



ENVIRO UNIT KES SERIES





ENVIRO UNIT FILTER BOX
Commercial Kitchen Exhaust

KES-ISH
1,000 to 40,000 CFM

Operation

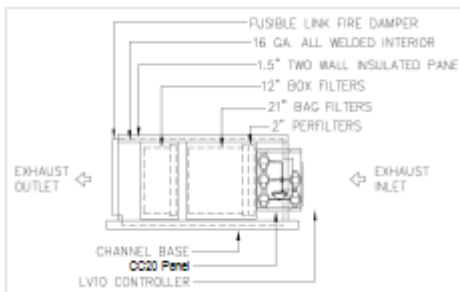
The grease laden air rises from the cooking equipment into the NFPA-96 commercial kitchen exhaust hood. The exhaust hood will remove some of the airborne grease, lint and dirt particulate. Typically most micron and submicron particle escape into the ductwork. The exhaust air is then ducted directly to the inlet of the **KES-ISH Enviro Filter Unit**. The exhaust duct from the commercial kitchen exhaust hood to the inlet of the **KES-ISH** must be installed in accordance with the NFPA-96 code. The ULC listing allows the exhaust discharge duct from the **KES-ISH** to be standard HVAC ductwork and discharge to atmosphere at low levels from the building.

Within the **KES-ISH Enviro Filter Unit** the exhaust air travels through three stages of particulate filters.

1. Two (2) inch (51mm) pleated – 30% ASHRAE 52-76 filters
2. Twenty-one (21) in. (525mm) bag – 90% ASHRAE 52-76 filters
3. Twelve (12) in. (305mm) box – 95% DOP filters, (or 99% ASHRAE 52-76)

Within the **KES-ISH Enviro Filter Unit** the exhaust air is cleaned of airborne grease, lint and dirt particulate. Once through the **KES-ISH Enviro Filter Unit** the exhaust air enters **KESF Enviro Fan Unit**.

KES-ISH Component Schematic

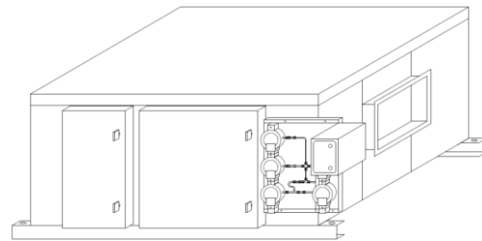


Description

The **KES-ISH Enviro Filter Unit** contains the CC20 panel, pressure switches and three stages of filters.

The unit is constructed of 16 gauge steel inner shell, continuously welded and liquid tight in accordance with the NFPA-96. The outside of the unit is wrapped in 1.5" insulation and 18 gauge steel protective covering primed and painted. The unit is supported by channels running along the length of each side. Lifting and support points are at the four corners of the **KES-ISH Enviro Filter Unit** at the ends of these channels. No external isolation of the unit is required. The two access doors are double wall construction with 1.5" insulation and cam lock

doors fasteners per the ULC fire rated listing. A fusible link fire damper is located at the outlet of the **KES-ISH**. The link temperature is 165F and is accessible through the prefilter/bag filter access door.



Pressure tubing from the pressure switches is run inside along the top of the unit to pressure probes located in front and behind each filter section. The Firestat is located at the exhaust inlet end and mounted on the same side as the CC20 panel.

KES-ISH Enviro Filter Box Controls

CC20 Control Panel

The main Enviro Unit control panel is the low voltage CC20 panel located on the **KES-ISH**. The KES CC20 electrical control circuit monitors the pressure between each filter stage.

1. Operation of the **KES-ISH** with dirty or clogged pre-filters, bag filters or box filters.
2. Operation of the **KES-ISH** with the bag for box filter removed.
3. Low air volume through the **KES-ISH**.
4. A fire in the **KES-ISH**.

