 110Ø PLASTIC.

DRAINAGE LOAD FROM BS12506-2:

TOTAL DISCHARGE UNITS = 9
K FACTOR OF 0.7 GIVES FLOW RATE 2.1l/s

FROM PART H TABLE 3 MAX CAPACITY FOR 100Ø STACK IS 7.2l/s SO LEAVES 5.1l/s CAPACITY.

FROM PART H TABLE 5 FLOW RATES 5.1l/s GIVEN AS ASSUMED FLOW FOR 20 DWELLINGS. THEREFORE WE FEEL ADDITIONS FROM RESTAURANT ARE ACCEPTABLE.

Rev.	Revision Details	By	Ckd'd	Date
P6	Preliminary	DM	AR	09.07.2024
P5	Preliminary	DM	AR	13.06.2024
P4	Preliminary	DM	AR	19.02.2024
P3	Preliminary	DM	AR	17.12.2023
P2	Preliminary	DM	AR	15.12.2023
P1	Preliminary	DM	AR	28.08.2023
P0	Preliminary	DM	AR	14.08.2023

CONSULTING ENGINEERS LTD.

Project Name: FRESH THAI

Client: Z+Y

Drawing Title: BASEMENT AND GROUND FLOOR MECHANICAL SERVICES LAYOUT

Drawn By	Ckd'd By	Scale @ P. Size	Date
DM	AR	1:50@A0	27.07.23

Project No.	Drawing No.	Revision
00136	M200	P6

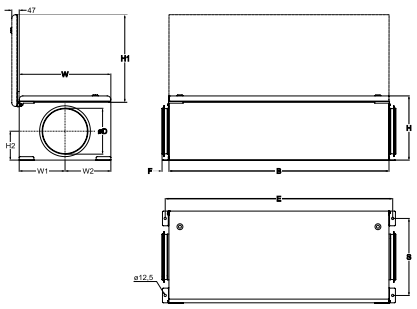
Appendix B – Equipment Datasheets

VEKA INT EKO

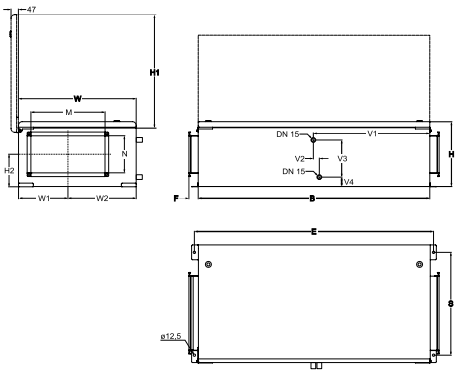
Application	Food production, Industrial premises, Warehouses, Sport facilities.
Description	VEKA INT EKO is a range of high-quality air supply units for premises with no need for recuperation. VEKA INT EKO units exceed ErP 2016 requirements and, together with other cost-saving solutions, provide the highest savings in their class. VEKA INT EKO units are light and can be mounted in all positions in the narrowest places. Units are suitable for various climate zones: each model has several electrical heater options and 1000+ models have water heater options. Air dampers are integrated to automatically shut down the air supply to the premises.
Controls	› Stouch › Flex
The main features	› 6 Models with different electrical heaters and water heaters. 25 options in total! › 6 mounting positions and service friendly. › Low height for installation under ceilings. › Modern automatic control. Integration with building management systems. › Cost-efficient solutions: high airtightness, efficient fans and filters.
Construction	› Powder-coated galvanized steel casing; › Acoustic and thermal insulation of external walls - 30 mm. › EC fan; › Integrated air damper with actuator. › Optional pressure switch for filter pollution. › Optional filters: G4, M5 or F7.

