

Section 1

Technical SubmissionTechnical Submission Ref No: **32396-6000-TS-ZZ-M-0008**

Revision: BIW ref: 32396-6000-TS-ZZ-M-0008

Date Issued: 12/05/2016

Title: **Fans****Issue & Approval dates:****Planned****Actual**

Trade contractor name to consultant

Status by Lead Reviewer

Review by Tenant Team

Drawing Commencement Date:

Trade Contractor Manager:

Revision No.	Date	Prepared By	Comments
01	12/05/2016	Andrew Tsang	

Ten point and Boiled extract fans

Section 2

Design Information and Technical Data used to prepare submittal

- ✓ Equipment Data Sheets / Schedules
- ☐ Particular Specification
- ☐ Materials & Workmanship
- ☐ Drawings
- ☐ Schematics/Diagrammatics
- ☐ Supplementary Specs

Project:	Commonwealth House	Date:	08/01/2016
Project No:	4931	Revision:	C1
Engineer:	G L Burd	Work Stage:	Construction

[illegible]

long partners

Project:	Commonwealth House	Date:	08/01/2016
Project No:	4931	Revision:	C1
Engineer:	G L Burd	Work Stage:	Construction

Notes

1. Toilet extract twin fans to be supplied with autochangeover panel and contacts for BMS VFC's for alarm and unit run monitoring
2. All Fans to be provided with speed controllers
3. BACnet Protocol Implementation Conformance Statements to be provided for each BACnet device.
4. All devices to have passed BACnet Testing Laboratories (BTL) certification

Revision History

[illegible]

1 New Oxford Street
Fan Schedule

Proposed Manufacturer: Vent Axia (in L&P preferred suppliers' list)

Fan Reference	Fan Location	Area Served	L&P Specified Fan Duty		Imtech Proposed Fan Duty		Design + 10% air vol. & 21% EGP safety		Duty for Manufacturer's Selection		Fan Type	Motor Drive	Mounting Type	Electrical Power Supply	L&P Specification		Weather Proof
			m ³ /s	Pa	m ³ /s	Pa	m ³ /s	Pa	m ³ /s	Pa (SP)					Part 1 Specific Fan Power (SFP) Requirement	Manufacturer Selection Specific Fan Power (SFP)	
EF 01	West Core Roof	West Core Tea Points	0.5	250	0.45	250	0.495	303	0.5	300	Single In-line Centrifugal box Fan	In-built speed controller	Duct mount on roof	415/3/50	max. 0.6	0.6	Yes
EF 02	South Core Roof	South Core Tea Points	0.5	250	0.468	250	0.515	303	0.52	300	Single In-line Centrifugal box Fan	In-built speed controller	Duct mount on roof	415/3/50	max. 0.6	0.6	Yes
TEF 01	North Core Roof	North Core Toilets	0.360	200	0.359	200	0.395	242	0.40	250	Twin Box Fan (Duty/Standby with Auto changeover)	In-built speed controller	Ceiling Duct mount	240/1/50	max. 0.6	0.6	Yes
TEF 02	South Core Roof	South Core Toilets & Basement Showers	1.000	200	0.941	300	1.035	363	1.05	360	Twin Box Fan (Duty/Standby with Auto changeover)	e-Demand inverter	Ceiling Duct mount	415/3/50	max. 0.6	0.7	Yes
TEF 03	West Core Roof	West Core Toilets	0.500	200	0.503	200	0.553	242	0.55	250	Twin Box Fan (Duty/Standby with Auto changeover)	e-Demand inverter	Ceiling Duct mount	415/3/50	max. 0.6	0.5	Yes

Note:

- For Imtech proposed fan duty, air volumes are based on the latest Long & Partner design schematics 4931-M-1504 iss4 Rev C1 and 4931-M-1506 iss4 Rev C1, external static pressure drop for each fan was calculated based on Long & Partner design duct sizes and critical paths on mechanical services layout drawings 4931-M-1000 to 1212, see calculations in this technical submission.
- Safety Margin of 10% on air volume and 21% on external static pressure added for each fan for coordination and commissioning purpose.