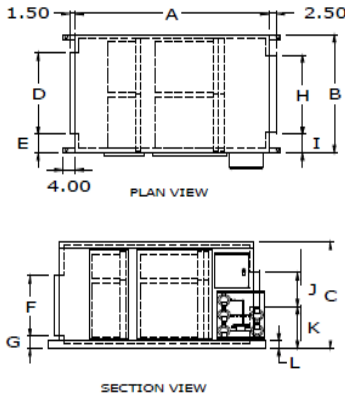
The CC20 panel is interconnected to the CC50 remote panel and the **KESF Enviro Fan Unit**.

CC50 Remote Annunciation Panels

The remote annunciation panel CC50 is located in the kitchen for annunciation of the following conditions: FIRE, FILTERS CLOGGED, FILTERS REMOVED, and WARNING. The KES Enviro on/off operation is controlled from the hood panel. (See the *CADEXAIR CC35 Ventilator Engineering Manual* for detailed information about water wash control panels available)



KES-ISH Filter Box Dimensions



KES-ISH.	Max. CFM	A	B	C	D	E	F	G	H	I	J	K	L
10	1000	64	25.5	24.5	22.75	1.38	18	4.75	9	8.25	10	8.5	3
20	2000	64	25.5	32	23	1.25	25	5	18	3.75	10	13.25	3
30	3000	64	37.0	32	34	1.5	25	5	27	5	10	13.25	3
40	4000	67	49.0	32	34	7.5	25	5	30	9.5	12	11.75	3
50	5000	69	49.0	44	34	7.5	25	5	32	8.5	14	17.25	3
50F	5000	69	60.5	32	34	13.25	25	5	32	14.25	14	11.25	3
60	6000	69	49.0	44	38	5.5	25	5	34	7.5	16	16.25	3
60F	6000	69	72.5	32	38	17.25	25	5	30	21.25	12	11.75	3
80	8000	72	49.0	58	36	6.5	36	8	36	6.5	20	22.25	5
80F	8000	72	72.5	45	44	14.25	36	6	36	18.25	20	15.25	4
100	10000	76	60.5	58	44	8.25	48	7	36	12.25	24	20	5
120	12000	81	72.5	58	44	14.13	48	7	36	18.25	30	17.25	5
140	14000	85	72.5	70	56	8.25	54	7	40	13.25	32	21.5	5
160	16000	86	72.5	70	56	8.25	54	7	40	16.25	36	20.25	5
180	18000	86	72.5	82	60	6.25	54	7	42	15.25	40	24.25	5
200	20000	86	96.0	70	60	18.0	54	7	50	23.00	36	20.25	5
240	24000	86	96.0	82	72	12.0	54	7	60	18.00	36	26.25	5
280	28000	86	96.0	94	72	12.0	60	7	70	13.00	36	32.25	5
320	32000	86	96.0	106	72	12.0	72	7	72	12.00	40	36.25	5
360	36000	86	107.5	106	72	17.75	72	7	80	13.75	40	36.25	5
400	40000	86	119.5	106	84	17.75	72	7	90	14.75	40	36.25	5

Kitchen Enviro Filter Unit Specification

The commercial kitchen Enviro filter box shall be a CADEXAIR Inc. model no. KES___-___-ISH, indoor/outdoor design, horizontal/vertical arrangement, assembled, wired and tested prior to shipment with exhaust capacity of ___ CFM at ___" W.C. internal static pressure. The KES filter box shall be listed by Underwriters Laboratories of Canada and installed in accordance to the NFPA-96, the Canadian Standards Association, and local authorities having jurisdiction.

Unit Casing

The filter box section casing shall be double wall, sandwich insulation construction. The inner wall shall be a minimum 16-gauge liquid tight and the outer wall shall be a minimum 18-gauge construction. The sandwiched insulation shall be 1.5" fibreglass. The unit casing shall be suitably reinforced to ensure rigidity. The filter section shall have a fire damper at the exhaust exit. Double walled, insulated, hinged access doors with cam lock fasteners shall be provided for entry to the filter sections.

