Consumption guide for Frigoboat 12/24v keel cooler systems

This guide should be used for estimation purposes only. There are many variables involved that will effect consumption & heat-leak calculations, but if you follow the step-by-step process below it will give approximate figures for estimation purposes.

Step one
Measure the box interior dimensions & calculate the volume in cubic feet.

Step two
Measure or estimate the thickness of the insulation.

Step three
Consult the tables below & find the approximate hourly heat-leak into the box for either a refrigerator or freezer. For a spill-over system, calculate the heat leak for both sides of the box & then add them together.

REFRIGERATOR
Heat leak into box in watts per hour.

Cubic volume	2" insulation	3" insulation	4" insulation	6" insulation
2'	20.7	17.1	13.4	12.2
3'	26.8	20.7	17.1	14.6
4'	30.5	24.4	20.7	17.1
5'	34.2	26.8	23.2	19.5
6'	37.8	30.5	25.6	20.7
7'	41.5	34.2	26.8	23.2
8'	45.1	36.6	29.3	24.4
9'	50.0	40.3	31.2	25.6
10'	53.7	43.9	34.2	26.8
12'	59.8	51.2	36.6	31.2
14'	70.7	57.3	43.9	36.6
16'	85.4	62.2	48.8	41.5
18'	87.8	68.3	59.8	46.4
20'	102.5	73.2	64.7	51.2

Continued over

FREEZER
Heat leak into box in watts per hour.

Cubic volume	2" insulation	3" insulation	4" insulation	5" insulation
2'	37.8	29.3	25.6	22.0
3'	46.4	37.8	31.7	26.8
4'	53.7	42.7	37.8	32.9
5'	59.8	48.8	42.7	36.6
6'	63.4	53.7	46.4	40.3
7'	67.1	59.8	50.0	42.7
8'	72.0	65.9	53.7	46.4
9'	79.3	73.2	58.6	51.2
10'	87.8	80.5	63.4	56.1
11'	97.6	87.8	69.5	62.2
12'	109.8	93.9	76.9	69.5

Step 4
Divide the figure found in step 3 by either 100 for a freezer, or 132 for a refrigerator to find estimated run time per hour. For a spill-over system, use the freezer figure.

Step 5
Multiply the figure found in step 4 by either 3.5 for a freezer or 4.5 for a refrigerator to find estimated current draw in amp-hours. For a spill-over system use the freezer figure.

Step 6
Multiply the figure found in step 5 by 24 to find approx. amp-hour consumption per 24 hours

Example
12 cu ft refrigerator box with 3" insulation

Step 3 From tables, estimated heat leak is 51.2 watts/hour

Step 4 Estimated run time per hour = 51.2/132 = 0.38 hours/hour

Step 5 Estimated current draw = 0.38 x 4.5 = 1.74 amp-hours/hour

Step 6 Estimated daily consumption = 1.74 x 24 = 41.9 amp-hours/24 hours

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