



***FN***

***Filter Hood***

***Maintenance Manual***

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2010 Update

# **FN Filter Hood Operating and Maintenance Manual**

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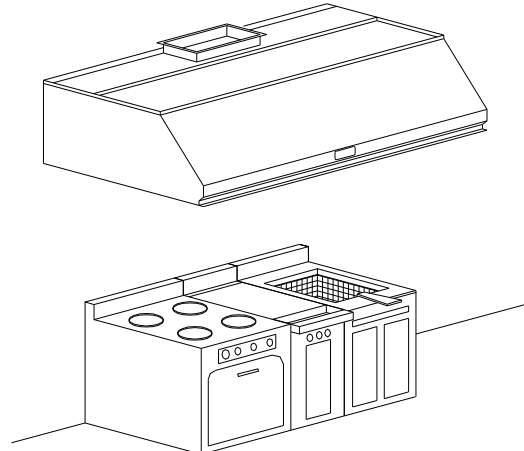
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# FN Filter Hood Operating and Maintenance Manual

## INTRODUCTION

Thank you for selecting a SPRING AIR SYSTEMS INC. commercial kitchen exhaust filter hood. Your system consists of a filter hood and exhaust fan. The exhaust fan may have been supplied by others.

Your SPRING AIR SYSTEMS INC. filter hood was selected to best meet the design requirements of your commercial kitchen application.



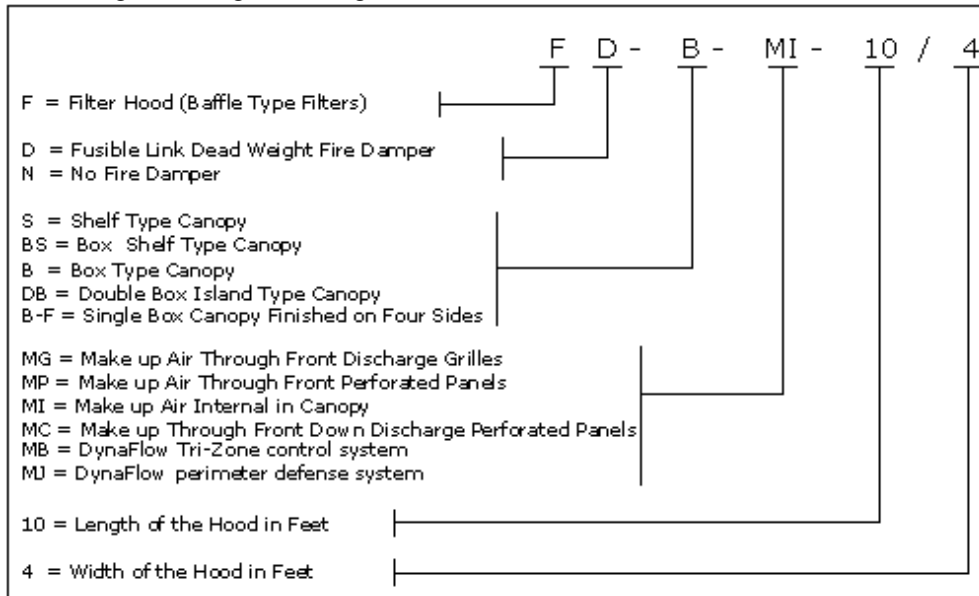
Typical SPRING AIR SYSTEMS Filter FN-B Hood

Figure 1

The exhaust fan is normally controlled by an ON/OFF selector switch located in the kitchen area or mounted on the exhaust fan starter coil electrical enclosure.

## SPRING AIR FILTER HOOD MODEL NUMBERS DESIGNATIONS

There are numerous types and styles of SPRING AIR SYSTEM filter hoods available. Refer to the ULC label for the complete model number and exhaust flow requirement for your filter hood. The ULC label is located on the underside of the grease trough on the right hand side of the filter hood.

