EarthLinked®
SYSTEM SIZING GUIDE
AIR COOLING

EARTHLINKED TECHNOLOGIES

This worksheet applies to systems using a DX air handler or cased coil to supply cooling in a climate where the <u>cooling load of the structure dominates.</u>

1. Determine heating and cooling requirements of the structure, based on **ACCA Manual J (latest edition)** procedure using the **99.6% heating design temperature** and the **0.4% cooling design temperature** from the **<u>EarthLinked® System Sizing and Performance Tables.</u>** Elite RHVAC or Wrightsoft Right-J software is recommended.

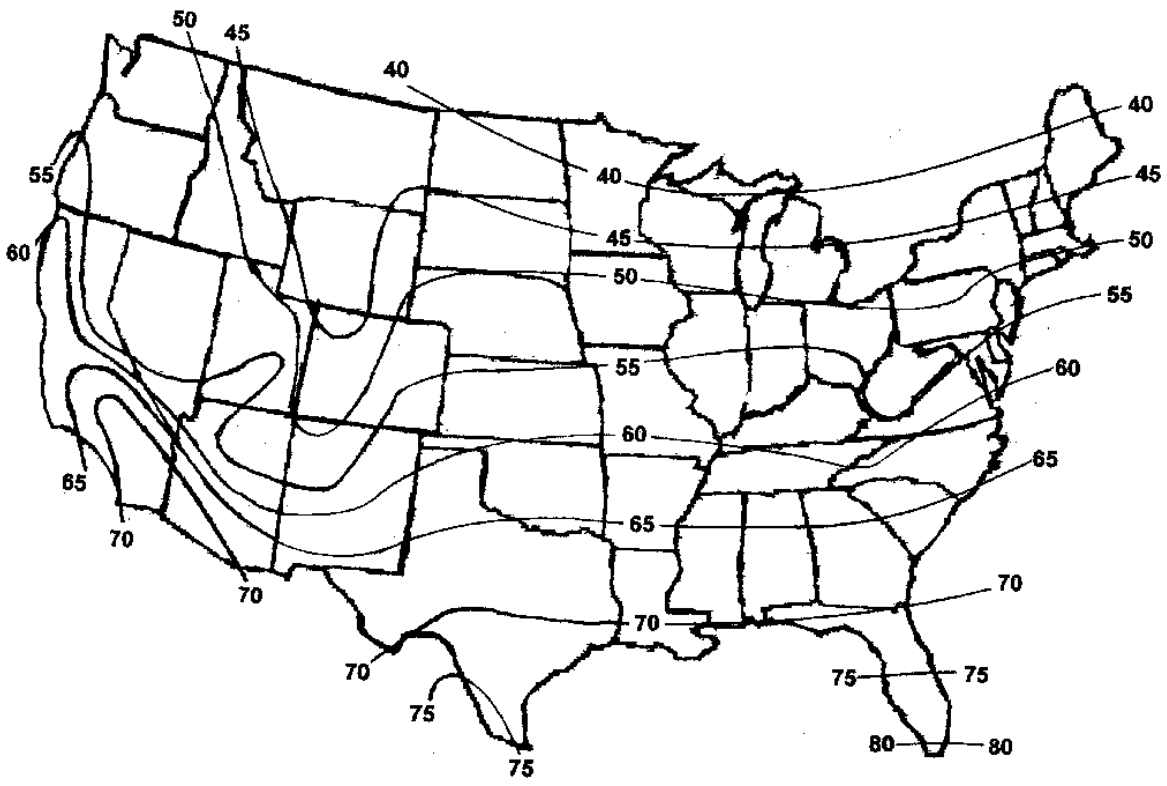
   If domestic water heating by Heat Recovery Module (HRM) is part of the system, add 1,000 BTUH for each adult and child to the <u>Design Heating Load</u>.

   If domestic water heating by Domestic Water Module (DWM) is part of the system, add 1,000 BTUH for each adult and child to the <u>Design Heating and Cooling Loads</u>.

   Summer Design Temp: _____ °F Total Cooling Load: _____ BTUH
   Winter Design Temp: _____ °F Sensible Cooling Load: _____ BTUH
   Design Heating Load: _____ BTUH

2. Determine local earth temperature from Temperature Map:

   Site Location: _____ (city) _____ (state/prov.) Earth Temp.: _____ °F



EARTH TEMPERATURES IN CONTIGUOUS UNITED STATES AND SOUTHERN CANADA

EARTHLINKED TECHNOLOGIES

3. Locate the System Performance Data for **Air Cooling** based on the following parameters:

   - Local Earth Temperature: _____ °F (enter temperature from map)
   - Earth Loop Configuration: _____ (V1, H1, etc. based upon available land area and geology of the earth at the site)

4. **Cooling Output Capacity**

   The size of the system will be determined by the **DESIGN Total and DESIGN Sensible cooling outputs** from the appropriate Air Cooling Performance Table selected based on steps 2 and 3 above. **The initial selection of a system size (capacity) should have DESIGN Total and DESIGN Sensible cooling outputs of 105% of the total and sensible cooling loads, respectively. Enter information below:**

System Size	DESIGN Cooling (100% Load)		Cooling Load	
_____ Tons	Total: _____	BTUH	Total: _____	BTUH
	Sensible: _____	BTUH	Sensible: _____	BTUH

   Is **Total Cooling Output** greater than Total Cooling Load? ☐ YES ☐ NO

   Is **Sensible Cooling Output** greater than Sensible Cooling Load? ☐ YES ☐ NO

   EarthLinked® compressor units that provide space cooling shall be equipped with the **EarthLinked® Hybrid Cooling Module** when (1)required by the performance tables OR (2) where BOTH of the following circumstances occur:

   - Ambient outdoor temperatures have exceeded the outdoor summer design temperature conditions for at least 7 hours of continuous system run time, coupled with the conditions described in the next sentence.
   - Low thermal conductivity soils do not effectively absorb and dissipate heat. Examples of such soils are light dry soil, dry sand, peat and organic soils, dry clay soils and hardpan.

