SelectTools
for
Water Source Heat Pumps
Version ~~2.00~~ 3.00

Specifications

Date	Revised By	Revisions
25-Mar-05	R. Morfei	Original Release
02-May-05	R. Morfei	Added text for expanding drop-down lists (page 5)
		Added EWT section)(page 14)
		Change number of data sets: 5 was 4 (page 5)
		Added list of data sources (pages 20-21)
		Changed capacity table format at request of Computair (page 30)
03-Jun-05	R. Morfei	Removed option for Large Vertical Extended Range models from table on page 14 (highlighted in blue). Added additional error messages on page 15 to cover this change (highlighted in blue)
10-Jun-05	R. Morfei	Added instructions for calculating both LOW and HIGH speed performance for Console models. Added instructions for calculating performance for both HP motors for Large Verticals.
23-Jun-05	R. Morfei	Added instructions for dealing with flowrates for EWT's below 50°F for specific Sm. Horiz and Sm. Vert models (highlighted in blue, page 15 of 34)
27-Jul-05	R. Morfei	Removed references for all Standard Range Small Horizontals. Changes highlighted in blue (page 14 of 35).
27-Jul-05	R. Morfei	Added requirement for Default Airflow and Fluid Flowrate. Clarified requirement to calculate esp or airflow based on user input. Changes highlighted in blue (pages 11, 19, and 31 of 35).

Table of Contents

Scope
The scope of this project is to improve the efficiency of the existing SelectTools for Water Source Heat Pumps (WSHP) by reducing the number of screens that a user must "pass through" in order to do a selection on a desired WSHP model.

There will be no additional input or output fields added to the program windows, although there may be additional combination edits added to some of the existing input fields, as well as changes to some of the existing combination edits in some of the existing input fields.

As a major change the performance data will be calculated via interpolation from within predetermined tables of established performance values provided by McQuay International. The Computair "engine" will no longer be used for calculating performance. This will allow for an easy update to performance data and well as bring to data in the program up to date.

There will be four (4) sets of performance data: 1 set each for horizontal models, vertical models, large vertical models, and console models (provided by McQuay).

Final completion of the code string and pricing for a selected model will continue to be completed from within the McQuayTools Job Editor.

SelectTools for Unit Ventilator
Version 2.0 for Reps
Window Application Specs

General Guidelines

- The overall operation of the program will NOT change; only the appearance of the windows will be altered. The inputs for the "Selection Criteria" window, as well as the outputs to the "Calculation Results" window, will now all be located in one window. This has been accomplished by increasing the size of the windows to 1024 x 768. The original individual windows were 800 x 600.
- It will be necessary to work with five (5) sets of data. The existing data will be replaced by data in new Microsoft Excel files. The data for these new database files will be provided by McQuay.
- The "Project Details" window will continue to be an individual entity but will also be 1024 x 768 for consistency.
- The number of inputs will not change; only their positions on the windows will change.
- "Selection Criteria", and "Calculation Results" will all be displayed in the same window. There will be neither more nor fewer inputs or outputs. All variable names used by the program should remain the same as in Version 1.44 (HP280105_01_44_001). All output calculations will be done via interpolation. Check the program code from Version 1.30 before creating any new code. <u>It should be possible to reuse some of the original code.</u>
- Some calculations used in Version 1.44 will be reused in Version 2.00. Computair should record the code for these calculations and input fields for reuse by Version 2.00.
- Computair shall capture and reuse all existing Version 1.44 error messages, warning messages, etc. for reuse in Version 2.00. It is Computair's responsibility to also record and reuse the logic that causes the messages to appear. (See APPENDIX, pages 33 - 42, for a list of known messages.)
- The three (3) existing report forms, Tech Data, Summary Data, and Spec Data, will be reused in Version 2.00.

Windows Standards

- The ability to move all windows, including the main program window and any and all pop-up windows, by click-dragging their title bars shall be activated. All windows are to have a titlebar.
- All pull-down lists shall expand to full width of enclosed text; the text can be truncated after a choice is made to accommodate the width of the original cell.
- When a pull-down menu or pull-down list is clicked upon, the entire menu or list shall be displayed unless there is an overriding reason for not displaying the entire menu or list. Computair is to communicate these "overriding reasons" in advance to McQuay before truncating the length of the displayed menus or lists.
- Drop-down lists may extend off the screen to the right depending on their width. This causes the user to lose the ability to use the up/down scroll arrows. If a list seems close to the right side of the screen, have the drop-down menus expand down and to the left instead of down and to the right.
- If a user clicks the primary mouse button within a cell containing a list of choices or, if the user clicks the primary mouse button on the down-arrow to the right of a cell containing a list

of choices, the list shall be vertically displayed until the user clicks on an item in the list, on the opening position of the list, or "clicks away". It will not be necessary for the user to keep the primary mouse button depressed in order to keep the list displayed or move the cursor over the choices in the list as described in the next bulleted item.

- All choices displayed in lists in pull-down menus are to be highlighted blue as the cursor passes over the choice. After a choice has been made by clicking on it with the primary mouse button, it will remain blue until the down arrow in that pull-down or a different pull-down cell has been clicked.
- The <Tab> key on the keyboard may be used to move between input cells in the Selection Criteria portion of the "Selection Criteria-Calculation Results" window.
- The <down-arrow>, <up-arrow>, <left-arrow>, and/or <right-arrow> keys may be used to move between choices within a pull-down menu or pull-down list.
- The <Alt> key may be used in conjunction with the underscored letter in a pull-down menu to display the items in that menu.

Starting/Opening a Job

- All jobs will begin in McQuayTools. A new job will be created or an existing job will be opened in the McQuayTools Job Manager.
- The user will select the SelectTools for Water Source Heat Pumps from a pull-down menu in McQuayTools Job Editor or, the user will double-click on an item in the Job Editor and, if that item was created by the SelectTools for Water Source Heat Pumps, the program will start SelecTools and open the "Selection Criteria-Calculation Results" window with the selected model's original settings.
- McQuayTools will determine, using Windows API functions, whether or not the SelectTools for Water Source Heat Pumps is already running. If it is running, it will be made the active window. If not, McQuayTools will execute the SelectTools for Water Source Heat Pumps with a job identifier as a parameter.
- When the SelectTools for Water Source Heat Pumps program is running, McQuayTools will send the job data to the SelectTools program with the following information:

Description	**Starting Position**	**Length**	**Comments**
Constant "J"	1	1	Job code to indicate to the ATS Selection Program that this is job header data.
Jobnum	2	6	Unique 6 character job identifier created by McQuayTOOLS.
Job Description	8	30	
Rep Name	38	35	Rep company name
Salesman's Initials	73	3	
Entry Date	76	8	Format "MM/DD/YY"
Pricing Date	84	8	Format "MM/DD/YY"

- The SelectTools for Water Source Heat Pumps program should receive the jobdata string and interrogate the first character. The first character of the string will tell the SelectTools for Water Source Heat Pumps program what to do with this string of data being sent. The 'J' indicates that this is job data. The SelectTools for Water Source Heat Pumps program will interrogate the jobnum field to determine if this is a new job or an existing one.
- If new, the SelectTools for Water Source Heat Pumps program should initialize a new job file.
- If it is an existing job, that job should be opened by the SelectTools for Water Source Heat Pumps program and it will bring up a file list showing all quote items that are tied to that job number. This will allow the user to choose on which quote item he wants to work. Additionally, the user will be able to add a new quote item at any time.
- The following pages describe how the user's actions will cause the program to flow through the different windows that make up the program.

Program Window Flow

- The opening splash screen will not change except for the version number that will be Version 2.00. The new version will be displayed on the opening splash screen, in the Help About screen, and in the program InstallShield.
- Following the SelectTools Water Source Heat Pumps Version 2.00 splash screen the program will display the "Open WSHP file" window (see Figure 1 below). The term "List $" has been removed from the right of the word "Rep". Price has never been displayed in this field; the term is extraneous; remove it. The size of this window has not been changed.

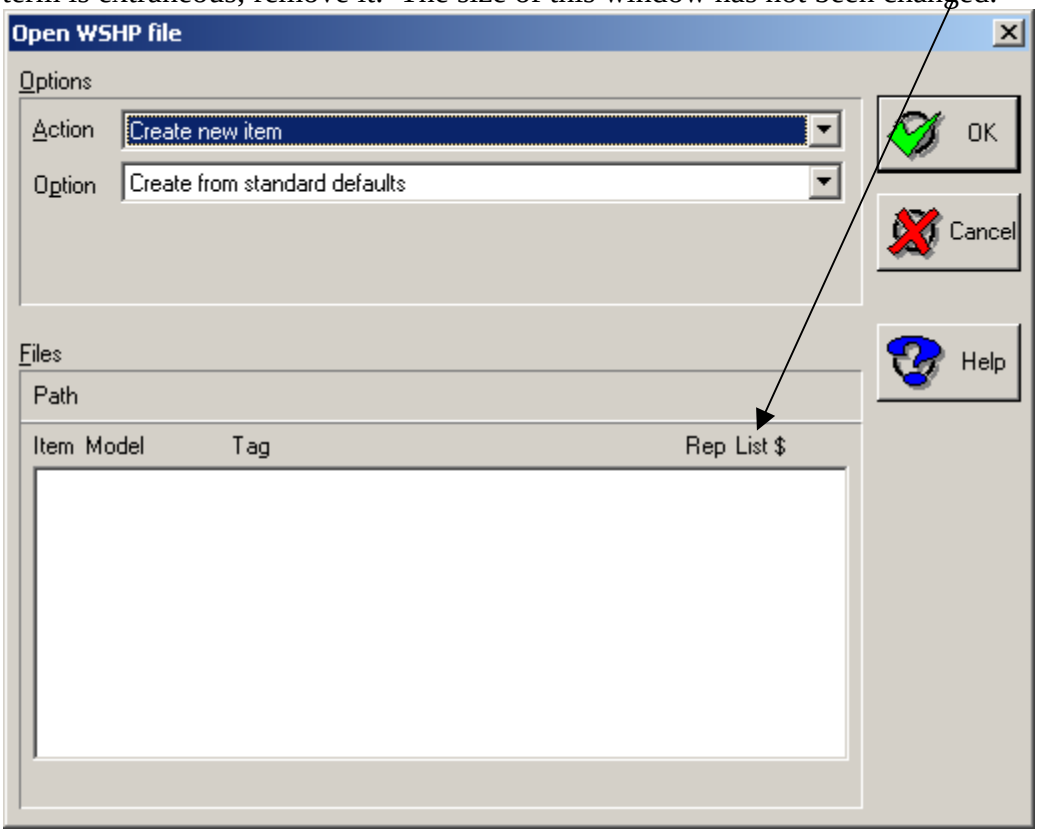


Figure 1

Under "Options":