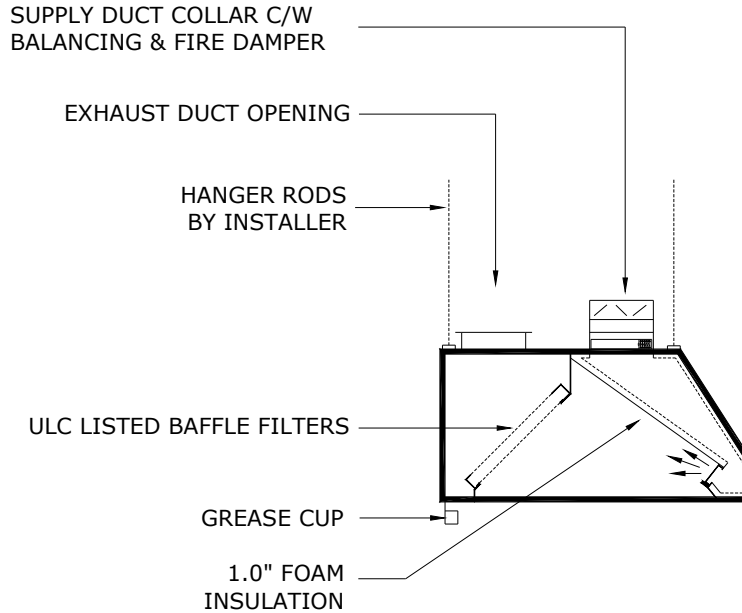


Model Number Designation

Figure 2

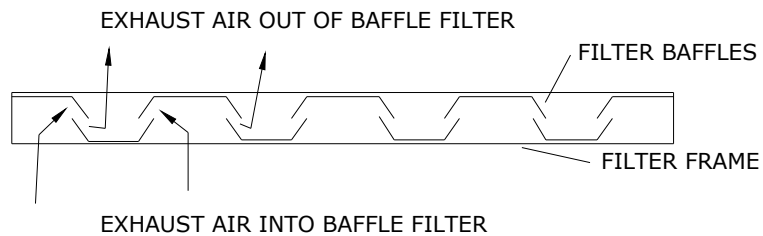
## PRINCIPLE OF OPERATION

The contaminated exhaust air rises off the cooking equipment and enters the baffle grease filters within the SPRING AIR SYSTEMS filter hood.



*Cross Section of Filter Hood Model FN-B-MI  
Figure 3*

The exhaust air accelerates through two 90 degree turns within the baffle filters. The liquefied grease then drains down the vertical length of the baffles to the grease trough and into a grease cup. Each grease baffle contains weeping holes to allow the liquid grease to drain into the grease trough



*Cross Section of Baffle Filter  
Figure 4*

Always ensure that the grease filters are installed with the weeping holes down toward the grease trough. The exhaust air travels into the exhaust plenum, fire damper, exhaust duct collar and then into the exhaust ductwork.

