

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 techhelp@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. $\text{Watts} \times 3.41 = \text{Btu/hr.}$
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.

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

To Calculate Watts:

1. First, determine the approximate Watts of heat generated within the enclosure.
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 Watts/m² for that differential. Multiplying the cabinet surface area times Watts/m² provides external heat transfer in Watts.
3. Add internal and external heat loads for total heat load.

Temperature Conversion Table (METRIC)	
Temperature Differential °C	Watts/m ²
3	5.2
6	11.3
9	17.6
12	24.4
15	31.4
18	39.5
21	47.7

After picking which NEMA integrity you need, choosing your options and calculating your heat load -go to page 222-224 to specify a model number.

See page 226 for HazLoc Cabinet Coolers. See page 228 for ATEX Cabinet Coolers.

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

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

$40 \text{ ft.}^2 \times 5.1 \text{ Btu/hr./ft.}^2 = 204 \text{ Btu/hr.}$ 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

Cabinet area: 3.7m²

Maximum outside temperature: 44°C

Desired internal temperature: 35°C

The conversion table (above) shows that a 9°C temperature differential inputs 17.6 Watts/m².

$3.7\text{m}^2 \times 17.6 \text{ Watts/m}^2 = 65.1 \text{ Watts}$ external heat load.

Therefore, 65.1 Watts external heat load plus 471 Watts internal heat load = 536.1 Watts total heat load or Watts of refrigeration required to maintain desired temperature.

In this example, the correct choice is a 586 Watt 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.

EXAIR® 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-pro-ccsg>



Online chat with us at
www.exair.com



Calculate Yourself
<https://exair.co/04-CCcalc>

Send Us The Facts!

Cabinet Cooler Sizing Guide

To: Application Engineering Department, **EXAIR®**

From: Name _____

Company _____

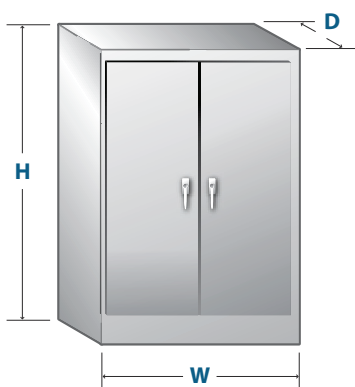
FAX number _____

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



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: ☐ YES ☐ NO

10. My cabinet is in an explosive environment: ☐ YES ☐ NO

11. 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 _____

12. Available voltage for thermostat control: ☐ 24 VDC ☐ 110 VAC ☐ 240 VAC



*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.