VEKA INT EKO

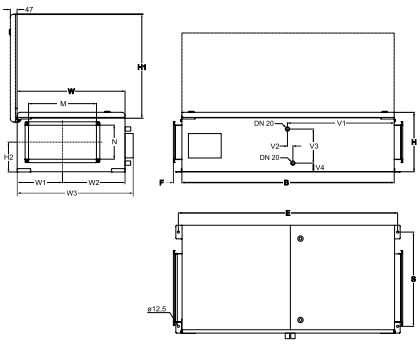
VEKA INT 400 EKO
VEKA INT 700 EKO



VEKA INT 1000 EKO
VEKA INT 2000 EKO
VEKA INT W 1000 EKO
VEKA INT W 2000 EKO



VEKA INT 3000 - 4000 EKO
VEKA INT W 3000 - 4000 EKO



	Dimensions [mm]																	
Unit	**W**	**W1**	**W2**	**W3**	**B**	**H**	**H1**	**H2**	**E**	**S**	**M**	**N**	**V1**	**V2**	**V3**	**V4**	**F**	**øD**
VEKA INT 400 EKO	450	225	225	-	1130	325	427	157	1171	370	-	-	-	-	-	-	30	200
VEKA INT 700 EKO	500	250	250	-	1200	350	477	157	1241	420	-	-	-	-	-	-	40	250
VEKA INT 1000 EKO	635	267	368	-	1250	350	612	174	1291	555	400	200	-	-	-	-	50	-
VEKA INT 2000 EKO	750	316	434	-	1550	460	727	249	1591	670	500	250	-	-	-	-	50	-
VEKA INT 3000 EKO	950	417	533	1065	1700	550	826	268	1526	992	700	400	-	-	-	-	50	-
VEKA INT 4000 EKO	950	417	533	1065	1700	550	826	268	1526	992	700	400		-	-	-	50	-
VEKA INT W 1000 EKO	635	267	368	-	1250	350	612	174	1291	555	400	200	618	43	190	71	50	-
VEKA INT W 2000 EKO	750	316	434	-	1550	460	727	249	1591	670	500	250	740	42	297	73	50	-
VEKA INT W 3000 EKO	950	417	533	1065	1700	550	826	268	1526	992	700	400	845	38	360	78	50	-
VEKA INT W 4000 EKO	950	417	533	1065	1700	550	826	268	1526	992	700	400	845	38	360	78	50	-

	Optional accessories									
Unit	**Stouch Flex**	**S-1141 S-RC02-F2 S-KFF-U**	**SKS**	**AKS AP**	**SSB** *Heating*	**SSB** *Cooling*	**RMG 80/60°C**	**RMG 60/40°C**	**VVP/VXP 80/60°C**	**VVP/VXP 60/40°C**
VEKA INT400 EKO	+	+	-	200	-	81	-	-	-	-
VEKA INT 700 EKO	+	+	-	250	-	81	-	-	-	-
VEKA INT 1000 EKO	+	+	400x200	-	-	81	-	-	-	-
VEKA INT 2000 EKO	+	+	500x250	-	-	81	-	-	-	-
VEKA INT 3000 EKO	+	+	700x400	-	-	81	-	-	-	-
VEKA INT 4000 EKO	+	+	700x400	-	-	81	-	-	-	-
VEKA INT W 1000 EKO	+	+	400x200	-	61	81	3-1,6-4	3-1,0-4	45.10-1,6	45.10-1,0
VEKA INT W 2000 EKO	+	+	500x250	-	61	81	3-2,5-4	3-2,5-4	45.10-2,5	45.10-2,5
VEKA INT W 3000 EKO	+	+	700x400	-	61	81	+	+	+	+
VEKA INT W 4000 EKO	+	+	700x400	-	61	81	+	+	+	+