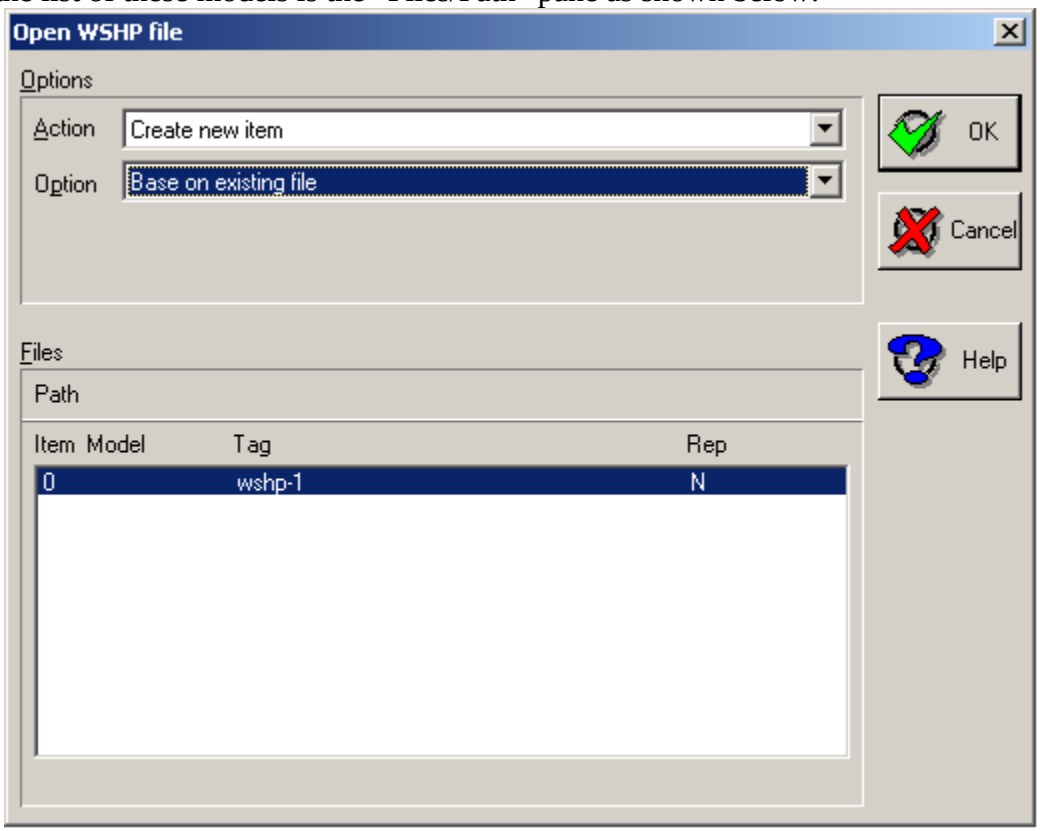
For "Action" the choice will be "Create new item" only.

For "Option" there will be two (2) choices:

- "Create from standard defaults" (*default*)
- "Base on existing file"

- The operation of the "Open Unit Ventilator file" window has not changed. Making any choice except for <Cancel> will take the user to the "Selection Criteria – Calculation Results" window (Appendix - Figure 2) in one of two different ways as follows:
    1. If the user chooses "Create from standard defaults" as the "Option" of choice, the program will open the "Selection Criteria – Calculation Results" window (see APPENDIX, Figure 2) with the default settings. The user will then change any settings as necessary to create a new item.

2. If the user chooses “Base on existing file” as the “Option” of choice, and there are no previously selected models in the Project Details screen, the program will display a blank “Files/Path” pane as shown above and the <OK> button will be rendered inactive. The <OK> button will remain inactive until the user changes the “Option” setting to “Create from standard defaults”. The user may also opt to click the <Cancel> button with the program performing as explained below.
3. If the user chooses “Base on existing file” as the “Option” of choice, and there are previously selected models in the “Project Details” window, the program will display the list of these models is the “Files/Path” pane as shown below:



4. The user will then choose the model on which to base the next selection by either
    a) clicking on the model of choice and then clicking on the <OK> button or,
    b) double-clicking on the model of choice.

    The user is allowed to select one, and only one, of the models displayed in this section of the window. Either method used will cause the program to open the “Selection Criteria – Calculation Results” window with the settings of the selected model displayed except for the selected model’s “Tag”; the “Tag” field shall be blank. The “Calculation Results” function shall not be performed until the “Tag” field has been populated. (A description of the “Calculation Results” function follows later in this document.)
5. If the user is at the “Open WSHP file” window and clicks the <Cancel> button, the program will progress to the “Project Details” window (see APPENDIX, Figure 3).

Toolbar Menus (New Functions Added)

- The toolbar menus at the top of the window will be "File", "Defaults", "Options", and "Help". The existing "File", "Options", and "Help" menus will not change.
- **NEW FUNCTION:** "Defaults" will be a new pull-down menu. This new menu is patterned after the menus in the SelectTools for Enfinity WSHP and the SelectTools for Unit ventilator programs. Computair should review the coding for this feature in Enfinity to determine if any of the code, windows, etc. can be used by the WSHP program.
- The menu heading will be "Defaults" as shown in Figure 3. The menu choices will be "Job Defaults" and "User Defaults".
- If a user chooses one of these menu options, the program will open the appropriate "Default Settings" window (APPENDIX, Figures 4 and 5). There are two windows: one for "User Defaults" and one for "Job Defaults". These windows are already used by the SelectTools for Enfinity WSHP program. Computair should be able to use the same windows for this program. For the most part this new function for SelectTools for Water Source Heat Pumps works the same way that it does for the Enfinity program. Computair shall review the code used by the Enfinity program and determine if it can be used by the WSHP program either in its entirety or some modified version.
- If the user chooses "User Defaults" from the "Defaults" menu, the program will open the "User Defaults" window. The user may choose to change any or all of the Factory Settings displayed when the window first opens. After the desired changes, if any, have been made, the user may click one of the three buttons in the window with resulting actions as follows:
    1. <Save User Settings>: this will store any changes made to the settings as the new Default Settings for the program. Any time the program is opened the new settings will be displayed in the "Selection Criteria/Calculation Results" window. The user is still allowed to change any of the new default settings in the "Selection Criteria/Calculation Results" window without changing the User Default Settings. The program will always use the settings used in the "Selection Criteria/Calculation Results" window to perform any and all "Calculation Results".
    2. <Restore Factory Defaults>: this will change the last "User Defaults" for the program, if any, to the factory provided defaults, i.e. 80, 67, etc. These defaults will remain in effect until the user changes them.
    3. <Cancel>: this cancels the actions taken during this session of "User Defaults". The program will continue to use the last User Defaults saved by the program.
- If the user chooses "Job Defaults" from the "Defaults" menu, the program will open the "Job Defaults" window. The user may choose to change any or all of the Factory Settings, or previously saved Job Defaults, displayed when the window first opens. After the desired changes, if any, have been made, the user may click one of the three buttons in the window with resulting actions as follows:
    1. <Save User Settings>: this will store any changes made to the settings as the new Default Settings for the job. Any time the program opens this job the new settings will be displayed in the "Selection Criteria/Calculation Results" window. The user is still allowed to change any of the new default settings in the "Selection Criteria/Calculation Results" window without changing the Job Default Settings. The program will always use the settings used in the "Selection Criteria/Calculation Results" window to perform any and all "Calculation Results".

2. <Restore Factory Defaults>: this will change the last "Job Defaults" for the job, if any, to the factory provided defaults, i.e. 80, 67, etc. These defaults will remain in effect for the job until the user changes them.
3. <Cancel>: this cancels the actions taken during this session of "Job Defaults". The program will continue to use the last Job Defaults saved with the job.

- On any particular job, "Job Defaults" will take precedence over "User Defaults".

The "Selection Criteria-Calculation Results" Window

- The new "Selection Criteria-Calculation Results" in version 2.00 window replaces the original two windows – "Selection Criteria" and "Calculation Results" – that were in version 1.44 of the SelectTools for Water Source Heat Pumps program.
- To accomplish this the window size must be increased from 800 x 600 to 1024 x 768.
- It will be absolutely imperative to minimize all unused space between input cells.
- Details for the new window can be seen in the APPENDIX, Figure 2.
- If the user has proceeded to the "Selection Criteria-Calculation Results" window by choosing "Create from standard defaults" as the "Option" in the "Open WSHP file" window, the default settings for the input fields will be as shown in Figure 2 in the APPENDIX.
- The "Selection Criteria-Calculation Results" window will open with two (2) of the three (3) buttons active:
    - Previous <Project Details>
    - Next <Calculation Results>

  The operation of all three buttons is explained later in this document (see "Operation of <Calculation Results> and <Project Details> Buttons").
- Changes to the following input fields maybe selected from pull-down lists only and may not be "keyed-in" by the user:
    - Unit Type
    - Hertz
    - Electrical Supply
    - Unit Size
    - Motor Type
    - Glycol Type
- The only choice for "Selection Type" (lower left section) will be "Rating". All program code for this section related to the "Selection Type"="Coil Selection" can be left in the program for future reference but it should be "rem'd out". This will be reactivated in a future version of the program. The Selection Type area of the screen may be rendered inactive for now.

