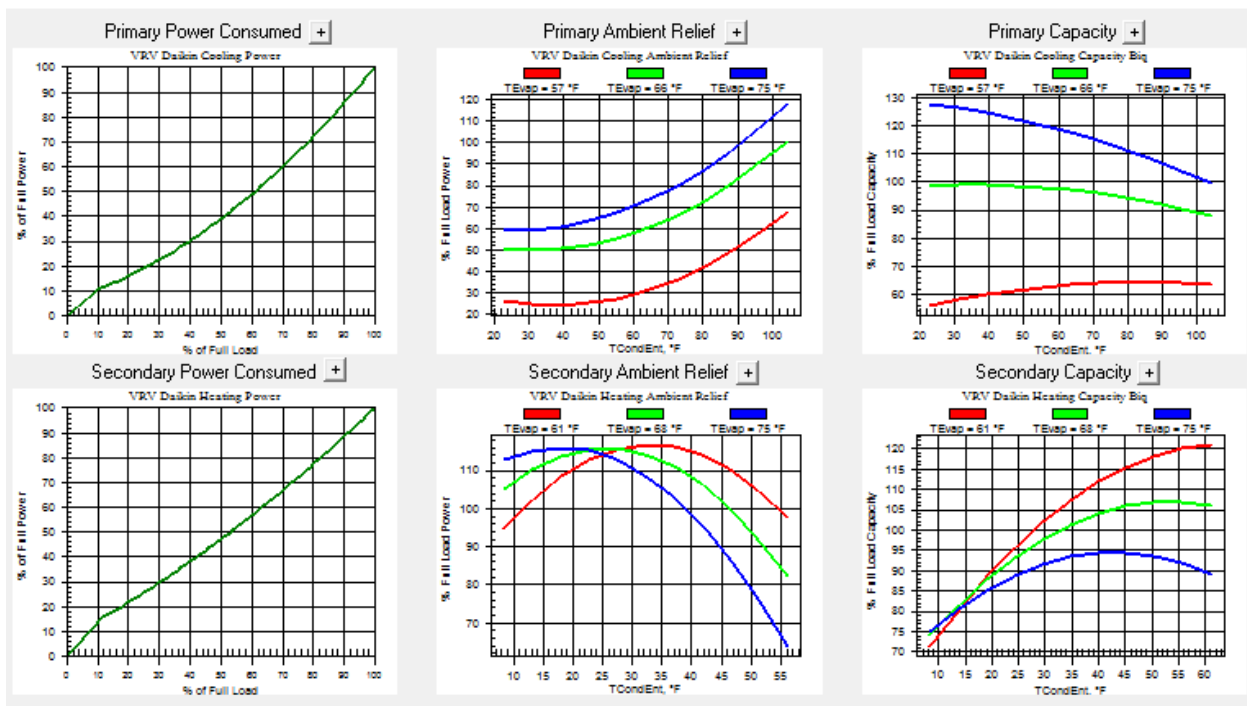


**Date:** April 1<sup>st</sup>, 2013  
**To:** Daikin AC Sales, Service, and Distribution  
**Subject:** VRV Libraries for Trane TRACE Modeling

Daikin AC is pleased to announce the availability of custom VRV equipment libraries for use in Trane TRACE 700. These equipment libraries offer an additional method for modeling the energy consumption of Daikin equipment for LEED projects or energy studies.



The complete range of PB-series air cooled VRV heat pumps and heat recovery units have been included in the library.

The custom equipment library is now available on the TRL FTP site as well as the software tools section of the new [www.Daikinac.com](http://www.Daikinac.com).

