

Verification Requirements for VRF/VRV Condenser Systems.

Variable refrigerant flow (VRF) systems, also known as Variable refrigerant volume (VRV) systems, can be configured to allow a single outdoor condensing unit to simultaneously drive multiple indoor evaporator coils serving either ducted and/or un-ducted zones. A common example of VRF systems are 'mini-split' systems. The following clarification applies only to VRF condensers driving multiple indoor coils.

Compliance criteria (pass/fail targets) for HERS verification of Airflow/Fan-Efficacy are based on the condenser capacity (tonnage) but currently the Efficiency Standards do not define how that capacity would be divided among multiple ducted zones connected to the same condenser. Similarly, there is no direction in the Standards as to how the 'Cooling Estimate' of system airflow used for duct leakage calculations would be applied to a VRF system with multiple zones.

Therefore, based on a clarification received from the CEC, when a VRF condenser serves more than one zone and at least one of those zones is ducted the following requirements will apply.

Airflow/Fan-Efficacy – HERS Verification shall be exempt for VRF condensers connected to multiple indoor coils/zones. Note: VRF condensers attached to a single ducted indoor coil are not exempt.

Duct leakage – HERS verification of each ducted zone is required. For each ducted zone, the target duct leakage rate shall be based on the measured airflow of that zone per RA3.1.4.2.3 - Measured System Airflow. The cooling estimate based on condenser capacity defined in RA3.1.4.2.2 - Nominal Air Handler Airflow shall not be used.

Refrigerant Charge Airflow – When required, refrigerant charge verification of VRF condensers can only be performed by means of Rater Observation of the Installer's Weigh-in Method. Ducted zones of VRF condensers attached to multiple coils shall be exempt from the minimum airflow requirements.

Entering VRF Systems in the Registry

Alterations – CF1R-ALT-02 (HVAC only)

- A separate project in the registry will be created for each VRF condenser attached to multiple coils. On Step 1 of creating the project the user shall indicate that this is a VRF condenser attached to multiple coils and the number of systems will be based on the number of indoor coils.
- The registry will automatically exempt the Airflow/Fan-Efficacy verification from any ducted zones and assign refrigerant charge, if applicable for the climate zone, to the 'first' system in the project.
- When completing the CF2R-MCH-01, the user will duplicate the condenser information (make, model, S/N) for each 'system'.

New Construction – CF1R-PRF

- VRF systems should be modeled as a standard, ducted split system. If Ducts in Conditioned Space is claimed it must be applicable to all of the zones served by that condenser.
- From the Systems Names tab on the CF1R page the user shall clone additional systems to match the number of indoor coils attached to the VRF condenser. User defined names should distinguish ducted from un-ducted zones. This step must be completed before starting any CF2R's.
- User will be able to adjust each 'system' when completing the CF2R-MCH-01 to indicate whether it is ducted or un-ducted and to exempt ducted systems from the Airflow/Fan-Efficacy verification.