1 New Oxford Street
Fans Pressure Drop Calculation

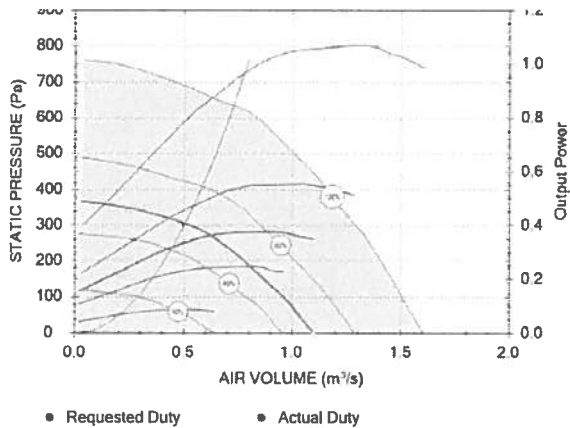
Equipment
Flow Rate

TEF 01
359 l/s

(North Core Toilets Extract)
(Fan Duty with 10% safety margin is 395 l/s)

Ref.	Description	Qty no.	Duct		Flow Rate (l/s)	Length (m)	k Factor	Friction Rate (Pa/m)	Velocity (m/s)	Pv (Pa)	Press. Drop (Pa)	Remarks
			W (mm)	H / Dia. (mm)								
1	Transfer Air Louver + MSD		300	100	69						20.00	
1	Extract Air Grille		200	50	27						15.00	
1	90° Square Bend (with vane) CR3-12	3	200	100	27		0.33		1.48	1.32	1.30	
2	Duct		200	100	27	3		0.23	1.48		0.68	
2	FD	2	200	100	27						20.00	
3	Duct		200	100	27	5		0.23	1.48		1.14	
3	Silencer (Cross Talk)	1	200	100	27						10.00	
3	VCD	1	200	100	27						15.00	
4	Transition (Rect/Rect) ER4-1		200	150	27		0.23		0.96	0.56	0.13	
5	Tee (converging, 90° turn) ER5-3	1	200	150	69		0.76		2.46	3.64	2.76	
6	Duct		200	150	69	10		0.46	2.46		4.62	
6	90° Square Bend (with vane) CR3-12	2	200	150	69		0.33		2.46	3.64	2.40	
6	VCD	1	200	150	69						15.00	
6	FD	1	200	150	69						10.00	
7	Transition (Rect/Rect) ER4-1		500	300	69		0.23		0.50	0.15	0.03	
7	90° Square Bend (with vane) CR3-12	1	500	300	69		0.33		0.50	0.15	0.05	
8	Duct (Riser)		500	300	69	4		0.01	0.50		0.03	
9	Tee (converging, straight) ER5-3	1	500	300	138		0.09		1.00	0.59	0.05	
10	Duct		500	300	138	4		0.03	1.00		0.12	
11	Tee (converging, straight) ER5-3	1	500	300	207		0.09		1.49	1.34	0.12	
12	Duct		500	300	207	4		0.07	1.49		0.27	
13	Tee (converging, straight) ER5-3	1	500	300	276		0.09		1.99	2.38	0.21	
14	Duct		500	300	276	4		0.12	1.99		0.46	
15	Tee (converging, straight) ER5-3	1	500	300	345		0.09		2.49	3.72	0.33	
16	Duct		500	300	345	4		0.18	2.49		0.71	
17	Tee (converging, straight) ER5-3	1	500	300	359		0.09		2.59	4.02	0.36	
18	Duct		500	300	359	16		0.19	2.59		3.07	
18	90° Square Bend (with vane) CR3-12	1	500	300	359		0.33		2.59	4.02	1.33	
19	Duct		500	300	359	5		0.19	2.59		0.96	
19	Silencer	1	500	300	359						30.00	
20	Transition (Rect/Round) SR4-3		400		359		0.07		3.00	5.40	0.38	
20	TEF 01											
20	Transition (Round/Rect) SR4-3		400		359		0.4		3.00	5.40	2.16	
20	Silencer	1	400		359						30.00	
21	Duct		400		359	1		0.28	3.00		0.28	
22	Discharge Air Louver		400		359						20.00	
	Sub-Total										209	
	Safety factor		21%								44	
	Total										253	

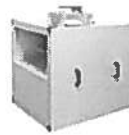
Performance Chart



Acoustic Information

	63	125	250	500	1k	2k	4k	8k	Total	dBA@3m
Inlet	46	62	69	69	70	67	62	55	75	53
Outlet	47	62	59	60	62	62	58	52	69	47
Breakout	-	-	-	-	-	-	-	-	-	-

Sound Power Level Spectra dB (re 10⁻¹² Watts) shown @ free air.