- The changes to the following input fields shall be "keyed-in" by the user:
    - Tag
    - Quantity (Default: 1; maximum allowed value: 999)
    - Airflow (Default: nominal for model size. See Airflow-esp table in "<*Respective Product*>_Data.xls" files)
    - ESP (Default: Blank)
    - Flow Rate (see APPENDIX, Figure 8 for table of Default Fluid Flowrates)
    - Glycol Content (Default: 0%)
    - Cooling Entering DB (Default: 80)

- Cooling Entering WB (Default: 67)
- Cooling Entering Fluid (Default: 85)
- ESP (Default: leave blank)
- Heating Entering DB (Default: 70)
- Heating Entering Fluid (Default: 70)

- The "Selection Criteria-Calculation Results" window is divided into two sections. In version 1.44 they would have been described as the "Selection Criteria" section and "Calculation Results" section.

The data for populating certain fields in the "Settings" section (left-hand portion of window) will be provided by McQuay International in the form of a Microsoft Excel workbook.

It is assumed Computair will create whatever "conversion utility" software solution is required, if not already available, to convert the data in the Excel files into a format and form to be used by the existing program database file(s) currently located in the installed program's folders.

Computair should be able to complete this "utility" without actual possession of the required files. Sample Excel files of the same physical structure as the required files can be supplied by McQuay International, if desired. Computair should have this conversion program ready for the files to be supplied by McQuay in the first week of April 2005.

Operation of <Calculation Results> and <Project Details> Buttons (MODIFIED FUNCTION)

- While the user is entering the required data in the "Selection Criteria-Calculation Results" window, the "Previous <Project Details>" button, the "Next <Calculation Results>" button, and the <Exit> button will be active. The "Next <Project Details>" button will be inactive.
- If at any time during the data input process the user clicks the "Previous <Project Details> button, the program will return the user to the previous "Project Details" window. The program will not retain the data input in the "Selection Criteria-Calculation Results" window by the user before taking this action. All data for that current item's selection will be lost. The user does <u>not</u> need to be notified of this fact with any kind of message.
- After completing/entering all of the required inputs in the left-hand portion of the "Selection Criteria-Calculation Results" window, the program will be ready to calculate the results for the user's selection.
- The user must now click the <Calculation Results> button. Upon completion of this action by the user, the program will calculate the required performance data and display it in the correct portion of the window. The <Calculation Results> button will become inactive; the "Next <Project Details>" button will become active. The "Previous <Project Details>" button and the <Exit> button will remain active through the entire selection process. The calculation of performance data for horizontal, vertical, large vertical, and console models will require separate database files to be supplied by McQuay.
- Once the performance data has been displayed in the window, the user may choose to send the selection to the "Project Details" window. The user will accomplish this action by clicking the "Next <Project Details>" button. Upon completion of this action by the user, the program will send the selection along with all of its data to the "Project Details" window.

How the program accomplishes this has not changed. Computair should have captured the code from Version 1.44 for reuse in Version 2.00.

- If the user chooses to make a change to any of the input fields, whether pull-down or key-in, the previously displayed calculations will be cleared from the Calculation Results portion of the window, the <Calculation Results> button will become active, and the "Next <Project Details>" button will become inactive. This will be allowed to continue until the user either:
    1. Sends the completed selection to the Project Details widow by clicking the "Next <Project Details>" button or,
    2. Aborts the selection by either returning to the previous Project Details windows or,
    3. Aborts the selection by clicking the <Exit> button.
- If the user chooses to send the completed selection to the "Project Details" window, the user will click the "Next <Project Details>" button. Upon completion of this action by the user, the program will send the selected model and all of its data to the "Project Details" in the same way that Version 1.44 performed these tasks. The same data items will be also saved as previously done in Version 1.44. It is important that the program save all of the selected item's "settings" with the item for retrieval by the user if necessary.

Operation of the Project Details Window (New Function Added)

- This window with all of its functions will continue to operate as it does in Version 1.31 today including:
    - Reopening an item by double-clicking on it. This opens the item in the "Selection-Criteria/Calculation Results" window. The program will display all of the settings saved with that item.
    - Deleting a highlighted item with the <Delete Item> button. This removes the highlighted item from the SelectTools Project Details window; it also removes the item from the McQuayTools Job Editor job.
    - **NEW FUNCTION** – "Copy Item" has been added to the Project Details window. "Copy Item" allows the user to create exact duplicates, less the "Tag", of the highlighted model on the Project Details window. A button and a key-in input cell will have to be added to the "Project Details" window as shown in Figure 3 in the APPENDIX.
    - The user will highlight an item already stored on the Project Details list. Then the user keys in the number of copies required for the highlighted model. Then the user clicks the <Copy Item> button.
    - The program should then make exact copies of the highlighted item, including all settings and selection criteria data, and displays the new items at the end of the existing models listed in Project Details. The "Tag" for the original item will not be copied. Each copy will have its own discreet Item No. It will be up to the user to open each of the copied items and give them a "Tag". The user may also, if desired, make changes to any of the settings or selection criteria in the copied items by double-clicking on that item to open it in the "Selection-Criteria/Calculation Results" window. The program will open the new item in the "Selection-Criteria/Calculation Results" window. The user may change any settings desired, do a "Calculation Results" and then, after giving the item a "Tag", resave the item to Project Details.

  This feature was recently added to SelectTools for Enfinity 4.02 and SelectTools for Unit Ventilators 2.00. Computair should investigate the code used by Enfinity and reuse it, if

possible, in SelectTools for Water Source Heat Pumps making any changes required to render the code program/product specific.

New Descriptions for "Unit Type"

- The current descriptions used in version 1.44 for "Unit Type" (APPENDIX, Figure 2 for location): "Horizontal", "Vertical", "Large Vertical", and "Console". These descriptions will not be used in version 2.00.
- New descriptions for "Unit Type" are listed below:

Old Description	New Description	Cooling EWT Temp Range	Heating EWT Temp Range
Horizontal	~~Horizontal, Std. Range~~	~~55°F – 110°F~~	~~55°F – 90°F~~
	Horizontal, Ext. Range	40°F – 110°F	40°F – 90°F
Vertical	Vertical, Std. Range	55°F – 110°F	55°F – 90°F
	Vertical, Ext. Range	40°F – 110°F	40°F – 90°F
Large Vertical	Large Vert., Std. Range	55°F – 110°F	55°F – 90°F
	~~Large Vert., Ext. Range~~	~~40°F – 110°F~~	~~40°F – 90°F~~
	Large Vert., Geothermal	30°F – 110°F	20°F – 90°F
New Unit Type not previously described.	Large Horiz., Std. Range	55°F – 110°F	55°F – 90°F
	Large Horiz., Ext. Range	40°F – 110°F	40°F – 90°F
	Large Horiz., Geothermal	30°F – 110°F	20°F – 90°F
Console	Console	**60**°F – 110°F	**60**°F – 90°F

Error Messages Associated With Entering Water Temps (EWT)

Users may run selections on Geothermal Range models at all EWT's from 30°F to 110°F.
Users may run selections on Extended Range models at all EWT's from 40°F to 110°F.
Users may NOT run Standard Range models at EWT's lower than 55°F (60°F for Console models).

- If a user has selected a ~~Small Horizontal (size 007, 009, 012, or 015 only) or~~ Small Vertical (all sizes) Unit Type described as "xxxx, Std. Range" and they try to enter an EWT that is less than 55°F, display the error message:

  "The Entering Water Temperature you have specified requires the application of an Extended Range model. You must either raise the EWT to 55°F or greater OR change the model type you have specified to an "Ext. Range" model."

  NOTE: ~~Small Horizontal models offer Extended Range only in sizes 007, 009, 012, and 015.~~ A separate message for Small Horizontal sizes 019 – 060 is given below. Small Vertical models offer Extended Range in all sizes 007 – 060 and will use this message.

- ~~If a user has selected a Horizontal Unit Type size 019, 024, 030, 036, 042, 048, or 060 described as "xxxx, Std. Range" and they try to enter an EWT that is less than 55°F, display the error message:~~

  ~~"The Entering Water Temperature you have specified requires the application of an Extended Range model. An Extended Range model in the size you have specified is not available. You must either raise the EWT to 55°F or greater OR choose an Enfinity WSHP to fit the job requirements."~~

- A user may not be allowed to select a Horizontal Unit Type size 019, 024, 030, 036, 042, 048, or 060 described as "xxxx, Ext. Range". Extended Range is not available for these models.

- If a user has selected a Large Horizontal ~~or Large Vertical~~ Unit Type described as "xxxx, Std. Range" and they try to enter an EWT that is less than 55°F but equal to or greater than 40°F, display the error message:

  "The Entering Water Temperature you have specified requires the use of an Extended Range model. You must either raise the EWT to 55°F or greater OR change the model type you have specified to an "Ext. Range" model."

- If a user has selected a Large Horizontal Unit Type described as "xxxx, Std. Range" and they try to enter an EWT that is less than 40°F but equal to or greater than 30°F, display the error message:

  "The Entering Water Temperature you have specified requires the use of a Geothermal Range model. You must either raise the EWT to 40°F or greater OR change the model type you have specified to an "Geo. Range" model."

- If a user has selected a Large Vertical Unit Type described as "xxxx, Std. Range" and they try to enter an EWT that is less than 40°F but equal to or greater than 30°F, display the error message:

  "The Entering Water Temperature you have specified requires the use of a Geothermal Range model. You must either raise the EWT to 55°F or greater OR change the model type you have specified to an "Geo. Range" model."

- Small Horizontal model sizes 007, 009, 012, and 015 and Small Vertical model sizes 007 – 060 (all sizes) have only two (2) fluid flowrates for EWT temperatures below 50°F. If a user selects a Small Horizontal or Small Vertical model in any available configuration, i.e. Std. Range, Ext. Range, etc., in the sizes listed above and enter an EWT less than 50°F along with a fluid flowrate that is less than the smaller flowrate listed in the capacity tables for that model, display the message:

  "The lowest allowable Fluid Flowrate for the Entering Water Temperature you have specified is <X> gpm. You must either increase the Fluid Flowrate for this EWT to a minimum of <X> gpm or raise the specified EWT to 50°F or greater."

