FANS, BLOWERS, LOUVERS AND VENTS OVERVIEW

Before choosing a thermal management solution, you need to carefully consider the specifics of your application in addition to the following factors:

- Fan packages and blowers may introduce ambient contaminants like oil mist and dust into the enclosure
- Heat exchangers (this section) cannot cool below the ambient temperature
- Closed-loop air conditioners can cool below ambient temperature and reduce humidity without introducing contaminants
- Simple ventilation devices such as louvers or grilles and filters are appropriate if maintaining a cool, constant temperature is not a critical factor

Once you have determined the proper form of cooling equipment you need, selecting the required cooling capacity is outlined in this section.

DETERMINE THE REQUIRED FAN/BLOWER SIZE (VOLUME AIRFLOW)

Step 1. Select the product family which best fits your application:

- Compact Cooling Fans (economical fan with no filter)
- Cooling Fan Packages (economical fan package with low-density filter)
- Type 12 Cooling Fan Package
- Filter Fan Packages (high-tech fan package with high-density filter, for IP54 rating)
- Blower Package (centrifugal blower package with filter for densely packed enclosures)

Step 2. Determine the internal heat load in Watts (W).
1 W = 3.413 BTU/Hr.

Step 3. Determine desired temperature difference in degrees F.
Determine the ΔT (F), the temperature difference between the maximum temperature outside the enclosure (T_o) and the maximum desired temperature inside the enclosure (T_i).
$T_o - T_i = \Delta T$ for heat exchangers and fans
NOTE: 1 C ΔT = 1.8 F ΔT

Step 4. Plot your application using the selection graph to the right.

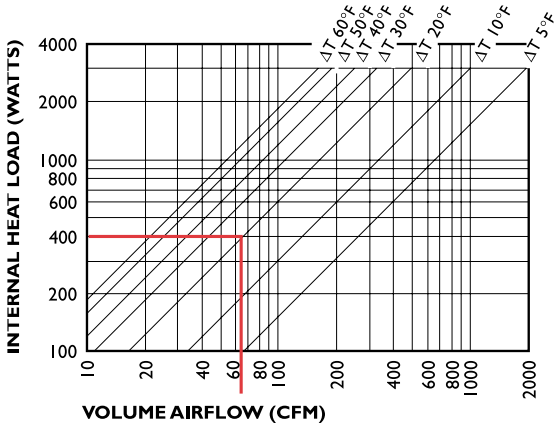
- Find Watts (internal heat load) on the vertical scale
- Draw a horizontal line across to the intersection point with the diagonal line representing your ΔT
- Extend a vertical line down to the horizontal scale to determine your CFM requirement
- Continue the vertical line to identify applicable fan or blower

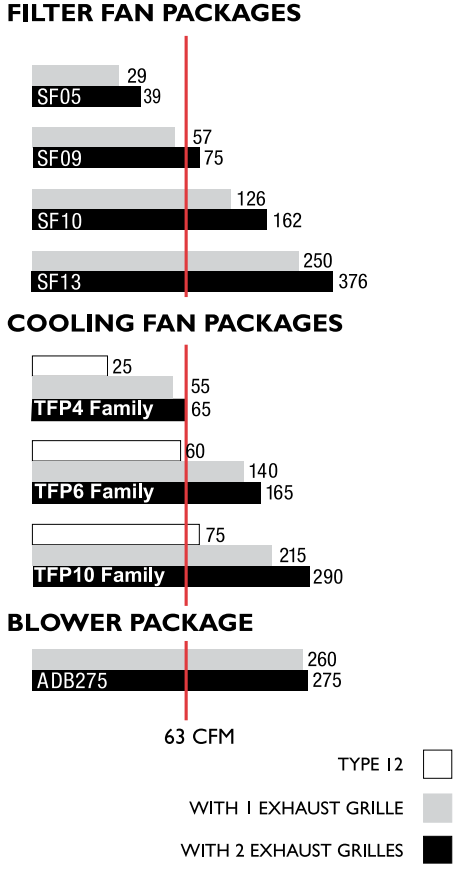
A sample line is shown in red for a 400 W heat load and a ΔT of 20 F, which indicates a 63 CFM airflow requirement.