Lo-Carbon Kitchen Box Fan (EKF)

Tech Ref File: 19848 REV 1
Customer Ref: EF01
Requested Duty: 0.5 m³/s @ 300 Pa
Actual Duty: 100% match
Stock Reference: EKF450E3
Product Type: Ventilation
Product Range: In-Line Fans
Impeller: Backward Curved
Casing: Aluzinc
Speed: Variable
Airstream Temperature: -20°C to 120°C
Specific Fan Power: 0.6 W/(l/s)
dBA: 53

Stated dB(A) levels at 3m with spherical propagation at a reference level of 2 x 10⁻¹² Pa
Specific Fan Power & dBA shown are at duty point.

Warranty: 2 Years

Electrical Information

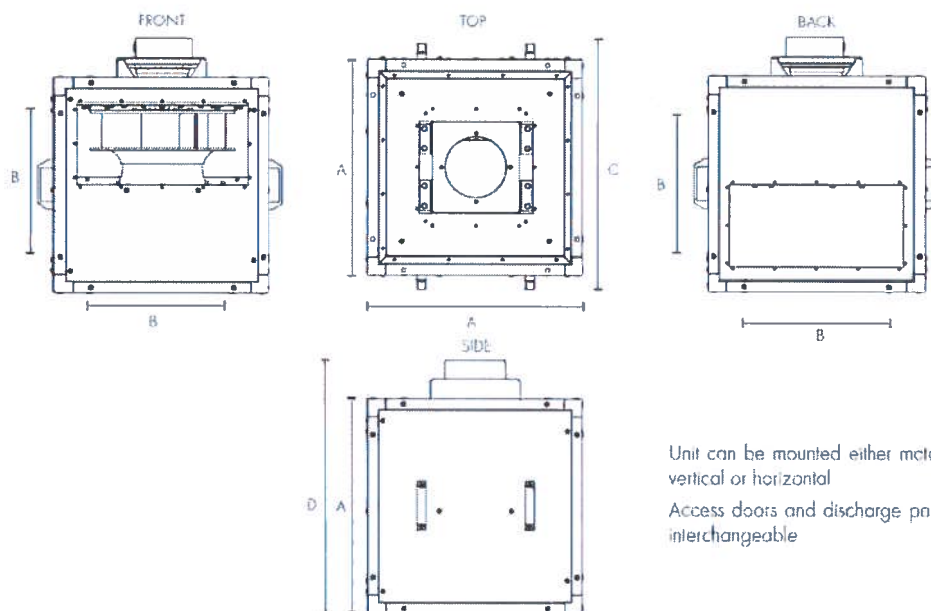
Watts: 334
Supply Voltage: 380-415V/3/50Hz
Full Load Current: 1.8 A
Motor IP Rating: IP54
Speed Controllable: In Built

Tea-point extract

EF 01

West core Roof

Dimensions

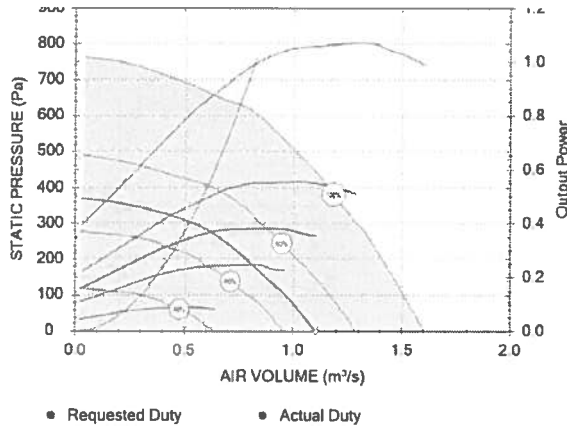


Unit can be mounted either motor shaft
vertical or horizontal
Access doors and discharge panel are
interchangeable

A	B	C	D	Wgt
700	500	784	826	83.5

Dimensions shown in mm
Weights in kg

Performance Chart



Lo-Carbon Kitchen Box Fan (EKF)

Tech Ref File: 19848 REV 1
Customer Ref: EF02
Requested Duty: 0.52 m³/s @ 300 Pa
Actual Duty: 100% match
Stock Reference: EKF450E3
Product Type: Ventilation
Product Range: In-Line Fans
Impeller: Backward Curved
Casing: Aluzinc
Speed: Variable
Airstream Temperature: -20°C to 120°C
Specific Fan Power: 0.6 W/(l/s)
dBA: 53

Stated dB(A) levels at 3m with spherical propagation at a reference level of 2×10^{-12} Pa
Specific Fan Power & dBA shown are at duty point.

