COOL SMART 2014 AC Design Procedure:
Manual J for Load Calculations
Manual S for Equipment Selection

The COOL SMART program is dedicated to reducing electric consumption through industry standard design and equipment selection procedures. Customer comfort and economy can coexist, with proper system sizing a key component.

COOL SMART requires load calculations and proper system sizing for contractors to be eligible for our packaged incentives (Standard Replacement and Early Replacement). The ACCA Manual J process will help properly size the building load. The ACCA Manual S procedure re-rates the equipment output to the climate that it will be installed in. The use of Manual S is not required, but is strongly suggested to ensure proper sizing in our climate.

This two step sizing and selection process assures customer comfort and eliminates callbacks, even when using seemingly “low” design temps. Failure to use proper design procedures can cause the selection of:

1-oversized AC equipment that fails to dehumidify, and costs more money to purchase and operate, or

2-undersized equipment that does not provide customer comfort.

These procedures have been developed by ACCA, a voluntary organization of the most successful AC contractors in the country.

This is the Right Way to Right Size.

Manual J Load Calculations (required)

COOL SMART requires the use of the ACCA 99% Design Temperature, (also used by the amended Mass. Energy Code 780 CMR 61). The load should be sized using 75F indoor dry bulb and one of the following outdoor temperatures (use the nearest weather city to the job site)

Boston	87F	Clinton	87F
Otis/E. Falmouth	82F	Fall River	84F
Framingham	86F	Gloucester	86F
Greenfield	85F	Lawrence	87F
Lowell	88F	New Bedford	82F
Pittsfield	84F	Springfield	87F
Taunton	86F	Weymouth	87F
Worcester	83F	Providence, RI	86F
Newport, RI	85F		

COOL SMART allows a +2F variance, in compliance with EPA sponsored ENERGY STAR® Quality Installation certification standards.

Manual S Equipment Selection (strongly recommended)

Performing a load calculation is only the first step in properly sizing an AC system. Contractors should then adjust the output of the AC equipment to match the design conditions for our region. AC equipment is rated under standard AHRI test weather (95F outside/80F indoor dry bulb/67F indoor wet bulb), roughly the weather found in St. Louis or Houston. AC equipment should be re-rated for our climate.

The easiest way to achieve this is to either:

1-adjust the Sensible Heat Ratio on sizing software to 0.85, then installing the size of equipment selected to the nearest half ton (if your software makes equipment size selections) or

2-add the calculated *Sensible Cooling Load* and the *Latent Cooling Load,* and select equipment from OEM data that satisfies this *Total Cooling Load* needed in our climate, not in the testing laboratory.

Some software packages, however, have a non adjustable 0.70 default SHR that can oversize the system recommendation. Care must be taken when using the SHR to select the installation size.

Most contractors find they will have unused latent capacity; Manual S allows that half of the unused latent can be added to the sensible capacity, providing “a little extra” for those days warmer than the design temperature limits.

In general, this process as suggested for our climate will specify an AC system ½ ton larger than the total Manual J load (sensible plus latent), performed to PROPER design conditions.

Use the ACCA Manual J and Manual S processes
to be sure you sell the right size AC system for the job.