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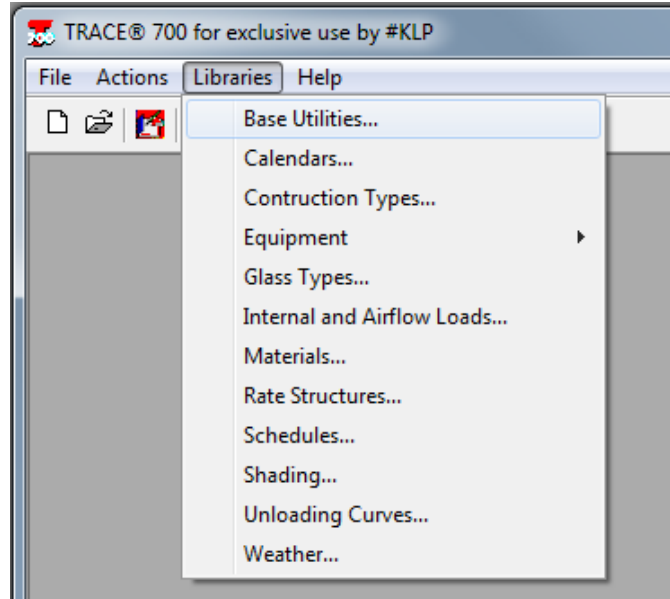
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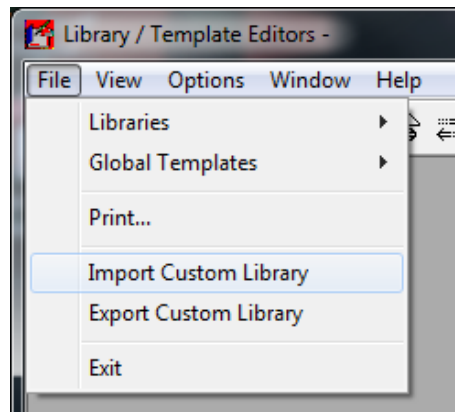
### Importing the new libraries:

In order to use the custom library containing the RXYQ and REYQ units, the library must first be imported into Trane TRACE. This can be done by the following steps:

- Launch Trane TRACE
- Enter the library editor by selecting **Libraries** from the menu bar and then selecting any of the library types. This will launch the Library/Template Editors.



- Once in the Library/Template Editor, simply select **File** → **Import Custom Library** from the menu bar and then direct the file path to the stored location of the **VRV\_PB.EXP** library.