Warranty: 2 Years

Acoustic Information

	63	125	250	500	1k	2k	4k	8k	Total	dBA@3m
Inlet	46	62	69	69	70	67	62	55	75	53
Outlet	47	62	59	60	62	62	58	52	69	47
Breakout	-	-	-	-	-	-	-	-	-	-

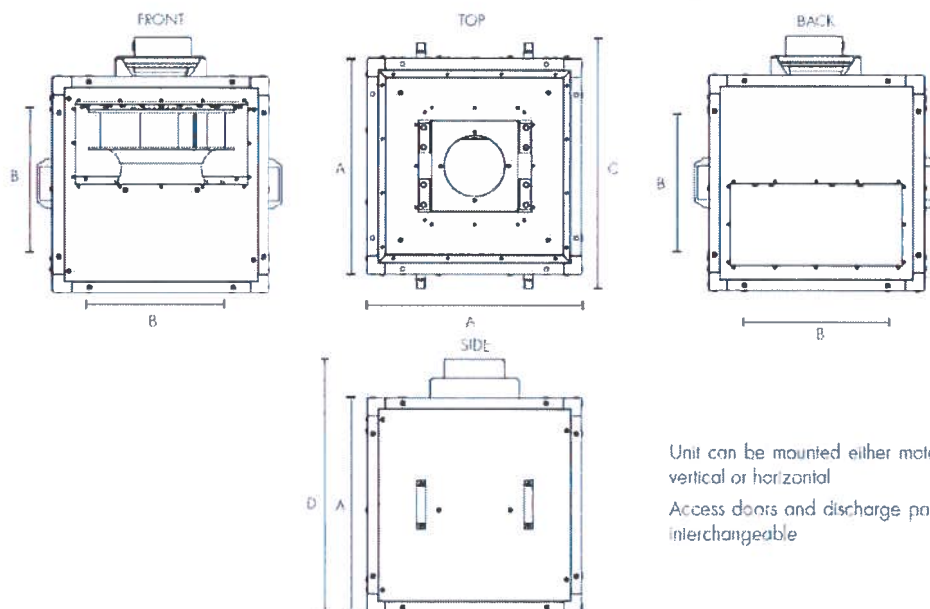
Sound Power Level Spectra dB (re 10^{-12} Watts) shown @ free air.

Electrical Information

Watts: 344
Supply Voltage: 380-415V/3/50Hz
Full Load Current: 1.8 A
Motor IP Rating: IP54
Speed Controllable: In Built

Tea Point extract
EF02
South Core Roof

Dimensions

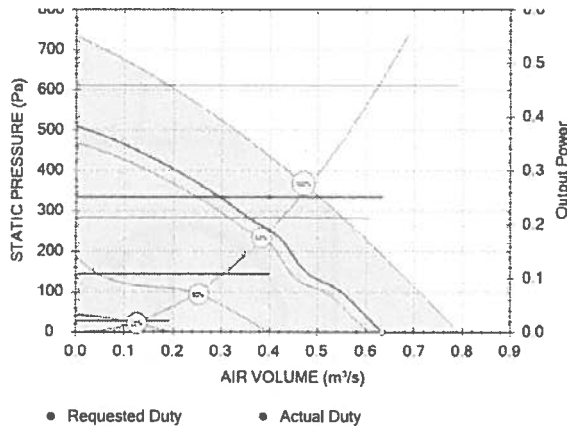


Unit can be mounted either motor shaft
vertical or horizontal
Access doors and discharge panel are
interchangeable

A	B	C	D	Wgt
700	500	784	826	83.5

Dimensions shown in mm
Weights in kg

Performance Chart



Acoustic Information

	63	125	250	500	1k	2k	4k	8k	Total	dBA@3m
Inlet	72	80	76	75	71	67	61	53	83	56
Outlet	74	77	77	69	63	56	47	38	81	51
Breakout	69	79	72	66	59	52	50	46	80	48

Sound Power Level Spectra dB (re 10⁻¹² Watts) shown @ free air.



Sentinel D-Box Twin Fan, Weatherproofed

Tech Ref File:
Customer Ref:
Requested Duty:
Actual Duty:
Stock Reference:
Product Type:
Product Range:
Impeller:
Casing:
Speed:
Airstream Temperature:
Specific Fan Power:
dBA:

19848 REV 1
TEF01

0.4 m³/s @ 250 Pa

100% match

SENT400T/WP

Ventilation

Twin Fans

Backward Curved

Galvanised sheet steel

Variable

-25°C to 60°C

0.6 W/(l/s)

48

Stated dB(A) levels at 3m with spherical propagation at a reference level of 2 x 10⁻¹² Pa
Specific Fan Power & dB(A) shown are at duty point.