SSB 61-control signal 0...10V DC

Accessories

Control panel

FLEX **p. 177**

Sensor controller

Stouch **p. 176**

Pressure transmitter

S-1141 **p. 179**

CO2 sensors

S-RC02-F2 **p. 180**

Duct humidity sensor

S-KFF-U **p. 181**

Rectangular duct silencer

SKS **p. 215**

Circular duct silencer

AKS **p. 216**

Mounting clamp

AP **p. 219**

Thermic water valve actuator

SSB **p. 195**

Mixing point

RMG **p. 196**

2 and 3 - way valves

VVP/VXP **p. 197**

PLA-ZM R32 Power Inverter Heat Pump

4-Way Blow Ceiling Cassette System

Product Specifications

PLA-ZM - INDOOR UNITS		PLA-ZM35EA	PLA-ZM50EA	PLA-ZM60EA	PLA-ZM71EA	PLA-ZM100EA	PLA-ZM100EA	PLA-ZM125EA	PLA-ZM125EA	PLA-ZM140EA	PLA-ZM140EA
CAPACITY (kW)	Heating (nominal)	4.1 (1.6-5.2)	6.0 (2.5-7.3)	7.0 (2.8-8.2)	8.0 (3.5-10.2)	11.2 (4.5-14.0)	11.2 (4.5-14.0)	14.0 (5.0-16.0)	14.0 (5.0-16.0)	16.0 (5.7-18.0)	16.0 (5.7-18.0)
	Cooling (nominal)	3.6 (1.6-4.5)	5.0 (2.3-5.6)	6.1 (2.7-6.5)	7.1 (3.3-8.1)	9.5 (4.9-11.4)	9.5 (4.9-11.4)	12.5 (5.5-14.0)	12.5 (5.5-14.0)	13.4 (6.2-15.0)	13.4 (6.2-15.0)
	Heating (UK)	3.5 (1.35-4.4)	5.1 (2.15-6.2)	6.0 (2.38-6.97)	6.8 (3.0-8.65)	9.5 (3.85-11.9)	9.5 (3.85-11.9)	11.9 (4.25-13.6)	11.9 (4.25-13.6)	13.6 (4.85-15.3)	13.6 (4.85-15.3)
	Cooling (UK)	3.3 (1.45-4.15)	4.6 (2.1-5.15)	5.6 (2.48-5.98)	6.55 (3.05-7.45)	9.2 (4.5-10.5)	9.2 (4.5-10.5)	11.5 (5.05-12.9)	11.5 (5.05-12.9)	12.9 (5.7-14.1)	12.9 (5.7-14.1)
SHF (nominal)		0.95	0.85	0.77	0.72	0.77	0.77	0.70	0.70	0.70	0.70
COP / EER (nominal)		5.00 / 5.10	4.40 / 4.52	4.10 / 4.20	4.40 / 4.30	4.30 / 4.60	4.30 / 4.60	3.81 / 3.70	3.81 / 3.70	3.71 / 3.60	3.71 / 3.60
SCOP / SEER (BS EN14825)		4.70 / 7.50	4.90 / 7.60	4.60 / 7.20	4.80 / 7.60	4.80 / 7.70	4.80 / 7.50	4.70 / 7.40	4.70 / 7.20	4.60 / 7.00	4.60 / 6.90
ERP ENERGY EFFICIENCY CLASS	Heating/Cooling	A++ / A++	A++ / A++	A++ / A++	A++ / A++	A++ / A++	A++ / A++	A++ / A++	A++ / A++	A++ / A++	A++ / A++
AIRFLOW (l/s)	Lo-Mi-Mi2-Hi	183-217-250-267	200-233-267-300	200-233-267-300	283-317-350-383	317-367-417-467	317-367-417-467	350-400-433-483	350-400-433-483	400-433-483-533	400-433-483-533
PIPE SIZE MM (in)	Gas/Liquid	12.7 (1/2") / 6.35 (1/4")	12.7 (1/2") / 6.35 (1/4")	15.88 (5/8") / 9.52 (3/8")	15.88 (5/8") / 9.52 (3/8")	15.88 (5/8") / 9.52 (3/8")	15.88 (5/8") / 9.52 (3/8")	15.88 (5/8") / 9.52 (3/8")	15.88 (5/8") / 9.52 (3/8")	15.88 (5/8") / 9.52 (3/8")	15.88 (5/8") / 9.52 (3/8")
SOUND PRESSURE LEVEL (dBA)	Lo-Mi-Mi2-Hi	26-28-29-31	27-29-31-32	27-29-31-32	28-30-33-36	31-34-37-40	31-34-37-40	33-36-39-41	33-36-39-41	36-39-42-44	36-39-42-44
SOUND POWER LEVEL (dBA)		51	54	54	57	61	61	62	62	65	65
DIMENSIONS (mm)	Width x Depth x Height (Grille)	840 (950) x 840 (950) x 258 (40)	840 (950) x 840 (950) x 258 (40)	840 (950) x 840 (950) x 258 (40)	840 (950) x 840 (950) x 298 (40)	840 (950) x 840 (950) x 298 (40)	840 (950) x 840 (950) x 298 (40)	840 (950) x 840 (950) x 298 (40)	840 (950) x 840 (950) x 298 (40)	840 (950) x 840 (950) x 298 (40)	840 (950) x 840 (950) x 298 (40)
WEIGHT (kg)	Unit / Grille	21 / 5	21 / 5	21 / 5	24 / 5	26 / 5	26 / 5	26 / 5	26 / 5	26 / 5	26 / 5
ELECTRICAL SUPPLY		Fed by Outdoor Unit	Fed by Outdoor Unit	Fed by Outdoor Unit	Fed by Outdoor Unit	Fed by Outdoor Unit	Fed by Outdoor Unit	Fed by Outdoor Unit	Fed by Outdoor Unit	Fed by Outdoor Unit	Fed by Outdoor Unit
FUSE RATING (BS88) - HRC (A)		6	6	6	6	6	6	6	6	6	6
INTERCONNECTING CABLE NO. CORES		4	4	4	4	4	4	4	4	4	4
GRILLE REFERENCE		PLP-6EA	PLP-6EA	PLP-6EA	PLP-6EA	PLP-6EA	PLP-6EA	PLP-6EA	PLP-6EA	PLP-6EA	PLP-6EA
WIRED REMOTE CONTROLLER REFERENCE		PAR-33MAA	PAR-33MAA	PAR-33MAA	PAR-33MAA	PAR-33MAA	PAR-33MAA	PAR-33MAA	PAR-33MAA	PAR-33MAA	PAR-33MAA
WIRELESS REMOTE CONTROLLER REFERENCE		PAR-SL100A-E	PAR-SL100A-E	PAR-SL100A-E	PAR-SL100A-E	PAR-SL100A-E	PAR-SL100A-E	PAR-SL100A-E	PAR-SL100A-E	PAR-SL100A-E	PAR-SL100A-E