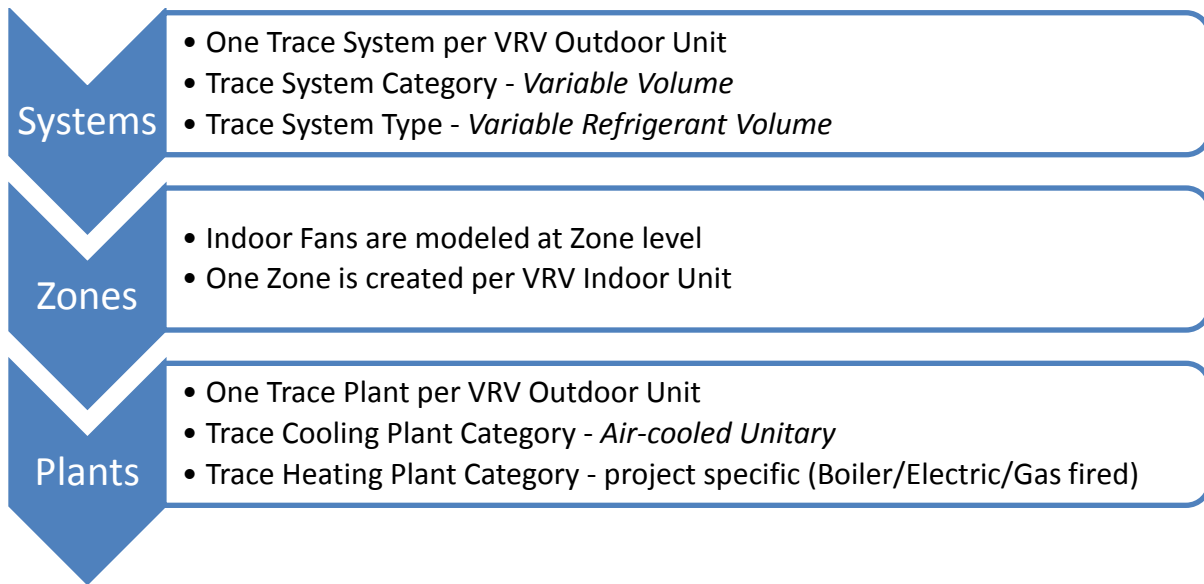


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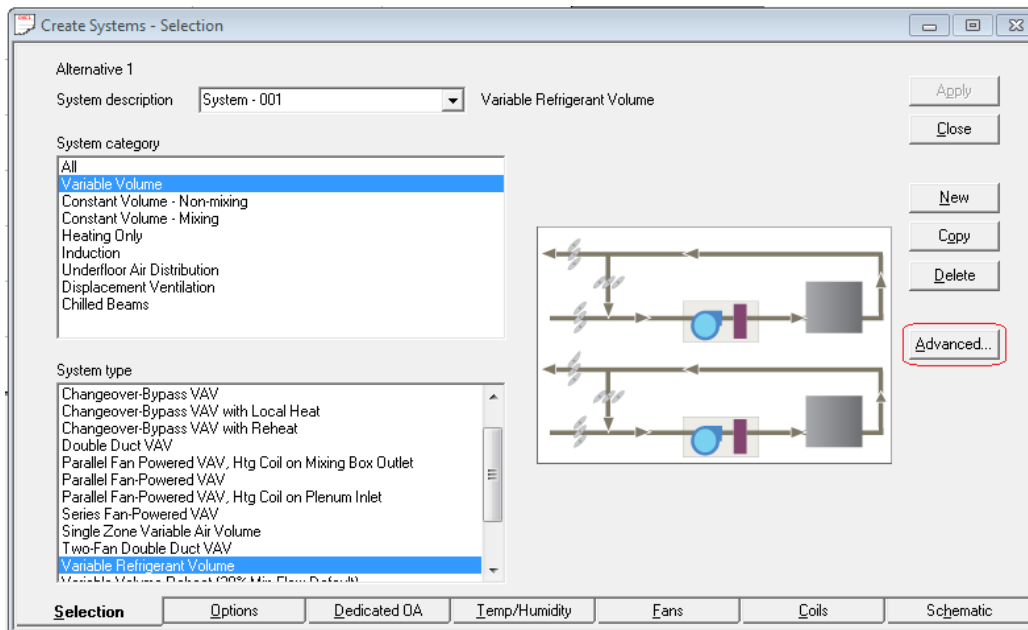
## VRV Modeling Workflow:



### System Creation Details:

One TRACE System should be modeled for each VRV outdoor unit. The system type should be *Variable Refrigerant Volume*.

Under the *Advanced* tab, the cooling coil location should be set to *Zone*. This ensures that fan energy consumption is properly accounted for on a per-indoor-unit basis.