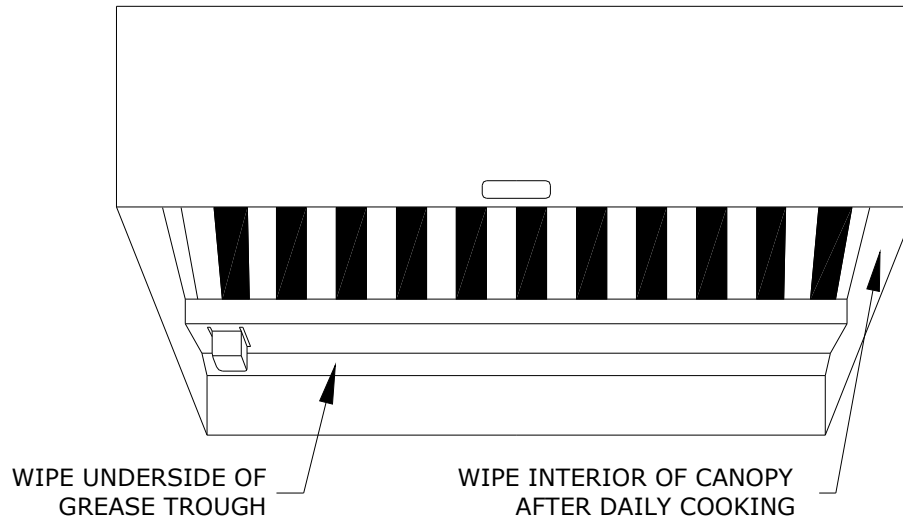
## MAINTENANCE SCHEDULE

### DAILY:

1. At the end of the cooking day wipe off the interior and exterior of the filter hood canopy and the underside of the grease trough with a damp cloth.

### WEEKLY:

1. Remove the grease filters and wash in a mild detergent and water mixture.



*Cleaning the Hood Exterior  
Figure 5*

Wipe off the interior of the filter hood plenum behind the grease filters and the interior and exterior of the grease trough. Remove the grease cup and clean if necessary.

### SIX MONTHS

1. Check the exhaust fan belts for alignment, tightness, and wear. Adjust and/or replace.
2. Hoods with makeup air only: remove filter from makeup air discharge and wash in a mild detergent and water mixture.

## CLEANING THE EXTERIOR

Normal soil can be removed with a mild detergent and water mixture applied to a cloth.

To remove baked on grease, apply a cleanser to a damp cloth or sponge and rub on the metal in the direction of the polishing lines. **DO NOT RUB IN A CIRCULAR MOTION.**

Burnt deposits which do not respond can usually be removed by rubbing the surface with SCOTCH-BRITE Scouring pads or Stainless scouring pads. Do not use ordinary steel wool.

Heat tint can be removed by a vigorous scouring in the direction of the polish lines using SCOTCH BRITE or STAINLESS scouring pads in conjunction with a powdered cleanser.

## TROUBLE SHOOTING

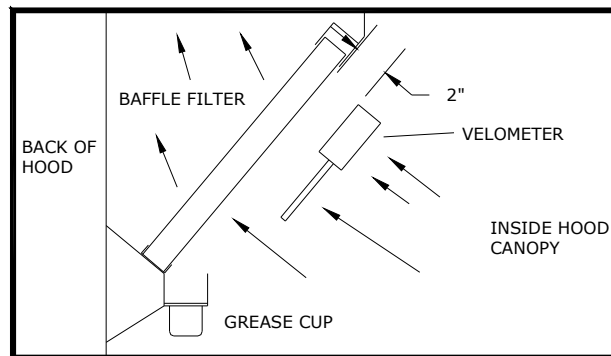
- |         |  |
|---------|--|
| Low air | (i) Improper exhaust fan rotation.           |
|         | (ii) Broken or slipping belt.                |
|         | (iii) Exhaust ductwork inspection door open. |
|         | (iv) Obstruction in the ductwork.            |
| No air  | (i) Broken belt.                             |
|         | (ii) Exhaust fan overload tripped.           |
|         | (iii) Exhaust fan disconnect open.           |
|         | (iv) Exhaust fan motor fuse blown.           |

## MEASURING THE EXHAUST AIRFLOW

The exhaust air is measured along the inlet slot of the ventilator. To ensure accurate results take a reading every one foot along the length of the ventilator.

### VANAXIAL VELOMETER

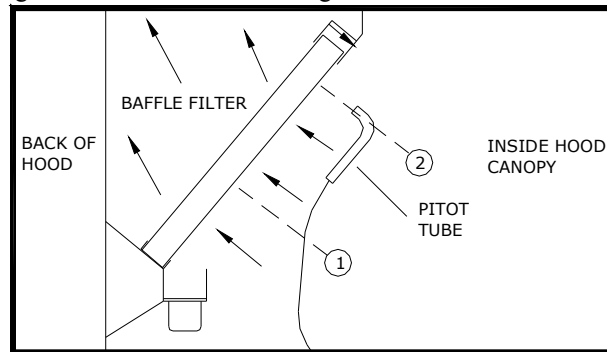
Hold the instrument perpendicular to the VORTEX BAFFLE and parallel to the throat (inlet slot) of the ventilator. Velometer should not exceed three inches in diameter.