  (<X> equals the flowrate listed in the table for the model size selected for less than 50°F EWT.)

- All other sizes and model types list three (3) fluid flowrates for EWT temperatures at the lowest end of their respective scales and are not a problem.

- All WSHP models have a maximum EWT of 110°F for Cooling. The capacity tables list only one water flow rate for 110°F; this flowrate is the highest of the three listed for the other EWT's in the tables. If a user has entered an EWT greater than 100°F and they attempt to enter a flowrate that is other than the single flowrate listed in that model's capacity tables, display the message:

  "For EWT greater than 100°F this model must be run at the required flowrate of <X> gpm. You must either lower the EWT to 100°F or less or run the selection at the flowrate noted."

  (<X> equals the flowrate listed in the table for the model size selected for 110°F EWT.)

- The error messages listed above should also be created with metric values for those users working in metric.

Sending SelectTools Items to McQuayTools for Pricing

- In the Project Details window, if the user clicks the <Create Quote Item> button on the toolbar, the program will open the window shown in the APPENDIX, Figure 6. **A titlebar needs to be added to this window.**
- This feature is not changing. SelectTools will continue to send models to McQuayTools for pricing just like it always has.
- The following data must be sent to McQuayTools:

Description	Starting Position	Length	Comments
Program ID	1	7	Constant value: "SELWSHP" for Unit Vent
Model	8	23	
Quantity	31	3	
Price	34	10	Currently Not Used By McQuayTools
Item Number	44	3	
Tag	47	50	
Special Text	97	1000	Currently Not Used By McQuayTools
Number of accessories	1097	1	
Accessories	1098	117	Up to 9 accessories (10 chars each for part #, 3 chars each for qty - repeated for each accessory.) Blank filled.
Program version	1215	5	Format "00.00"

This should be the same data that is being sent to McQuayTools by Version 1.44 of the SelectTools for Water Source Heat Pumps program.

1. The selection program will deliver one of the generic code strings to McQuayTools.
2. McQuayTools will "lock" the Product Category (column 1 of the Model), Capacity (columns 6, 7,8 of the Model) and Voltage (column 9 of the Model) fields delivered by the Selection Program and not allow them to be changed via McQuayTools.

The location of the generic "*" codes within the model may vary between product types, but not within a product type.

Deleting Job Items

- The user may delete an item from the McQuayTools job. When this happens, McQuayTools will prompt the user for a confirmation, initiate the ATS Selection Program as in #1 above and send an Execute command with the following information:

String passed from McQuayTools to the ATS Selection Program:

Description	Starting Position	Length	Comments
Constant "X"	1	1	Job code to indicate to the ATS Selection Program to turn off the quote item flag.
Jobitem	2	to end	The filename of the ATS Selection Program file that corresponds to the item being deleted.

The ATS Selection Program should intercept this command and execute appropriate code to turn off the flag that indicates this is a McQuayTools item.

Changing Job Header Data

- If the user modifies any of the job header data that has been passed to the ATS Selection Program, McQuayTools will initiate the ATS Selection Program as in #1 above and send a DDE Execute command with the following information:

DDE String passed from McQuayTools to the ATS Selection Program:

Description	Starting Position	Length	Comments
Constant "C"	1	1	Job code to indicate to the ATS Selection Program to change header data.
Jobnum	2	6	Unique 6 character job identifier created by **McQuayTools**.
Job Description	8	30	
Rep Name	38	35	Rep company name
Salesman's Initials	73	3	
Entry Date	76	8	Format "MM/DD/YY"
Pricing Date	84	8	Format "MM/DD/YY"

Action the ATS Selection Program will take:
The ATS Selection Program should intercept this command and execute appropriate code to modify the job header data.

Deleting Jobs

- All jobs and their related ATS Selection Program selection files can only be deleted from McQuayTools. When the user selects a job to delete, McQuayTools will prompt the user for a confirmation and send a DDE Execute command with the following information:

DDE String passed from McQuayTools to the ATS Selection Program:

Description	Starting Position	Length	Comments
Constant "D"	1	1	Job code to indicate to the ATS Selection Program to delete the job.
Jobnum	2	6	Unique 6 character job identifier.

Action the ATS Selection Program will take:
The ATS Selection Program should intercept this command and execute appropriate code to delete this job and all its appropriate files.

NEW FUNCTION
If the user attempts to exit the program before completing the entire selection process for a model by either:

1. Clicking the <Exit> button before sending the completed model to Project Details or,
2. Clicking the window-closing "X" on the titlebar before sending the completed model to Project Details, the program shall display a pop-up window displaying the message:

"Attempting to exit without completing the selection will cause all data to be lost. Do you wish to continue to Exit?
Choose "Yes" to exit. Choose "No" to complete and save current selection."

Inside the window at the bottom of the message have two buttons: <Yes> and <No>. Clicking one or the other will complete the desired action described in the message.
If the user chooses to exit the selection without competing and saving the current selection, the program will perform the exit function without saving any of the current selections information.
The program will still perform the "Save Current Job Before Closing?" routine before exiting.

RE-ACTIVATED FUNCTION: External Static Pressure (esp)
The program will now have the ability to calculate ESP (external static pressure) based on required airflow OR calculate produced airflow based on required esp.

- An input field for ESP has been added to the Selection Criteria-Calculation Results screen (see APPENDIX, Figure 2).
- The user will enter either the required airflow or required ESP, *but not both*.
- When initially started, the program will default to airflow with the ESP input field blank. The default airflow at the start of a new item selection will be the Nominal Airflow for that Model/Unit Size. (A table of default airflow values can be found in APPENDIX, Figure 8.)
- If a user clicks into the ESP field, the airflow field will go blank and remain blank until the user enters an airflow. The program will use ESP to calculate the resulting airflow.
- If a user decides to enter a desired airflow by clicking in the airflow field, the ESP field will go blank The program will use airflow to calculate the resulting ESP.
- Both ESP and airflow will be displayed in the Calculation Results portion of the screen and any subsequent reports (tech Data, etc.).
- The program will interpolate either airflow or esp based on user requirements by using the McQuay esp-cfm tables.
- When the selection is sent to Project Details, the program will store/save whichever input the user keyed-in to create the selection.
- If the user reopens a model selection by double-clicking on it in Project Details and then changes the keyed in value from the original selection from esp to airflow (or airflow to esp whichever the case may be), the program will store/save the new input value when the selection is resent to Project Details.
- Only the value that was last saved to Project Details should be displayed in the Selection Criteria screen if the item is reopened.
- Both values will only be displayed in the Calculation Results side of the screen.

NEW - Program Database Files for Which New Data Will Be Supplied

- McQuay International will be using the data in the following Version 1.44 database (.db) files located in installed directory c:\Program Files\McQuay\WSHP\:

elecdata.db		
physdata.db		
Wshpcode.db		
LgVertFLAData.db		
LgVertHPData.db		
Located in folder's C:\Program files\McQuay\WSHP\Wshpdb01 - Wshpdb04		
Airvol01.db	Airvol12.db	Airvol12.db, Airvol13.db and, Airvol14.db are located in dirs WSHPdb02 – 04 only
Airvol02.db	Airvol13.db	
Airvol03.db	Airvol14.db	
Airvol04.db		
Airvol05.db		
Airvol06.db		
Airvol07.db		
Airvol08.db		
Airvol09.db		
Airvol10.db		
Airvol11.db		

NEW - Database Files to Be Created

With the elimination of the Computair engine for calculating performance new capacity tables for horizontal, vertical, large vertical, and console models will have to be created from Excel tables supplied by McQuay. All the Excel tables from McQuay will have the same format: (The format is displayed in the APPENDIX, Figure 7.) Computair should create whatever software utilities are required to convert the Excel tables to .db tables the program can use.

Performance Data to Be Interpolated and/or Taken Directly from Tables

The program will use the McQuay-supplied tables to interpolate the following performance items or use a table datapoint:

Item	McQuay Excel Tables
Cooling Total Capacity	Product Capacity Excel files PLUS Airflow Correction Factors
Cooling Sensible Capacity	
Cooling Heat of Rejection	
Cooling Leaving Water Temperature	
EER (Cooling)	
Heating Total Capacity	
Heat of Absorption	
Heating Leaving Water Temperature	
COP (Heating)	
ESP (if airflow is supplied)	Product esp-cfm Tables
Airflow (if ESP is supplied)	
Flowrate	Product Capacity Excel files
Water Pressure Drop (WPD)	
Shipping and Operating Weights	Product Data Excel files
Physical Data	Product Data Excel files
Electrical data	Product Data Excel files

Calculating Performance for Console Fan Speeds

- Console WSHP models (Code 2 starts with "W") are the only WSHP models with user adjustable fan speeds: LOW and HIGH. All of the performance data tables provided for Console models are listed at HIGH speed; performance at LOW speed must be calculated from these tables using the correction factors provided in the first worksheet ("Low Speed Factors") in performance data file "Console_Capacity_1140-12.xls".
- The program should calculate performance at HIGH speed and then apply the appropriate correction factors for LOW speed.
- The program should display both sets of data (LOW and HIGH) in the pane labeled "A" in Figure 2. Clicking on either set of data should highlight that set and change the data displayed in the Calculation Results fields accordingly.
- For Console models only the program will display both LOW and HIGH performance data in the Tech Data report and Job Summary report in the corresponding data cells. LOW and HIGH data will be separated by a slash (/). Example:

Total Capacity	9935 / 12456	BtuH

- It is not necessary give the user a choice of speeds because all Consoles come with two speeds as standard.