Warranty: Up to 5 years

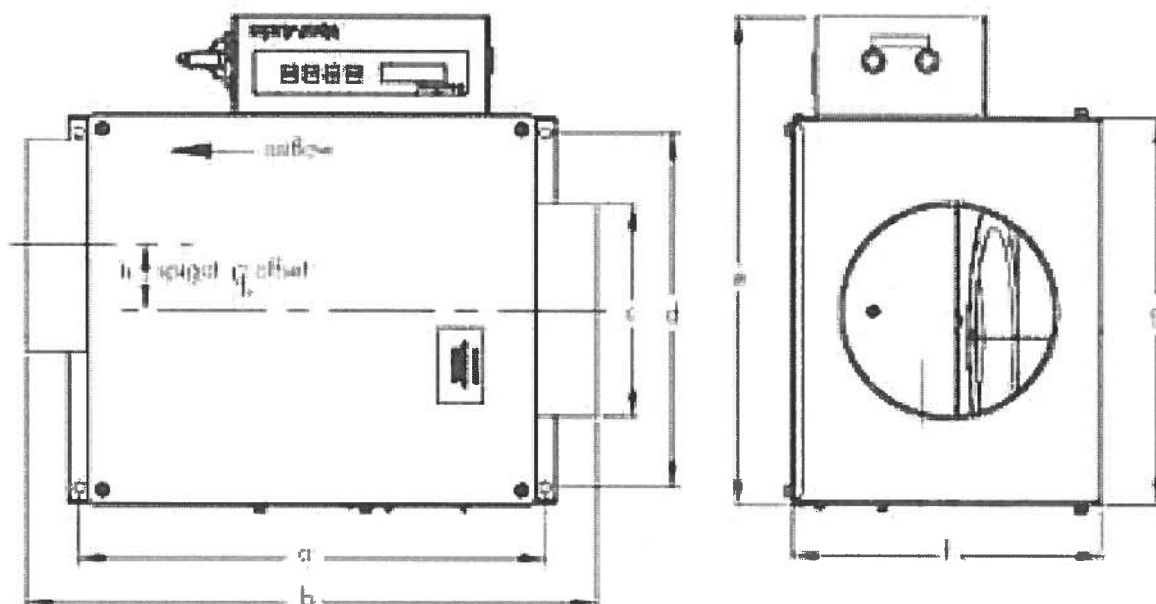
Electrical Information

Watts
Supply Voltage:
Full Load Current:
Starting Current:
Insulation:
Motor IP Rating:
Speed Controllable:

251
220-240V/1/50Hz
2.86 A
2.86 A
B
IP44
In Built

Toilet extract
TEF01
North core roof

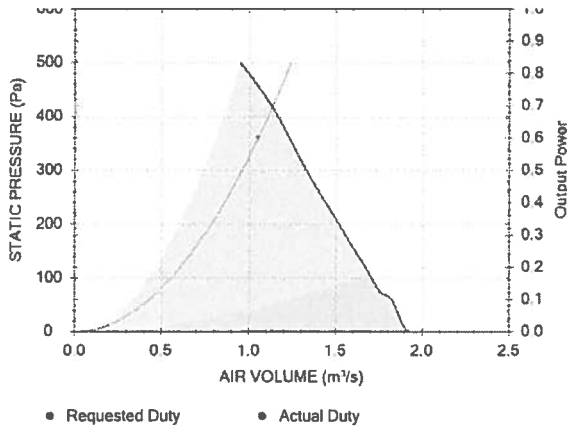
Dimensions



a	b	c	d	e	f	g
1255	1353	400	1145	1272	536	1176

Dimensions shown in mm
Weights in kg

Performance Chart



Acoustic Information

	63	125	250	500	1k	2k	4k	8k	Total	dB(A)@3m
Inlet	76	95	88	86	81	76	76	71	96	67
Outlet	76	80	73	71	66	61	61	56	83	52
Breakout	76	95	88	86	81	76	76	71	96	67

Sound Power Level Spectra dB (re 10^{-12} Watts) shown @ free air.