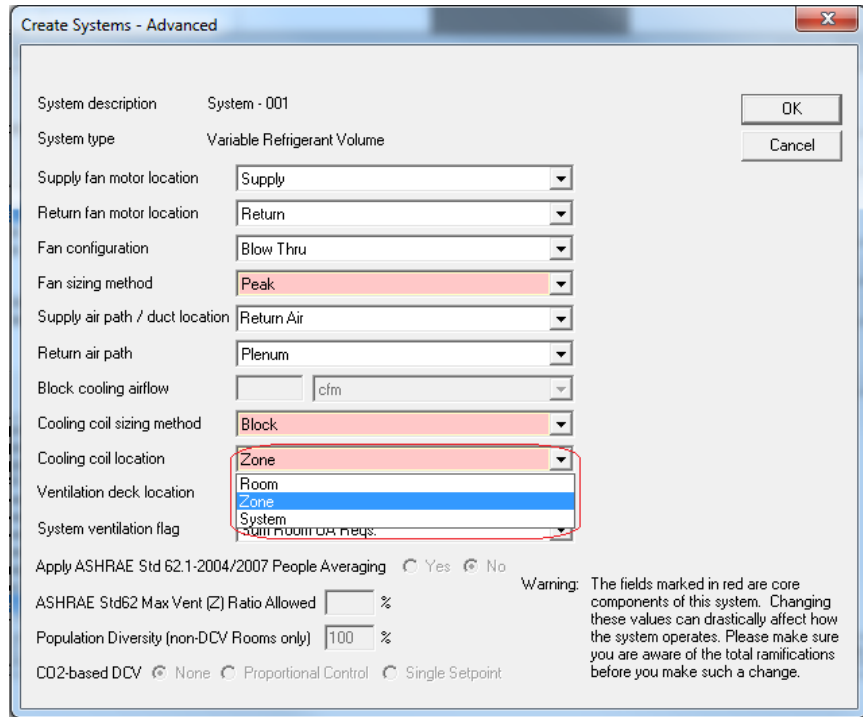


**System Selection**

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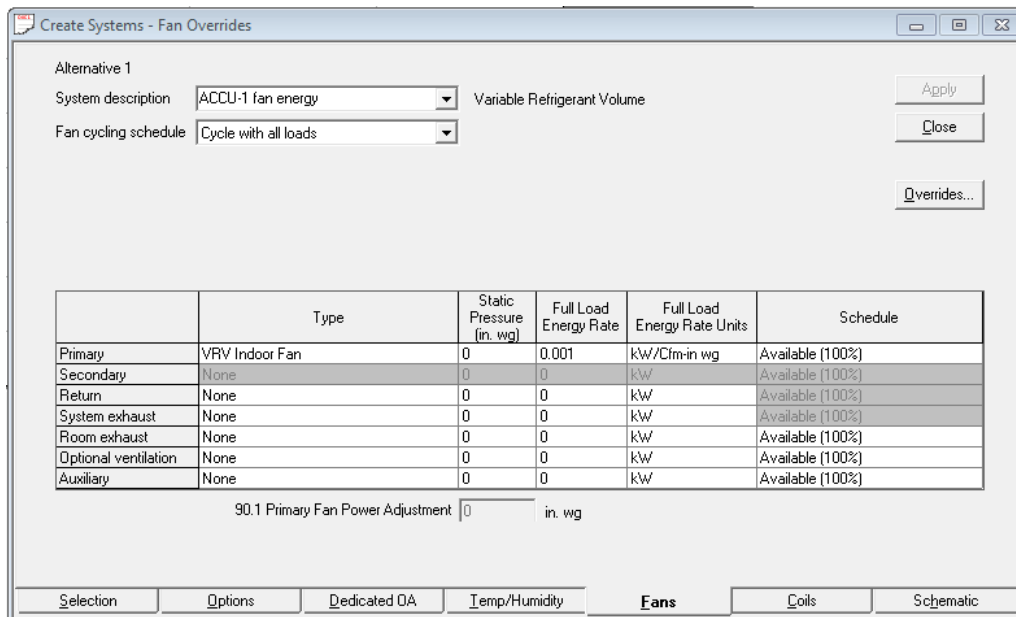
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### Advanced Options

For purposes of modeling fan energy consumption, either a full load energy sum or a weighted-average full load energy rate should be used for the system-level fan. This value is entered for each System on the *Fans* tab of the System menu.







### System Level Fan Power Input

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For non-ducted fan coils, the full load energy rate can be entered directly in the form of a full load energy **sum** [kW] basis. For example:

Fan Coil		Nominal Tonnage	Power Input
	FXAQ18PVJU	1.5 ton	33 W
	FXAQ24PVJU	2 ton	50 W
	FXAQ18PVJU	1.5 ton	33 W
	FXAQ12PVJU	1 ton	30 W

The System fan power input would be modeled directly as the sum of the indoor individual fan power inputs, 146W.

For ducted fan coils, the **weighted-average** energy rate should be entered in on a [kw/cfm\*in.w.g.] basis, and an average design static pressure should be entered.

Fan Coil		Nominal Tonnage	Power Input	Nominal CFM	Nom. Static Pressure	Full Load Energy Rate
	FXMQ18PVJU	1.5 ton	214 W	635 cfm	0.8 in.w.g.	0.000421 kW/cfm*in.w.g.
	FXMQ24PVJU	2 ton	229 W	688 cfm	0.8 in.w.g.	0.000416 kW/cfm*in.w.g.
	FXMQ18PVJU	1.5 ton	214 W	635 cfm	0.8 in.w.g.	0.000421 kW/cfm*in.w.g.
	FXMQ12PVJU	1 ton	84 W	335 cfm	0.8 in.w.g.	0.000313 kW/cfm*in.w.g.

The weighted average could then be determined by:

$$\frac{(0.000421 * 1.5) + (0.000416 * 2.0) + (0.000421 * 1.5) + (0.000313 * 1)}{6}$$

$$= 0.000401 \text{ kW/cfm*in.w.g.}$$

In the case where both ducted and non-ducted units are used on the same system, it is recommended that the sum of individual fan power inputs is used, similar to using only non-ducted indoor units.

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**Plant Creation Details:**

Each outdoor unit should be simulated with an individual Plant in TRACE. Once the *VRV\_PB.EXP* library has been imported into TRACE, the Plant for each VRV system can be created simply by selecting the appropriate outdoor unit under the *Create Plants* menu.

The user must first select *Air-cooled unitary* as the Category. The various VRV libraries will then be visible as *Equipment Type*.

A separate heating plant must also be created. Any heating load that is not capable of being satisfied by the heat pump capacity will be assigned to the heating plant. This is useful in determining the energy consumption of an additional heat source (i.e. electric, hot water, etc.).

**Operating mode**

Operating mode	Capacity	Energy rate
Cooling	288 Mbh	23.6 kW
Heat recovery	324 Mbh	25.4 kW
Tank charging	tons	kW/ton
Tank charging & heat recovery	tons	kW/ton

**Pumps**

Pumps	Type	Full load consumption
Primary chilled water	None	0 ft water
Condenser water	None	0 ft water
Heat recovery or aux condenser	None	0 ft water

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