Using "Airflow-esp" tables in "Lg_Vert_Data.xls"

- The data contained in the "Airflow-esp" tables contained in file "Lg_Vert_Data.xls" are used to calculate and display two of the three following performance items:
    - Either delivered airflow based on input esp,

    - Or delivered esp based on input airflow,
    - Plus motor HP required to meet job conditions based on the results from calculating esp or airflow.
- To calculate airflow based on input esp for the size model selected
    - determine whether or not the input esp is in range for either or both of the two available HP motors;
    - if the input esp is in range for both HP motors, interpolate the delivered airflow for each motor size and display both sets of performance data in the pane labeled "A" in Figure2. The program will allow the user to click on either set of data highlighting the set upon which the user clicked. The complete performance dataset will be displayed in the Calculation Results section of the screen with the results for the Standard Static motor highlighted in blue and displayed above in the Calculation Results section of the screen.
      The user may click back and forth between the two datasets in pane "A" changing the displayed performance values accordingly.
    - if the input esp is out of range for both motor sizes, display the esp range for each motor size in a pop-up window with an OK button to close the pop-up window. The message displayed will be:
      "The allowable range for esp for the Standard Static motor for this model size is <lower esp limit> to <upper esp limit>.
      The allowable range for esp for the High Static motor for this model size is <lower esp limit> to <upper esp limit>."
    - if the input esp is out range for the Standard Static motor but is in range for the High Static motor, open a pop-up window with an OK button to close the window and display the message:
      "The allowable range for esp for the Standard Static motor for this model size is <lower esp limit> to <upper esp limit>. Performance results will be calculated for the High Static motor only."
    - if the input esp is out range for the High Static motor but is in range for the Standard Static motor, open a pop-up window with an OK button to close the window and display the message:
      "The allowable range for esp for the High Static motor for this model size is <lower esp limit> to <upper esp limit>. Performance results will be calculated for the Standard Static motor only."
    - The calculated data for whichever motor size is highlighted when the user clicks the <Next – Project Details> is the data that will be used for the printed reports including the HP of that motor. This will have no effect on the code string sent to Project Details; the user chooses the final motor size in the McQuayTools Job Editor.

Known Issues in 1.44 Requiring Fixes in 2.00

- If you key in Entering Temperatures (air or fluid) with decimal values, i.e. 80.6, 55.2, etc., the program uses the decimal places to calculate performance but, when the values are displayed in the Calculation Results section or on the printed reports, the program rounds them to the nearest whole degree. The program should maintain the decimal values for all displays and printed reports.

APPENDIX

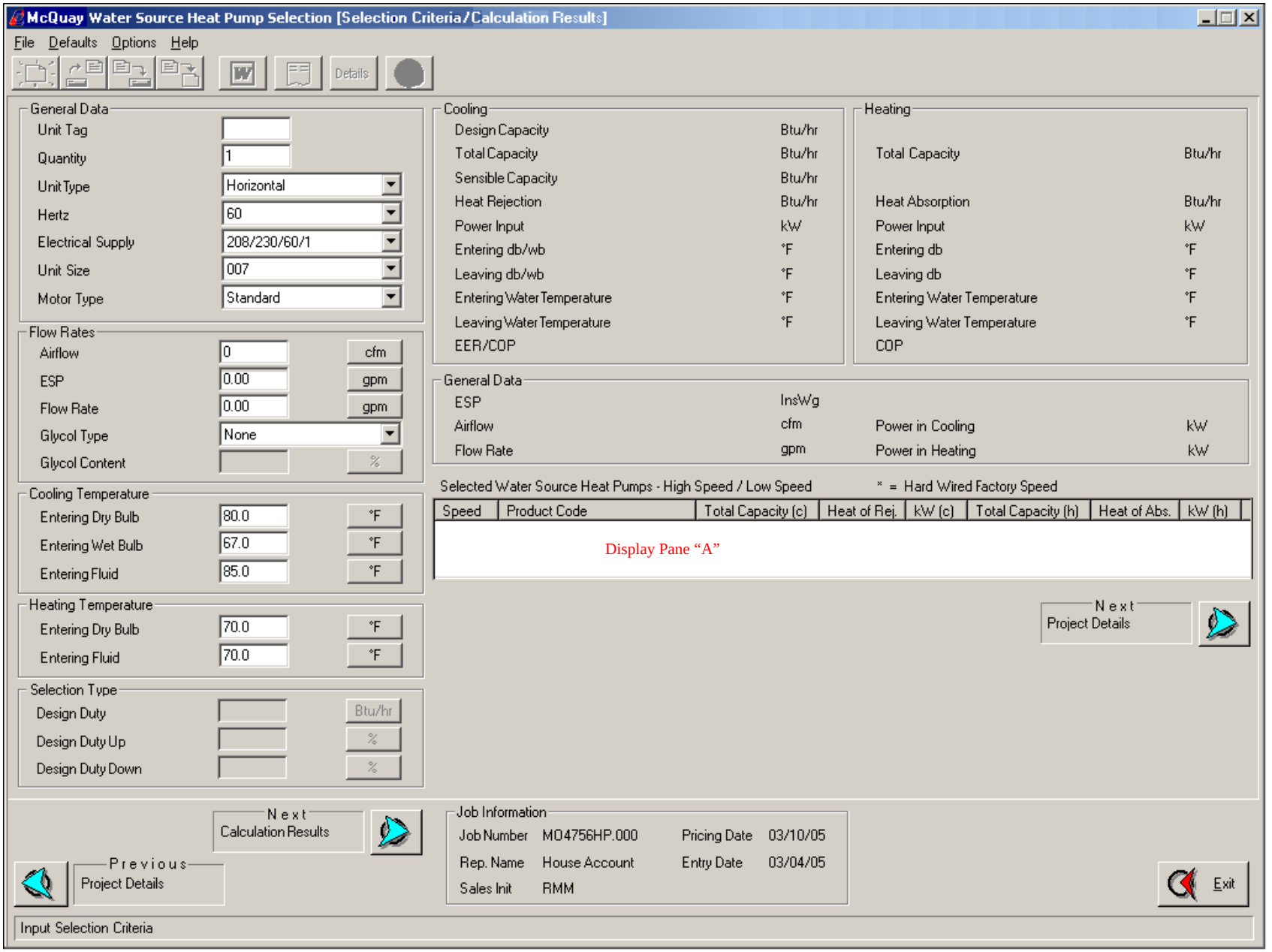

McQuay Water Source Heat Pump Selection [Selection Criteria/Calculation Results]
File Defaults Options Help
Details
General Data
Unit Tag
Quantity
1
Unit Type
Horizontal
Hertz
60
Electrical Supply
208/230/60/1
Unit Size
007
Motor Type
Standard
Flow Rates
Airflow
0
cfm
ESP
0.00
gpm
Flow Rate
0.00
gpm
Glycol Type
None
Glycol Content
%
Cooling Temperature
Entering Dry Bulb
80.0
°F
Entering Wet Bulb
67.0
°F
Entering Fluid
85.0
°F
Heating Temperature
Entering Dry Bulb
70.0
°F
Entering Fluid
70.0
°F
Selection Type
Design Duty
Btu/hr
Design Duty Up
%
Design Duty Down
%
Cooling
Design Capacity Btu/hr
Total Capacity Btu/hr
Sensible Capacity Btu/hr
Heat Rejection Btu/hr
Power Input kW
Entering db/wb °F
Leaving db/wb °F
Entering Water Temperature °F
Leaving Water Temperature °F
EER/COP
Heating
Total Capacity Btu/hr
Heat Absorption Btu/hr
Power Input kW
Entering db °F
Leaving db °F
Entering Water Temperature °F
Leaving Water Temperature °F
COP
General Data
ESP InsWg
Airflow cfm
Flow Rate gpm
Power in Cooling kW
Power in Heating kW
Selected Water Source Heat Pumps - High Speed / Low Speed
* = Hard Wired Factory Speed
Speed
Product Code
Total Capacity (c)
Heat of Rej.
kW (c)
Total Capacity (h)
Heat of Abs.
kW (h)
Display Pane "A"
Next
Project Details
Next
Calculation Results
Previous
Project Details
Job Information
Job Number MO4756HP.000
Pricing Date 03/10/05
Rep. Name House Account
Entry Date 03/04/05
Sales Init RMM
Exit
Input Selection Criteria