Filter Section

The KES unit shall include three stages of particulate filtration. The first stage shall be a 2" pleated UL/ULC class 2 filters, rated at 30% ASHRAE 52-76. The second stage shall be a 22" bag filter, UL/ULC class 2, rated at 90% ASHRAE 52-76. The third stage shall be a 12" box filter, UL/ULC class 2, rated at 95% DOP or 99% ASHRAE 52-76.

Controls

The unit shall have a CC20 control panel with circuit fuses and control relay. The unit shall include a Firestat, and pressure switch circuit for filter clogged and filter removed annunciation.

Remote Station Options

The remote control station shall be a model CC50 with indication pilot lights for NORMAL operation, FIRE, FILTER CLOGGED, FILTER REMOVED and a unit ON/OFF and SERVICE OVERRIDE switch.

Mechanical Services

All exhaust ductwork from the kitchen hood to the KES inlet shall be supplied and installed in accordance to the NFPA-96. The KES exhaust discharge ductwork shall conform to standard HVAC construction.

Options

Outdoor/Indoor, Odor Reducing Section, Spray or Pellets (See OP and OS Odor Specification Sheet)



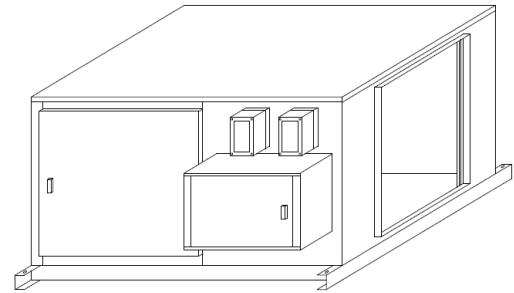
ENVIRO FAN UNIT
Commercial Kitchen Exhaust

The UL/ULC listing allows recirculation only with electric cooking and only up to 80% of the total exhausts air.

KESF
1,000 to 40,000 CFM
Used in conjunction with the KES-ISH Enviro Filter Box

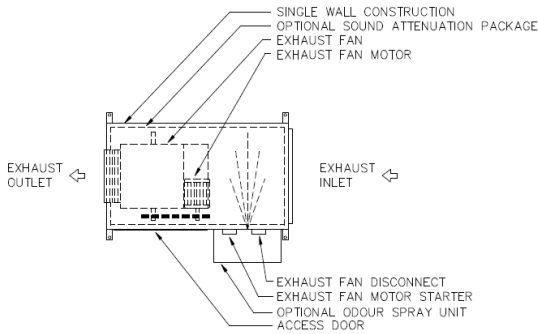
General Description

The KESF Enviro Fan Unit is a separate package containing a backward inclined, AMCA rated exhaust fan with heavy-duty bearings, fan isolators, optional sound attenuation package, and two groove sheaves. The exhaust air from the KESF is either discharged to atmosphere or re-circulated to the commercial kitchen. Recirculation is usually achieved with a KRS Recirculation Unit. (See the CRS Engineering Manual)



The unit casing is 16-gauge steel, primed and painted suitably reinforced to ensure rigidity. An optional sound attenuation package is available for the interior of the fan unit. This sound package is highly recommended on all indoor units. The KESF unit is supported by channels running along the length of each side. Lifting and support points are at the four corners of the KESF unit, at the ends of these channels. An access door is provided to the exhaust fan motor and drives section.

KESF Component Schematic with DWDI fan



The following options are available:

- Internally or externally isolated exhaust fan. The externally isolated exhaust fan reduces the height of the KESF.
- Single Width, Single Inlet (SWSI) or Double Width, Double Inlet (DWDI). The SWSI provide discharge at right angles to the exhaust inlet on either side of the KESF.
- Indoor or outdoor design.
- Cooling Coil when re-circulating exhausts air back to kitchen.