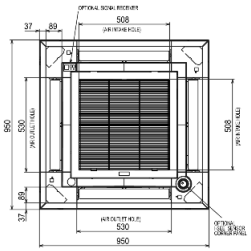
PUZ-ZM - OUTDOOR UNITS		PUZ-ZM35VKA	PUZ-ZM50VKA	PUZ-ZM60VHA	PUZ-ZM71VHA	PUZ-ZM100VKA	PUZ-ZM100YKA [3]	PUZ-ZM125VKA	PUZ-ZM125YKA [3]	PUZ-ZM140VKA	PUZ-ZM140YKA [3]
SOUND PRESSURE LEVEL (dBA)	Heating/Cooling	46 / 44	46 / 44	49 / 47	49 / 47	51 / 49	51 / 49	52 / 50	52 / 50	52 / 50	52 / 50
SOUND POWER LEVEL (dBA)	Cooling	65	65	67	67	69	69	70	70	70	70
WEIGHT (kg)		46	46	70	70	116	123	116	125	118	131
DIMENSIONS (mm)	Width x Depth x Height	809 x 300 x 630	809 x 300 x 630	950 x 330 + 25 x 943	950 x 330 + 25 x 943	1050 x 330 + 40 x 1338	1050 x 330 + 40 x 1338	1050 x 330 + 40 x 1338	1050 x 330 + 40 x 1338	1050 x 330 + 40 x 1338	1050 x 330 + 40 x 1338
ELECTRICAL SUPPLY		220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	380-415v, 50Hz	220-240v, 50Hz	380-415v, 50Hz	220-240v, 50Hz	380-415v, 50Hz
PHASE		Single	Single	Single	Single	Single	Three	Single	Three	Single	Three
SYSTEM POWER INPUT (kW)	Heating/Cooling (nominal)	0.820 / 0.705	1.363 / 1.106	1.707 / 1.452	1.818 / 1.651	2.604 / 2.065	2.604 / 2.065	3.674 / 3.378	3.674 / 3.378	4.312 / 3.772	4.312 / 3.772
	Heating/Cooling (UK)	0.73 / 0.59	1.21/ 0.94	1.43 / 1.15	1.61 / 1.39	2.09 / 1.77	2.09 / 1.77	3.27 / 2.87	3.27 / 2.87	3.83 / 3.15	3.83 / 3.15
STARTING CURRENT (A)		5.0	5.0	6.0	6.0	13.0	6.0	13.0	6.0	13.0	6.0
SYSTEM RUNNING CURRENT (A)	Heating/Cooling [MAX]	3.89 / 3.51 [13.2]	6.05 / 5.00 [13.2]	7.39 / 6.31 [19.2]	7.79 / 7.06 [19.3]	11.25 / 8.97 [27.0]	3.75 / 2.96 [8.5]	15.77 / 14.53 [27.0]	5.32 / 4.89 [10.0]	18.41 / 15.88 [28.7]	6.23 / 5.37 [13.7]
FUSE RATING (BS88) - HRC (A)		16	16	25	25	32	16	32	16	40	16
MAINS CABLE NO. CORES		3	3	3	3	3	5	3	5	3	5
MAX PIPE LENGTH (m)		50	50	55	55	100	100	100	100	100	100
MAX HEIGHT DIFFERENCE (m)		30	30	30	30	30	30	30	30	30	30
CHARGE REFRIGERANT (kg) / CO_2 EQUIVALENT (t)	R32 (GWP 675) - 30m	2.0 / 1.35	2.00 / 1.35	2.80 / 1.89	2.80 / 1.89	4.00 / 2.70	4.00 / 2.70	4.00 / 2.70	4.00 / 2.70	4.00 / 2.70	4.00 / 2.70
MAX ADDITIONAL REFRIGERANT (kg) / CO_2 EQUIVALENT (t)	R32 (GWP 675)	0.30 / 0.20	0.30 / 0.20	0.80 / 0.54	0.80 / 0.54	2.80 / 1.89	2.80 / 1.89	2.80 / 1.89	2.80 / 1.89	2.80 / 1.89	2.80 / 1.89

3 Three Phase

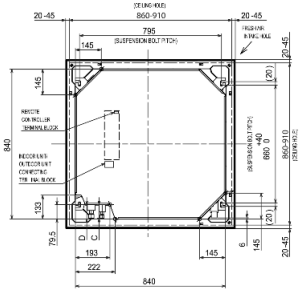
Product Dimensions

PLA-ZM35-140EA

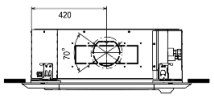
Lower View



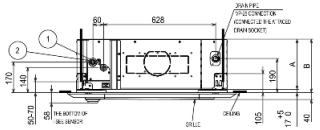
Upper View



Front View



Side View



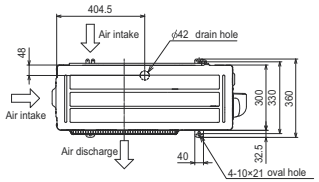
PLA-ZM-EA*: 35/50/60/71/100/125/140

ZM	①	②	A	B	C	D
35/50	REFRIGERANT PIPE Φ 6.35 FLARED CONNECTION 1/4F	REFRIGERANT PIPE Φ 12.7 FLARED CONNECTION 1/2F	241	258	76	76.5
60	FLARED CONNECTION 3/8F REFRIGERANT PIPE Φ 9.52	REFRIGERANT PIPE Φ 15.88 FLARED CONNECTION 5/8F			79.5	79.5
71			281	298		
100-140						

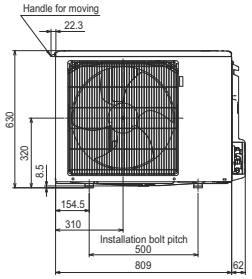
PUZ-ZM R32 Power Inverter Heat Pump
Outdoor Unit
Product Specifications