Figure 2

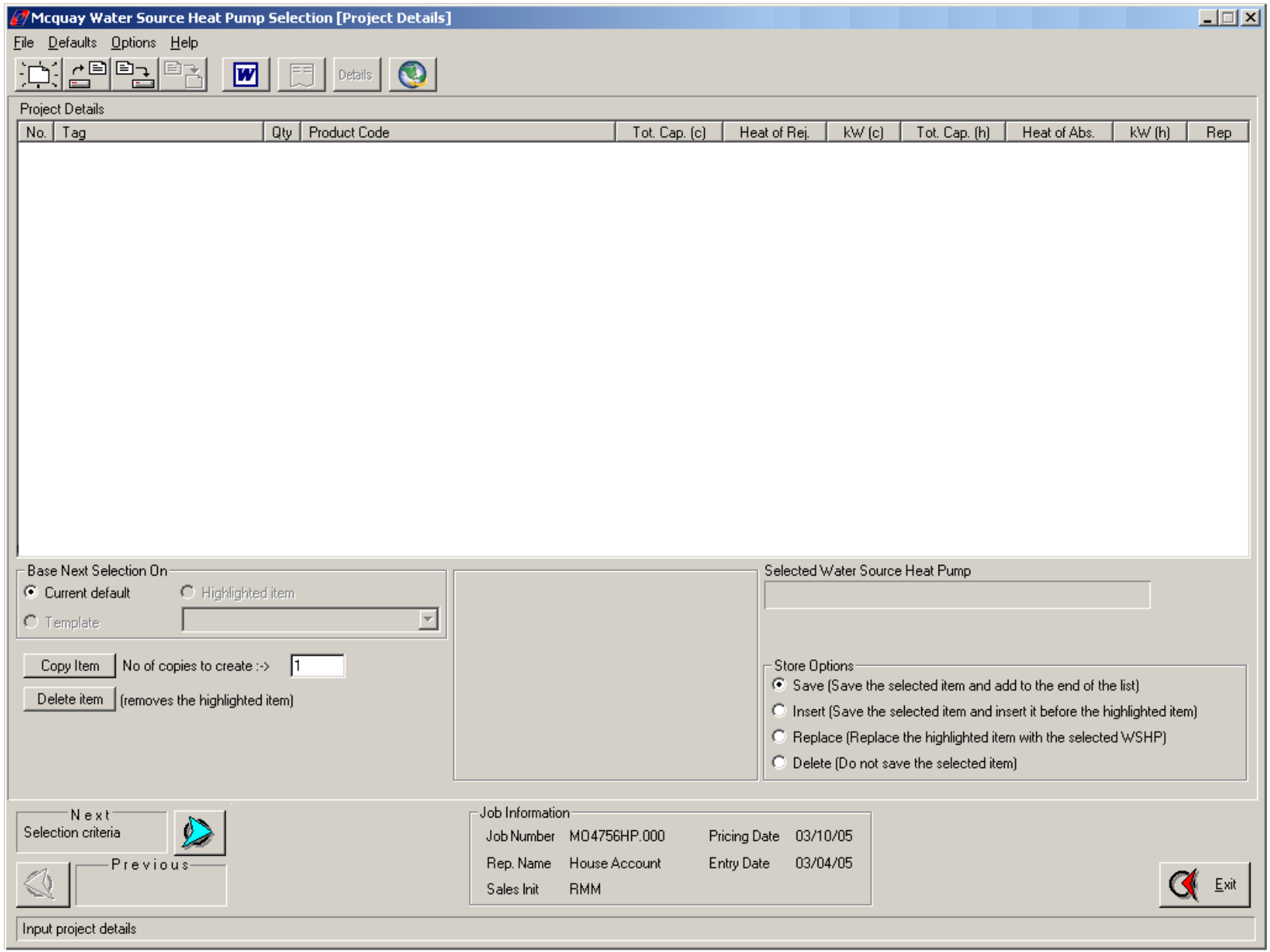

Mcquay Water Source Heat Pump Selection [Project Details]
File Defaults Options Help
Details
Project Details
No. Tag Qty Product Code Tot. Cap. (c) Heat of Rej. kW (c) Tot. Cap. (h) Heat of Abs. kW (h) Rep
Base Next Selection On
Current default
Highlighted item
Template
Copy Item
No of copies to create :->
1
Delete item
(removes the highlighted item)
Selected Water Source Heat Pump
Store Options
Save (Save the selected item and add to the end of the list)
Insert (Save the selected item and insert it before the highlighted item)
Replace (Replace the highlighted item with the selected WSHP)
Delete (Do not save the selected item)
Next
Selection criteria
Previous
Job Information
Job Number MO4756HP.000
Pricing Date 03/10/05
Rep. Name House Account
Entry Date 03/04/05
Sales Init RMM
Exit
Input project details

Figure 3

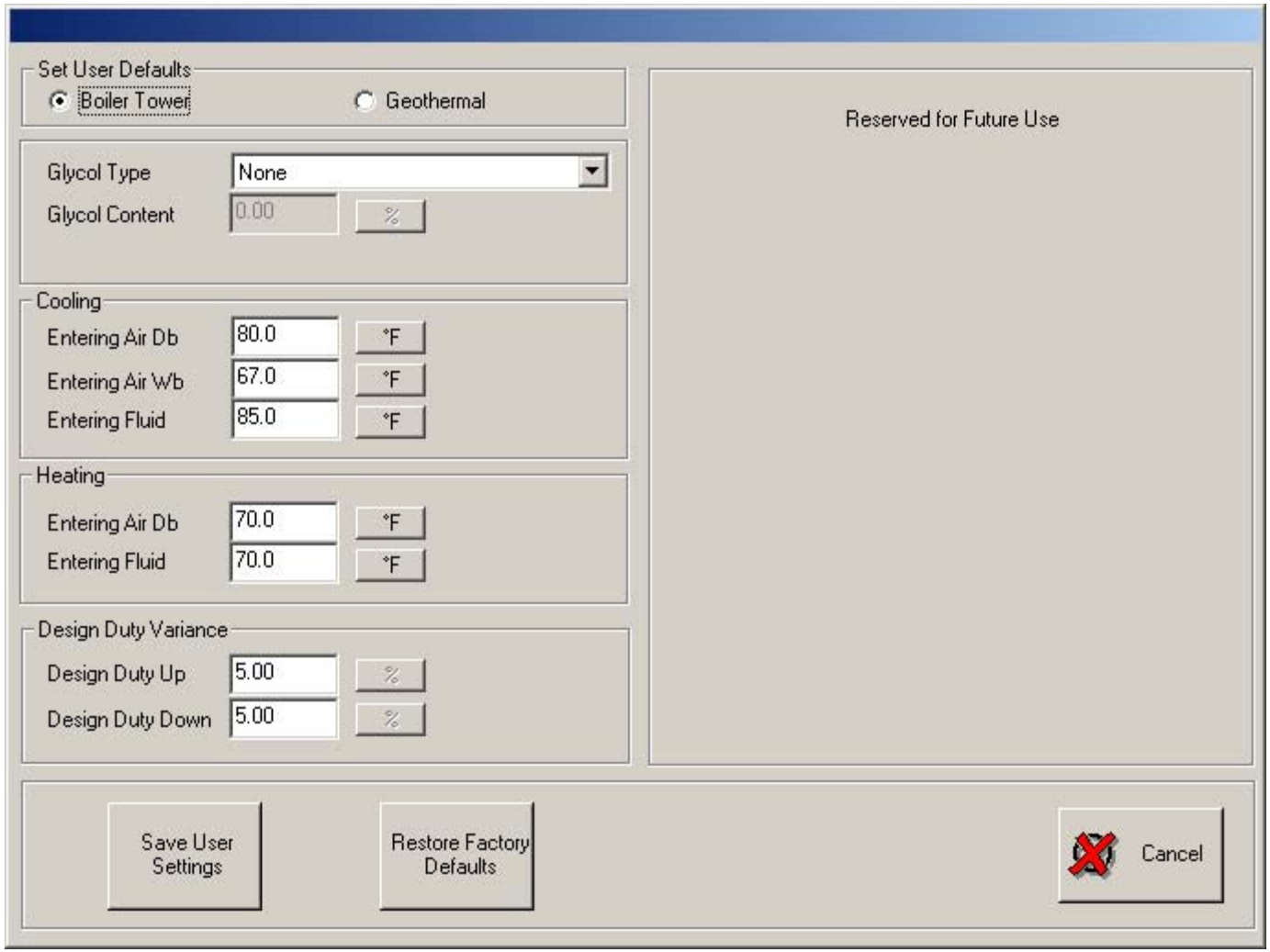


Figure 4 "User Defaults"

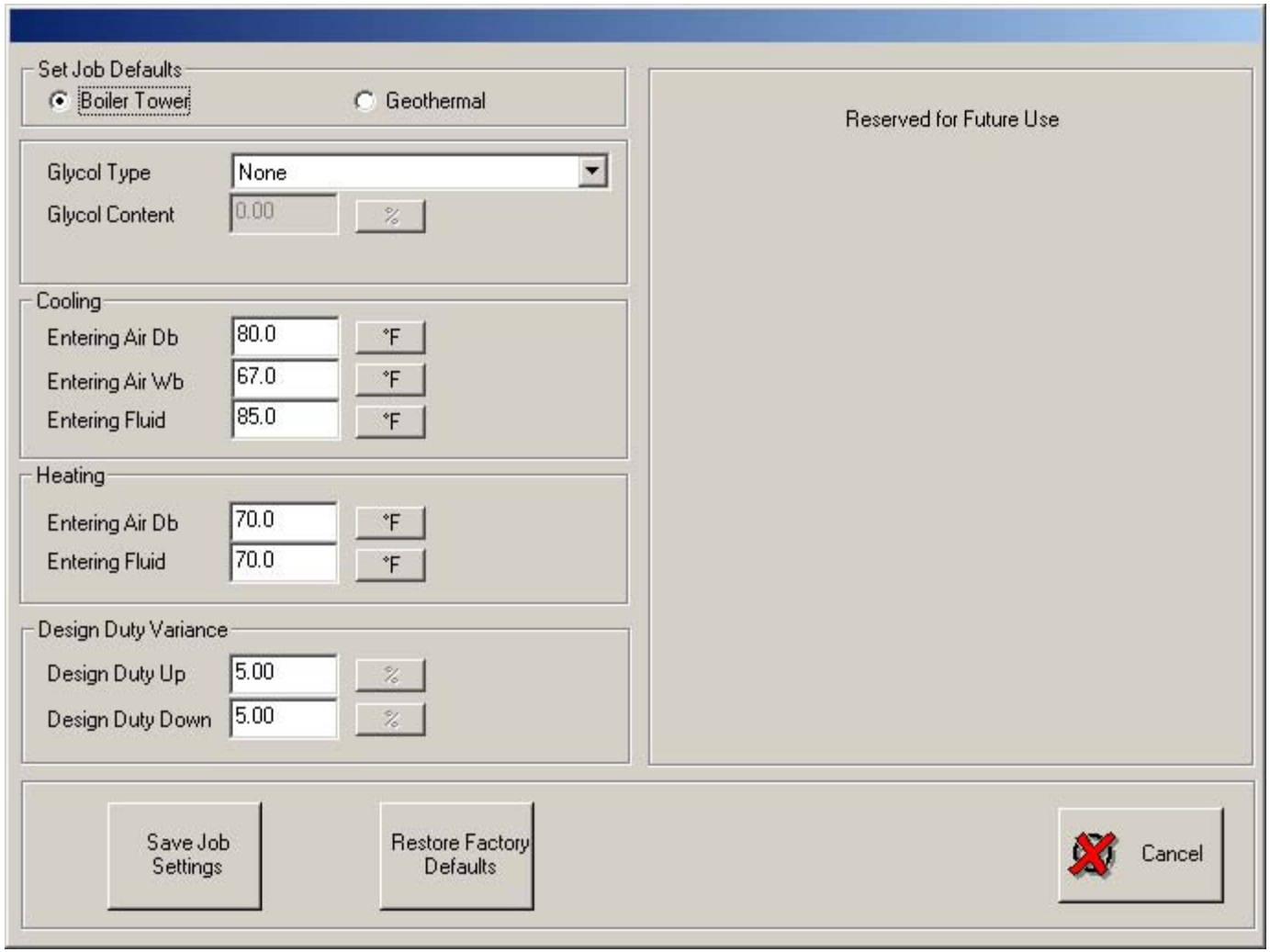


Figure 5 “Job Defaults”