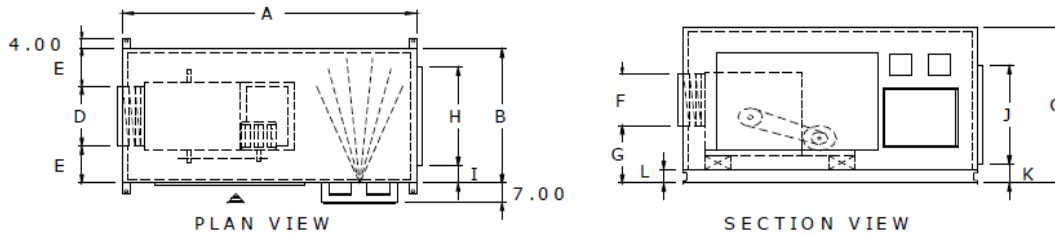
KESF Fan Chart – 1000 CFM to 10,000 CFM

KES	CFM	External Static Pressure ("W.C.)*									
		1.50		1.75		2.00		3.00		4.00	
		HP	RPM	HP	RPM	HP	RPM	HP	RPM	HP	RPM
10	1000	2.78	2630	2.98	2645	3.80	2760	3.81	2916	n/a	n/a
20	1500	2.08	2261	2.27	2334	2.46	2406	3.21	2576	3.27	2676
20	2000	3.41	2636	3.70	2699	3.92	2761	4.26	2830	4.86	2997
30	2500	2.91	2377	3.13	2444	3.35	2511	3.85	2610	4.28	2762
30	3000	4.40	2707	4.66	2766	4.91	2825	5.21	3110	n/a	n/a
40	3500	4.03	2547	4.29	2609	4.55	2671	5.61	2900	5.81	2294
40	4000	5.61	2833	5.90	2888	6.19	2943	7.62	3085	n/a	n/a
50	4500	5.12	2074	5.45	2127	5.78	2179	6.31	2201	7.17	2376
50	5000	6.40	2219	6.76	2268	7.12	2317	8.10	2433	n/a	n/a
60	5500	6.20	2143	6.87	2223	7.53	2320	7.61	2440	7.99	2755
60	6000	7.49	2271	7.88	2318	8.27	2364	9.81	2730	n/a	n/a
80	7000	7.10	1697	7.56	1741	8.02	1785	9.90	2019	11.27	1734
80	8000	9.32	1841	9.84	1881	10.32	1921	12.5	2178	n/a	n/a
100	9000	10.34	1575	10.96	1611	11.57	1648	13.1	1702	14.10	1854
100	10000	12.72	1675	13.38	1709	14.04	1742	15.8	1963	n/a	n/a

*The above fan chart includes internal static pressure of the KES-ISH, and KESF fan unit. The chart is for a DWDI exhaust fan in a vertical or horizontal arrangement either indoor or outdoor design. For other selections options or higher CFM's, call your local CADEXAIR representative. The "External Static Pressure" is the sum of the exhaust hood, all exhaust ductwork and discharge cowl or louver.



KESF FAN DIMENSIONS
Indoor, DWDI with Odour Spray Option



KESF	Max CFM	A	B	C	D	E	F	G	H	I	J	K	L
10	1000	67	37	32	15.5	10.75	13.5	15.5	23	7	18	5	3
20	2000	67	37	32	15.5	10.75	13.5	15.5	23	7	25	5	3
30	3000	67	37	32	15.5	10.75	13.5	15.25	34	1.5	25	5	3
40	4000	67	49	36	18.5	15.25	16	16.75	34	7.5	25	5	3
50	5000	72	49	44	18.5	15.25	16	16.75	34	7.5	25	5	3
60	6000	72	49	44	22	13.5	19	18.5	38	5.25	25	5	3
80	8000	80	49	57	22	13.5	19	21	36	6.5	36	7	5
100	10000	88	60.25	58	25.5	17.38	25.5	20.5	44	8.13	48	7	5
120	12000	88	72.25	58	28	22.12	28	22.25	44	14.1	48	7	5
140	14000	95	74.5	70	28	23.25	28	22.25	56	9.25	54	7	5
160	16000	95	72.25	70	28	22.13	28	22.25	56	8.13	54	7	5
180	18000	100	72.25	82	31.5	20.38	31.5	23.88	60	6.13	54	7	5
200	20000	100	95.5	70	31.5	32	31.5	23.75	60	17.7	54	7	5
240	24000	102	95.5	82	35.5	30	35.5	25.75	72	11.7	54	7	5
280	28000	119	95.5	94	35.5	30	35.5	25.75	72	11.7	60	7	5
320	32000	129	95.5	106	39.5	28	39.7	28	72	11.7	72	7	5
360	36000	129	106.75	106	44.5	31.13	44.5	30.25	72	17.3	72	7	5
400	40000	129	118.75	106	44.5	37.13	44.5	30.25	84	17.3	72	7	5