Product Dimensions PUZ-ZM35/50VKA

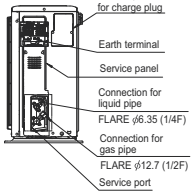
Upper View



Front View

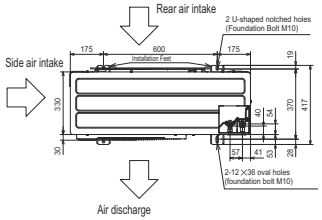


Side View

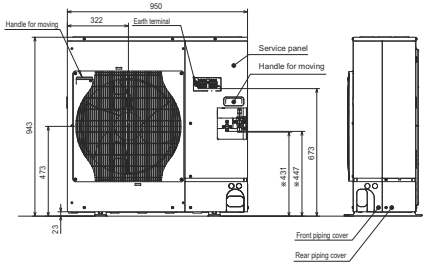


Product Dimensions PUZ-ZM60/71VHA

Upper View



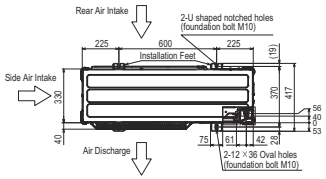
Front View



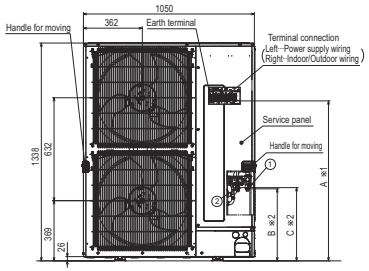
Side View

Product Dimensions PUZ-ZM100/125/140VKA, PUZ-ZM100/125/140YKA

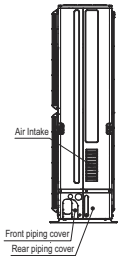
Upper View



Front View



Side View



① Refrigerant GAS pipe connection	② Refrigerant LIQUID pipe connection
ø15.88 (5/8F)	ø9.52 (3/8F)

MODEL	A	B	C
PUZ-ZM100-140VKA	1067	442	450
PUZ-ZM100-140YKA	919	442	450

※1···Indication of Terminal connection location.
※2···Indication of STOP VALVE connection location.

MITSUBISHI ELECTRIC
Changes for the Better

Telephone: 01707 282880
email: air.conditioning@meuk.mee.com web: airconditioning.mitsubishielectric.co.uk microsite: timeforR32.co.uk

UNITED KINGDOM Mitsubishi Electric Europe Living Environment Systems Division, Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, England. General Enquiries Telephone: 01707 282880 Fax: 01707 278881
IRELAND Mitsubishi Electric Europe, Westgate Business Park, Ballymount, Dublin 24, Ireland. Telephone: Dublin (01) 419 8800 Fax: Dublin (01) 419 8890 International code: (003531)

Note: The fuse rating is for guidance only. Please refer to the relevant databook for detailed specification. It is the responsibility of a qualified electrician/electrical engineer to select the correct cable size and fuse rating based on current regulation and site specific conditions. Mitsubishi Electric's air conditioning equipment and heat pump systems contain a fluorinated greenhouse gas, R410A (GWP:2088), R32 (GWP:675), R407C (GWP:1774) or R134a (GWP:1430). *These GWP values are based on Regulation (EU) No 517/2014 from IPCC 4th edition. In case of Regulation (EU) No.626/2011 from IPCC 3rd edition, these are as follows. R410A (GWP:1975), R32 (GWP: 550), R407C (GWP:1650) or R134a (GWP:1300).

Effective as of October 2017 SAP No. 317318

Green Gateway
www.greengateway.mitsubishielectric.co.uk
Mitsubishi Electric UK's commitment to the environment

Follow us @meuk_les
Follow us @green_gateway
Mitsubishi Electric Living Environmental Systems UK
mitsubishielectric2
thehub.mitsubishielectric.co.uk

ECOLIGHT

OZCON
environmental solutions

HIGHLIGHTS

1. COMPACT SIZE
2. ELECTRONIC FILTER FEL SYSTEM STANDARD
3. ELECTRONIC ENGINE STANDARD
4. NEW PREFILTRATION WITH 3 WASHABLE STAGE
5. GRANULAR COCONUT/BAMBOO ACTIVATED CARBON
6. GUARANTEED HYGIENIC AND ANTIBACTERIAL EFFECT

Ozcon offers the new range of exhaust filtration units for kitchens with **compact size**, especially suitable for installation in small kitchens in historic centers: **ECOLIGHT.**

The **FEL System filter** installed as standard has been specifically designed for the removal of pollutants such as oil mist and vapors thanks to pointed collection blades that allow the capture and drop down high quantities of oily pollutant downwards.

Energy Saving is guaranteed as energy consumption is 3 times lower than that of a mechanical filter with equal filtration efficiency: this is mainly due to the **low pressure drops** almost constant over time, 62 Pa even when the filter is completely dirty.

The low energy consumption of the **ECOLIGHT** units is also guaranteed by the use of an **electronic motor** instead of a belt motor.

They are equipped with a new **3-stage prefiltration** completely removable and **washable.**

The possibility of installing before the activated carbon the combination of an **ionization cell FI** and an **ozonation cell FX** provides a hygienic and **antibacterial effect** and at the same time reduces odors.

Ozcon uses active labyrinth carbons with low pressure drops and high performance. It consists in **granular coconut/bamboo carbon.**

The **ECOLIGHT** can be supplied to be wired or **fully wired** ready for use, **including an electrical control panel.**

The structures are presented i**n self-supporting aluminum profiles,** with external 25 mm sandwich panels. Their body is made up of a **single block** that contains all the components inside it.

The **ECOLIGHT** units can be **installed on the wall**, on the **ceiling** or on the **floor** and are equipped with a folding, flag or removable door.

