Sizing Guide - Let us do the work

On the following page, EXAIR provides a simple guide to fill in and send to us so we may do the heat load calculations for you and specify a Cabinet Cooler system. You may e-mail the information to techelp@exair.com, call 1-800-903-9247, fill out an online form at exair.com/sizing, use our new calculator at https://exair.co/cccalc_ca or fax the information to 1-866-329-3924.

How To Calculate Heat Load for Your Enclosure

If you would like to determine the correct model for your enclosure without our assistance, it is first necessary to determine the total heat load to which the control panel is subjected. This total heat load is the combination of two factors – heat dissipated within the enclosure and heat transfer from outside the enclosure.

To Calculate Btu/hr.:

1. First, determine the approximate Watts of heat generated within the enclosure. Watts x 3.41 = Btu/hr.
2. Then, calculate outside heat transfer as follows:
   a. Determine the area in square feet exposed to the air, ignoring the top of the cabinet.
   b. Determine the temperature differential between maximum surrounding temperature and desired internal temperature. Then, using the Temperature Conversion Table *(below)*, determine the Btu/hr./ft.^{2} for that differential. Multiplying the cabinet surface area times Btu/hr./ft.^{2} provides external heat transfer in Btu/hr.
3. Add internal and external heat loads for total heat load.

To Calculate Kcal/hr.:

1. First, determine the approximate Watts of heat generated within the enclosure. Watts x .86 = Kcal/hr.
2. Then, calculate outside heat transfer as follows:
   a. Determine the area in square meters exposed to the air, ignoring the top of the cabinet.
   b. Determine the temperature differential between maximum surrounding temperature and desired internal temperature. Then, using the Metric Temperature Conversion Table *(below)*, determine the Kcal/hr./m^2 for that differential. Multiplying the cabinet surface area times Kcal/hr./m^2 provides external heat transfer in Kcal/hr.
3. Add internal and external heat loads for total heat load.

Temperature Conversion Table

Temperature Differential °F	Btu/hr./ft.^{2}
5	1.5
10	3.3
15	5.1
20	7.1
25	9.1
30	11.3
35	13.8
40	16.2

After picking which NEMA integrity you need, choosing your options and calculating your heat load -go to page 212-214 to specify a model number.

See page 216 for HazLoc Cabinet Coolers.

OR Contact EXAIR and we'll walk you right through it.

Temperature Conversion Table (METRIC)

Temperature Differential °C	Kcal/hr./m^2
3	4.5
6	9.7
9	15.1
12	21.0
15	27.0
18	34.0
21	41.0

Example:

Internal heat dissipation: 471 Watts or 1,606 Btu/hr.
Cabinet area: 40 ft.^{2}
Maximum outside temperature: 110°F
Desired internal temperature: 95°F

The conversion table (*above*) shows that a 15°F temperature differential inputs 5.1 Btu/hr./ft.^{2}

40 ft.^{2} x 5.1 Btu/hr./ft.^{2} = 204 Btu/hr. external heat load.

Therefore, 204 Btu/hr. external heat load plus 1,606 Btu/hr. internal heat load = 1,810 Btu/hr. total heat load or Btu/hr. refrigeration required to maintain desired temperature.

In this example, the correct choice is a 2,000 Btu/hr. Cabinet Cooler System. Choose a Cabinet Cooler model by determining the NEMA rating of the enclosure (type of environment), and with or without thermostat control.

Example:

Internal heat dissipation: 471 Watts or 405 Kcal/hr.
Cabinet area: 3.7m^2
Maximum outside temperature: 44°C
Desired internal temperature: 35°C

The conversion table (*above*) shows that a 9°C temperature differential inputs 15.1 Kcal/hr./m^2.

3.7m^2 x 15.1 Kcal/hr./m^2 = 56 Kcal/hr. external heat load.

Therefore, 56 Kcal/hr. external heat load plus 405 Kcal/hr. internal heat load = 461 Kcal/hr. total heat load or Kcal/hr. refrigeration required to maintain desired temperature.

In this example, the correct choice is a 504 Kcal/hr. Cabinet Cooler System. Choose a Cabinet Cooler model by determining the NEMA rating of the enclosure (type of environment), and with or without thermostat control.

Cabinet Cooler® System Sizing Guide

Deliver your Data – Receive a Quote

Use this form to gather the information necessary to specify a Cabinet Cooler System and choose a delivery method below.

submit online
www.exair.com/sizing.htm

Call us at
1-800-903-9247

TO QUICK MOBILE VERSION
https://exair.co/qr-ccszg

Online chat with us at
www.exair.com

Calculate Yourself
https://exair.co/cccalc_ca

We'll respond with our recommended solution within 24 hours.

Send Us The Facts!

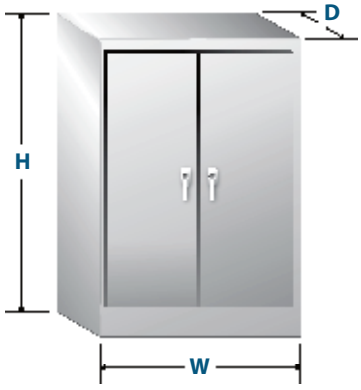
Cabinet Cooler Sizing Guide

To: Application Engineering Department, EXAIR® Corporation

From:
Name _____
Company _____
FAX number _____
Phone number _____ **Ext.#** _____
E-mail _____

In a hurry? For help NOW, call our Application Engineering Department at 1-800-903-9247
You can fill this form out online at: www.exair.com/sizing.htm

I have completed the information below. I want to know which EXAIR Cabinet Cooler® System is the best choice for my control panel.



1. Height (H)_____ 2. Width (W)_____ 3. Depth (D)_____
4. *External air temperature now?_____°F or °C
5. *Internal air temperature now?_____°F or °C
6. Maximum external air temperature possible?_____°F or °C
7. Maximum internal air temperature desired?_____°F or °C
8. My cabinet rating is: ☐ NEMA 12 ☐ NEMA 4 ☐ NEMA 4X
   ☐ Other (explain) _____
   _____
9. My cabinet is in an area with a hazardous classification: ☐ NO: ☐ YES
10. My cabinet is (check all that apply): ☐ Vented - outside air circulates through the enclosure
    ☐ Not Vented - outside air does not circulate through the enclosure
    ☐ Wall mounted
    ☐ Fan(s)/Vent(s) - Indicate diameter or SCFM _____
    Number of fans/vents _____
11. Available voltage for thermostat control: ☐ 24 VDC ☐ 110 VAC ☐ 240 VAC

TECHELP 1-800-903-9247 DIRECT

*Using a "Temperature Gun" or infrared thermometer will result in measuring surface temperatures. Air temperatures are needed for the cabinet cooling calculations. Please use a standard thermometer or thermocouple to measure the air temperature.

For Technical Assistance, Call An EXAIR Application Engineer 1-800-903-9247
Toll Free FAX (866) 329-3924 • E-mail: techelp@exair.com • www.exair.com
blog.exair.com @EXAIR