** For dimensions of units with SWSI or DWDI fans, with or without odour spray and pellets refer the CADEXAIR Enviro Engineering Manual. Refer to the KES-ISH specification sheet for details on Enviro Filter Box.

CADEXAIR KESF Enviro Fan Unit Specification

The commercial kitchen Enviro fan unit shall be a Cadexair Inc. model no. KESF____, indoor/outdoor design, horizontal/vertical arrangement, assembled, wired and tested prior to shipment with exhaust capacity of _____ CFM at _____" W.C. total static pressure. The KES fan unit shall be listed by Underwriters Laboratories of Canada and installed in accordance to NFPA-96, and local authorities having jurisdiction.

Unit Casing

The exhaust fan motor and drive section shall be single wall construction with minimum 16 gauge wall and optional 1" sound attenuation insulation. The exhaust fan section shall be internally/externally spring isolated.

Exhaust Fan

The KES unit shall be supplied with an AMCA rated double width, double inlet, (single width, single outlet SWSI) airfoil centrifugal fan

statically and dynamically balanced. The fan shall be mounted on a heavy duty turned, ground and polished steel shaft, internally isolated, (externally isolated with hanging isolators shipped loose for field installation). The bearings shall be heavy duty, pre-lubricated type. V-belt drives shall be two grooves, adjustable up to 7.5 HP motors, sized with a capacity 25% greater than the motor horsepower. The exhaust fan shall be a ____ Hp, ____ V/3/60, TEFC motor.

Controls

The unit shall have a fused disconnect switch, motor starter and overload in EEMAC 1 enclosure.
Options: Internal/external fan isolation, sound attenuation package, odour pellets, odour spray, coiling coil, and SWSI fan.

Mechanical Services

All exhaust ductwork from the filter box to the KESF fan inlet shall be supplied and installed in accordance to standard HVAC construction.



KES ENVIRO ODOUR CONTROL
Commercial Kitchen Exhaust

OP / SP
Odour Reducing Pellets Module / Odour Reducing Spray Module

General Description

The OP and SP odor-reducing module are used in conjunction with a KES-ISH filter box and KESF fan unit. The KES units are installed to clean the commercial kitchen exhaust air of airborne grease, lint and particulate. The ULC listing allows the use of non-welded exhaust ductwork downstream of the KES-ISH exhaust discharge. In addition, the exhaust may be discharged at low levels. When the odour from the exhaust discharge can be a nuisance, SP or OP modules are required.

Operation

The grease-laden air rises from the cooking equipment into the NFPA-96 commercial kitchen exhaust hood. The exhaust hood will remove some of the airborne grease, lint and dirt particulate. The exhaust air is then ducted directly to the inlet of the KES-ISH.

Within the KES-ISH the exhaust air travels through three stages of particulate filters and the exhaust air is cleaned of airborne grease, lint and dirt particulate. Once through the KES-ISH the exhaust air enters KESF.

The KESF is a separate package containing the exhaust fan, motor, belts, drives, motor starter, disconnect and the optional odour removal section. After leaving the KES Enviro Fan Unit the air is either discharged to atmosphere or re-circulated to the commercial kitchen. Re-circulation is achieved with a KRS Recirculation Unit. See the CRS Engineering Manual.

The OP module is normally located between the KES-ISH and KESF fan unit. The SP module can be incorporated into the KESF fan unit or installed in the ductwork as a remote unit.