The installer will not have to provide any drainage system since the units are equipped with a **removable tray** designed tray to collect the oil captured by the electronic filter.

HIGHLIGHTS

1. DIMENSIONI COMPATTE
2. FILTRO ELETTRONICO FEL SYSTEM DI SERIE
3. MOTORE ELETTRONICO DI SERIE
4. NUOVA PREFILTRAZIONE A 3 STADI LAVABILE
5. CARBONE ATTIVO DI COCCO/BAMBU' GRANULARE
6. EFFETTO IGIENICO ED ANTIBATTERICO GARANTITO

Ozcon presenta sul mercato la nuova gamma di unità filtranti per cucine con dimensioni compatte, adatta soprattutto all'installazione nelle piccole cucine dei centri storici: **ECOLIGHT.**

Il **filtro FEL System** installato di serie è stato progettato appositamente per l'abbattimento di inquinanti quali nebbie e vapori oleosi grazie a lame di captazione appuntite nella parte inferiore che permettono la cattura e lo scorrimento di elevate quantità di inquinante oleoso verso il basso.

L'**Energy Saving** è garantito in quanto i consumi energetici risultano essere 3 volte inferiori rispetto a quelli di un filtro meccanico con pari efficienza di filtrazione: questo soprattutto grazie alle **basse perdite di carico** pressoché costanti nel tempo, 62 Pa anche a filtro saturo.

Il basso consumo energetico delle unità **ECOLIGHT** è garantito anche dall'utilizzo di un **motore elettronico** anziché a trasmissione.

Sono dotate di nuova **prefiltrazione a 3 stadi** completamente smontabile e **lavabile.**

La possibilità di installare prima dei carboni attivi la combinazione di **cella ionizzante FI** e **cella ozonizzante FX** garantisce **effetto igienico ed antibatterico** e riduce allo stesso tempo gli odori.

Ozcon utilizza carboni attivi a labirinto con basse perdite di carico ed alte performance. Si tratta di **carbone di cocco/bambù granulare.**

Le **ECOLIGHT** possono essere fornite da cablare o **totalmente cablate** pronte per l'uso, **comprensive di quadro elettrico di gestione**.

Le strutture si presentano in **profilati d'alluminio autoportanti,** con pannellature esterne a sandwich da 25 mm. Il corpo delle **ECOLIGHT** è costituito da un **blocco unico** che contiene tutti i componenti al suo interno.

Le unità **ECOLIGHT** possono essere **installate a muro,** a **soffitto** o a **pavimento** e sono dotate di porta apribile a ribalta, a bandiera o removibile.

L'installatore non dovrà prevedere alcun sistema di drenaggio dal momento che le unità sono provviste di una **vaschetta estraibile** predisposta per raccogliere l'olio catturato dal filtro elettronico.

TECHNICAL FEATURES

As you can see from the table below, Ozcon provides different models based on:

- Airflow required
- Overall dimensions
- Components installed inside according to customer needs.

MODEL MODELLO	**DIMENSIONS (MM)** DIMENSIONI (MM)	**AIRFLOW (m^3/h)** PORTATA D'ARIA (m^3/h)	**EXTERNAL STATIC PRESSURE (Pa)** PRESSIONE STATICA (Pa)
ECO 0,5 A	458 x 1350 x 715	1500	400
ECO 0,5 B	458 x 1700 x 715	1500	400
ECO 0,5 C	458 x 2100 x 715	1500	400
ECO 0,5 D	458 x 2100 x 715	1500	400
ECO 0,5 E	458 x 1850 x 715	1500	400
ECO 0,5 F	458 x 1500 x 715	1500	400
ECO 1 A	693 x 1350 x 715	2500	500
ECO 1 B	693 x 1700 x 715	2500	500
ECO 1 C	693 x 2100 x 715	2500	500
ECO 1 D	693 x 2100 x 715	2500	500
ECO 1 E	693 x 1850 x 715	2500	500
ECO 1 F	693 x 1500 x 715	2500	500
ECO 2 A	1285 x 1350 x 715	5000	700
ECO 2 B	1285 x 1700 x 715	5000	700
ECO 2 C	1285 x 2100 x 715	5000	700
ECO 2 D	1285 x 2100 x 715	5000	700
ECO 2 E	1285 x 1850 x 715	5000	700
ECO 2 F	1285 x 1500 x 715	5000	700
ECO 3 A	1877 x 1500 x 715	7650	500
ECO 3 B	1877 x 1850 x 715	7650	500
ECO 3 C	1877 x 2100 x 715	7650	500
ECO 3 D	1877 x 2100 x 715	7650	500
ECO 3 E	1877 x 1850 x 715	7650	500
ECO 3 F	1877 x 1500 x 715	7650	500

PF METAL: Metal mesh prefilter
FEL: Electrostatic filter FEL system
FAN: Fan
LAB: Labyrinth filter
FI: Ionization cell
FX: Ozonation cell
CARBOPACK: 2,5/5kg Active carbon filter
CARBOX: Box with active carbon filters 26/52 kg