   The following table provides the appropriate Hybrid Cooling Module size for the compressor unit selected, based on the foregoing system sizing process.

Compressor Unit Size	Hybrid Cooling Module Model
	R-410A
-018 thru -036	HCM-1836C
-042 thru -072	HCM-4272C

   No Cooling capacity or efficiency adjustments are necessary for the addition of the Hybrid Cooling Module (HCM) to the system.

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NOTE: If air handler or cased coil are more than 40 feet higher than the compressor unit, call ETI Technical Support before specifying.

5. From the appropriate performance table and the system selected for cooling, determine the DESIGN heating capacity for the system. This heating capacity must be equal to or greater than the heating load.

System Size	Design Heating (100% Load)	Heating Load
_____ **Tons**	_____ **BTUH**	_____ **BTUH**

Check to see that the heating output is at least 100% of the Heating Load.

Is the DESIGN Heating at least 100% of the Heating Load? ☐ YES ☐ NO

Supplemental heat (electric strip heat) of at least 20% of the heating load is required.

6. Final system size is as follows:

System Size: _____ Tons

Compressor Unit Model: _____

Air Handler/Cased Coil Model: _____

Supplemental Electric Heat: _____ KW

Earth Loop Model: _____

Domestic Water Module Model: _____

Heat Recovery Module Model: _____

7. **Balance Point Temperature**

The balance point temperature for a heating system must be determined **if an outdoor thermostat is installed to initiate supplemental heat.** The outdoor thermostat set point is adjusted to be the balance point temperature.

For EarthLinked® R-410A systems two values must be known to determine balance point temperature:

- **Heating output capacity @ design point (100% Load)**, determined in 5.
- **Heating output capacity @ 5% Load**, determined by the procedure that follows.

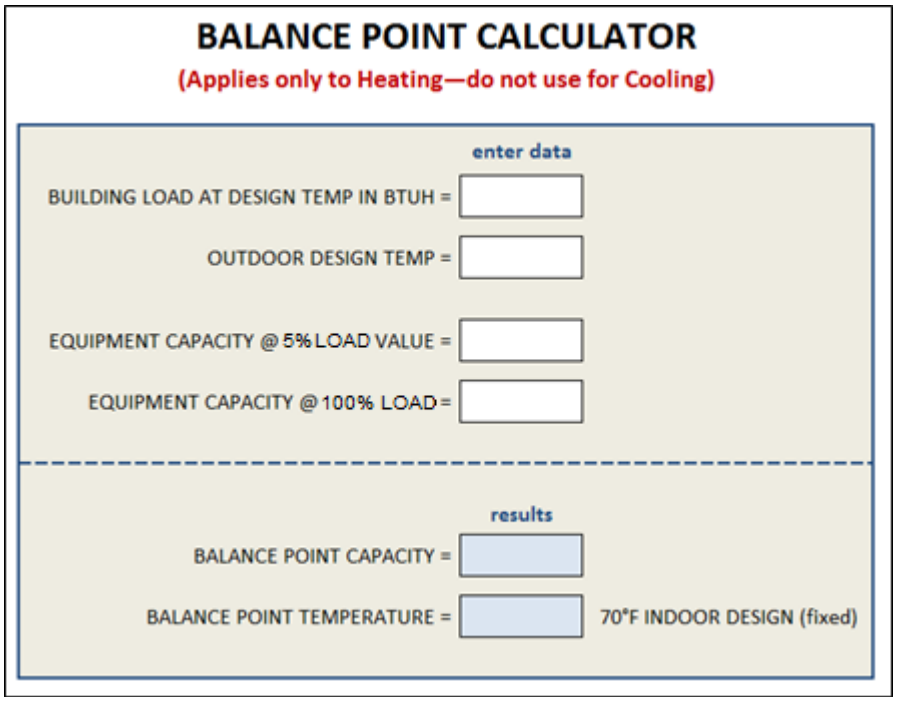
Heating output capacity @ 5% Load is the MAXIMUM heating capacity taken from the performance table for the specific system selected.

With the above information and the building heating load determined by the Manual J method, access the Earthlinked Technologies website at www.earthlinked.com to access the **Balance Point Calculator.**

Under the heading **"Dealer Info",** scroll down and click on **"Dealers Login only".**

Go to **"Dealer Resource Center"** and scroll down to **"Forms and Policies".**

Click on **"Balance Point Calculator"** and you will see the following:



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EARTHLINKED TECHNOLOGIES

Under "ENTER DATA", input the values for Building Design Heating Load (from 1.); Outdoor Winter Design Temperature (from 1.); Heating Output (Equipment) Capacity @ 5% Load (from 7.above); and Heating Output (Equipment) Capacity@ Design (100% Load) (from 5.).

The resulting balance point capacity and temperature can be read under "RESULTS".

Balance Point Capacity = _____ **BTUH**

Balance Point Temperature = _____ **°F**