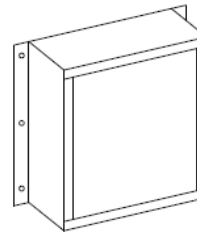
Odour Reduction

Odour reduction is required if the exhaust discharge is to be located in an area where the smell could be a nuisance. The choice of pellets or

spray is a personal preference. The pellets are generally changed once a year while the spray bottle is changed every one to two months.

OP-PELLETS

The section consists of metal cells filled with activated alumina pellets impregnated with potassium permanganate. The odour is controlled through a combination of sorption and a chemical modification of the gaseous contaminates. The odour media is non-toxic and non-flammable. OP-Pellets are contained in 24" x 24" x 2" and 12" x 24" x 2" perforated cells located in a separate odour reduction section normally located between the KES-ISH filter box and the KESF fan box. There are no moving parts and the odour reduction is continuous. All of the exhaust air is drawn over the pellets whenever the fan is operating. The cells are removed through a side access door on the odour section. The cells split in two to remove the used pellets and add new pellets.

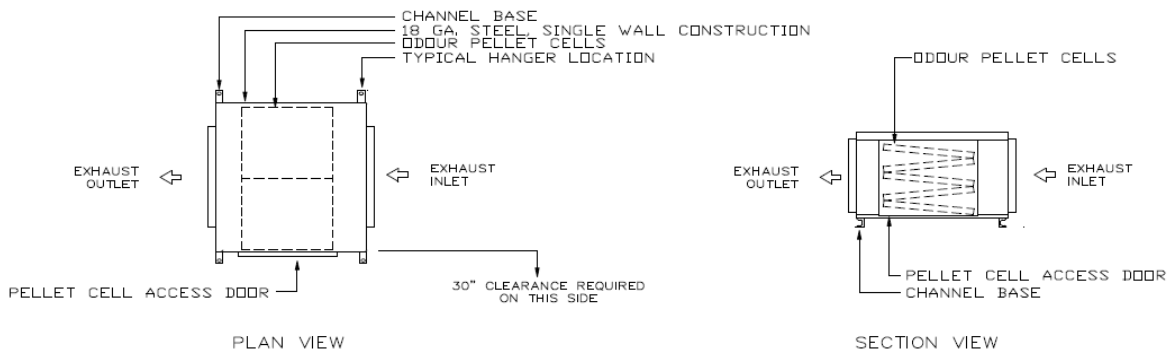


ODOUR SPRAY CABINET
 ISOMETRIC

OP-SPRAY

The section consists of an atomizing air nozzle, air compressor, a container of CADEXAIR deodorizer and associated piping. The CADEXAIR solution is sprayed for an adjustable cycle, for an adjustable spray time into the exhaust ductwork to reduce the commercial kitchen odors. The SP-Spray system requires

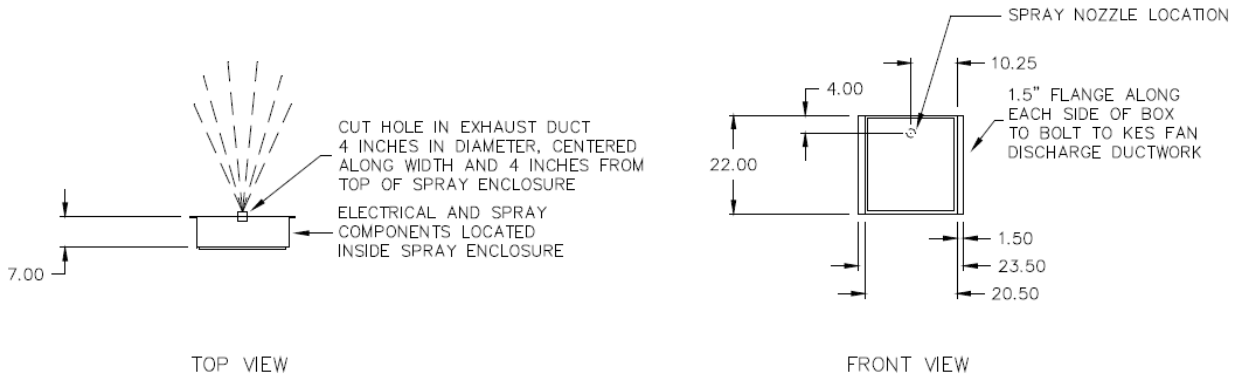
120V/1/60 power from the KESF fan motor starter. The spray unit is located in the KESF fan unit or in a separate remote unit. When the spray unit is located on the KESF fan unit the wiring is completed by Cadexair. When the remote odour spray unit is used, a 120V/1/60 supply is required from the KESF unit. The spray is cycled every 0 to 10 minutes for a preset spray time when the exhaust fan is operating. Both the cycle time and the spray time are adjustable. The time settings relate to the type of cooking and applianKES under the hood.