CARATTERISTICHE TECNICHE

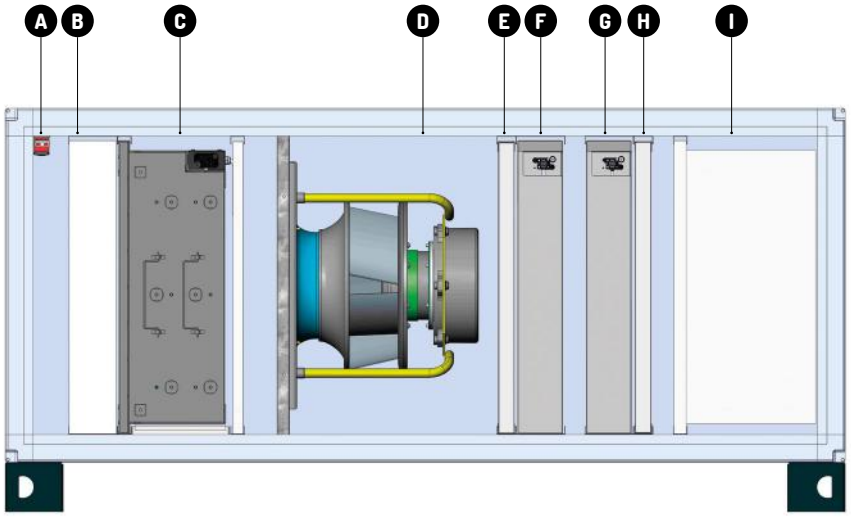
Come potete vedere dalla tabella sottostante, Ozcon fornisce diversi modelli in base a:

- Portata d'aria richiesta
- Dimensioni d'ingombro
- Componenti installati all'interno in base alle necessità del cliente.

FAN VENTILATORE	**CHARACTERISTICS** CARATTERISTICHE	**MODEL** MODELLO
7/7 TIG	PF METAL + 1FEL300 + FAN + CARBOPACK 2,5 KG	ECO 0,5 A
7/7 TIG	PF METAL + 1FEL300 + FAN + LAB + FI + FX + CARBOPACK 2,5 KG	ECO 0,5 B
7/7 TIG	PF METAL + 1FEL300 + FAN + LAB + FI + FX + CARBOX 26 KG	ECO 0,5 C
7/7 TIG	PF METAL + 1FEL300 + FAN + LAB + FI + CARBOX 26 KG	ECO 0,5 D
7/7 TIG	PF METAL + 1FEL300 + FAN + LAB + CARBOX 26 KG	ECO 0,5 E
7/7 TIG	PF METAL + 1FEL300 + LAB + FI + FX + CARBOX 26 KG	ECO 0,5 F
RAD 310	PF METAL + 1FEL600 + FAN + CARBOPACK 5 KG	ECO 1 A
RAD 310	PF METAL + 1FEL600 + FAN + LAB + FI + FX + CARBOPACK 5 KG	ECO 1 B
RAD 310	PF METAL + 1FEL600 + FAN + LAB + FI + FX + CARBOX 52 KG	ECO 1 C
RAD 310	PF METAL + 1FEL600 + FAN + LAB + FI + CARBOX 52 KG	ECO 1 D
RAD 310	PF METAL + 1FEL600 + FAN + LAB + CARBOX 52 KG	ECO 1 E
RAD 310	PF METAL + 1FEL600 + LAB + FI + FX + CARBOX 52KG	ECO 1 F
RAD310	2PF METAL + 2FEL600 + FAN + 2CARBOPACK 5 KG	ECO 2 A
RAD310	2PF METAL + 2FEL600 + FAN + 2LAB + 2FI + 2FX + 2CARBOPACK 5 KG	ECO 2 B
RAD310	2PF METAL + 2FEL600 + FAN + 2LAB + 2FI + 2FX + 2CARBOX 52 KG	ECO 2 C
RAD310	2PF METAL + 2FEL600 + FAN + LAB + 2FI + 2CARBOX 52 KG	ECO 2 D
RAD310	2PF METAL + 2FEL600 + FAN + 2LAB + 2CARBOX 52 KG	ECO 2 E
RAD310	2PF METAL + 2FEL600 + 2LAB + 2FI + 2FX + 2CARBOX 52KG	ECO 2 F
RAD400	3PF METAL + 3FEL600 + FAN + 3CARBOPACK 5 KG	ECO 3 A
RAD400	3PF METAL + 3FEL600 + FAN + 3LAB + 3FI + 3FX + 3CARBOPACK 5 KG	ECO 3 B
RAD400	3PF METAL + 3FEL600 + FAN + 3LAB + 3FI + 3FX + 3CARBOX 52 KG	ECO 3 C
RAD400	3PF METAL + 3FEL600 + FAN + 3LAB + 3FI + 3CARBOX 52 KG	ECO 3 D
RAD400	3PF METAL + 3FEL600 + FAN + 3LAB + 3CARBOX 52 KG	ECO 3 E
RAD400	3PF METAL + 3FEL600 + 3LAB + 3FI + 3FX + 3CARBOX 52KG	ECO 3 F

PF METAL: Prefiltro in maglia metallica
FEL: Filtro elettrostatico FEL system
FAN: Ventilatore
LAB: Filtro a labirinto
FI: Cella ionizzante
FX: Cella ozonizzante
CARBOPACK: Filtro a carbone attivo da 2,5/5kg
CARBOX: Box con filtri a carbone attivo 26/52 kg

FILTRATION SECTIONS - SEZIONI FILTRANTI



A

Safety microswitch
with separate actuator.