*Measuring Exhaust Air  
Figure 6*

### PITOT TUBE OR ANOMETER

Hold the instrument perpendicular to the VORTEX BAFFLE and parallel to the throat (inlet slot) of the ventilator. Take three readings across the throat and average the results.



*Measuring Exhaust air  
Figure 7*

Calculate the average velocity across the inlet slot and refer to the chart below for the corresponding exhaust volumes. Add the individual exhaust volumes to determine the total exhaust.

### Exhaust Air Flow Per Filter

Baffle Filter		Average Filter Velocity					
Size		100 fpm/0.5m/s		200 fpm/1.0m/s		300 fpm/1.5 m/s	
in x in	mm x mm	CFM	l/s	CFM	l/s	CFM	l/s
20 x 16	508 x 406	200	94	400	189	600	283
20 x 20	508 x 508	260	123	520	245	780	368
20 x 25	508 x 635	320	151	640	302	960	453

Chart No. 1

Use the chart below when measuring the velocity in the filter slot with a hot wire anemometer. Place the hot wire anemometer directly in the filter slot level with the adjacent baffle. Take four readings up and down each slot in every other slot of each filter. Average these readings to use the chart below. The chart is only applicable when using a hot wire anemometer.

### Filter Size/Slot Velocity vs Exhaust Volume

Velocity (fpm)*	Filter Size vs CFM per filter			
	20 x 20 (CFM)	20 x 25 (CFM)	12 x16(5)+ (CFM)	12 x16(4)! (CFM)
100	60	70	30	20
200	120	140	60	40
300	180	210	90	70
400	240	270	120	90
500	300	350	150	110
600	350	410	170	140
700	410	480	200	160
800	470	550	230	180
900	530	620	260	200
1000	590	690	290	230
1100	650	760	320	250
1200	710	830	350	280
1300	770	900	370	300
1400	830	970	410	320
1500	890	1040	440	350
1600	940	1100	460	370
1700	1000	1170	490	390
1800	1060	1240	520	420

\* Slot velocity measured with hot wire anemometer

+ Filter in rack with 5 slots facing out.

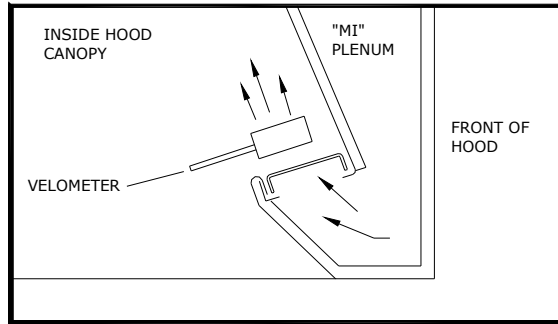
! Filter in rack with 4 slots facing out.

## MEASURING THE SUPPLY AIRFLOW - MI MODELS ONLY

The supply air discharge from a FN-B-MI or FN-DB-MI is measured along the internal discharge perforated plate inside the filter hood canopy. To ensure accurate results take a reading every one foot along the length of the filter hood.

### VANAXIAL VELOMETER

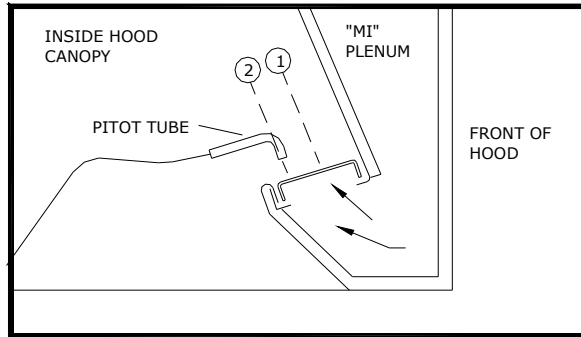
Hold the instrument parallel to and about one (1) inch from the perforated discharge slot.