Power Twin Fans (TDF)

Tech Ref File: 19848 REV 1
Customer Ref: TEF02
Requested Duty: 1.05 m³/s @ 360 Pa
Actual Duty: 108% match
Stock Reference: TDF480/4/3
Product Type: Ventilation
Product Range: Twin Fans
Impeller: Backward Curved
Casing: Galvanised steel
Speed: 1360 rpm
Specific Fan Power: 0.8 W/(l/s)
dB(A): 52

eDemand inverter controlled to requested duty point
Specific Fan Power: 0.7 W/(l/s)
dB(A): 50.4

Stated dB(A) levels at 3m with spherical propagation at a reference level of 2×10^{-12} Pa
Specific Fan Power & dB(A) shown are at duty point.

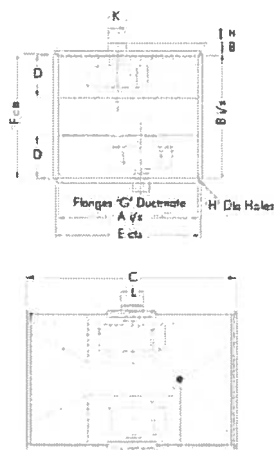
Warranty: 2 years

Electrical Information

Kilowatts: 1.25
Supply Voltage: 380-415V/3/50Hz
Full Load Current: 2.3 A
Starting Current: 11 A
Insulation: -
S.T.O.P. Protection: Yes
Speed Controllable: Yes

Toilet extract
TEF 02
South side roof

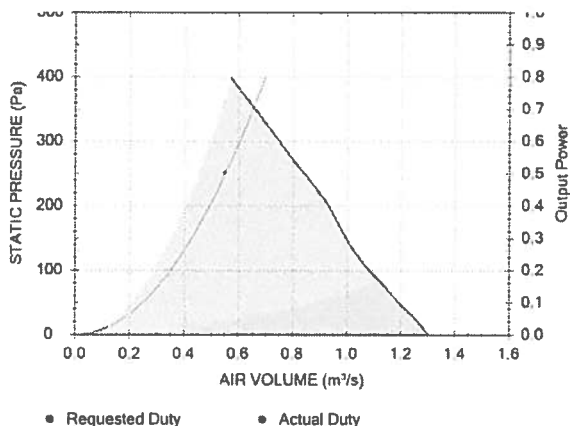
Dimensions



A	B	C	D	E	F	G	H	J	K	L
700	925	1250	325	735	960	35	11	65	230	230

Dimensions shown in mm
Weights in kg

Performance Chart



• Requested Duty • Actual Duty

Acoustic Information

	63	125	250	500	1k	2k	4k	8k	Total	dB(A)@3m
Inlet	74	91	83	81	76	72	69	65	92	62
Outlet	74	76	68	66	61	57	54	50	79	47
Breakout	74	91	83	81	76	72	69	65	92	62

Sound Power Level Spectra dB (re 10⁻¹² Watts) shown @ free air.



Power Twin Fans (TDF)

Tech Ref File: 19848 REV 1
Customer Ref: TEF03
Requested Duty: 0.55 m³/s @ 250 Pa
Actual Duty: 119% match
Stock Reference: TDF420/4/3
Product Type: Ventilation
Product Range: Twin Fans
Impeller: Backward Curved
Casing: Galvanised steel
Speed: 1280 rpm
Specific Fan Power: 0.7 W/(l/s)
dBA: 47

eDemand inverter controlled to requested duty point

Specific Fan Power: 0.5 W/(l/s)
dBA: 43.2

Stated dB(A) levels at 3m with spherical propagation at a reference level of 2 x 10⁻¹² Pa
Specific Fan Power & dB(A) shown are at duty point.

Warranty: 2 years

Electrical Information

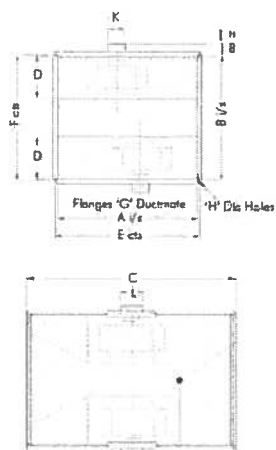
Watts: 640
Supply Voltage: 380-415V/3/50Hz
Full Load Current: 1.3 A
Starting Current: 3.7 A
Insulation: -
S.T.O.P. Protection: Yes
Speed Controllable: Yes

Toilet extract

TEF 03

West core roof

Dimensions



A	B	C	D	E	F	G	H	J	K	L
625	830	1130	295	600	865	35	11	50	230	230

Dimensions shown in mm
Weights in kg