Microinterruttore di sicurezza
con attuatore separato.

B

Metal filter made with galvanized wire mesh and galvanized frame, filter class EN 779 G2

Filtro in maglia metallica composto da rete metallica zincata e telaio zincato, classe filtro EN 779 G2

C

Electrostatic precipitator for oil and fat. FEL SYSTEM model, high efficiency performance with 230V electrical supply.

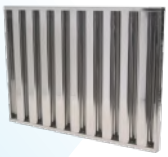
Filtro elettrostatico per oli modello FEL SYSTEM ad alta efficienza. 230V.

D

Electric **fan** with power control.

Ventilatore elettronico con controllo elettronico della potenza.

E



Labyrinth filter that guarantees the blockage of further possible drops of oil. It is placed before and after the ionization filter FI.

Filtro a labirinto che garantisce il blocco di ulteriori possibili gocce d'olio. Viene posto prima e dopo la cella ionizzante FI.

F

Ionization cell FI ensures better sterilization and reduction of odours.

La **cella ionizzante FI** garantisce una maggiore sterilizzazione e riduzione degli odori.

G

Ozonation cell FX, with plates that eliminates viruses and bacteria.

Cella ozonizzante FX, a piastre che è in grado di eliminare virus e batteri.

H

Inox Steel **Turbulator** to increase air, ions and ozone combination.

Turbolatore in acciaio inox per aumentare la miscelazione aria, ioni e ozono.

I

Carbox: Granular **activated carbon filters** with galvanized metal frame sheet. Labyrinth disposition. 26/52 kg.

Carbox: Filtri a carboni attivi granulari con telaio in lamiera zincata, disposti a labirinto. 26/52 kg.

Carbopack: plated active carbon mechanical filter. 2,5 / 5 kg.

Carbopack: filtro meccanico plisettato a carbone attivo. 2,5 / 5 kg.

ELECTROSTATIC FILTER FEL SYSTEM

The **FEL System electrostatic filter** has been specifically designed for the removal of pollutants such as fumes, oil mist and vapors. It is characterized by:

- ✓ **Pointed capture blades** in the lower part that allow the capture and the dropping of high quantities fumes, oil mist and vapors pollutant downwards.
- ✓ **Multi-polar connection** system and installation by simple sliding on a filter holder frame.
- ✓ **Standard ASHRAE dimensions** that allow the retrofit with classic pocket filters according to the EN 15805.
- ✓ **Low pressure drops** almost constant over time, 62 Pa even when the filter is completely dirty.
- ✓ **Thermal protection** that automatically blocks the filter functioning when temperatures are too high.
- ✓ **Energy Saving** guaranteed as energy consumption is 3 times lower than that of a mechanical filter with equal filtration efficiency.
- ✓ **FEL system electrostatic filters are certified according to UNI EN ISO 16890** which has replaced the old and obsolete EN 779: high filtration efficiency on 0.3-0.4 micron particles, comparable to classes E10, E11 according to EN 1822: 2009 and classes ePM1, ePM2.5, ePM10 according to EN ISO 16890.
- ✓ **No disposal and replacement costs**. In fact, the filter can be completely **regenerated by washing** with a specific detergent, without removing the **built-in electronics** as it is **resin-coated** and therefore **waterproof**.

FILTRO ELETTRONICO FEL SYSTEM

Il **filtro elettronico FEL System** è stato progettato appositamente per l'abbattimento di inquinanti quali fumi, nebbie e vapori oleosi. Esso è caratterizzato da:

- ✓ **Lame di captazione appuntite** nella parte inferiore che permettono la cattura e lo scorrimento di elevate quantità di inquinanti quali fumi, nebbie e vapori oleosi verso il basso.
- ✓ **Sistema di connessione multipolare** ed installazione per semplice scorrimento su telaio portafiltro.
- ✓ **Dimensioni standard ASHRAE** che permettono il retrofit con i classici filtri a tasche seconde EN 15805.
- ✓ **Basse perdite di carico** pressoché costanti nel tempo, 62 Pa anche a filtro saturo.
- ✓ **Protezione termica** che blocca automaticamente il funzionamento del filtro al raggiungimento di temperature troppo elevate.
- ✓ **Energy Saving** garantito in quanto i consumi energetici risultano essere 3 volte inferiori rispetto a quelli di un filtro meccanico con pari efficienza di filtrazione.
- ✓ **I filtri elettrostatici FEL system sono certificati secondo la UNI EN ISO 16890** che ha sostituito la vecchia ed obsoleta EN 779: elevata efficienza di filtrazione su particelle 0,3-0,4 micron, paragonabile alle classi E10, E11 secondo la normativa EN 1822:2009 e alle classi ePM_1, $ePM_{2,5}$, ePM_{10} secondo la EN ISO 16890.
- ✓ **Assenza totale di costi di smaltimento e sostituzione.** Il filtro, infatti, è **completamente rigenerabile tramite lavaggio** con apposito detergente, senza rimuovere l'**elettronica incorporata** in quanto **resinata** e dunque **waterproof**.

Appendix B – Equipment Datasheets