*Measuring Supply Air  
Figure 8*

### PITOT TUBE OR ANEMOMETER

Hold the instrument parallel to and about one (1) inch from the perforated discharge slot. Take two readings across the slot and average the results.



*Measuring Supply Air  
Figure 9*

Calculate the average velocity along the length of the perforated discharge and refer to chart No. 2 for corresponding CFM/ft (l/s/m). If the supply air is too high adjust the opposed blade dampers on top of the filter hood at the supply air inlets just above the supply fire dampers. Multiple dampers can be balanced to provide the velocity profile required across the supply discharge.

### Supply Velocity vs Supply Flow Rate

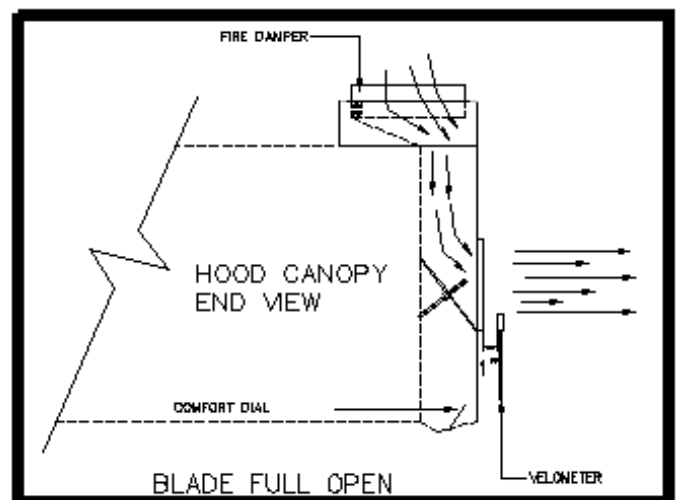
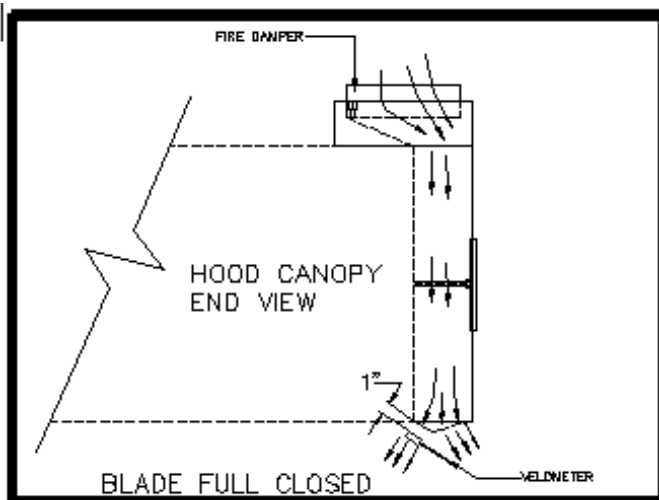
Supply Discharge Velocity		Supply Flow Rate	
fpm	m/s	CFM/ft	l/s/m
400	2.1	120	186
600	3.1	180	372
800	4.1	240	372
1000	5.1	300	466

*Chart No.2*

## MEASURING THE SUPPLY AIRFLOW - MB

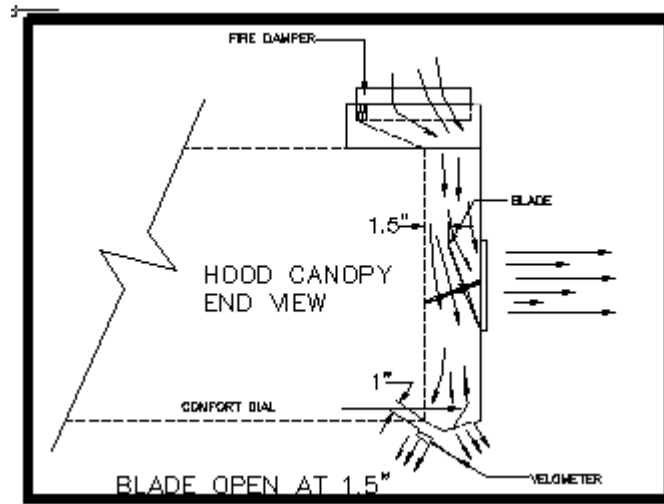
### Measuring the total supply fan airflow through the Blade:

- \_\_\_ 1. Remove Blade front discharge perforated panel with appropriate tools.
- \_\_\_ 2. Turn Blade's threaded rod counter-clockwise until the Blade comes to a fully open position, which is required to determine the total supply volume at each hood.
- \_\_\_ 3. Turn supply fan on.
- \_\_\_ 4. Re-install Blade front discharge perforated plate with appropriate tools.
- \_\_\_ 5. Take velocity reading across the perforated plate as shown in the diagram below. Take two vertical readings, one at 2" from the bottom of perforation and one at 4". Repeat these horizontal readings every 12" along the hood.
- \_\_\_ 6. Total all readings and divide by the number of reading to determine the average velocity.
- \_\_\_ 7. Multiply the average velocity x 72 x length of perforated panel (in inches) to determine the total CFM per perforated panel. (It is critical to take the velocity readings 1" off the surface of the perforated panel to use this formula).
- \_\_\_ 8. If the total supply volume was not correct and Spring Air Systems provided the supply fan/unit then adjust the supply volume at the fan/unit or at field supplied balancing dampers. If the supply fan/unit was not provided by Spring Air Systems advise the general contractor to adjust the supply air volume and do not proceed unit the volume has been correct. The total supply volume required can be found on the Spring Air Systems shop drawings.



## Measuring supply airflow through the Custom Comfort Dial:

1. Remove Blade front discharge perforated panel with appropriate tools.
2. Turn Blade's threaded rod clockwise until the blade is 1.5 inches off the vertical front surface of the hood. See diagram below.
3. Set the velometer parallel to the bottom discharge with the face open perpendicular to the perforated screen where the air discharges and take a reading every 12" apart for the full length of the hood. See diagram below.
4. Total all velocity readings and divide by the number of reading to determine the average velocity.
5. Refer to Custom Comfort Dial Velocity Chart below. Based on the hood length and the temperature rating indicated on the UL/ULC plate determine the Custom Comfort Dial Velocity.
6. If the measured average velocity is too high, turn the Blade threaded rod counter-clockwise 5 times. Re-measure average velocity. Repeat until the measured velocity at Custom Comfort Dial is correct.
7. If the measured average velocity is too low, turn the Blade threaded rod clockwise 5 times. Re-measure average velocity. Repeat until the measured velocity of Custom Comfort Dial is correct.