Step 5. Make sure the line intersects the bar which includes the exhaust grille kit(s) from the product family chosen in Step 1.
Remember, actual airflow going through your enclosure may be less depending on how densely packed your enclosure is.
Fan output (CFM) is reduced by 10-15% when operated at 50 Hz.

Or calculate using the formula:
CFM = (3.16 x W) / ΔT (°F)
Where:
Watts = Internal Heat Load in Watts
ΔT = Internal Temperature minus Ambient Temperature in °F
CFM = Required airflow in ft.^{3}/min.
Example:
An internal heat load of 400 W requires airflow of about 63 CFM to maintain the enclosure at a ΔT of 20 F above the ambient temperature.

CFM = (3.16 x W) / ΔT (°F) ≈ 63 CFM





HOW TO READ FILTER FAN PACKAGE CATALOG NUMBERS

Filter Fans
SF - 05 - 1 - 6 - 001
SF = Filter fan
05 = Approximate size of fan frame (i.e., 05 = 5")
1 = 115 Volt, or 2 = 230 Volt
6 = 50/60 Hz
001 = Standard model

Exhaust Grille Kit
SG - 0500 - 001
SG = Exhaust grille kit
0500 = Approximate size of fan frame (i.e., 05 = 5")
001 = Standard model

COOLING PRODUCT SELECTION APP

MCLEAN PENTAIR
Prod. Select

Designed to assist you in determining the most suitable choices of air conditioners, heat exchangers or fans for your application. Download a free copy of our selection software by visiting our web site: hoffmanonline.com.
Click on **Cooling** chapter.

COOLING FAN AND BLOWER SELECTION

Cooling Fan Packages

CFM	Cooling Fan Packages
55	TFP41, TFP42
140	TFP61, TFP62
215	TFP101, TFP102

CFM is with one exhaust grille @ 60 Hz.

Filter Fan Packages

CFM	Filter Fan Packages
29	SF05
57	SF09
126	SF10
250	SF13

CFM is with one exhaust grille @ 60 Hz.

Blower Package

CFM	Blower Package
260	ADB275

CFM is with one exhaust grille @ 60 Hz.

COMPACT COOLING FANS

Catalog No.	Diameter in./mm	Square in./mm	Depth in./mm	CFM@60 Hz (M^3/Hr.)
A4AXFN	— —	4.69 119	1.52 39	100 (170)
A6AXFN	6.72 171	— —	2.00 51	240 (408)
A10AXFN	10.00 254	— —	3.50 89	560 (951)

COOLING FAN PACKAGES

Catalog No.	Diameter in./mm	Square in./mm	Depth in./mm	CFM@60 Hz (M^3/Hr.)
TFP41	6.29 160	7.37 187	2.65 67	55 (95)
TFP61	7.80 198	8.87 225	3.75 95	140 (238)
TFP101	11.81 300	12.99 330	5.25 133	215 (370)

CFMs with single exhaust grille installed.

FILTER FAN PACKAGES

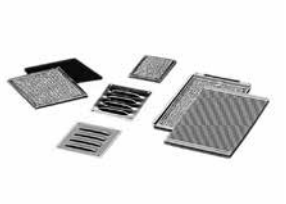
Catalog No.	Diameter in./mm	Square in./mm	Depth in./mm	CFM@60 Hz (M^3/Hr.)
SF05XXXXXXX	5.83 148	5.83 148	2.76 70	29 (49)
SF09XXXXXXX	8.03 204	8.03 204	3.76 96	57 (97)
SF10XXXXXXX	9.84 250	9.84 250	5.20 132	126 (214)
SF13XXXXXXX	12.72 323	12.72 323	6.09 155	250 (425)

CFMs with single exhaust grille installed.

BLOWER PACKAGE

Catalog No.	Diameter in./mm	Square in./mm	Depth in./mm	CFM@60 Hz (M^3/Hr.)
ADB275	5.75 146	19.00 483	7.25 184	230/275 (135/162)

LOUVERS AND VENTS



Three styles of louvers and vents provide passive cooling.