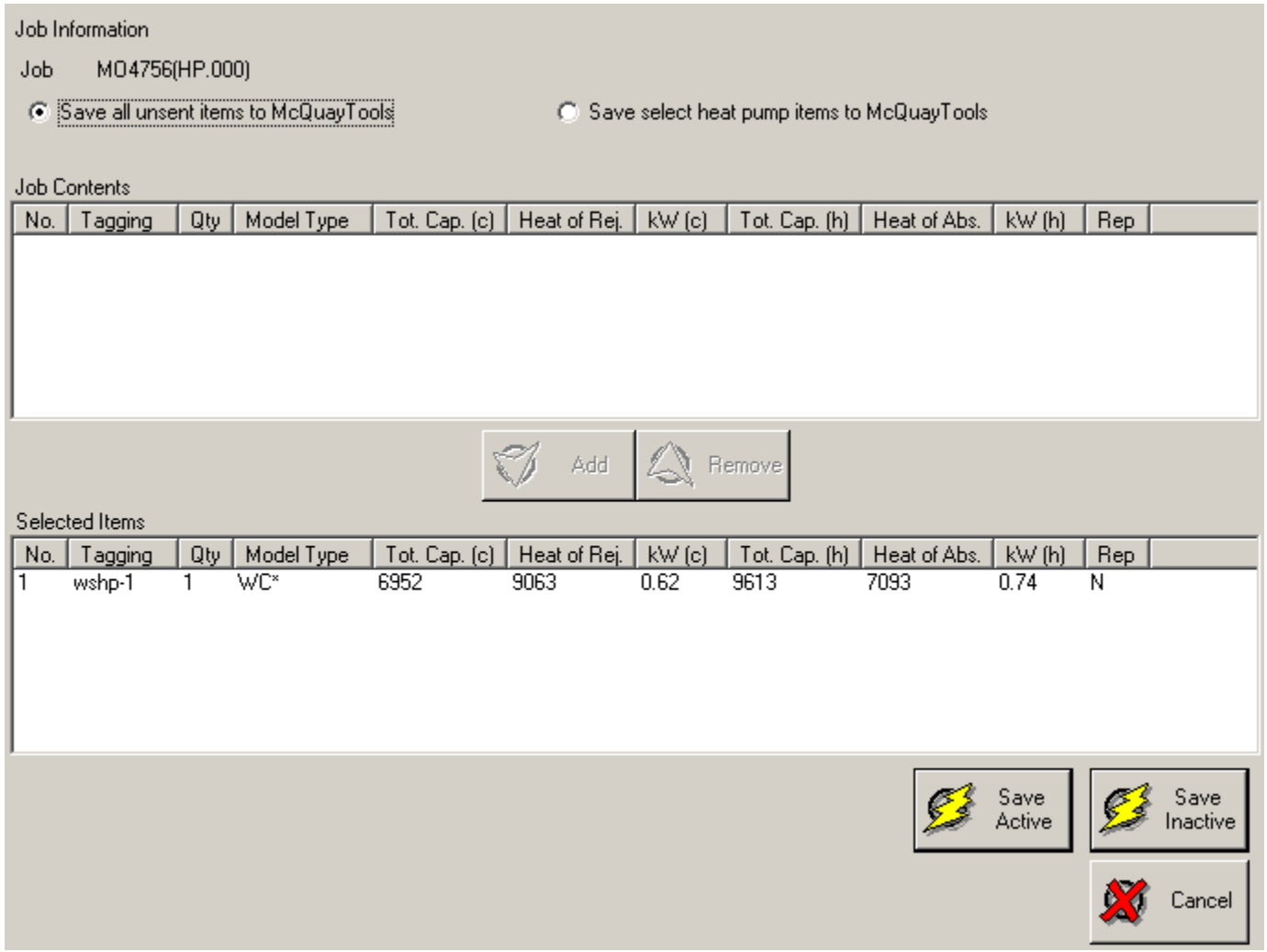


Figure 6 “Send Item to McQuayTools”

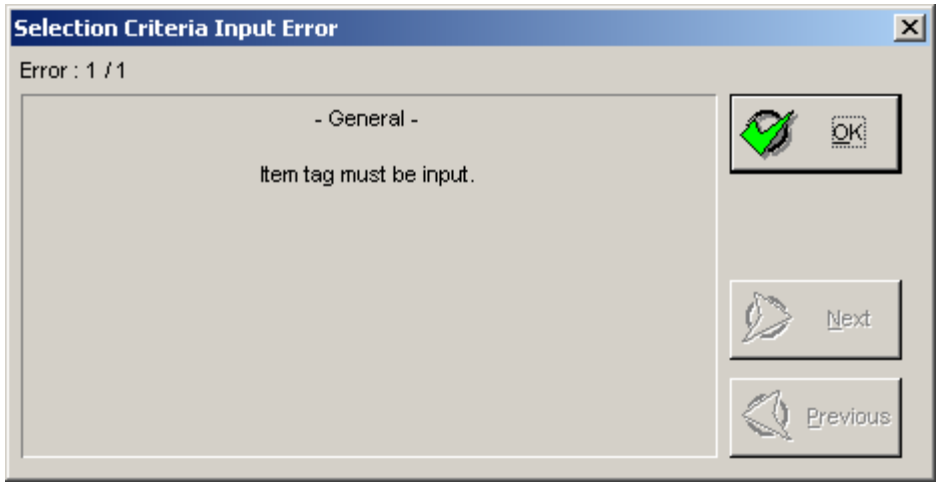
EWT	GPM	WPD	Cooling						Heating			
			EA: db - wb		LWT	TOT	SEN	kW	THR	EA	TOT	kW	THA
60	6.0	5.1	75	63	79	45000	34700	3.455	56799	60	47950	3.433	36229
			80	67	81	50000	36600	3.555	62200	70	47530	3.628	35149
			85	71	83	55500	38399	3.661	68000	80	47219	3.842	34109
	9.0	10.6	75	63	73	45799	35000	3.325	57200	60	48520	3.448	36750
			80	67	74	50899	37000	3.406	62500	70	48100	3.646	35649
			85	71	75	56399	38799	3.498	68299	80	47780	3.864	34590
	12.6	19.5	75	63	69	46600	35399	3.213	57500	60	19039	3.462	37229
			80	67	70	51700	37299	3.270	62899	70	48609	3.664	36109
			85	71	71	57299	39100	3.339	68700	80	48289	3.885	35030

Figure 7 Excel format for performance data files to be supplied to Computair by McQuay.

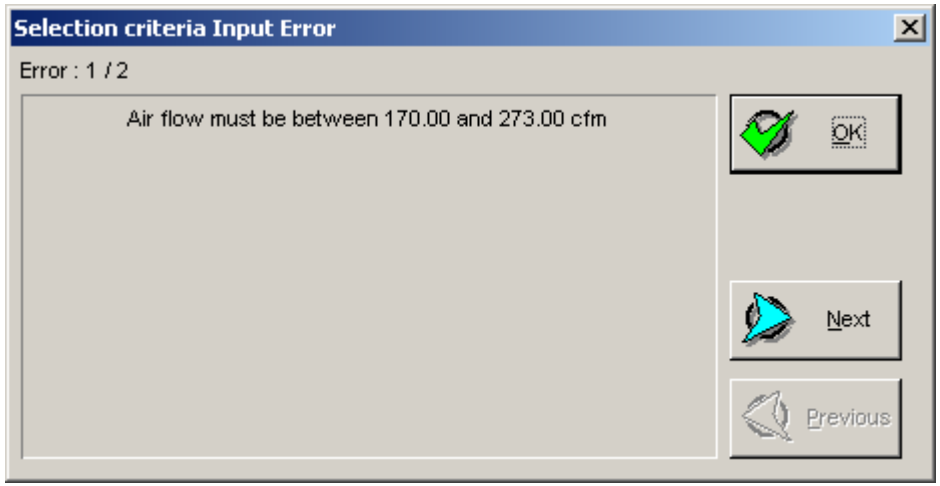
Model Size	Small Horizontal (All Ranges)	Small Vertical (All Ranges)	Large Horizontal (All Ranges)	Large Vertical (All Ranges)	Console (All Ranges)
007	1.40	1.40	N/A	N/A	1.01
009	1.80	1.80	N/A	N/A	1.55
012	2.60	2.60	N/A	N/A	2.59
015	2.70	2.70	N/A	N/A	2.60
019	3.90	3.80	N/A	N/A	3.60
024	5.00	5.00	N/A	N/A	N/A
030	6.00	5.70	N/A	N/A	N/A
036	7.50	7.00	N/A	N/A	N/A
042	8.00	7.70	N/A	N/A	N/A
048	9.00	9.00	N/A	N/A	N/A
060	12.00	12.00	N/A	N/A	N/A
070	N/A	N/A	13.40	15.00	N/A
090	N/A	N/A	18.40	N/A	N/A
108	N/A	N/A	N/A	21.00	N/A
120	N/A	N/A	24.00	N/A	N/A
121	N/A	N/A	N/A	27.00	N/A
180	N/A	N/A	N/A	36.00	N/A
215	N/A	N/A	N/A	42.00	N/A
290	N/A	N/A	N/A	54.40	N/A