OP Odour Reducing Pellets Module



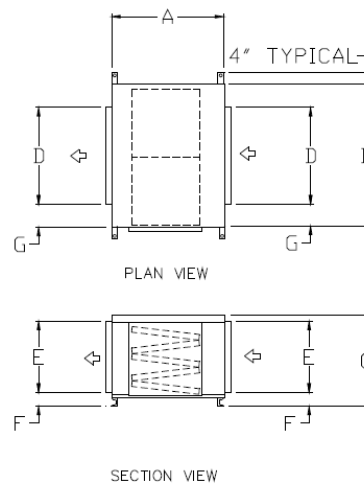
Remote OS Odour Reducing Spray Module *



* The OS remote module is installed in the ductwork between the KES-ISH and the KESF fan unit or downstream of the KESF fan unit. The OS module can be factory installed in any KESF fan unit with a DWDI fan. When the unit is factory installed see the KES Enviro Engineering manual for dimensions of the KESF.

OP Odour Reducing Pellets Module Dimensions

MODEL	CFM	A	B	C	D	E	F	G
10	1000	34	26.5	24.5	23	18	4.75	1.75
20	2000	34	26.5	32	23	25	5.	1.75
30	3000	34	38.5	32	34	25	5	2.25
40	4000	40	50.5	32	34	25	5	8.25
50	5000	40	5.05	44	34	25	5	8.25
50F	5000	48	62.5	32	34	25	5	14.25
60	6000	40	50.5	44	44	25	5	3.25
60F	6000	48	62.5	32	44	25	5	9.25
80	8000	44	50.5	58	44	36	7	3.25
100	10000	44	62.5	58	44	48	7	9.25
120	12000	48	74.5	58	44	48	7	15.25
140	14000	68	74.5	70	56	54	7	9.25
160	16000	68	74.5	70	56	54	7	9.25
180	18000	68	74.5	82	60	54	7	7.25
200	20000	68	98.5	70	60	54	7	19.25
240	24000	68	98.5	82	72	54	7	13.25
280	28000	82	98.5	94	72	60	7	13.25
320	32000	88	98.5	106	72	72	7	13.25
360	36000	88	98.5	110.5	72	72	7	19.25
400	40000	88	106	122.5	84	72	7	19.25



Cadexair OP Odour Pellet Module Specification

The OP Odour Module shall include 2" perforated cells filled with activated alumina pellets impregnated with potassium permanganate. The module duct section casing shall be constructed of 18 GA steel with channel support base and include an access door for removal of the odour cells. The odour module shall provide odour removal continuously during exhaust fan operation. The odour module is controlled through a combination of sorption and the chemical modification of the gaseous contaminants. The odour media shall be non-flammable and non-toxic.

Cadexair OS Odour Spray Module Specification

The OS Odour module remote/factory mounted on KESF, shall include an 18 GA painted steel enclosure, a reverse spray nozzle, an air compressor unit and associated piping, 1 gallon, 4 liters of CADEXAIR spray solution and a control panel. The CSA certified control panel shall include a cycle timer, adjustable from 0-60 seconds and a duration timer adjustable from 0-10 minutes. A 120V/1/60 - 5 amps power supply is required when the OS module is shipped for remote installation.