**FN or FB Hood Custom Comfort Dial Velocity Chart**

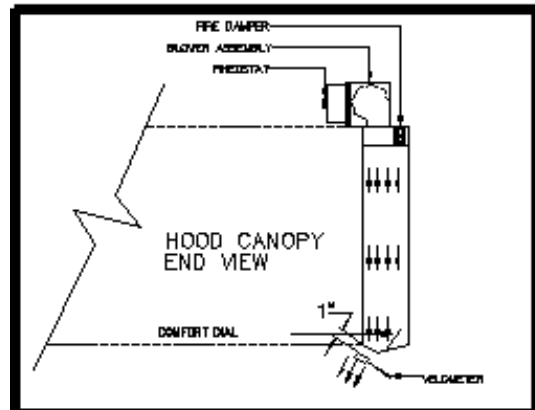
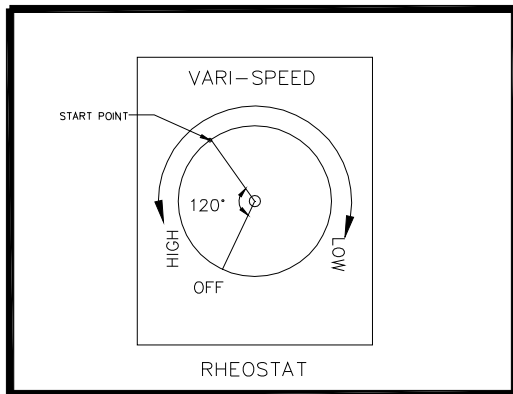
APPLIANCES	TEMP.	Hood Length (ft)	CCD VELOCITY (fpm)	
			FRONT	SIDE FLOW
			Set point	Set point
Heavy - Charbroiler	600 <sup>0</sup> F	9 - 14	500	450
Heavy - Charbroiler	600 <sup>0</sup> F	6 - 9	500	450
Heavy - Charbroiler	600 <sup>0</sup> F	4 - 6	550	450
Heavy - Charbroiler	600 <sup>0</sup> F	Up to 4	550	450
Medium - Griddle, fryer	400 <sup>0</sup> F	9 - 14	450	400
Medium - Griddle, fryer	400 <sup>0</sup> F	6 - 9	450	400
Medium - Griddle, fryer	400 <sup>0</sup> F	4 - 6	450	450
Medium - Griddle, fryer	400 <sup>0</sup> F	Up to 4	450	450

## MEASURING THE SUPPLY AIRFLOW - MJ

The supply air is measured along the bottom inside discharge opening of the make up air plenum. To ensure accurate results take a reading every one foot along the length of the ventilator.

### Measure supply air flow through comfort dial:

- \_\_\_ 1. Ensure the MJ blowers are powered when the exhaust fan is activated.
- \_\_\_ 2. Locate the rheostat on the back of the MJ Blower which is on top of the MJ plenum.
- \_\_\_ 3. Turn the rheostat 120 degree clock-wise to activate the MJ blower.
- \_\_\_ 4. Set the velometer parallel to the bottom discharge with the face open perpendicular to the perforated screen where the air discharges and take a reading every 12" apart for the full length of the hood. The first reading should be one inch from the end and continue every twelve inches to the opposite end of the ventilator.
- \_\_\_ 5. Total all velocity readings and divide by the number of readings to determine the average velocity.
- \_\_\_ 6. Refer to Custom Comfort Dial Velocity Chart below. Based on the hood length and the hood temperature rating indicated on the UL/ULC plate determine the Custom Comfort Dial velocity on the chart.
- \_\_\_ 7. If the measured average velocity is not correct adjust the rheostat as follows: Rotate clockwise for lower or counterclockwise for higher velocity. Retake the velocity reading to confirm the recommended set point.



**FN or FB Hood  
Comfort Dial Velocity Chart**

APPLIANCES	TEMP.	Hood Length (ft)	CD VELOCITY (fpm)	
			FRONT	SIDE FLOW
			Set point	Set point
Heavy - Charbroiler	600 <sup>0</sup> F	9 - 14	500	450
Heavy - Charbroiler	600 <sup>0</sup> F	6 - 9	500	450
Heavy - Charbroiler	600 <sup>0</sup> F	4 - 6	550	450
Heavy - Charbroiler	600 <sup>0</sup> F	Up to 4	550	450
Medium - Griddle, fryer	400 <sup>0</sup> F	9 - 14	450	400
Medium - Griddle, fryer	400 <sup>0</sup> F	6 - 9	450	400
Medium - Griddle, fryer	400 <sup>0</sup> F	4 - 6	450	450
Medium - Griddle, fryer	400 <sup>0</sup> F	Up to 4	450	450

## Other Fine Products From



- RevLow Hoods
- DynaFlow Hoods
- TruFlow Energy Management Systems
- UL/ULC Listed Pollution Control Systems
- Dry Extractor Hoods
- Catridge Hoods
- Filter Hoods
- Water Wash Ventilators
- Surface Fire Suppression
- Commercial Kitchen Exhaust Fans
- Commercial Kitchen Supply Units
- Utility Distribution Systems

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