Figure 8. Default Fluid Flowrates

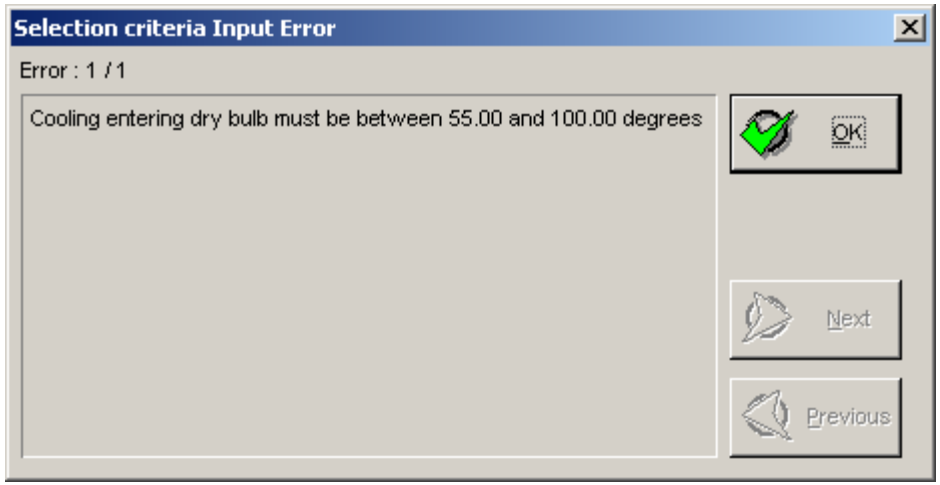
Known Warning/Error Messages



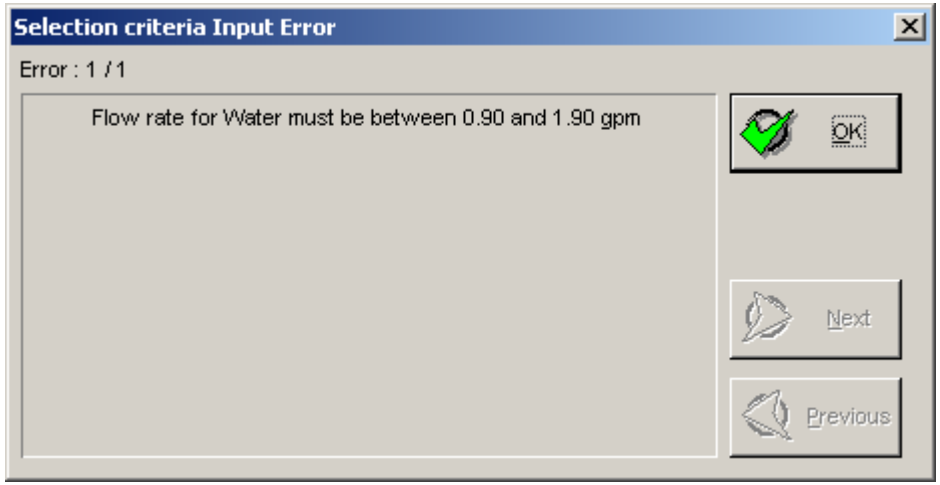
Appears if a “Tag” has not been keyed-in.



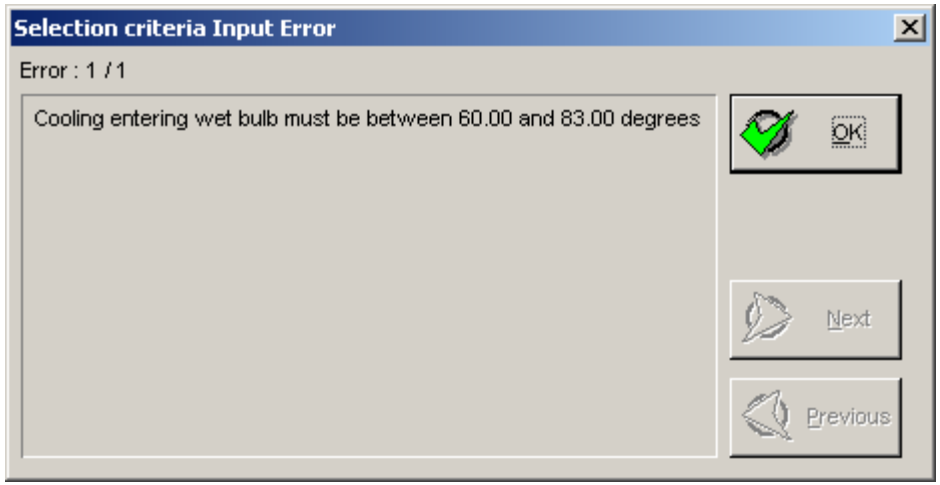
Appears if airflow setting is out of range. The lower and upper airflow settings are provided in the McQuay tables.



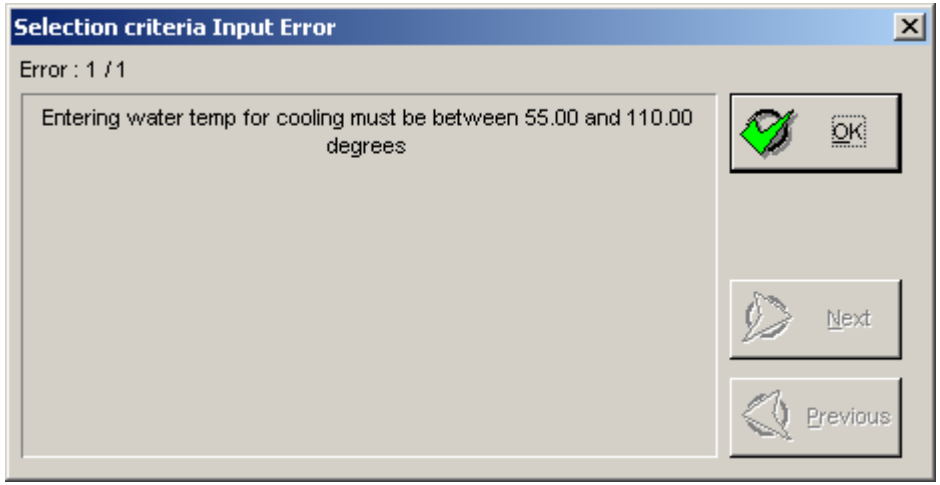
Appears if Cooling Entering Dry Bulb is out of range. Entering Dry bulb range is provided in the McQuay Capacity tables.



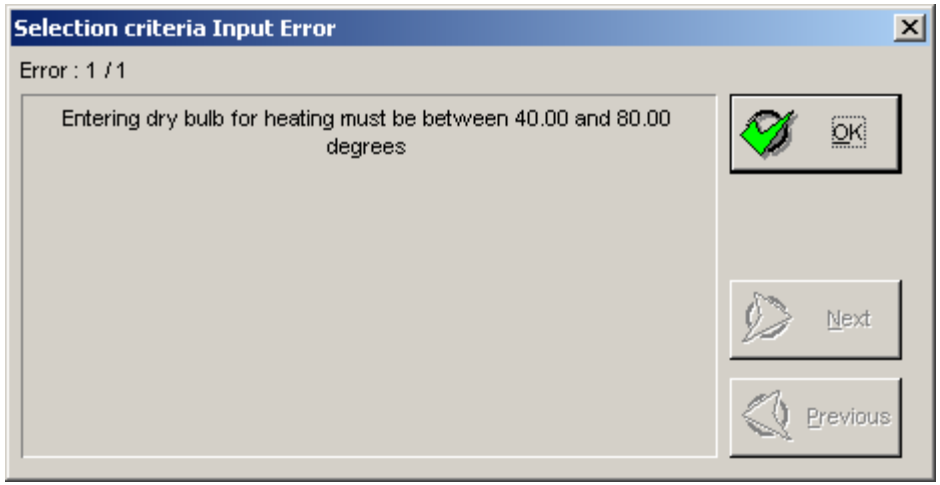
Appears if Flow Rate is out of range. Flow Rate range is provided in the McQuay Capacity tables.



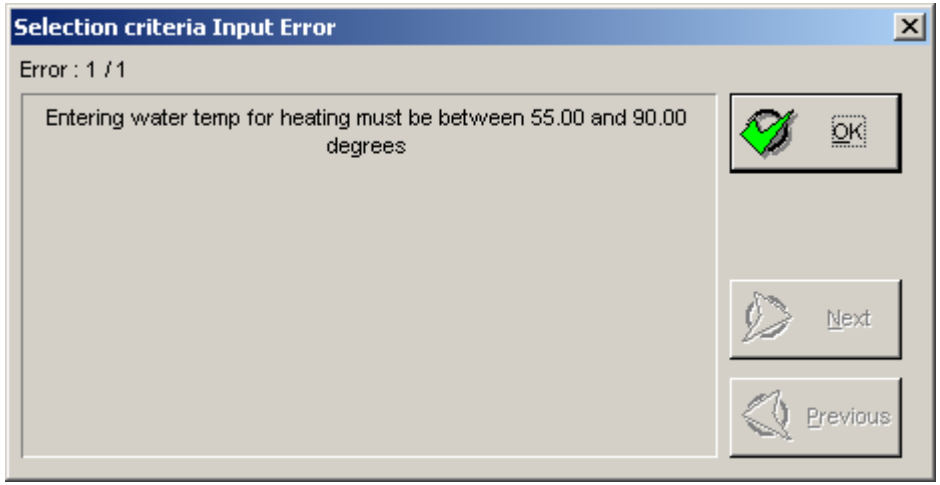
Appears if Entering Wet Bulb is out of range. Entering Wet Bulb range is provided in the McQuay Capacity tables.



Appears if Entering Fluid temperature for Cooling is out of range. Entering Fluid temperature range is provided in the McQuay Capacity tables.



Appears if Heating Entering Dry Bulb is out of range. Entering Dry bulb range is provided in the McQuay Capacity tables.



Appears if Entering Fluid temperature for Heating is out of range. Entering Fluid temperature range is provided in the McQuay Capacity tables.